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Liquidity and Dividend Policy: International Evidence

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Abstract

Since the days of Miller and Modigliani, academics have been studying dividend policy. There have been many theories as to why companies declare dividends, under what circumstances investors may prefer dividends to other forms of compensation, and factors that cause dividends to rise. However, the concept of liquidity has until very recently been largely ignored. This paper examines liquidity and dividend policy on the international level to determine what relationship the liquidity of a firm's stock has on the decision of how much dividend to disburse to investors. It finds that in several specific cases, there is an inverse relationship between stock liquidity and the dividend amount paid. This perhaps would point to dividends indeed at times compensating for lower stock liquidity.

Keywords: Liquidity, Dividend policy, International

JEL Classification: Market Efficiency

1. Introduction

Dividends, since the days of Miller and Modigliani, have been a topic of widespread research in academia and debate among practitioners. Dividends provide a "reward" in a sense to investors who have taken a risk by investing in the stock of a certain company. Income that is earned by the company is distributed to shareholders, and frequently increases over time. They are normally paid on a consistent basis, such as quarterly. Companies that have a record of paying dividends are usually traded at a premium versus those that do not. Investors in the company are thus provided cash flow without having to sell shares; therefore, traditionally, companies paying relatively high dividends have been purchased by those on a fixed income. Managers base current dividend levels on past dividend levels and current earnings and prefer dividends to be stable over time (Lintner, 1956).

Firms have several options when deciding what to do with net income. It can be distributed as dividends, but it also can be held as retained earnings or used to repurchase company equity shares in the secondary market. The company's decision of which option is preferable depends on several factors, one of which is the future prospects that the firm has. The common assumption is that if a company has many projects in mind for future growth, dividends will be held to a minimum or not paid at all. If the company does not have many projects in mind for the near future, the current revenue is more likely to be paid out to shareholders.

1.1. Expectations

Additionally, the expectation by investors of whether or not a firm will be paying dividends is of utmost importance. In other words, if a firm has a strong record of paying dividends (perhaps even increasing dividends over the years), then a sudden reversal of dividend policy will normally be detrimental to the stock price, at least in the short term (although theoretically, these funds would be reinvested in the form of retained earnings and ultimately lead to a higher share price). Thus, it is imperative that a firm give a clear indication of dividend policy and that dividends be predictable.

2. Liquidity and dividends

According to Miller and Modigliani, investors should be indifferent as to whether or not they receive dividends now or capital appreciation in the future, an idea known as the Dividend Irrelevance Theory. According to these authors, an increase in current dividends must lead to a reduction in the terminal value of the existing shares because the dividend stream on the existing shares must be diverted to attract outside capital from which higher future dividends are paid (1961). Although this theory is one of the most central theories of finance, their theory assumed that markets are frictionless and that there would be no direct or indirect costs of trading. The fact that trading friction is pervasive in financial markets leads one to believe that the more liquid a stock is the better and that investors do indeed have a dividend preference based on the liquidity of the stock (Banerjee et al, 2007). Stocks that pay dividends satisfy investors' need for liquidity. This is even more important for stocks that

are thinly traded, for which investors may either have to wait a long time for a buyer and/or take a potentially lower price. Although the possibility of a link between liquidity and dividends dates back to Miller and Modigliani (1961), there is very little direct empirical evidence on the issue.

Liquidity is a relatively broad concept which in this case refers to the ability to trade large volumes quickly, at low cost, and without moving the price. Liquidity affects the attractiveness of a stock to investors. Investors may require higher expected returns on assets whose returns are sensitive to liquidity. Local market liquidity is also an important driver of returns in emerging markets (Bakaert et al, 2007). According to Graham et al, liquidity deteriorates before (after) anticipated (unanticipated) announcements (2006). This is applicable to emerging markets in the sense that emerging markets and economies are normally viewed as more volatile than that of the U.S. and other developed markets, with economics and/or political news leading to large swings in liquidity.

Publicly traded companies are not paying dividends as frequently as they did in the past, falling from 66.5% of firms in 1978 to 20.8% of firms in 1999. This is attributable to several factors, such as a multitude of new listings, the increasing proportion of small firms with low profitability, and strong growth opportunities. However, dividend payers have a higher measured profitability and are larger than non-payers (Fama and French, 2001). According to Banerjee et al, firms with lower trading volume and a higher proportion of non-trading days (variables representing illiquidity) are more likely to pay dividends (and vice versa). The authors perform several tests, among which are share turnover to dividends and firm characteristics to dividends, with all of them seeming to confirm an inverse relationship between liquidity and the likelihood that dividends will be paid (2007). Additionally, an increase in liquidity effectively expands the set of positive Net Present Value projects a firm may undertake because it reduces the cost of capital (Becker-Blease et al, 2006). This would also tend to confirm an inverse relationship between liquidity and dividends because the more liquid a firm's stock, the more a company would be able to invest in positive NPV projects, thus decreasing the amount paid out in dividends.

3. Liquidity and dividends in international firms

The previously described studies all indicate that many firms are less likely overall to pay dividends now, especially if the stock is considered more liquid. Presently, however, the body of research on liquidity focuses on the United States, perhaps the most liquid market in the world. The U.S. market is not only much more prolific in number of traded securities, but also has an exceptionally diversified ownership structure. These characteristics are lacking in emerging markets, and may strengthen the liquidity effects (Bakaert et al, 2007). Additionally, according to Chuhan, lack of liquidity in international markets (especially emerging markets) is one of the main impediments to foreign investors' investing funds into these areas (1992). Additionally, in many emerging economies, the state has had a long history of involvement in corporate affairs, thus differentiating them even more from developed country based firms. Therefore, this study will take an international approach to liquidity, focusing on several international countries/regions to more closely ascertain the relationship between a firm's stock liquidity and dividend amounts paid. Given the differing levels of liquidity, history of government involvement and type of ownership structure between U.S. companies and international companies, as well as the dearth of research regarding liquidity on an international level, the research question is the following:

Given the differing company fundamentals, government involvement, and other macro and micro factors, what is the relationship between dividends and liquidity on an international level?

3.1. Canada

In Canada, agency problems seem to exist due to the relative scarcity of widely held corporations and the predominance of a family-controlled pyramid type structure. According to Attig, only 27.66% of Canadian firms are widely held, as compared to 40.26% of U.S. firms. Beyond this, he shows that multiple class shares and control pyramids are much more pronounced in Canada and that family management is present in approximately 70% of the analyzed firms. All of these factors are more apt to lead to asymmetric information, agency problems, and corporate diversions (2005). La Porta et al confirms that both large and small Canadian firms are less widely held, more family held, and more pyramidal than their U.S. counterparts (1999). According to Baker et al, there is a striking difference between ownership concentration between U.S. and Canadian firms in the sense that ownership of Canadian firms is highly concentrated and that a small group of large blockholders is the dominant form of ownership (2007).

According to Minh, the Toronto Stock Exchange (Canada's largest exchange) follows an upward trending intraday pattern, with volume low at the open, stable during the day and increasing at close (2007). The Canadian stock market, although relatively well developed when compared to other stock markets of the world, is much smaller than the NYSE or AMEX and thusly less liquid. However, as would be expected, Canadian

dividend-paying firms are significantly larger and more profitable than non-dividend-paying firms, have greater cash reserves and fewer growth opportunities. (Baker et al, 2007).

3.2. Latin America

In general, liquidity in Latin America is very thin. There are only 7 listed firms per one million people in this region compared to 30 per one million in the U.S. Adding to the lack of liquidity is the fact that much of many companies' shares rests in the hands of a very concentrated group of shareholders or families. This generally leads to a misalignment of goals between the majority and minority shareholders (Santiago-Castro and Brown, 2007). Much of this can be traced back to the type of legal system Latin America initially adopted and has developed over the years. The Latin American legal system is based on French civil law, which traditionally has had weaker investor protection and less developed capital markets when compared to common law countries (La Porta et al, 1997).

For example, according to LaPorta et al, Mexican firms tend to be very family oriented, and thus very closely held (2000). Approximately 79% of all companies in the country are classified as family-owned (Santiago-Castro and Brown, 2007). Brazil has a history of state intervention in economic affairs across many industries and many of these, such as telecommunications, mining and petroleum have received state incentives and subsidies over the years. Additionally, the state has worked in partnership with local business groups (all family owned and operated), thus creating a system whereby a privileged few have close connections to the state. Thus, the state has traditionally been the predominant ultimate owner, followed by families (with a dominant shareholder or group of shareholders) and multinational subsidiaries. In fact, approximately 43% of all businesses in the country are classified as family owned (Santiago-Castro and Brown, 2007). Although this very concentrated ownership structure has changed somewhat over the last decade or so, it still remains relatively quite concentrated (Rabelo and Vasconcelos, 2002). In Argentina, the Buenos Aires Stock Exchange was founded in 1854, with the Merval being the most important index (www.merval.sba.com.ar). Despite this long traditional of stock trading, company power tends to be concentrated in family and state hands (La Porta et al, 1999).

3.3. Other country exchanges

The Australian, British and Hong Kong markets are all very liquid. The ASX (Australia) exchange is one of the world's top ten listed exchange groups as measured by market capitalization (www.asx.com.au). The London Stock Exchange is one of the world's oldest and lists over 2800 companies with a market capitalization of over £3.5 trillion. It is considered Europe's most prestigious listing venue (www.londonstockexchange.com/en-gb/about). As of year end 2006, the Hong Kong Exchange boasted a market capitalization of over HK\$13 trillion, placing it 6th among members of the World Federation of Exchanges. It also ranked 3rd by total equity funds raised and 2nd by new listings raised (Hong Kong Exchange Fact Book, 2006). According to LaPorta et al, large publicly traded firms tend to be very widely held in Australia and Britain, while highly family held in Hong Kong (1999). In fact, Hong Kong is not only characterized by concentrated family-shareholdings, but by low corporate transparency and no tax on dividends (Cheng et al, 2007).

4. Methodology

This paper seeks to determine the relationship between the liquidity of a firm's stock (as measured by Share Turnover) and the amount of dividends paid. It will examine the international markets of Canada (Toronto Stock Exchange), Australia (ASX), Mexico (Bolsa de Valores), Brazil (Bovespa), Argentina (Merval), Hong Kong (HKE) and the United Kingdom (FTSE 100). The variable of Share Turnover (shares traded/shares outstanding) will be used as the sole independent variable while Dividends per Share is the dependent variable. To begin, companies will be run according to the entire range of sample data, followed by sub-periods. The regression is then run again with companies sorted first by Market Capitalization and then by Earnings per Share to isolate any effect that these characteristics may have. The simple (linear) regression can be expressed in the following manner (with a negative relationship expected between the independent and dependent variables):

$$\text{Div} = \alpha - \beta_1 \text{Turnover} + \varepsilon$$

The time periods used are generally from 1988 to 2006, although in the case of Canada data from as far back as 1975 was used. Data was collected on a monthly basis from Compustat North America and Compustat Global. Sample sizes range from 21 firms (Argentina) to 249 firms (Canada), with an average being 92 for a given country. Variables have been selected based on Banerjee et al's study (with the exception of several variables which were not available).

Liquidity is extremely difficult to measure. Although the availability of detailed microstructure data is widely available for the U.S., such data as absolute and proportional bid-ask spreads, quoted share and dollar depth are not available for many other markets, especially emerging markets (Bakaert et al, 2007). Therefore, a relatively general variable for liquidity (Share Turnover) is used in this study for which data is available for the countries in question. Despite its general nature, however, Share Turnover is commended for its empirical and theoretical proximity toward expressing liquidity (Banerjee et al, 2007).

The stock markets in these seven countries are relatively small and illiquid (some much more so than others). Also, differences in ownership structure and corporate governance as explained in the previous section could have an impact on liquidity and dividend strategy, thus making the international question an interesting one. Again, the purpose of this study is to obtain a preliminary view of the relationship between dividends and liquidity on an international level.

5. Results

The following are the results from the linear regression analyses. In Table 1, overall results are presented for each of the seven sample countries regarding Share Turnover. In Table 2, time has been divided into two subperiods to capture any effect that economic instability and market liberalization during the 1980s and 1990s may have caused, once again examining Share Turnover. Although several countries in Tables 1 and 2 showed statistically significant relationships between liquidity and dividends for either the overall time period or a subperiod, Mexico and Canada stand out as demonstrating the anticipated negative relationship.

INSERT TABLE 1 HERE

INSERT TABLE 2 HERE

In Table 3, the sample countries are classified according to Market Capitalization (a proxy for size). This is done to determine if the relationship of liquidity with dividends varies according to a firm's size. Brazilian and Canadian companies considered to have low Market Capitalization display a statistically significant inverse relationship, as do medium sized Canadian companies. It is noteworthy, therefore, that this statistically significant relationship between dividends paid and liquidity occurs most in smaller companies. This perhaps would support the idea that smaller companies feel the investors' need for liquidity more acutely than larger companies.

INSERT TABLE 3 HERE

In Table 4, sample countries are sorted according to Earnings per Share (a proxy for firm profitability). The only relationship of interest is the Low EPS Canadian firm grouping. This could perhaps support the above table as well and the idea that smaller/less profitable companies should perhaps be more aware to investors' liquidity requirements.

INSERT TABLE 4 HERE

Thus, taking the preceding tables together, it appears that there is a strong inverse relationship between share turnover and amount of dividends paid for several countries, most notably Mexico, Brazil and Canada (three countries in which liquidity has traditionally been somewhat lacking). Further research will need to be done to determine why exactly the relationship holds better in some countries than in others. However, if one were to look for a common thread, it would appear that stock markets that are more closely tied to those of the U.S. tend to exhibit a negative relationship between share liquidity and dividends paid to a greater degree than countries that have lesser ties with U.S. stock markets. Savvy investors from these countries may be willing to quickly abandon their own countries' stocks for those of the U.S. if not provided the desired liquidity.

6. Conclusion

Stocks that pay dividends satisfy investors' need for liquidity. This is even more important for stocks that are thinly traded, for which investors may either have to wait a long time for a buyer and/or take a potentially lower price. In the event that a stock is illiquid, a dividend provides an income stream that otherwise may be out of reach. For a liquid stock, on the other hand, an investor can create artificial dividends by selling a portion of the stock quickly, with fewer transaction costs, and possibly a higher price. In this study, the idea of an inverse relationship between dividends and stock liquidity on an international level has been examined. The international question is a valid one because liquidity is low compared with that of the U.S., especially in emerging markets. This study examined seven countries (a mix of developed and developing countries) and found that in several cases there exists an inverse relationship between stock liquidity and dividends paid, especially in smaller/less profitable firms. It also appears that countries whose stock markets have closer ties to the U.S. stock market may

exhibit this relationship to a greater degree than those with lesser ties. More research will need to be done to determine if indeed this is the case. A policy implication for managers (both domestic and international) could include being aware of the particular company's size and profitability when setting dividend policy. If it is lower, it is perhaps wise to begin or continue to pay dividends. This perhaps would bolster investors' confidence in the company and create a tangible economic incentive for the investor to not abandon the stock.

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Table- 1. Share Turnover (Full Time Period)

Country	Year	β	t-stat	Sig.
Argentina	1988-2006	0.003	0.163	0.871
Australia	1988-2006	0.058	2.506	0.012**
Brazil	1990-2006	0.003	0.392	0.695
Britain	1988-2006	0.037	5.147	0.000***
Canada	1975-2006	-0.011	-0.703	0.482
HK	1988-2006	0.000	0.008	0.994
Mexico	1988-2006	-0.021	-1.730	0.084*

*** = significant at the 1% level

** = significant at the 5% level

* = significant at the 10% level

Table- 2. Share Turnover (Subperiod Results)

Country	Year	β	t-stat	Sig.
Argentina	1988-1997	-0.010	-0.388	0.698
	1998-2006	-0.002	-0.072	0.943
Australia	1988-1997	0.023	0.845	0.398
	1998-2006	0.118	3.845	0.000***
Brazil	1990-1998	0.016	1.329	0.164
	1999-2006	-0.005	-0.539	0.590
Britain	1988-1997	0.068	6.186	0.000***
	1998-2006	-0.002	-0.154	0.878
Canada	1975-1990	-0.066	-1.775	0.076*
	1991-2006	-0.014	-0.778	0.437
HK	1988-1997	-0.009	-0.575	0.565
	1998-2006	0.000	0.008	0.994
Mexico	1988-1997	-0.040	-1.906	0.057*
	1998-2006	-0.012	-0.767	0.443

*** = significant at the 1% level

* = significant at the 10% level

Table- 3. Share Turnover (Classified by Market Capitalization)

Country	Market Cap	β	t-stat	Sig.
Argentina	High	-0.017	-0.437	0.662
	Med	0.011	0.124	0.901
	Low	-0.005	-0.129	0.898
Australia	High	0.012	0.465	0.642
	Med	-0.020	-0.505	0.614
	Low	-0.086	-1.407	0.159
Brazil	High	-0.001	-0.101	0.920
	Med	0.002	0.061	0.951
	Low	-0.225	-9.656	0.000***
Britain	High	-0.003	-0.213	0.831
	Med	0.004	0.093	0.926
	Low	0.077	3.850	0.000***
Canada	High	0.049	1.337	0.181
	Med	-0.083	-1.854	0.064*
	Low	-0.091	-2.744	0.006***
HK	High	0.028	1.043	0.297
	Med	0.002	0.066	0.947
	Low	-0.001	-0.056	0.956
Mexico	High	-0.026	-1.242	0.214
	Med	-0.136	-0.581	0.562
	Low	-0.003	-0.131	0.896

*** = significant at the 1% level

* = significant at the 10% level

Table- 4. Share Turnover (Classified by Earnings per Share)

Country	EPS	β	t-stat	Sig.
Argentina	High	-0.002	-0.087	0.931
	Med	-0.009	-0.262	0.793
	Low	-0.001	-0.021	0.983
Australia	High	-0.015	-0.698	0.485
	Med	-0.006	-0.164	0.870
	Low	-0.141	-0.878	0.380
Brazil	High	-0.001	-0.113	0.910
	Med	-0.011	-0.886	0.376
	Low	-0.001	-0.042	0.967
Britain	High	0.004	0.145	0.885
	Med	0.002	0.160	0.873
	Low	0.107	8.199	0.000***
Canada	High	0.080	2.689	0.007***
	Med	0.005	0.180	0.857
	Low	-0.090	-3.529	0.000***
HK	High	-0.009	-0.557	0.578
	Med	-0.014	-0.658	0.510
	Low	0.000	-0.032	0.975
Mexico	High	-0.016	-0.769	0.442
	Med	-0.025	-1.058	0.290
	Low	-0.030	-1.108	0.268

*** = significant at the 1% level

Technical Efficiency of the Malaysian Wooden Furniture Industry: A Stochastic Frontier Production Approach

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Abstract

Wood furniture industry is an important component in our manufacturing sector for it significantly contributes to the industrialization of Malaysia's economy. Evaluating wood furniture industry's level of efficiency is important to assist and provide a relative direction to small and medium firms on their business. The objective of this research is to examine the efficiency of wooden furniture industry by determining the technical efficiency using stochastic frontier production model. Results show that firm output is 54 per cent less than the maximal output which can be achieved from the existing inputs. The technical inefficiency on individual firm varies from 1.63 to 94.69 per cent and so does the potential to increase firm output from the existing inputs. This evidence suggests that many firms still operate below the efficiency level, confirming the conventional view that labor-intensive firms are most likely inefficient.

Keywords: Technical efficiency, Stochastic frontier model, Wooden furniture industry

1. Introduction

The furniture sub-sector is largely export-oriented, with more than 90 per cent of its production exported. In 2005, wooden furniture contributed 27.8 per cent to the total export earnings in the industry exceeding RM5.8 billion. Malaysian furniture was exported to more than 160 countries. Apart from the traditional markets, comprising the USA, Japan, the United Kingdom (UK) and Australia, exports of Malaysian furniture had diversified into non-traditional markets, such as South America, West Asia, Africa, Russia and the Association of Southeast Asian Nations (ASEAN). The furniture industry in Malaysia is dominated by small and medium firms, labor-intensive and employing low level automations. The feature of this industry is normally linked to low efficiency. This paper attempts to examine the efficiency of the wooden furniture industry, namely the technical efficiency.

The efficiency term describes the maximum outputs attainable from utilizing the available inputs. A production is efficient if it cannot improve any of its inputs or outputs without worsening some of its other inputs or outputs. Efficiency can be increased by minimizing inputs while holding output constant or by maximizing output while holding inputs constant or a combination of both may increase efficiency.

Several empirical studies using frontier function methodologies have been undertaken with the purpose of measuring firm efficiency but with different results. These differences may have been the results of numerous reasons, including the time period analysed, the degree of sample homogeneity, output aggregation and the method employed (Neff *et al.*, 1991). For example, Bravo-Ureta and Rieger (1990) examine New England and New York farm efficiency using four production frontier methods. The results of their analysis show that, while large differences exist between estimated average firm efficiency ratios, all four sets of efficiency ratios are correlated within two time periods.

Farrell's works directly measure the technical efficiency with linear programming techniques that simultaneously estimate the production frontier. To estimate the deterministic frontier production function by Farrell (1957), which provides the upper bound of output levels at all combination of inputs, was followed by the works of Aigner and Chu (1968), Timmer (1970), Arfiat (1972). Richmond (1974) and Schmidt (1976) first use mathematical programming techniques, both parametric and non-parametric, and then the econometric approach to measure technical efficiency. Measuring technical efficiency of firms by estimating frontier models is the latest econometric method developed.

The stochastic frontier production function (SFPF) was independently proposed by Aigner *et al.* (1977). This differs from the traditional (average) production function in that its residuals have two components: one to account for technical inefficiency and the other to permit random events that affect production. Many authors have altered and generalized the original specification of the SFPF. Forsund *et al.* (1980), Schmidt (1986), Bauer (1990) and Battese (1992) provide excellent surveys of the literature on frontier analysis.

In this paper, we used the stochastic frontier production function proposed by Battese and Coeli (1992), which followed the models developed by Aigner *et al.* (1977), and Meeusem and van den Broeck (1977). The advantage of using the stochastic production frontier model is to introduce a disturbance term representing noise, measurement error, and exogenous shock beyond the control of production unit in addition to the efficiency component. The maximum likelihood estimation procedure was employed to obtain parameter estimates. In this study, a Cobb-Douglas stochastic frontier production function is estimated using data from 511 furniture manufacturing industries in Malaysia for the year 2005.

2. Literature Review

The parametric approach of benchmarking also includes the stochastic frontier approach (SFA). SFA differs from simple regression analysis in many aspects. For example, whereas simple regression uses ordinary least squares to find the best fit of the average cost function, SFA uses mainly what is called “maximum likelihood” estimation techniques to estimate the frontier function in a given sample.

In addition, SFA separates error components from inefficiency components. In particular, it requires separate assumptions to be made to the distributions of the “inefficiency” and “error” components, potentially leading to more accurate measures of relative efficiency. SFA uses available data in order to estimate the cost function of a relatively efficient firm — known as the “frontier”. This function is assumed to be common for all firms and is used to obtain measures of inefficiency.

SFA has the advantage – compared to non-parametric techniques, such as DEA – that it can provide some statistical inference to the functional form of the frontier and the significance of individual explanatory factors upon the shape of the frontier. In addition, since the method uses maximum likelihood estimation, there is no guarantee that the final estimators will hold any desirable statistical properties (unbiasedness, efficiency, consistency) in small samples. Unfortunately, it is difficult to define a clear-cut sample size which inferences become problematic as this will ultimately depend on the quality and nature of the data, the number of explanatory variables and the estimation procedure being followed.

There are vast notable analytical studies of technical efficiency using SFA in manufacturing firm across countries. There are various factors that contribute to technical inefficiency e.g., socio-economic, demographic and regional responsible for technical efficiencies to be different across provinces. In Heru and Subhash (2004) study, the factors considered are: inflation, mean years of schooling, regional location, and sectoral differences. In twenty out of twenty-six provinces the TFP growth was driven by efficiency changes while in four provinces the TFP growth was driven by technological progress.

Most empirical studies concentrate on technical inefficiency since technical inefficiency happens to be an important source of underperformance. Technical inefficiency also embodies all the managerial and organizational sources of inefficiency, what Leibenstein (1966) refers as X-inefficiency. The allocative efficiency of an organization is a comparative measure of how well its prices are according to its marginal productivity. As a conclusion, allocative efficiency relates to prices while technical efficiencies relates to quantities. When comparing between allocative and technical efficiency, it determines the degree of total economic efficiency. Thus when a firm uses its technical resources completely and efficiently, then it can be said to have achieved total economic efficiency. Similarly, when either allocative or technical inefficiency is present, the organization will be operating at less than total economic efficiency; Worthington (2004).

Nik Hashim and Basri (2004) measured (TFP) growth of Malaysian manufacturing sector using stochastic frontier approach with translog production function. They found that between 1990 and 2000 TFP growth was very low for some industries at below unity or even negative for E&E, transport and food industries. The positive growth is achieved in chemical, textiles, rubber, petroleum and wood. However, this study found that technical efficiency was a major contribution of Total Factor Productivity (TFP) growth.

Study by Yanrui (2000), using the stochastic frontier approach showed that TFP growth was positive for all countries. This study includes seven APEC developed countries and nine APEC developing countries and found that APEC developed countries performed better in terms of TFP growth contribution. Mahadevan (2001) however, studied TFP growth using the Malaysian Manufacturing Survey data of 1981-1996. She divided the data into three periods namely 1981-1984, 1987-1990 and 1991-1996. She found that the contribution of input

has increased overtime but the contribution of TFP growth was negative in the last two periods due to different reasons. During the second period, the negative contribution of TFP growth was due to a negative contribution of technical progress, whereas during the third period it was due to a negative change in technical efficiency.

Sharma, et al. (2003) estimated technical efficiency and total factor productivity growth in fifty U.S. states from 1977 to 2000 and found that, on average, technical efficiency is around 75%. Other studies on regional technical efficiencies that use different methods include Osiewalski, et al. (2000) and Maudos et al. (2000). Osiewalski et al. (2000) examined productivity disparity between Poland and other Western economies using a Bayesian stochastic frontier. They claimed that at the beginning of Poland's reform its economy exhibited low technical efficiency. Maudos et al. (2000) employed Data Envelopment Analysis to estimate efficiency in Spanish regions using panel data from 1964 to 1993 and they observed that efficiency varies across sectors and time.

2. Methodology

A stochastic frontier production function as proposed by Battese and Coelli (1992) is defined as:-

$$Y_i = f(X_i, \beta) \varepsilon_i \quad (1)$$

Y_i is the output vector for the i^{th} firm, X_i is a vector of inputs, β is a vector of parameter and ε_i is an error term. In this model, a production frontier defines output as a function of a given set of inputs, together with technical inefficiency effects. Furthermore, this model specifies that these inefficiency effects are modelled by other observable explanatory variables and all parameters are estimated simultaneously. The stochastic element of this model allows some observations to lie above the production function, which makes the model less vulnerable to the influence of outliers than with deterministic frontier models.

The stochastic frontier is also called *composed error* model, because it postulates the error term ε_i as two independent error components:

$$\varepsilon_i = v_i + u_i \quad (2)$$

When a symmetric component is normally distributed, $v_i \sim (N, \sigma_v^2)$, represents any stochastic factors that is beyond the firms' control affecting the ability to produce on the frontier such as luck or weather. It can also account for measurement error in Y or minor omitted variables. The asymmetric component, in this case distributed as a half-normal, $u_i \sim (N, \sigma_u^2)$, $u_i > 0$, can be interpreted as pure technical inefficiency. This component has also been interpreted as an unobservable or latent variable; usually representing managerial ability.

The parameters of v and u can be estimated by maximizing the following log-likelihood function:

$$\ln(Y \sim \beta, \lambda, \sigma^2) = \frac{N}{2} \ln \left[\frac{2}{\pi} \right] - N \ln \sigma + \sum_{i=1}^N \ln [1 - F(\varepsilon_i \lambda \sigma^{-1})] + \frac{1}{2\sigma^2} \sum_{i=1}^N \varepsilon_i^2 \quad (3)$$

Where,

$$\varepsilon_i = Y_i - f(X_i, \beta)$$

$$\sigma^2 = \sigma_u^2 + \sigma_v^2$$

$$\lambda = \sigma_u / \sigma_v$$

F = the standard normal distribution function

N = number of observation

Given the assumptions on the distribution of v and u , Jondrow *et al.* (1982) showed that the conditional mean of u given ε is equal to

$$E(u_i | \varepsilon_i) = \frac{\sigma_u \sigma_v}{\sigma} \left[\frac{f(\varepsilon_i \lambda \sigma)}{1 - F(\varepsilon_i \lambda \sigma)} - \frac{\varepsilon_i \lambda}{\sigma} \right] \quad (4)$$

where f and F are the standard normal density and distribution functions evaluated at $\varepsilon_i \lambda / \sigma$. Measures of technical efficiency (TE) for each firm can be calculated

$$TE_i = \exp(-E[u_i | \varepsilon_i]) \text{ so that } 0 \leq TE \leq 1 \quad (5)$$

The Cobb-Douglas stochastic frontier production function in logarithm form is as follows:

$$\ln VA_i = \ln \beta_0 + \beta_1 \ln C + \beta_2 \ln L_i + \beta_3 \ln E_i + \varepsilon_i \quad (6)$$

where VA represents value added (RM) per year. Independent variables are C (capital, RM), L (number of labour), and E (energy expenditure). Parameters β_0 denotes the technical efficiency level and β_i is elasticities of the various inputs with respects to output level. A summary of data used is presented in Table 1.

3. Results and Discussion

The empirical shown of the stochastic production frontier for the furniture manufacturing industries are presented in Table 2. For comparison purposes both the 'average' production function estimated using ordinary least square (OLS) and the frontier likelihood function are presented. All the coefficients have the expected positive signs implying that an increase in an input ultimately increases the output level. All variables in the stochastic frontier production functions are significantly different from zero at five and one per cent level. Summation of the elasticities of production indicates return to scale of 1.16 respectively for the 'average' production function and the stochastic frontier function. The value of return to scale greater than unity suggests that increasing return to scale is prevails. A one-percent increase in all inputs resulted in an increase of 1.16 per cent in output level for the stochastic frontier.

A direct comparison of the parameter estimated for the 'average' production function and stochastic function shows close similarity between the intercepts and inputs coefficients. As can be seen in Table 2, the intercept differences between the two production functions suggest the stochastic frontier functions represent neutral shifts from the 'average' production function. On the other hand, the slope coefficients which display slight differences between the two functions might be due to the inefficient estimates of OLS. Furthermore, by the specification of the likelihood function, the difference between the production function estimated by the OLS and frontier function can be statistically shown by the significance of λ , implying that there is a significant difference between the two production function.

The significance of the parameter λ is able to show that there is sufficient evidence to suggest that technical inefficiency is present in the data. As shown in Table 2, the estimates of the error variances σ_u^2 and σ_v^2 are 0.0885 and 0.0230 respectively. Therefore, it can be easily seen the variance of one-side error, σ_u^2 , is larger than the variance of random error, σ_v^2 . Thus the value of λ (i.e. $\lambda = \sigma_u / \sigma_v$) of more than one. This clearly shows the dominant share of the estimated variance of one-sided error term, u , over the estimated variance of the whole error term. This implies that a great part of the residual variation in output is associated with the variation in technical inefficiency rather than with 'measurement error' which is associated with uncontrollable factors related to the production process.

Following the Battese and Cora (1977), we can also estimate the total variation in output from the frontier that is attributable to technical efficiency using the parameter Ω , where $\Omega = \sigma_u^2 / \sigma^2$. Using this formula, it can be calculated that Ω is 0.9789. This means that about 98 per cent of the discrepancies between observed output and the frontier output are due to technical inefficiency. In other words, the shortfall of observed output from the frontier output is primarily due to factors which are within the control of the firms.

In Table 3, we presented the technical efficiency index using Jondorow et al (1982) procedure. The level of technical efficiency for each individual firm, e^{-u_i} , is calculated by estimating the one-sided error component u_i from equation (4). The minimum estimated efficiency is 1.63 per cent while the maximum is 98.76 per cent, and the mean level of technical efficiency is 34.53 per cent. According to Grabowski *et al.* (1990), a firm is considered technically inefficient even if the firm registered a technical efficiency index of 82 per cent. By this standard, therefore, the number of firms considered efficient technically is only 8.4 per cent of the total firms in the sample under study. Separating the composed error term of stochastic frontier model to estimate the level of technical inefficiency for a sample of furniture manufacturing industries in Malaysia, the analysis shows that, on average, there is 54.47 per cent technical inefficiency in the sample. This means that firm output is 54.47 per cent less than the maximal output which can be achieved from the existing level of inputs.

5. Conclusion and Policy Implications

The study has shown the furniture industry in Malaysia, despite being able to increase its production significantly over the years, produce at a low level of efficiency. This has resulted in an inefficient utilization of resources and so does the potential to increase firm output from the existing level of inputs. Through the effective use of existing inputs the firm value-added can be increased by almost 55 per cent at the aggregate level without any additional cost to the firms. In terms of value it can be translated to about RM2.4 billion loss due to inefficiency.

The study also revealed the technical inefficiency on individual firms varies, from 1.63 to 94.69 per cent. This is due to the structure of the industry being characterized as unorganized with a few large firms at one end and many small firms scattered at the other. Policy should be driven to consolidate the industry to reap the economies of scale used which will lead to more efficiency.

Finally, steps must be taken to increase the usage of technology in this industry, in order to improve the efficiency. Concurrently, the focus will be the quality of human resources and the policy accompanying it. Attempts to maximize production through improve in efficiency will not be achieved without the appropriate

skills of human resources.

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Table 1. Summary of Data Used

	Minimum	Maximum	Mean	Std. Deviation
Output (RM'000)	7.66	246128.62	12330.80	27458.54
Raw material (RM'000)	6.52	188883.20	7623.14	18246.71
Value added (RM'000)	1.14	81938.15	4707.65	9810.71
Capital (RM'000)	1.18	129759.40	4540.61	12000.51
Energy expenditure (RM'000)	0.26	3114.17	215.12	431.72
Numbers of labour	2.00	1424.00	116.36	182.18

Table 2. Empirical Estimates of Ordinary Least Square (OLS) and Frontier Production Function

Variables	OLS	Frontier
Intercept	7.2210 (0.2357)*	8.0461 (0.1533) *
ln C	0.0546 (0.0222) *	0.0591 (0.0153) *
ln L	0.8500 (0.0491) *	0.8512 (0.0268) *
ln E	0.2488 (0.0354) *	0.2521 (0.0173) *
R ²	0.9019	
$\lambda = \sigma_v / \sigma_u$		6.8172 (0.3832) *
$\sigma = \sqrt{\sigma_u^2 + \sigma_v^2}$		1.0452 (0.0312) *
σ_v^2		0.0230
σ_u^2		1.0693
Log-likelihood		-577.4416

Note: Figure in parentheses is standard error

* Significant at 1 percent level

Table 3. Firm Specific Technical Efficiencies in the Stochastic Production Frontier

Percent	Frequency	Percent
0.00 - 9.99	15	2.94
10.00 - 19.99	37	7.24
20.00 - 29.99	69	13.50
30.00 - 39.99	110	21.53
40.00 - 49.99	94	18.40
50.00 - 59.99	72	14.09
60.00 - 69.99	37	7.24
70.00 - 79.99	27	5.28
80.00 - 89.99	33	6.46
90.00 - 99.99	17	3.33
Total	511	100.00
Minimum		1.63
Maximum		98.76
Mean		45.53
Std. Deviation		21.35

Housing Crises: A Theoretical Study of the Home Building Industry in Nigeria

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Abstract

The paper examines the housing problems in Nigeria and the home building market on an international viability landscape with special references to the Nigerian housing sector. The paper creates a platform for a global building industry company that is well capitalized through a series of mergers and acquisitions (M&A). Furthermore, the emphasis on the establishment of a global building company is imperative because of its role in developing and emerging housing markets where home ownership has just commenced and mortgage financing is rare.

Keywords: Mergers & Acquisition (M&A), Housing Market, Mortgages, Developing & Emerging Markets.

Introduction/Overview

With the recent downturn of the housing market, most companies within the home building industry in the United States of America have either downsized, filed for bankruptcy merged/acquired (M&A) or a combination of all of the aforementioned. In developing countries like Nigeria, home ownership through mortgage financing is in its infancy. The global performance of the housing industry is mixed. North American markets have been hit hard with subprime lending and other practices that have led to the current debacle. The European market has been affected as well but unlike the North American market, the housing sector in Europe has maintained a sense of stability in terms of cost valuation.

In Nigeria and most developing and emerging countries there has historically been housing shortage. The federal government of Nigeria set out to build 121,000 units to curb the shortage (Ajanlekoko, J.S. 2001). In addition, the number of Licensed Primary Mortgage Finance Institutions (LPMFI) rose from 251 in 1993 to 276 in 1994. However, by the end of 1998, it declined to 115. In concert with the decline, the Federal Government capital expenditure on housing increased by over 500 per cent (CBN 1994 and 1998). Despite the push by the federal government for the construction of 121,000 units, it was reported that a little over 1000 units were completed. Without the formation of private home building companies the housing shortage will remain a major socio economic and financial constraint for these economies.

In terms of population, there are 3 major urban centers of Nigeria. Cities like Lagos, Port Harcourt and the federal capital Abuja are the most populated areas of the country. Lagos has an estimated population of 15 million residences of which about half make rent payments due to the staggering prices of homes. Since Lagos is Nigeria's most prosperous city, and much of the nation's wealth and economic activity are concentrated there, most residence endure the living conditions to seek job opportunities and economic stability. According to the 2006 census, Abuja has an estimated population of 1 million. In recent years more people migrate to the capital territory in search for housing and economic opportunities to no avail. As a result, these individuals manage to live with 3 to 6 other individuals per room. With no running water or steady electricity supply, the living conditions these individual face are bleak. Port Harcourt holds a population of roughly 8 million, of which 2 million reside in the urban center. Like the other cities, Port Harcourt faces the same harsh realities of inadequate housing.

The opportunity for a well capitalized home building company is present. In the major cities mentioned, an estimated supply gap of 6000 – 10000 thousand units is needed per annum in the near term to curb the housing shortage.

Furthermore, home ownership in Nigeria is dependent on ones liquidity. Commercial banks as well as its banking activities have been present since the country was under colonial governance. These institutions at the time primarily served the needs of commerce, prompting some growth in the commercial banking sector while the growth in savings and domestic financing of investments continued to remain dormant (Nubi, 2003). Arguably, some of the mitigating factors that have prevented developing nations like Nigeria to extend credit to potential home buyers can be linked to the ability of debt repayment by borrowers, and high interest rates extended to potential home buyers by the banking institutions to name a few.

Recently in the American Housing market Pulte merged with Centex. While Pulte executives dominate the roster of the newly merged Pulte, the company is adopting some of Centex's operating principles, including a push toward selling homes that are built to order, rather than speculative homes, because they tend to yield greater margins. The new Pulte is also moving toward Centex's cadence model of construction. This approach, which is essentially even-flow production, applies manufacturing techniques to home building, calling for a steady number of homes to be in various stages of construction at all times, smoothing the process, and creating savings through efficiencies (Burney, 2009). The merger of the two companies has created a stronger force that will be able to survive the downturn.

The researcher firmly believes that with the emergence of mortgage financing in Nigeria, various building companies should undergo (M&A) in order to have adequate capital and leverage to break into the developing and emerging markets. To that effect, it is important to note that in every business and financial crises, a niche market can be formed in order to sustain growth and profitability. Furthermore, the historic problems that have prevented developing and emerging countries from extending credit to home buyers will be explained. The researcher intends on accomplishing this by explaining the key factors such as: Debt repayment by borrowers, lack of home building companies, and the high interest rates by the banking institution. Lastly, a case is made for a global building company through (M&A).

Literature Review

Debt repayment by Borrowers:

The major issues that arise from the ability of one to pay back a home loan can be traced to the staggering cost of land in relation to wages and salaries, and transaction or origination cost associated with the loan agreement. Buckley (1989) opines in developing countries there is seldom mortgage credit extended to potential home buyers because of the high transaction cost associated with enforcing the contract. Where the reverse is the case for developed countries that is, mortgage credit is restrained by the cost of the post contract governance. Acquiring mortgage debt is an insidious problem in developing countries because of the imbalance of cost of building to an individual's earning power. Since the majority of the materials required in constructing a house are monopolized, these companies can fix the prices for the bricks, blocks and cement needed for construction. Furthermore, unlike developing countries, securing financing for a home is facile. In the United States for instance, a thorough background check is conducted. During this time the banks or mortgage companies run the personal information obtained from the applicant verifying income, place of employment, and place of residence to name a few. Once these items can be verified, the next step is computing the affordability factor. Some applicants are denied because they are over leveraged. That is to say the debt to income ratio is unfavorable. In the case of developing countries these steps can be replicated but should be strongly enforced if one defaults on a loan agreement.

Since there is an estimated 15 million residence in the aforementioned cities renting homes and apartments on a monthly basis, one begs to question why a home building company cannot build an affordable home for these individuals and in turn collect their monthly payments? After all, once you are done paying your mortgage you become the owner of the property to which you reside. While on the other hand there is no financial gain from making rental payments from the viewpoint of the renter.

Lack of Home Building Companies:

According to Nubi (2003), and Zubairu (2000), the absence of large real estate development companies with access to the relevant technology and financial muscle to develop cheap houses on a mass scale for the urban poor is a major setback in the housing delivery system. The lack of major developers has discouraged the development and local production of low cost building materials on a commercial basis. Nubi (2003) asserts that Cappa and Dalberto, solely own Oregon Clay Industry. Since the formation of these companies, a monopolistic market was created and the two companies have enjoyed profits since its inception. Consequently, the market created has not helped to reduce the prices which are supposed to be an alternative to cinder blocks. Currently in Nigeria, bricks are more expensive than blocks. The reliance of more builders on imported conventional building materials has led to high cost of construction, thereby compounding the problem of affordability (Nubi, 2003).

In lieu of major home building companies, the emergence of low skilled contractors has created a major problem for home owners during the process of construction. Researchers like Windapo (2000), Iyagba, & Asumo, (1997), and Odusami (1998) stated that the reliance on low skilled contractors and laborers alike is one of the major problems stifling progress in the home building industry in developing countries. For instance, if one decides to build a house in Nigeria, the probability of these individuals spending more money than budgeted is higher because of errors on the part of the construction workers. In some cases the errors may be from the design or foundation issues. In scenarios like this, the home builder would stop construction of the home and sue the

contractor hoping to recover the losses. On the other hand, if there were home building companies who have the resources to build the home, the burden would rest upon the company and not fall on the individual. After all, ownership does not transfer until the home is 100 per cent complete.

High Interest Rates:

Recently, Nubi (2003) enumerated the new structure for housing finance, in that framework came about the National Housing Fund (NHF) in 1992 which is a governmental agency established to provide loan financing to individuals. This institution can be directly compared to Fannie Mae of the United States. The NHF role is essentially to ensure a continuous flow of long term funding for housing development and to provide affordable loans for low income housing. Once this institution was formed, there came about the emergence of private mortgage companies. Despite the good intentions, Nubi (2003) asserts the technicalities and difficulties of releasing the loan to the mortgage institutions to lend to the public have not been properly implemented and as such most potential home buyers have been frustrated by the high interest rate and cost of funding. Without the steady stream of funds, most mortgage companies began raising the funds on their own by the way of deposits and savings and then pushing the burden on the potential home buyer.

In developed countries interest rates range from 4.75% to 7% on fixed term 30 year home loans, in contrast developing countries like Nigeria, interest rates are staggering. In most cases, the range is from 15% to 20% payable on a 5 year mortgage loan. Without proper systematic overhaul, the housing problems will continue without end in sight.

Definition

Mergers & Acquisition:

To enable home affordability in developing countries the researcher asserts a (M&A) is in order. A (M&A) can be explained as an aspect of corporate strategy, corporate finance and management dealing with the buying, selling and combining of different companies that can aid, finance, or help a growing company in a given industry grow rapidly without having to create another business entity (Depamphils, 2008). In the case of the home building industry, there has not been any multi - National home building Company formed. Although there have been numerous (M&A) transactions in the banking and investment sector as well as the manufacturing sector. To name a few, Heidelberg Cement group a building materials company based in Germany has been successful in the acquisition of several building company across continents. Lehigh cement and Hanson Aggregates is a couple of the North American acquisitions. Since every market is not the same, Heidelberg has been able to synergize and remain profitable in its separate entities around the world. With the global financial crises impact on the housing industry of many developed countries, many home building companies are finding it difficult to avoid bankruptcy. The merger of Pulte and Centex has created one of the biggest home building companies in the world. In the United States there are several home building companies who have been reporting staggering losses since 2007.

In the event of a merger Porter (2005) asserts that the determinant of a company's profitability is the attractiveness of the industry in which it operates. It is quite obvious that in Nigeria the demand for affordable homes are present, the major issues are financing and affordability. Some of the generic strategies highlighted by Porter are: cost leadership, differentiation strategy and focus strategy. As this pertains to the home building industry one may conclude that not anyone of these strategies will succeed in the long term alone. A combination of cost leadership and differentiation will aid in capturing majority of the profits in the global housing sector. According to Marcus (2005), the cost leadership strategy emphasizes efficiency. By producing high volumes of standardized products, the mergers of these companies may take advantage of economies of scale and experience curve effects. The product is often a basic no-frills product that is produced at a relatively low cost and made available to a very large customer base. Maintaining this strategy requires a continuous search for cost reductions in all aspects of the business. While on the other hand the differentiation strategy is aimed at the broad market that involves the creation of a product or services that is perceived throughout its industry as unique. Combining the two strategies can sustain growth in the long term for the global company.

Lastly, numerous articles have been published by researchers such as (Marcus, 2005; Porter, 1980; Porter 2005) to name a few in the management and financial literature on strategy and planning. The researcher believes that the market shares that can be captured by the global company through (M&A) are the low as well as middle class because these classes of people make up a greater number of the population of all African countries. In the interim, decision makers within the company should continuously monitor changes in the market in order to maximize the resources as well as new prospective home buyers.

The data on the figures below represents the economic pricing per square feet in Nigeria and the United States from 2000-2008. The Nigerian currency the "Naira" has been converted to present a concise comparison.

Based on the cost analysis, it is important to note that given the purchasing power of the American dollar and the increasing inflation issues affecting Nigeria and most developing countries, a well capitalized company will benefit vastly from the opportunity presented. Furthermore, the business model that will aid in the success of this endeavor is the loyalty business model which companies employ to generate loyalty to customers and other stakeholders. Focusing on the quality of product and service leads to customer satisfaction, which generally translates to customer loyalty and sustainable profitability. Dawkins & Reicheld (1990) elucidates that a 5% improvement in customer retention can cause an increase in profitability between 25% and 85% (in terms of net present value) depending upon the industry. The exponential increase in profitability can be linked to the following criteria;

1. Long term customers tend to be less inclined to switch and also tend to be less price sensitive. This can result in stable unit sales volume and increases in dollar-sales volume.
2. Long term customers may initiate free word of mouth promotions and referrals.
3. Long term customers tend to be satisfied with their relationship with the company and are less likely to switch to competitors, making market entry or competitors' market share gains difficult.

Recommendation/ Conclusion:

To recapitulate, in Nigeria and must developing countries, there is a stringent demand for home building companies who can build affordable homes for the individuals that seek them, and also provide financing for the loans. The home building company needed is not the typical builder whose role is merely building a house. In this case, the paper emphasizes the need for the formation of a multi – national company to carry out this project. The technologies and skilled labor shortage in these countries are limited and as such it is imperative that the formation of a global builder will aid in bridging the education and technological gap. Furthermore, since there is a problem with debt repayment by borrowers, reducing the cost of the home on the part of the new global company by using new materials and technologies will further curb the issue with affordability and debt repayment.

On that note the paper recommends the following actions must transpire.

1. A series of mergers of the home building industry in the United States, Asia, and Europe. Once the mergers have been accomplished, the new company that has emerged should move into the developing countries of Africa and acquire the smaller companies that are still operational. Doing so will create a sense of glocalization. That is, being global but acting local. The overall objective by these (M&A) is specifically intended for capital building and synergizing resources within the companies' structure.
2. The acquisition of the smaller companies in the developing countries will be beneficial in maneuvering and understanding the politics, zoning rules, and laws within the host country. Having employees that are familiar with the language of the people will also reassure the prospective home buyer that all business dealings are legitimate.
3. The built up capital by the new global building company will be able to secure and streamline the building processes of the home because each project is self funded. The cost of construction of homes in developed countries is significantly cheaper than that of undeveloped countries because of the varying materials used in the building process. For example, in the United States, the average timeframe for constructing a new home range from 3-6 months. While in developing countries like Nigeria it is difficult to complete a house in 1 year.

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Median Cost of Building a Home in Nigeria:

Year	Nigeria	North	Region South	Southeast
2000	\$ 80.59	\$ 65.59	\$ 151.10	\$ 58.51
2001	\$ 78.21	\$ 67.21	\$ 158.08	\$ 60.43
2002	\$ 90.39	\$ 70.39	\$ 168.80	\$ 63.31
2003	\$ 91.07	\$ 73.07	\$ 181.02	\$ 64.80
2004	\$ 78.90	\$ 78.90	\$ 200.66	\$ 67.61
2005	\$ 105.45	\$ 83.61	\$ 220.98	\$ 72.03
2006	\$ 98.52	\$ 105.00	\$ 220.10	\$ 75.36
2007	\$ 114.22	\$ 118.00	\$ 216.72	\$ 77.36
2008	\$ 115.82	\$ 120.00	\$ 217.72	\$ 76.54

Median Cost of Building a Home in the United States:

Year	United States	North east	Region Midwest	South	West
2000	\$ 65.59	\$ 75.55	\$ 73.43	\$ 58.51	\$ 72.28
2001	\$ 67.21	\$ 79.04	\$ 74.89	\$ 60.43	\$ 75.38
2002	\$ 70.39	\$ 84.40	\$ 76.52	\$ 63.31	\$ 82.56
2003	\$ 73.07	\$ 90.51	\$ 80.71	\$ 64.80	\$ 85.95
2004	\$ 78.90	\$ 100.33	\$ 85.52	\$ 67.61	\$ 93.68
2005	\$ 83.61	\$ 110.49	\$ 87.32	\$ 72.03	\$ 106.29
2006	\$ 85.44	\$ 110.05	\$ 86.96	\$ 75.36	\$ 111.86
2007	\$ 84.71	\$ 108.36	\$ 84.95	\$ 77.36	\$ 108.30
2008	\$ 81.78	\$ 103.86	\$ 84.41	\$ 76.54	\$ 99.24

Source: National Association of Homebuilders.

Figure 1.

Study on the Moderating Effect of the Employee Psychological Empowerment on the Enterprise Employee Turnover Tendency: Taking Small and Middle Enterprises in Jinan as the Example

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Abstract

In the knowledge economy, the competition among enterprises is the competition about talents in the final analysis, and the intelligence capital becomes the key to build the core competitive advantage of enterprise. However, the abnormal turnover of employee will not only waste the human capital investment of enterprise, but also make against the implementation of the enterprise strategy and the construction of the culture. Based on the Price-Mueller (2000) model, this article adopts the definitions of the control variable, the structured variable, and the environment variable about employee turnover tendency, and creatively introduces the “employee psychological empowerment” as the Moderating variable to design and survey the questionnaire, and uses SPSS to regress in a stepwise way. The test result of the structure model by the empirical research shows that the fair allocation, the promotion opportunity, the monotonous work, the social internal support, and the exterior work chance are main factors to influence the employee turnover tendency, and the employee psychological empowerment could adjust enterprise employees’ turnover tendency. Finally, this article suggests that enterprises should harmonize the relationship between the leader’s authorization behavior and the employee’s psychological empowerment to create healthy enterprise culture and promote effective talent encouragement.

Keywords: Employee psychological empowerment, Employee turnover, Price-Mueller model (2000)

1. Introduction

Private enterprise is very important for the national economic development of China, especially because of its flexible mechanism and big autonomy in management including employee invitation, salary system, and employee resign, private enterprise has big advantage to have good-quality talent resource, but some problems still are concealed in this advantage (Jiang, 2004). The normal flow of employee is normal and necessary for enterprise, but the actuality of employee flow in private enterprises of China is seriously unreasonable, and the general employee flow rate in private enterprises has achieved 50% (Jiang, 2004, P.220), even more, which brings serious human resource replacement cost for enterprises, and impacts the sustainable development of enterprise. Therefore, to study the employee turnover phenomena of enterprise, especially study the influencing factors and Moderating factors of the employee turnover tendency could help enterprises to grasp employees’ development trends, effectively predict and control employees’ turnover behaviors, and reduce the risk of employee flow.

At present, for the research of the employee turnover, certain gap still exists in China and foreign countries. The development direction of the turnover research could provide new explanation variable for employee turnover tendency, specially could explore the decision-making process of the interactive influence of the employee turnover tendency (Price, J. L, 2001). But the factors with interactive influences are largely different, which decides that the western conclusions about employee turnover should not be copied. Domestic representative experts include Zhang Mian (2003) and Zhang Yichi (2005), and based on the Price-Mueller (2000) Model, they introduced many Moderating variables such as individual-organization matching (Zhang, 2005(3)), individual value view (Zhang, 2005(5)), promotion chance (Zhang, 2005(9)), and career satisfaction (Li, 2005), and studied the interactive influences of the factors deciding the employee turnover tendency, and obtained certain result, which could provide research methods to study the interactive influences of the factors in the process deciding

the employee turnover tendency.

In the research of turnover, some experts put forward the opinion of “the contingency theory of employee turnover (Mobley W H, 1997, P.23 & 7-240)”, i.e. when considering the employee turnover, the environment variable of the organization should be emphasized. But as a rising concept, the “employee psychological empowerment” is very important to construct the organizational culture. At the same time, some researches indicate that the employee psychological empowerment and management validity (Spreitzer, 1995, 1997, 1999), the organizational commitment (Li, 2006 & Kraimer, 1999), the employee innovational behavior (Janssen, 2005), and the work performance (Chen, 2005) all had significant influences, but according to Price-Mueller (2000)’s employee turnover model, these factors are key factors to impact the employee turnover, so it is necessary to study the function of the employee psychological empowerment in the employee turnover.

2. Literature review

2.1 Theoretical review of employee psychological empowerment

2.1.1 Empowerment

The empowerment is the usual behavior of enterprise, and especially in the development of modern enterprise, with the increase of enterprise scale, teacher’s management extent is limited, and it is necessary to select part of power to realize the right sharing between superiors and juniors, which is the so-called empowerment (Robbins, 2005).

In past 20 years, the empowerment has been accepted by numerous organizational managers and utilized in their management practice, and the relative research of empowerment has been extensively concerned by organizational behaviorists (Li, 2006, P.99-106). However, because of the difference of the analysis view or key points, scholars have not achieved the common cognition for the definition of the empowerment for a long time. But in total, there are two trends for the research of empowerment in the academic circle (Hechanova M R M, 2006, P.72-78).

(1) Relationship empowerment

The relationship empowerment is also called by leader’s empowerment (Wall, Cordery & Clegg, 2002), and it is a superincumbent empowerment (Conger & Kanungo, 1988). This mode regards the empowerment as a mode of participation, i.e. giving power and control force to employees in management (Ergeneli, 2007).

(2) Encouragement empowerment

The core content of encouragement empowerment is employee psychological empowerment (Liden, Wayne & Sparrowe, 2000). This mode thinks that employees will have the feeling of empowerment when they are encouraged (Quinn & Spreitzer, 1997).

In total, the empowerment is the combination of leader’s empowerment behavior with his underling’s psychological state (Lee and Koh, 2000).

2.1.2 Employee psychological empowerment

Conger & Kanungo (1998) proposed another research angle of empowerment, i.e. the underlings’ psychological state after they are empowered, and they called it as the “psychological empowerment”.

Because psychological empowerment involves individual psychological cognition and experience, the meanings of empowerment must be different for different persons and different situations. Scholars have studies the attributive variables of psychological empowerment from different angles. From past relative empirical researches, the factors influencing individual psychological empowerment includes three aspects, (1) individual factors such as population statistical variable, personal character and interpretive styles, (2) factors of work character such as work autonomy, task feedback, (3) factors of team and organization such as team validity, social structural characteristics of the unity, and leader behavior (Ling, 2007).

2.1.3 Research situation of employee psychological empowerment

In existing researches, the research about psychological empowerment mainly includes the influences of organizational commitment and work performance. Concretely speaking, for example, Spreitzer (1995, 1997 & 1999) adopted the samples of senior managers in 50 strongest enterprises of “Fortune” to study the influences of the employee psychological empowerment on employee work behavior and work performance. Jason (2005) found that the influencing dimension of psychological empowerment was significantly related with employees’ innovational behavior. Chen (2005)’s research indicated that the psychological empowerment and the performance had the spiral relationship. Li Chaoping (2006) took the psychological empowerment as the agency

variable, and researched the backside function mechanism of the revolutionary leadership on the employee satisfaction and the organizational commitment. Hepworth (2004) also found that the relationship of the psychological empowerment and the work invasion had part function of agency (Ling, 2007).

To sum up, though many researches about psychological empowerment studies many relative factors about employee turnover, but the function mechanism of employee psychological empowerment on the employee turnover has not been studied directly.

2.2 Total design of the theoretical model

To study the Moderating effect of the employee psychological empowerment on the employee turnover, the enterprise employee turnover model should be established first, and the Moderating variable of the “employee psychological empowerment” should be added in the employee turnover model to design and test the function mechanism of the model.

In domestic research about turnover, part of scholars combined western advanced theories with the concrete national situation of China from the empirical angle, such as the establishment and empirical research of Chinese IT enterprise employee flow cause model by Zhangmian (2001), the empirical research of the IT enterprise technical employee turnover intention route model by Zhangmian and Zhangde (2003), and the empirical research of the Price-Mueller (2000) model introducing “individual-organization matching”, “individual value view”, “promotion chance”, and “career satisfaction” as the Moderating variables.

By using the usual method in Zhangmian (2001, 2003) and Zhang Yichi (2005)’s researches about turnover as references, based on the Price-Mueller (2000) turnover model, the function mechanism of “employee psychological empowerment” is established in this article.

The research of psychological empowerment mainly includes its influence on organizational commitment and work performance, but the organizational commitment and work performance are important factors to induce the employee turnover (David Buchanan, 2005). According to the researches about employee psychological empowerment (Spreitzer, 1999, Jason, 2005 & Chen, 2005), large numerous of research results have been obtained after the employee psychological empowerment is introduced into the organizational behavior as the Moderating variable. The scholar Lingli (2007) provided the basic characters about the psychological empowerment when he summarized the research actuality of the employee psychological empowerment, and he pointed out that “in the researches taking the work attitude as the result viable, researchers found that the psychological empowerment was the complete agency variable among revolutionary leader and organizational commitment (Avolio, 2004 & Aryee, 2006), LX and work satisfaction (Aryee, 2006), and empowerment atmosphere and work satisfaction (Seibert, 2004), i.e. the influence of the revolutionary leader behavior, LMX, and empowerment atmosphere on the organizational commitment or work satisfaction is completely realized by enhancing individual psychological empowerment level, and the psychological empowerment had part of agency function for the structure empowerment and work satisfaction. And some scholars surveyed the agency effect of different dimensions of psychological empowerment to the relative variables. For example, Liden (2000)’s researches showed that the dimension of meaning in the psychological empowerment had the function of agency between the work characteristic and work satisfaction with the organizational commitment, and the dimension of self-effect feeling had the function of agency between the work characteristic with the work satisfaction (Liden, 2000), and Li Chaoping (2006)’s research indicated that the revolutionary leaders’ moral criterion could completely influence the employee satisfaction and organizational commitment by the dimension of meaning in the psychological empowerment, and the vision encouragement could completely influence the work satisfaction by the self-effect, and influence the organizational commitment by the meaning and the self-effect feeling.” And the “organizational commitment”, the “work satisfaction”, and “LMX” proposed by Lingli (2007) are important variables in the research of turnover.

Therefore, using Zhangmian (2003) and Zhang Yichi (2005)’s usual methods in the research of employee turnover for references, the “employee psychological empowerment” is regarded as the Moderating variable in this article to study the Moderating effect in the employee turnover process.

3. Research hypotheses

According to above theoretical analysis, based on the Price-Mueller (2000) model and relative research literatures (Zhang, 2003 (4) & Zhang, 2005 (5)), following research hypotheses are established.

3.1 Control variable

In the research about employee turnover, the variable of population statistics is usually researched as the important influencing factors. Based on former researches, many factors such as sex, age, and education have

been proved as the important influencing factors of the employee turnover.

3.2 *Structured variable influencing the turnover*

In the research about employee turnover, the variable of population statistics is usually researched as the important influencing factors. Based on former researches, many factors such as sex, age, and education have been proved as the important influencing factors of the employee turnover.

Hypothesis 1a: Work autonomy is propitious to reduce the employee turnover tendency

Domestic experts have studied the relationship between the work autonomy and the employee turnover. Jean Marie Hiltrop (1999) pointed out that the work autonomy is the important factor to influence the employee turnover, and Smith (1996) thought that it was the fourth factor influencing the employee turnover that the company didn't endow employees' decision-making right, and Xia Yanling (2007) thought that the work autonomy would significantly influence the employee turnover. Therefore, the work autonomy is correlative to the employee turnover tendency.

Hypothesis 1b: Fair work allocation is propitious to reduce the employee turnover tendency

Domestic scholars, Liu Yong'an and Wangfang (2006), thought that employees' fair feeling, especially employees' fair feeling about salary could largely influence the employee turnover intention, and Xia Yanling (2007) thought that the justice of allocation could significantly explain the employee turnover tendency, and foreign expert Smith (1996) also thought that the unfair tendency in the allocation was the important factor to induce the employee turnover.

Hypothesis 1c: Fair organizational program is propitious to reduce the employee turnover tendency

About the research of the relationship between the fair organization program and the employee turnover tendency, domestic expert, Zhang Yichi (2005), thought that the fair organizational program could significantly explain the employee turnover whether it was the single variable or the Moderating variable, when he studied the Moderating effect of "individual-organization matching", "individual value view", "career satisfaction", and "promotion opportunity" in the decision-making process of the employee turnover tendency.

Hypothesis 1d: Salary (concealed) satisfaction is propitious to reduce the employee turnover tendency

There are many researches about the influences of the system salary on the employee turnover, and foreign experts, Kennedy, Ford (1999), and Hilltop (1999) all definitely pointed out that the income level was the important factor to influence the employee turnover. Domestic experts such as Xia Yanling (2007), Gu Jiajun (2007), Zhangmian (2003), Zhao Xiping (2003) and Liubing (2005) all studied both relationship, and thought that the both had the relativity.

But for the system salary, there are few researches about the concealed salary. Because of the characters of the concealed salary of enterprise, the relativity exists in the both.

Hypothesis 1e: Occupation growth is propitious to reduce the employee turnover tendency

For the research of the employee growth, Hilltop (1999) thought that the opportunity of training and ability promotion was the important factor to influence the employee turnover, and in the survey of the private enterprise in Hangzhou of Zhejiang, Xu Kenpeng (2006) found that the occupation growth was one of five main factors influencing the employee turnover.

Hypothesis 1f: Promotion opportunity is propitious to reduce the employee turnover tendency

The promotion opportunity is the demand that the employees achieve and realize themselves. Foreign experts Hanm and Gelesif (1995) thought that the performance the opportunity enhancement were important factor to influence the employee turnover, and Kennedy and Ford (1999) pointed out that the development of anticipated future would seriously influence the employees' decision of turnover, and Hilltop (1999) also thought that the opportunity of promotion could influence the employee turnover. Domestic experts, Xia Yanling (2007), Gu Xijun (2007), and Zhao Xiping (2003) also thought that the promotion opportunity was the important factor to influence the employee turnover.

Hypothesis 1g: Interior social support is propitious to reduce the employee turnover tendency

For the research about the influence of the interior social support on the employee turnover, Smith (1996) thought that the deficiency of the support of the senior layer of the company was the second largest factor influencing the employee turnover, and domestic experts, Zhangmian (2003) and Zhang Yichi (2005) also provided corresponding result, and Liu Yong'an also indicated that the interior human relationship was the important facto influencing the employee turnover.

Hypothesis 1h: Work pressure is propitious to enhance the employee turnover tendency

For the relationship between the work pressure and the employee turnover tendency, Zhao Xiping (2003), Liu Yong'an (2006), Xia Yanling (2007) all thought that the employee turnover tendency was positively correlative with the work pressure, and the role pressure and the career development pressure were the most important influencing factors.

Hypothesis 1i: Monotonous work is propitious to enhance the employee turnover tendency

Hilltop (1999) pointed out that the work challenge was negatively correlated with the employee turnover tendency, and Hanm and Gelesif (1995) thought that the work complexity was the main factor to influence the employee turnover, and domestic expert, Xia Yanling (thought) that the monotonous work could significantly explain the employee turnover, and these both factors were positively correlated.

3.3 Environment variable influencing the turnover

Other work opportunities are an important variable in the Price-Mueller (2000) model, and it means the possibility estimation that employees could acquire the work opportunity in other organizations (Price, J. L, 2001).

Therefore, aiming at the environment variable, following hypothesis is proposed.

Hypothesis 2: Exterior work opportunities are apt to enhance the employee turnover tendency

In the Price-Mueller (2000) model, as two important variables, the opportunity and the family responsibility could significantly influence the employee turnover. And in the empirical analysis, Xia Yanling (2007) pointed out that the environment variable could significantly influence the employee turnover, and Hilltop (1999) also pointed out that the social economy was closely correlated with the employee turnover.

3.4 Moderating variable influencing the turnover

The employee turnover tendency will not certainly induce the turnover behavior, because in the process influencing employee turnover, except for the influences of control variable, structure variable, and environment variable, the influences of various Moderating variables, i.e. the interactive influences among factors could influence the employee turnover tendency under certain conditions (Mobley W H, 1977, P.23 7-240). On the contrary, when some employees have not the tendency of turnover or have lower turnover tendency, the Moderating variable may induce the turnover.

Traditionally, to study the influencing factors of employee turnover, most researches only considered the single influencing function of variable, not the interactive influences among variables.

Therefore, based on the Price-Mueller (2000) model, many scholars added various variables into the model to empirical test the model. In China, Zhang Yichi (2005) took the "individual-organizational matching (Zhang, 2005, P.37-41)" as the Moderating variable and found that the crossing item of the "blur role" and the "individual-organizational matching" and the "other work opportunities" and the "individual-organizational matching" have significant correlativity with the employee turnover tendency. And Zhang Yichi took the "individual value view (Zhang, 2005 (5))" as the Moderating variable and found two significant crossing items including the crossing item of the "role conflict" and the employee "individual value view" and the crossing item of the "skill diversity" and the "individual value view (Zhang, 2005 (9))". Taking the "promotion opportunity" as another Moderating variable, Zhang Yichi (2005) found three significant crossing items, i.e. the crossing item of "work autonomy" and "promotion opportunity", the crossing item of "fair allocation" and "promotion opportunity", and the crossing item of "superior support" and "promotion opportunity". Taking the "career satisfaction (Li, 2005 (11))" as the Moderating variable, Zhang Yichi (2005) found that the explanation of the employee career satisfaction to the employee turnover tendency could be enhanced about 3% significantly, and the crossing item of "career satisfaction" and "work autonomy" and the crossing item of "career satisfaction" and "superior support" could significantly influence the employee turnover tendency.

As discussed above, "the development direction of the employee turnover research is to discover new explanation variable for the employee turnover (Price, 2001)", especially to explore the Moderating effect of the Moderating variable for employees to make the decision of turnover, i.e. the crossing influence of the Moderating variable and the structure variable will influence the employee turnover.

Since the concept of "psychological empowerment" was proposed, the research about the psychological empowerment has been widely concerned by the management scholars. According to above literature summarization, following hypotheses are proposed.

Hypothesis 3a: For the organization with high employee psychological empowerment, the work autonomy is propitious to reduce the employee turnover tendency more significantly.

Hypothesis 3b: For the organization with high employee psychological empowerment, the fair allocation is propitious to reduce the employee turnover tendency more significantly.

Hypothesis 3c: For the organization with high employee psychological empowerment, the fair program is propitious to reduce the employee turnover tendency more significantly.

Hypothesis 3d: For the organization with high employee psychological empowerment, the work pressure is apt to enhance the employee turnover tendency more significantly.

Hypothesis 3e: For the organization with high employee psychological empowerment, the salary (concealed) satisfaction is propitious to reduce the employee turnover tendency more significantly.

Hypothesis 3f: For the organization with high employee psychological empowerment, the occupation growth is propitious to reduce the employee turnover tendency more significantly.

Hypothesis 3g: For the organization with high employee psychological empowerment, the promotion opportunity is propitious to reduce the employee turnover tendency more significantly.

Hypothesis 3h: For the organization with high employee psychological empowerment, the monotonous work is apt to enhance the employee turnover tendency more significantly.

Hypothesis 3i: For the organization with high employee psychological empowerment, the social interior support is propitious to reduce the employee turnover tendency more significantly.

Hypothesis 3j: For the organization with high employee psychological empowerment, the exterior work opportunity is propitious to enhance the employee turnover tendency more significantly.

Before empirical analysis, it is emphasized that this research has not considered the agency variable influencing the employee turnover tendency. In the Price-Mueller (2000) model, as the agency variables, the “work satisfaction” and the “organizational commitment” could influence the decision process of the employee turnover tendency. The focus of the research is the Moderating function of the employee psychological empowerment in the decision process of the turnover tendency, so this article doesn’t consider the potential agency function of the work satisfaction and the organizational commitment between the attributive variable and the turnover tendency.

4. Empirical analysis

4.1 Survey program and sample structure

4.1.1 Scaling

This research adopts the locale interview and the questionnaire survey to compile the scaling, and the questionnaire includes three parts, and the first part is the individual basic information of employee, and the second part is the questionnaire of turnover cause (Price, 2001), and the third part is the questionnaire of the employee psychological empowerment (Spreitzer, 1995), and the questionnaire should be designed by the Likert’s five-point scaling method.

To ensure the rationality of the questionnaire structure, the design of questionnaire adopts the focus group method, the interview method, and after the first-edition questionnaire was experimented in a small scale, the questionnaire was discussed and modified aiming at the problems. The survey is implemented after the experiment succeeded.

The SPSS 16.0 software is adopted to analyze the first-hand data collected by the questionnaire, and the concrete method includes the descriptive statistical analysis and relative analysis of variables, and the stepwise regression analysis method to validate above hypotheses.

4.1.2 Sampling and surveying

From July to Sep in 2008, the authors selected the private enterprise in Jinan of Shandong as the survey objects, and first primarily interviewed them, and then survey them by the questionnaire. To ensure the reliability of the survey result, the random sampling method is adopted to study the samples, so the result of questionnaire survey has more extensive representative characteristic. In this research, the amount of the questionnaire is 309, and 279 of them are returned, and the return rate is 90.2%. Because the measurements of questionnaire were respectively implemented in various departments, the quality of questionnaire could be ensured, and the validity of questionnaire is 90.2%. The questionnaire adopts the anonymous mode, and the survey object of this research is

only limited in formal employees of the sample enterprises.

4.1.3 Reliability analysis of questionnaire

This article adopts the coefficient of Cronbach α to test the reliability of questionnaire. According to the requirement of the psychological measurement, if the coefficient exceeds 0.8, the survey scaling has highly interior coherence, and if the coefficient achieves 0.7, the interior coherence of this scale could be accepted.

According to the characteristics of the questionnaire, the structure variable and the environment variable are taken out as one part to test, and the character of the employee psychological empowerment is taken out as the second part to test, and finally the whole questionnaire is tested.

By testing the questionnaire by the SPSS, the result is seen in Table 1.

Through Table 1, the reliability of questionnaire is reliable.

4.2 Data analysis

According to the empirical research framework, based on above research design, to test the explanation function of the structure variable and the environment variable to the employee turnover tendency, and the Moderating effect of the Moderating variable to the decision of the employee turnover tendency, this research adopts the SPSS 16.0 analysis software and the stepwise regression method to test the explanation ability of multiple explanation variables to the employee turnover tendency, and the regression analysis result is seen in Table 2.

According to the analysis in Table 2, the last list in Table 2 is the variance expansion index of variable (VIF) in the model 4, all VIFs are in 1~3 (Zhang, 2005, P.37-41, and Zhang thought that the value of VIF in 1~5 was acceptable) below 2, which indicates that the serious multiple-common-linearity doesn't exist among variables. In addition, the value of D. W test (Durbin-Watson) value is 1.854, which shows that the serious auto-correlation doesn't exist. Therefore, this research is meaningful, and the regression result is acceptable.

The control variables could explain 31% of the variable of turnover tendency ($F=17.149$, $p<0.1$). In all control variables, the age ($\beta=-0.430$, $p<0.01$) and the education ($\beta=0.347$, $p<0.01$) could strongly explain the turnover tendency, which indicates that the age is bigger, the turnover possibility is smaller, and the young employees' turnover is obvious, especially the employees (who were born in 1980s)' turnover should be concerned, and the education is significantly correlative with the employee turnover, which indicates that the education level is higher, the possibility of the turnover tendency is bigger, and the management of knowledge employee could be embodied.

To test the hypothesis 1 and the hypothesis 2, in the second step of the regression analysis, the structure-environment variable is put into the regression equation, and the regression result shows that the explanation ability of the model 2 to the variance of the employee turnover tendency could be significantly increased, $\Delta R^2=41.6\%$. And the fair allocation, the promotion opportunity, the monotonous work, and the social interior support in the structure variables could significantly explain the employee turnover tendency ($\beta=-0.225$, $p<0.05$; $\beta=-0.405$, $p<0.01$; $\beta=-0.210$, $p<0.05$; $\beta=-0.212$, $p<0.05$), which supports the hypothesis 1b, the hypothesis 1f, the hypothesis 1g and the hypothesis 1i, i.e. the justice of allocation could significantly reduce the employee turnover tendency, and the promotion opportunity is higher, the employee turnover tendency is lower, and the social interior support is higher, the employee turnover tendency is lower, and the work is more monotonous, the employee turnover tendency is higher. In these four factors, the explanation ability of the promotion opportunity to the employee turnover is most significant. The exterior work opportunity in the environment variable could significantly explain the employee turnover tendency ($\beta=0.432$, $p<0.01$), and the hypothesis 2 is supported, which indicates that when employees apperceive exterior work opportunity, the possibility of turnover will be increased significantly.

To eliminate the possible influences on the turnover tendency before testing the Moderating effect, the authors put the employee psychological empowerment in the regression equation, and the result shows that this variable has not any explanation ability to the employee turnover tendency, that means the employee psychological empowerment could not influence the employee turnover tendency.

To test the hypothesis 3, the "employee psychological empowerment", the "structure variable", and the "environment variable" are first converted, and then the converted data are multiplied, and the product item of the employee psychological empowerment and the structure variable and the environment variable is put in the regression equation to establish the model 4. The result indicates that for the organization with the strong degree of the employee psychological empowerment, the relationship that the salary (concealed) satisfaction could reduce the employee turnover tendency could be significantly strengthened, and the possibility that the

monotonous work is apt to enhance the employee turnover tendency is significantly enhanced, and the fair program could actively reduce the employee turnover tendency.

5. Conclusions and perspectives

5.1 Conclusions

Based on the Price-Mueller (2000) model, by the empirical research method, using the domestic experts Zhangmian (2003) and Zhang Yichi (2004)'s usual methods in the research of the employee turnover, the questionnaire survey of the employee turnover is implemented in the article, and the software of SPSS 16.0 is used in this article to empirical analyze and study the structure variable and the environment variable influencing the employee turnover tendency, and the employee psychological empowerment (being the Moderating variable) is creatively introduced to study the Moderating effect of the employee psychological empowerment in the decision process of the employee turnover tendency.

According to the result of the regression analysis, as the single structured variables, the fair allocation, the promotion opportunity, the monotonous work, and the social interior support have close relationship with the employee turnover tendency. The environment variable, i.e. the exterior work opportunity, is positively correlated with the employee turnover tendency. After the Moderating variable, i.e. the employee psychological empowerment, is introduced, the "employee psychological empowerment", the "fair program", and the crossing item of "salary" and "promotion opportunity" could significantly explain the employee turnover tendency.

Aiming at the factors influencing the employee turnover tendency, the human resource management of enterprise could be strengthened with pertinence, and the prediction, cognition, and control of the employee turnover should be enhanced, which could help enterprises to establish the core human resource advantage.

5.2 Limitations in this research

Because of time and energy, there are many limitations in this research.

- (1) Like other researches, the problem of common method variance is also a limitation of this article to some extent, and in this article, the error of the common method variance is not measured.
- (2) The concrete organizational characteristics about the employee psychological empowerment have not been classified, and the Moderating function with pertinence has not been studied.
- (3) The amount of the data survey sample needs to be further expanded, which could enhance the representative characteristic.

5.3 Future research directions

Except for the design of questionnaire and the selection of sample, the future research should perfect the design of the questionnaire to test the reliability and effect, actively expand the selection of sample, and make the research conclusion more representative and scientific. First, the research about the employee psychological empowerment should be studied more concretely.

- (1) Aiming at different employee psychological empowerments, their respective Moderating effects on the employee turnover should be studied, and the difference should be compared and analyzed.
- (2) Aiming at the concrete characteristics of the employee psychological empowerment, the Moderating effect should be further studied.

Second, the future research should consider the Moderating effect of other Moderating variables in the decision-making process of the employee turnover tendency, such as the "leader quality" and the "enterprise culture".

Third, the research about employee should be further reified, and this research has provided relative research information such as "the turnover and management of the employees who were born in 1980s" and "the knowledge employees' turnover and management".

- (1) Taking the age as the background, for example, the research about the Moderating effect of the Moderating variable in the employees (who were born in 1980s)' decision of turnover tendency;
- (2) Taking the post as the characteristic, for example, the research about the Moderating effect of the Moderating variable in the sales employees' decision of turnover tendency;
- (3) Taking the educated degree as the object, for example, the research about the Moderating effect of the Moderating variable in the knowledge employees' decision of turnover tendency.

Finally, future researches should further emphasize the empirical research.

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Table 1. Questionnaire reliability table

Name of scale	Cronbach's Alpha
First part	0.795
Second part	0.707
Total questionnaire	0.796

Table 2. Result of regression analysis

Item		Turnover tendency				Multicollinearity test VIF
		Model 1	Model 2	Model 3	Model 4	
1.	sex	-0.244	-0.476	-0.476	-0.268	1.342
2.	age	-0.430***	-0.112	-112	-0.129	1.545
3.	work age	-0.177	0.047	0.047	0.274	1.356
4.	study experience	0.347***	-0.163	-0.163	-0.192**	1.743
5.	married	-0.286	0.094	0.094	0.395	1.155
6.	post	-0.573	0.045	0.045	0.259	1.634
7.	work autonomy		-0.153	-0.153	-0.184	1.252
8.	fair allocation		-0.225**	-0.225**	-0.25	2.754
9.	fair program		0.154	0.154	0.218	2.456
10.	work pressure		-0.113	-0.113	-0.021	1.235
11.	salary (hidden)		-0.129	-0.129	-0.251***	1.843
12.	occupation growth		-0.09	-0.09	-0.183	2.148
13.	promotion chance		-0.405***	-0.405***	-0.326***	2.013
14.	monotonous work		0.210**	0.210**	0.226*	1.254
15.	social internal support		-0.212**	-0.212**	-0.022**	1.332
16.	exterior work chance		0.432***	0.432***	0.453***	1.436
17.	PE factor			0.095	0.175	1.354
18.	PE* work autonomy				-0.181	1.016
19.	PE* fair allocation				-0.048	1.254
20.	PE* fair program				0.294**	1.248
21.	PE* work pressure				-0.139	1.528
22.	PE* salary (hidden)				-0.139***	1.451
23.	PE*occupation growth				-0.149	1.656
24.	PE*promotion chance				0.127	2.006
25.	PE*monotonous work				-0.219***	1.246
26.	PE*social internal support				-0.11	1.152
27.	PE*exterior work chance				0.22	1.553
R ²		0.31	0.726	0.726	0.809	Durbin-Watson
F		17.149*	12.823**	12.823**	15.648**	1.854
ΔR^2		0.31	0.366	0	0.074	

Note: * denotes $p < 0.1$, ** denotes $p < 0.05$, *** denotes $p < 0.01$, and PE denotes the influencing factors of the employee psychological empowerment.

Technology Market in the European Union

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Abstract

The common market of factors of production in the European Union (EU) involves the free movement of labour factor, financial capital and innovation/technology. Technology as a separate factor of production in an integrating area is rarely incorporated into theoretical analysis. From a theoretical point of view, there are different relationships between various segments of the market of factors of production. Importance and strength of the relationship between them changes with each shift in the economic development of the EU member countries and deepening of integration processes. No doubt, however, that the central element becomes innovations / technologies, that lead to structural changes and local changes in integrating areas. Therefore, the purpose of this article is to assess the progress of the integration processes on the technology market in the EU and the identification of the relationship between this segment of the market of factors of production and its remaining segments.

The first part of the article presents the technology as a factor of production in an integrating area. Next we describe the influence of R&D on the region's competitiveness and we identify the main characteristics of the technology market in the European Union. The main aim of the next part of the paper is to indicate the role of international business in the creation and transfer of technology in the European Union. The analysis conducted in the paper is based on specialist literature and statistical data.

Keywords: Technology, European Union, Integrating Area

1. Introduction

With the economic opening up of Eastern Europe and the advances of Asian newly industrializing countries in the world market global competition has intensified - especially in the field of labor-intensive products and medium intensive technologies. For European Union's countries and regions facing intensified import competition and the relocation of production in the context of foreign direct investment outflows it is therefore important to increasingly position themselves in advanced technology fields. Hence Research and Development (R&D) are increasingly important for growth and international competitiveness. It particularly enables the development of new products and process, the reduction of production costs and the improvement in the quality of production.

When regional differences in the European Union are discussed, the focus is often on economic differences. However, if the analysis is extended to research and technology factors, it becomes clear that the gap between strong and weak countries is even more pronounced in connection with research and technology than the economic gap. Furthermore, pronounced differences exist not only between the member states, as there are also major differences between regions within individual countries (European Commission, 1994; European Parliament, 1997).

2. Technology as a factor of production in an integrating area

Technology as a factor of production in an integrating area was not the subject of comprehensive studies in the theory of integration. Technology understood in the broad sense includes not only the production technologies (product and process technologies), but also managerial knowledge, marketing skills, and other so-called intangible assets on the level of a company (Pavitt, 1999; Van Tho, 1993). Constant development and spread of technology is widely recognized as a key factor distinguishing modern and modernizing societies.

Technology can be transferred in the form of tangible assets such as new products and equipment; in the form of intangible assets such as patents and licenses and in an informal way, by exchanging information and knowledge (Howells, 1998). It can be transferred through various channels, which are divided, generally speaking, into public and private. In the first case, the transfer is carried out by public organizations: the governments of highly developed countries and international agendas. Technology is then the public good. Its transfer is a part of technical assistance and economic cooperation with developing countries. In the second case, the technology is transferred by private companies on commercial basis.

Creating a technology is subjected to the process of internationalization starting from the early '80s, what is expressed in the so-called R&D internationalization (Gerybadze, Reger, 1999). Traditionally, this process was characterized by a unilateral transfer of technology, i.e., ideas for new products and technological knowledge have been created by a dominating parent institution and copied in other peripheral locations. This process can be interpreted as learning from the outside or the exploitation of knowledge moving from the center to the periphery. In contrast, the new innovation process is characterised by: 1/. Multiple centers of knowledge in different geographic locations; 2/. A combination of learning through the transfer of knowledge from the parent company and the knowledge created in a given location; 3/. Technology transfers, both between different geographical locations and between organizational units. Developments in science and technology (Note 1) have led to crystallizing of the polycentric structure of national research and innovation systems. In every important area of research there have developed two - three so-called "centers of excellence", which compete with each other and which rankings can change quickly.

3. Research and Development as a Factor of Competitiveness

Research and technological development or, more generally, the ability to innovate and produce new products and knowledge are important factors for competitiveness and hence for an economy's growth potential (O.E.C.D., 1996; European Commission 1997; Schmookler, 1966; Solow, 39/3; Kaldor, Mirlees, 1962; Gomulka, 1971). Since continual change is the feature of the market, on-going research and technological development and innovation are essential. Access to technological development and innovation is of crucial importance for a region's capacity to compete in a global market.

The post-war view of R&D policy was based on an implicit routinized model of innovation in an economy where the most important inputs were land, labor and capital. R&D and technological change itself were viewed as being simply supplement to these factors of production. This was also an economy of relative certainty and stability. The international competitive advantage was generally achieved through cost reduction resulting from large-scale mass production to exploit scale economies. The supplemental role of R&D in the post war economy was designed to reduce costs through process innovation and to generate incremental innovations. The routinized role of R&D was perhaps first articulated by Schumpeter who observed that, "Innovation itself is being reduced to routine. Technological progress is increasingly becoming the business of teams of trained specialists who turn out what is required and make it work in predictable ways" (Schumpeter, 1942).

Companies in the weaker regions can no longer compete with procedures in the developing countries on wage costs. At the same time, they are subject to the pressure of competition from strong countries and regions with rapidly changing patterns of innovation and a faster and shorter life cycle for products. In order to compete on high-tech markets, the weaker regions must adjust to the demanding pace set by the prosperous regions in the Community in the area of product and process invention and innovation (Note 2). R&D is needed for process innovations, which allow costs to be cut and hence markets to be widened - this could facilitate the exploitation of static and dynamic economies of scale (Audretsch, 1995; Scherer, 1992). R&D is also a requirement for product innovations, which allow firms to charge higher prices. Firms that are eager to recover R&D investment costs and to earn a Schumpeterian rent from innovation will try to ensure intellectual property rights, typically via patents. They will also massively invest into marketing in order to create preferences in favor of the novel products. R&D as well as marketing expenditures create market entry barriers because they largely represent sunk costs; newcomers will find it therefore difficult to successfully enter the market. Innovative firms thus can enjoy extra profits which partly will have to be shared with workers since trade unions in highly profitable industries will strongly lobby for wage rises. With continued product innovations the value-added by the firm will indeed rise continuously such that the wage bargaining process will result in rising real wage rates and higher real incomes in some sectors. This in turn will result in multiplier effects in the overall economy.

Launching product innovations will stimulate the growth of demand directly as was emphasized by Schumpeter who also stressed that entrepreneurship is the basis for long-term growth and economic cycles (Schumpeter, 1939; Korres, Lionaki, Polichronopoulos, 2001). Both for R&D devoted to product innovations and to process innovations it holds that unit R&D costs can be reduced if large output volumes are realized during a given innovation cycle. From this perspective the gradual increase of R&D expenditure - GNP ratios is bound to stimulate competitiveness. While competitiveness certainly has aspects of relative technological positing in world markets - typically emphasized in the literature - one should not overlook the global real income effect of process innovations (the price reduction effect). Product innovations create new markets and stimulate the expansion of firms as diffusion of novel products and processes follow a logistical expansion path. In the context of an open economy it is crucial that EU firms specialize in a way that is consistent with their respective comparative

technological advantage (Dosi, 1988). This could be an actual comparative advantage of a potential advantage that relies on strong domestic market growth or R&D subsidies in the context of dynamic scale economies.

4. Characteristics of the technology market in the European Union

Market of knowledge is highly imperfect, and when left to its own, functions improperly. This results from the characterization of knowledge as a public good, which discourages the supply of knowledge and investment in research. Three ways are indicated to improve the functioning of the market of knowledge and commercial ideas (Pelkmans, 1997): 1/. Subsidizing the supply side by the government; 2/. The internalisation of the market of knowledge within enterprises by controlling the internal R&D activity and a systematic commercialization of results; 3/. The introduction of and respect of the protection of intellectual property rights. It should, however, be noted that these methods could also be the source of distortion in the market. With regard to the subsidization of R&D sphere in the EU's support for R&D, activities can be made at the level of a member country and at EU level. (Basic data on the size, structure and effectiveness of expenditures on R&D are summarized in table 1 and note 3). Functioning of multi-research programs funded by particular governments can lead to a reallocation of R&D activities among member states. Subsidizing R&D activities at EU level is, as it was evaluated, not more than 6% of expenditures of the member states on this purpose.

The internalisation of the market of knowledge within companies, as a method of correcting its deficiencies at the EU level, requires consideration of two aspects: i.e. the extent of internationalization (or to be more precise "Europeanization") of companies and their participation in cooperation for networks in the scope of R&D. Internationalization of production and R&D means the distribution of these activities in different EU member states and a free movement of knowledge within the integrated areas but exclusion of single companies from this activity. This can result in uneven distribution of R&D function in the whole European Union and in concentration of more developed countries, attracting these types of activities.

Creating a network of cooperation between companies in the field of technology is also an indicator characterizing the technology market in the EU. This cooperation is made between institutions of non-profit type and in business sector. Institutions which are not focused on gaining profit (such as various types of colleges and universities) are traditionally open to international cooperation. Business sector, operating in conditions of competition, is seen as an unwillingly cooperating with strategic rivals, especially in the field of technology. Data on cooperation agreements between the companies - not just in the European Union - collected in the 90s deny, however, this quite common view (Cantwell, Janne, 1999; Archibugi, Michie, 1995). An increase in creating networks of cooperation between companies is observed, especially in the field of so-called high technologies (biotechnologies, new materials, information technologies). According to estimates, approximately 70% of all monitored agreements were attributed to these sectors (Archibugi, Michie, 1995).

Two main reasons for the increase in popularity of these agreements are indicated: 1/. Due to the nature of new technologies, which require a substantial „wealth” of knowledge for their mastering, the success of innovative activities of individual companies depends on the access to information about what is happening in a given field; 2/. In the case of emerging industries, particularly important is to gain and exchange information in order to reduce potential losses. Benefits of companies arising from this type of cooperation include distribution among partners considerable financial outlays necessary for the specific activity, which is the R&D, accelerating the return on investment incurred by a faster spread of the company's assets, risk spread, increasing efficiency owing to the benefits of scale, scope and specialization, turning of competition into collaboration.

In relation to companies from the European Union, a strong growth in the number of cooperation networks between them, especially in the field of information technologies. These are networks created independently by companies, and such, which are sponsored by the European Union. The available data suggest, however, that it would be unjustifiable to make a conclusion about the dominance of intra-EU relationships in the different segments of EU technology market, or the existence of general patterns of behaviour attributed to the operation of the market. Data collected at the stage of finalizing the construction of the Single Market indicated that, European companies in a greater extend cooperated with partners from the U.S. than with European partners. Intra-European joint research projects accounted for 19% of all such operations, while Euro-American – 21%. This would indicate that there is a more global rather than regional approach to technology issues. It should also be remembered that intra-European cooperation was not only a result of the shifts in market forces and effects of market integration in the market of the factors of production, but also the effect of policy to support the research and technological development, carried out at EU level.

4.1 Technology Policy of the European Union

The technology policy's objective (Note 4) is to promote technological research and technological development as one of the key factors of the improvement of the competitiveness of the whole EU on the international markets.

From the point of view of this analysis it is important to identify those elements of technology policy that affect the functioning of the market of the factors of production in the integrating area. This policy is based on the principle of subsidiarity. The Member States retain the freedom in the field of research and development, and at EU level, the attempts are made to coordinate and finance, with respect to these research areas which are of a super national meaning. The technology policy of the European Union covers both support for basic research and diffusion of technology, as well as for the development of technological cooperation of various organizations and institutions, focused on the development of scientific research base for small and medium-sized companies. Realization of such formulated objectives corresponds to the need of the improvement in functioning of the market of knowledge within EU functioning of markets previously discussed. Crucial elements here include: 1/. Support for the basic research, 2/. Support for the spread of technology, 3/. Promotion of the technological cooperation. The technology policy of the European Union is realized in practice within long -lasting research framework programs (the so-called Framework Programs). These programs, define the scientific and technological objectives, priorities and proposed projects necessary for their implementation, together with financial resources and their distribution among particular leading research tasks.

4.2 Technological specializations and the international competitive position of the European Union

Indirect answer to the questions posed above can be sought in analysis and evaluation of technological specialization of the European Union and its international technological competitiveness. Evaluation of technological specialization of the EU, in the scope of the deepening of integration came out unfavourably against its competitors: the U.S. and Japan.

The technological specialization of so-called Triad (USA, Japan, EU) measured by the sum of absolute differences in shares of patented ideas (which are assigned to specific industries in the tested period of time) and by so called Herfindahl index - which is a measure of the concentration of patent patterns (sum of squares of the shares of individual industries in the total number of patented ideas from each country, multiplied by 100) - shows significant differences. Between 1992 and 2002 the U.S. and Japan have reached a much stronger shift towards a concentration of innovative activity, and as a result, a higher degree of technological specialization than the EC. At that time the European Union experienced a reduction of technological specialization, what proved not enough use of their potential to achieve scale benefits within R&D activity. It is assumed, that the lack of an innovative specialization still results from parallel competitive functioning of R&D programs in various countries. Studies show that there is still a considerable scope for improving the effectiveness of European Union technology policy coordination between national policies in the field of R&D and policy at EU level.

Assessment of the position of the EU in trade in technologically advanced products come out more favourably, although they are geographically diverse and concern a slightly different period than that examined above. In the years 1999-2005 the trade in high-tech products was characterised by a deficit. Japan is the top net exporter, through with a negative trend (42beuro in 1999, 31beuro in 2005). US has a negative balance in 2002 and 2003 (-20beuro); its balance was positive in 1999 and become positive again in 2004 and 2005. China had negative balance till 2004 (-2beuro), but in 2005 it becomes positive. EU25 has the highest negative balance over the period 1999-2005 (-28beuro in 2005) (European Commission, 2007)

Other studies conducted for the years 1999-2005 are based on the amount of exports/imports of high-tech products per capita. This provides the magnitude of high-tech trade in relation to the population of the country considered. (Table 2 and 3).

The data show that exports of high-tech per capita (i.e. the intensity of high-tech exports) are higher in Japan than in US, although the world market shares of Japan's exports are consistently much lower than those of US. In EU25, exports of high-tech products per capita are much lower than those of Japan, despite the fact that EU25 has higher exports world market shares. China's figures are very small compared to the other countries: its intensity in high-tech trading is still very low and it will take many years to catch up with the other countries. The statistical data show that the picture of EU and Japan for imports across years is very similar (around 500 – 550 euro/cap in 2005). However, such intensity is highest in the US (US population and enterprises are eager of high-tech products, above 700 euro/cap). China, due to its large population, has very small intensity (about 120 euro/cap).

These results allow only in an indirect way to answer the questions previously raised about the legitimacy and effectiveness of technology policy of the EU. Critically evaluating the technological specialization of the Union one should pay attention to the need for a better coordination of efforts in the scope of R&D, non-spreading and non-replication of R&D programs at the national level. By contrast, the observed improvement of the competitive position of EU in relation to its main rivals was a joint effect of activated mechanisms and conducted technology policy. One should agree with the view that the establishment and proper functioning of this market is, so far, the

most important incentive for private innovations. Technology policy corrects imperfections of the European market of knowledge which are being revealed.

5. Creation and technology transfer in the European Union. The role of international business

The European Union is an area where the largest transnational corporations operate. Change in behaviour of these companies in the process of deepening European integration were the subject of research, whereas, an attempt to define the specific processes of internationalization of technological activity of transnational corporations in the EU faces difficulties due to lack of research focusing on this aspect of the problem.

From the empirical research conducted in a wider context than the integration and focusing on a selected group of 21 largest transnational corporations it can be concluded that European companies are characterized by some identity in internationalization strategies of research - development activity (Gerybadze, Reger, 1999). These strategies depend on the size of the country of origin, specificity of industry and features of enterprise itself. We can distinguish companies of a global range that come from small, but highly developed European countries. The size of their national R&D base is limited, so the transnational companies which come from these countries are obliged to actively participate in foreign researches. However, many transnational companies from large European countries, characterized by significant technological base (Germany, France, United Kingdom), still shows a tendency to focus a substantial part of their research in country of origin. This concerns in particular the engineering industry and the construction of means of transport and electrical equipment. By contrast, the strategies of companies of chemical and pharmaceutical industry are different, since they are characterized by a substantial share of foreign R&D in their activities. For comparison, transnational corporations which came from the U.S. based on their own, and a strong national research base and were less internationalized in R&D than European companies. Major Japan corporations were characterized by the low degree of internationalization of R&D. By contrast, studies conducted on a sample of 244 transnational corporations operating in technologically intensive fields indicate that European companies were characterized by the greatest share of R&D activity located abroad, in total capital expenditures on R&D in comparison with their major competitors that are American and Japanese companies (Roberts, 1999). This share was shaped on the level of 30%, but the European companies had a tendency to focus on intra-European investments.

Deepening of European integration, that is passing through its successive stages pushed researchers to formulate hypotheses that with the advancement of integration processes there are changes made in specialization of innovative activity of transnational corporations in an economically integrated region. In J. Cantwell model (Cantwell, 1987) on the cumulative causation in the scope of specialization of innovative activity in integrated area, two types of production undertaken by transnational companies are distinguished: 1/. Intensive research production usually associated with local research and development works; 2/. Assembly production type does not require support of local research and development.

Production of research intensive components final assembly operations can be separated by location but integrated through intra-European market, as a result of the strategic decisions of transnational companies. Regularity is that the research intensive production is drawn in to places of strong innovation activity. In countries where local firms are strong in the innovation sector operations of transnational companies are becoming an additional incentive for the development of this sector. They induce increase in the share of research intensive activity in the whole of local production; and this in turn, is associated with a higher rate of productivity growth and -by increasing local competitiveness – with a higher rate of production growth. A kind of virtuous circle is being activated.

Conversely, is in the case when local companies in a given sector are technologically backward. If a transnational company invests there in production, this will be the type of an assembly production, and innovation and advanced components will be imported. Local activities in R&D field may be then in danger. Highly competitive transnational companies may strengthen their position by increasing the transfer of funds from local sales to the parent company, intended to further develop their R&D. Local companies lack the resources and are forced to cut their expenses on this purpose. It moves down the function of technical progress in countries where companies are relatively weak in important innovative industries. Mechanism of a vicious circle is activated. In countries that are not quite able to compete effectively with TNCs, the activity of the latter can stop this "vicious circle" through indirect influence on the function of technical progress. Then the local innovations take the form of skills development, improvement of manufacturing processes, better technical equipment of the production process, a new quality of technical control, etc.

Today's global economy reveals a tendency for geographical concentration of innovative activity in areas that bring investors the benefits of technological agglomeration. These are benefits arising from conducting innovative business activity in geographic proximity to other entities involved in such activity. Knowledge, unless it is

codified, does not spread in an automatic and simple way. Its diffusion is made easiest through direct personal contacts. Then the concentration of innovative activity in a certain geographical area, in which other innovators are present, strengthens and facilitates innovation processes.

6. Conclusions

Integration in the scope of market of production factors is not yet a completed process in the European Union and proceeds unequally. The European Union technology market is just emerging. Because of the specificity of this market, that is its encoded imperfection which results from character of knowledge as a public good, the integration efforts in this field will not be able to bring quick results. On the one hand, the EU's Common Technology Policy is trying to support the emergence of a more integrated technology market, on the other - the internationalization of creation and technology made beyond the borders of EU countries and integration groups, as a result of the activities of transnational corporations, can constitute a serious barrier in realizing the common technology market.

It is necessary to create now in all regions of EU a basis for future growth and development. Short-term solutions to a number of problems are not enough, as they jeopardize future growth. As a result of the changes in economic activity, which have meant that knowledge has become the crucial factor for economic growth, policies must also be adjusted to keep pace with those changes. The increasing importance of R&D requires regional, national and union's R&D policies to be adapted to the new structures and requirements. Among them it is worth to mention: the formulation of favourable conditions at universities and research institutions for commercialization of research and development results, support of innovation in non-industrial sectors of the economy, cooperation of research and educational institutions at developing spin-off firms in the first phases of their existence. How exactly new structures and policies are to be formulated is still open to debate and this paper can be seen as an introduction to that debate.

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Notes

Note 1. In this paper the term "science" is understood to cover the creation, discovery, examination, classification, reorganization and dissemination of knowledge on physical, biological or social subjects. "Technology" is science application know-how. As such, it belongs to a large group of like activities, which embrace the creation and use of artifacts, crafts and items of knowledge as well as various forms of social organizations. Technology does not only signify the application of scientific results, but any purposive treatment, methods, working method and skill in the exploitation of scientific knowledge together with the products of so doing. The significance of the "research" process in the materialization of the innovations nowadays is uncontested. According to the rules of present day research statistics, a distinction must be made between fundamental research, applied research and experimental development. The three subsequent differentiated concepts are often combined under the heading "Research and Development". See: *Frascati Manual*, OECD 1992; *Proposed Standard Practice, for Surveys of Research and Experimental Development*, Fifth Revision, Paris 1993.

Note 2. Invention can be defined as the discovery of new solutions and new ideas for acquiring new knowledge. Innovation is when an invention is for the first time implemented and put into production or a new idea is for the first time put into practice.

Note 3. In October 2008, the EU industrial R&D investment scoreboard was released. This presents information on the top 1,000 companies in terms of R & D investment whose registered offices are in the EU. The report shows that R & D investment by these top 1,000 companies grew in 2007 at a faster pace than for non-EU competitors from either the United States or Japan. It should be noted that there was a marked reduction in investment activity in the United States at this time. Nevertheless, the data presented show that R & D investment by EU companies grew for the fifth consecutive year. The regional distribution of companies in the top-50 R & D investors in 2007 was split: 20 in the United States, 18 in the EU and 9 in Japan.

Note 4. Technology policy can be defined as comprising the sum of all state measures promoting new or existing technologies for economic application in broad sense. Although Ergas concluded that "precise boundaries of technology policy are often difficult to identify", there are district technology policies, which have been pursued in the European Union. The legal basis for supranational research and technology policy in the European Community is laid down in specific articles of the ECSC Treaty (steel and coal union), the EAEC Treaty (nuclear research) and the European Community Treaty, the Single European Act and the Treaty of Maastricht on European Union. The main objectives of the common R&D policy are to provide impulses for welfare-increasing progress in important technological fields and to stimulate the diffusion of new technologies. The idea is to develop coordinated national policies as well as supranational research activities, where the concrete aims are: 1/. Strengthening the scientific and technological bases of Community industry and encouraging it to become more competitive at the international level, 2/. Eliminating unwarranted duplication of national R&D programs, 3/. Improving the efficiency of projects by task and cost sharing or use of pooling resources, 4/. Helping to reduce unemployment in the EU through new technologies and product innovations.

Table 1. Basic data on the size, structure and effectiveness of expenditures on R&D

	1998	2001	2003	2005	2007
Research and development expenditure, by sectors of performance % of GDP E.U. 27	1.79	1.86	1.86	1.82	1.85
Research and Development expenditure, government sector	0,27	0,25	0,24	0,25	0,27
Share of research and Development Personnel (%of the labour force)	na	1,29	1,33	1,37	1,41
Total European patent applications (in 000's)	45,2	50,8	51.5	55.1	56.7

Source: Eurostat, European Commission

Table 2. Exports (euro/cap)

	1999	2000	2001	2002	2003	2004	2005
EUR25	307	401	414	371	356	389	437
JAPAN	771	1096	872	796	743	796	791
CHINA	21	34	42	55	73	99	132
USA	725	843	894	683	575	694	747

Source: European Commission, 2007

Table 3. Imports (euro/cap)

	1999	2000	2001	2002	2003	2004	2005
EU25	400	536	507	458	437	474	499
JAPAN	439	644	563	520	486	516	543
CHINA	24	39	50	64	80	101	126
USA	658	932	811	749	645	666	719

Source: European Commission, 2007

Correlation Analysis of Service Quality Gaps in a Four-Star Hotel in Iran

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Abstract

During the past decades, service sector has been known as an important player in the world economy. Considering the significant role of services in the hospitality industry, this research assesses the service quality gaps based on expectations and perceptions of customers in a four-star hotel in Isfahan as the major tourism focal point in Iran. For this purpose, service quality gaps have been measured and studied through correlation analysis based on a comprehensive set of service quality dimensions. The findings imply that almost all of the service quality gaps are positive and “price” as a service quality dimension has the highest positive value. “Communication” also has the highest correlation with other service quality dimensions.

Keywords: Service Quality, Hotel, Dimension, Gaps Correlation

1. Introduction

Service quality is crucial to the success of any service organization. Since customers participate in delivery and consumption of services, they interact closely with various aspects of organizations. This knowledge gives them the opportunity to assess critically the services provided in organizations (Kandampully, 2000). Customers will assess service quality by comparing services they received with their desired services. Hence, service quality plays a critical role in adding value to the overall service experience (Lau et al, 2005).

During the past decades, the tourism industry has become one of the most important players of economies worldwide. This important industry has many infrastructures and service institutions in its category among which the most important infrastructure is the hotel industry. In this respect, customer satisfaction is a definite need for service organization improvement and therefore, maintaining and measuring customer satisfaction, as one of the most important aspects of quality improvement is a basic need of organizations. King (1995) mentioned that hospitality as a commercial activity is a special kind of relationship between service providers and customers. In this relationship, the host understands the needs and wants of the customer and gives pleasure to the customers in order that they enhance their needs and feel comfortable. The hospitality industry simply cannot survive without delivering satisfied quality of their services. Based on academic literature, Wuest (2001) reported similar impacts of service quality in tourism, hospitality, and leisure businesses which were improving guest convenience; enhancing service provider's image; ensuring customer security; generating traffic linking to profits, saving costs, and higher market share; and establishing a competitive edge, and customer demand.

For the attempts of the hospitality industry to attain service quality as sustainable competitive advantage, researchers affirmed that hospitality organizations are actively receptive to service quality initiatives, such as the British Standards Institute, the European Quality Award, the Malcolm Baldrige National Quality Award, and the Edwards Deming prize. In addition, the hospitality organizations pay close attention to raising service quality through investment in human resources development (Narangajavana, 2007).

In this paper, the hospitality industry and in particular the hotel sector is undertaken for correlation analysis of service quality gaps. It is important to note that while the literature review denotes that a large and relatively similar work has been done on the SERVQUAL approach and the correlation analysis of the dimensions values,

there seems a lack of work on the correlation analysis of service quality gaps. Therefore in the following, the literature is reviewed on the subject of service quality, its dimensions and gaps. Then, the new methodology is described and a four-star hotel in Isfahan as the major zone of tourism in Iran is undertaken as a sample for analysis. A comprehensive set of service quality dimensions (SQDs) which encompasses all the aspect of delivered services is used for analysis. The correlation and gap analysis is used to find the interrelationships amongst SQDs and to prioritize the addressed dimensions. Finally, the results are analyzed, discussed and major conclusions are presented.

2. Literature review

A service is an activity or series of activities of more or less intangible nature that normally, but not necessarily, take place in interactions between customers and service employees and/or physical resources or goods and/or systems of the service provider, which are provided as solutions to customer problems (Fitzsimmons and Fitzsimmons, 2000). The subject of service quality is wide and varied. The theory has been greatly developed by many researchers. During the past decades, many scholars have recognized and investigated the subject of service quality. In numerous service quality resources, conceptualization, measurement, implementation, and management of service quality have been studied. The concept of service quality was established after there had been a growing interest in the quality of goods served. Garvin (1988) was among first scholars who examined the quality concepts to cover both goods and services. He explained perceived quality as the subjective perception of quality through indirect measures of quality comparison. Christopher (1994) introduced perceived service quality as a result of comparing the real experience with the expectation of a customer before consuming the service. Based on the perceived service quality concept, Parasuraman et al. (1985) applied premises from other previous studies to form their model of service quality gaps. The ideas included a consumer had difficulty in evaluating service quality rather than goods quality, that a perception of service quality was developed from a comparison of consumer expectation with actual service performance; also quality evaluation involved the evaluation of both the process and outcome of service delivery. Therefore, service quality gap denotes the gap between customer's expectations (E) or what the service should provide and the customer's perception (P) of what the service actually provides (Shahin, 2006):

$$G = E - P$$

In the conceptual model of Parasuraman et al. (1985), 10 quality dimensions were introduced which included reliability, responsiveness, competence, access, courtesy, communication, creditability, security, understanding/knowing the customer, and tangibles. Parasuraman et al. (1988) developed a multiple-item scale (SERVQUAL) for measuring service quality and simplified the 10 dimensions of service quality to five dimensions as tangible, reliability, responsiveness, assurance and empathy. In this paper, a comprehensive set of 12 SQDs is considered for the study as addressed in Table 1.

While Parasuraman et al. (1988) identified five gaps that can result in unsuccessful service delivery, the majority of literature has focused on the fifth gap, which is the difference between customer's expectation and perception of service quality. The studies are not limited to five gaps as Luk and Layton (2002) and Shahin et al. (2006) addressed more gaps.

The outcomes of studies on service quality addressed several contributions to dimensional structure of service quality in the hospitality industry. These studies have argued that in the hotel sector, some of quality dimensions are different from the five dimensions described by the original SERVQUAL researchers. Akan (1995) developed a questionnaire adapted from the SERVQUAL instrument and investigated the application of the SERVQUAL instrument in an international environment. Akan aimed to examine the dimensions of the SERVQUAL and measure the level of importance of the dimensions for the users of four and five star hotels in Turkey. He identified seven dimensions including courtesy and competence of the personnel, communication and transactions, tangibles, knowing and understanding the customer, accuracy and speed of service, solutions to problems, and accuracy of hotel reservations among which, courtesy and competence of hotel personnel were the most significant dimensions influencing the perception of quality.

Enz and Siguaw (2000) examined the best practices in service quality among the US hospitality industry. Only a small number of hotel operations focused specifically on service excellence, which they did extremely well for one or more service issues; creating a service culture; building an empowered service-delivery system; facilitating a customer listening orientation; and developing responsive service guarantees.

In the field of hospitality, the measurement of service quality was derived from the concept and studies of service quality experts. A number of studies applied or modified the SERVQUAL instrument to measure service quality in the hospitality industry. Several specific instruments were developed based on the SERVQUAL approach. Lee

and Hing (1995) supported the SERVQUAL application in measuring service quality because it was relatively simple and inexpensive; provided benefits to entrepreneurs for developing better tailored marketing; and was comparable in tracking the service quality of different firms in the same business sector.

The study of Saleh and Ryan (1992) attempted to apply the SERVQUAL approach within the hospitality industry. Initially, assuming the same five dimensions of the developers, the result of their study however showed a somewhat different construct from the original approach of the SERVQUAL. The factor analysis of the study combined tangibles, reliability, responsiveness, and assurance dimensions of the original approach into "conviviality", the first factor of Saleh and Ryan's study, which explained roughly 63% and the remaining four factors (tangibles, reassurance, avoid sarcasm, and empathy) accounted for another 16%. They justified that different constructs might occur when using a 5-point scale instead of a 7-point scale as in the original research, and the invalidity of questions concerning tangibles.

Mei et al. (1999) examined the dimensions of service quality in hotel industry in Australia. They used the SERVQUAL approach as a foundation and developed a new scale called HOLSERV scale as a new instrument to measure service quality in the hotel industry. They concluded that service quality could be represented by three dimensions in the hotel industry as employees, tangibles, and reliability. Fick and Ritchie (1991) examined the SERVQUAL approach and its management implications in four major sectors of travel and tourism industry, i.e. airline, hotel, restaurant, and ski area services. They found that the most important expectations concerning service are reliability and assurance for all of the four sectors.

As it was emphasized earlier and is clear from the literature review, while there a large and relatively similar published work exists on the SERVQUAL approach and the correlation analysis of the dimensions values, there seems a lack of work on the correlation analysis of service quality gaps.

3. Research methodology

Hotels play a vital role in improving tourism in Iran and contribute to remarkable economic growth in historical cities such as Isfahan. A survey is developed and conducted in a four star hotel in Isfahan as the major tourism focal point in Iran.

The data is collected using 30 questions, based on the second level of SQDs in Table 1, which are submitted to customers in order to measure their perceptions and expectations. Therefore, customers are asked to response to totally 60 questions. Customers are also asked to fill the questionnaire using a five point Likert scale (1 as very low, 2 as low, 3 as moderate, 4 as high and 5 as very high).

As it is addressed in Table 1, the questionnaire includes four questions related to reliability, three questions to responsiveness, three questions to security and confidentiality, two questions to access and approachability, two questions to communication, two questions to understanding the customer, three questions to credibility, three questions to tangibles, two questions to courtesy, two questions to price, two questions to competence and two questions to flexibility.

4. Sample selection and data collection

Aseman Hotel is selected for the survey. The Aseman hotel is located in the heart of the historical city of Isfahan. It's only 20 minutes away from the Isfahan International Airport and 5 minutes away from the Isfahan city center. Hotel Building is a one block with 13 floors, each of which has at least two guests elevators for optimum convenience. Aseman Hotel offers 90 rooms with five single, 30 double and twin, 35 triple, 15 standard suites and four royal suites and one suit conference.

The sample of the survey includes 38 customers of the hotel. Table 2 addresses the demographic characteristics of the sample of customers. As it is clear, majority of the sample of respondents contains young people (71.1% less than 35 years old). In this category, 15.8% of respondents are between 15 and 25 years old and 55.3% are between 25 and 35 years old. 68.4% of customers are men and 31.6% are women. Most of the customers (50%) have bachelor degree and 74.4% earn more than five million Rials per month. 31.6% of respondents are single, while 68.4% of them are married. 32% of respondents have experienced the hotel more than two times.

5. Findings and discussion

The values in Table 3 denote the gaps of SQDs and as it is depicted, all of the values are positive. These positive values indicate that the delivered service performance is lower than customers' expectations. The "Price" gap has the highest positive value amongst the SQDs. The lowest positive value is also related to creditability. The reliability of data is calculated by the Cronbach's Alpha with the value of 0.833 which is satisfactory.

The Pearson correlation test is also performed on the data and the results are presented in Table 4. As it is shown

in Table 4, while there are correlations amongst a number of the SQDs, the significant correlations are just related to a few of the dimensions.

The 1 to 12 codes on the first row of the Table, refer to SQDs which are represented on the second column. With the same order, as it is illustrated, communication has the highest correlation with other SQDs. Also, there are significant correlations among other service dimensions including flexibility, competence, responsiveness, understanding the customers, tangibles, courtesy and creditability. The SQDs which do not have significant correlations are reliability, security and confidentiality, access and approachability and price. If we assume that values higher than 0.5 denote a relatively strong correlation, then it is argued that the highest correlation value of 0.60 is also referred to communication and courtesy.

As it was addressed in Table 3, some of the standard deviations were relatively high. For example, the value of standard deviation of "price" dimension is almost 1 which is very high. It is important to note that the gaps can have a maximum value of 4, and therefore, the gap value of this dimension (i.e. 1.1447) should be considered with more care.

The advantage of this research, comparing to the literature (e.g. Akan, 1995 and Mei, 1999) is in undertaking correlations amongst service quality gaps. The proposed approach could be used in any service organization and it is believed that the findings could provide great competitive advantage to hotel managers who try to improve their customer satisfaction.

However, regarding the fact that there are some correlations amongst service quality gaps in this research, it is likely to have correlations amongst SQDs, similar to what is apparent in the literature. Similar to the investigation of Saleh and Ryan (1992), the proposed approach of this paper could be developed for factor analysis in order to reduce the number of dimensions and recategorize them. The difference would be that Saleh and Ryan made the factor analysis on the dimensions values and the new approach suggests the analysis to be made on the gaps values.

Another important subject, which is necessary to explain is that the 12 dimensions used in this study seems comprehensive compared to other studies addressed in the literature as it encompasses almost all the dimensions used by other researchers.

The gap analysis is critical and valuable from the view point of the hotel managers because it is a useful tool for them to identify the service problems or service fail points. It is recommended to the hotel managers to carry the proposed analysis regularly so that they can understand more about the customers' evaluation process, and thus meet customers' expectations more consistently.

Another managerial implication includes the need for the hotel to develop human resource management strategies to train employees to become more skilled in their job, have excellent communication skills, being courteous, friendly and competent to meet customers' need. This aspect of the study is compatible with the Nadiri and Hussain (2005) investigation. Considering the correlation of the gap of tangibles with other gaps, it is suggested to the hotel managers to invest in hotel decor including appearance, tools and equipment used to provide service and physical facilities. This is in consistence with the findings of Wong et al. (1999) and Lau et al. (2005). As underlined by Zeithaml and Bitner (2003), in the hospitality industry where customers visit the establishment to receive the services, the tangibles should be overemphasized.

6. Conclusions

In this paper, service quality gaps were examined using correlation analysis. A comprehensive set of SQDs which encompasses almost all of the aspect of delivered services was used for analysis. The findings imply that all of the service quality gaps were positive and price as a service quality dimension had the highest positive value. Communication had also the highest correlation with courtesy. In addition, this dimension had the most interrelationships with other SQDs including responsiveness, creditability, courtesy and flexibility.

Compared to other studies, this paper also has some limitations. Although the set of SQDs used in this research seems comprehensive, it is costly and time consuming due to the large number of questions it holds. As a suggestion, factor analysis prior to the correlation of gaps might be an effective solution. With respect to similar investigations which are survey based and conceptual, the same problems exist and sometimes the quality of data is questionable. For this purpose, increasing the sample size will increase the quality of the data.

In this study, it is assumed that all the gap values of SQDs dimensions have the same importance value. However, in real cases, their importance might not be equal. On the other hand, the results are limited to one hotel and cannot be expanded to other hotels and service providers of the hospitality industry. These two important issues provide good opportunities for further development of the subject in future studies.

In this paper, only the correlation analysis was made on the service quality gaps. The next subject of research that the authors are currently studying is the comparison between the results of correlation analysis of dimensions and the results of the correlation analysis of gaps. If the results become different, then it would mean that relying on only the results of the correlation analysis of dimensions values is risky and insufficient and service organizations should no longer utilize the simple traditional approaches commonly used in the literature.

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Table 1. 12 service quality dimensions in two levels (Shahin, 2007)

First level	Second level
(1) Reliability	(1) Performance (2) Accuracy and Dependability (3) Consistency (4) Completeness
(2) Responsiveness	(1) Willingness to help customer (2) Readiness, Promptness (Timeliness and speed) (3) Comfort
(3) Security and confidentiality	(1) Physical security (2) Financial security (3) Safety
(4) Access and approachability	(1) Ease of contact (2) Timely access
(5) Communication	(1) Word-of-mouth communication (2) Giving information
(6) Understanding the customer	(1) Comprehension (2) Individual attention
(7) Credibility	(1) Trustworthiness and Believability (2) Honesty (3) Reputation of service
(8) Tangibles	(1) Appearance (2) Tools or equipment used to provide the service (3) Availability of physical facilities
(9) Courtesy	(1) Politeness, respect and consideration (2) Empathy
(10) Price	(1) Discountable for money (2) Valuable for money
(11) Competence	(1) Skills, knowledge and professionalism of personnel
(12) Flexibility	(1) Specification and volume flexibility (2) Service delivery speed

Table 2. Sample demographic characteristics

	N	%		N	%
Age			Gender		
15 to 25	6	15.8	Male	26	68.4
25 to 35	21	55.3	Female	12	31.6
35 to 45	8	21.1	Education Level		
45 to 55	3	7.9	High School	0	0
55 and over	0	0	Diploma	5	13.2
Marriage Status			Associates	6	16.7
Single	12	31.6	Bachelors	19	50
Married	26	68.4	Masters and higher	8	21.1
Purpose of the Journey			Customers' Revenue (Rials)		
Job related	24	63.2	Less than 3000000	3	7.9
Entertainment	13	34.2	3000000 to 5000000	6	15.8
Others	1	2.6	More than 5000000	29	74.4

Table 3. Mean and Std. deviation values of the gaps of SQDs

No.	Item	Mean	Std. Deviation	No.	Item	Mean	Std. Deviation
1	Reliability	0.5684	0.5794	7	Creditability	0.2447	0.6845
2	Responsiveness	0.4447	0.5631	8	Tangibles	0.4184	0.7436
3	Security and confidentiality	0.3526	0.5316	9	Courtesy	0.4211	0.9410
4	Access and approachability	0.4737	0.6571	10	Price	1.1447	1.0585
5	Communication	0.2632	0.8522	11	Competence	0.6579	0.7453
6	Understanding the customer	0.3684	0.8438	12	Flexibility	0.5132	0.7212

Table 4. Two Tailed Pearson Correlation Test for SQDs gaps

No.	Service Quality Dimensions	1	2	3	4	5	6	7	8	9	10	11	12
1	Reliability	1	0.409**	0.128	0.363*	0.250	0.434**	0.385**	0.320*	0.383**	0.043	0.171	0.392**
2	Responsiveness		1	0.219	0.284*	0.499**	0.394**	0.478**	0.163	0.479**	0.272**	0.269	0.498**
3	Security and confidentiality			1	0.317*	0.240	0.242	0.373*	0.336*	-0.064	0.085	0.091	0.097
4	Access and approachability				1	0.339*	0.298**	0.408**	0.244	0.303	0.297*	0.229	0.314*
5	Communication					1	0.397**	0.556**	0.225	0.600**	0.196	0.422**	0.511**
6	Understanding the customer						1	0.551**	-0.013	0.225	-0.122	0.184	0.103
7	Creditability							1	0.354*	0.442**	0.187	0.465**	0.429**
8	Tangibles								1	0.276*	0.355*	0.548**	0.304*
9	Courtesy									1	0.371*	0.587**	0.470**
10	Price										1	0.253	0.431**
11	Competence											1	0.524**
12	Flexibility												1

*Significant at 0.05, **Significant at 0.01

Trade Liberalization and Employment Performance of Textile and Clothing Industry in Tanzania

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Abstract

The objective of this study is to investigate the effect of trade liberalization on employment performance of textile industry in Tanzania. The basic issue of concern is that the implementation of trade liberalization has differential impact on employment and wage in many African countries. In addressing this issue as well as achieving the objective, econometric models of employment and wage are estimated using co-integration method of analysis. The analysis shows that effective rate of protection and export intensity have an insignificant positive impact on demand for labour, but import penetration has a significant negative impact on employment. Also, only import penetration has a significant negative impact on wage. The impact of import penetration is larger than that of export orientation, as the increase in import competition leads to a decline in labour demand. These findings point to the fact that to make trade liberalization to be effectual in Tanzania, the process of trade reform needs to be gradual and also need to be strengthened with appropriate institutional support.

Keywords: Employment, Trade Liberalization, Textiles and Wages

JEL: C22, E24, F13, J31, L67

1. Introduction

The study investigates the issue of trade liberalization and employment performance in the textile and clothing industry in Tanzania. Furusawa (1999) states that trade liberalization increases the incidence of poverty, unemployment, job security, and social inequalities. However evidence from countries like India, Mexico, India, Russia and Tunisia indicates that trade liberalization has not negatively affect the manufacturing sector but instead increases the performance of industries in these countries.

Tanzania is one of the African countries that implemented economic reforms in the mid 1980s. The country implemented Structural Adjustment Programme (SAP) under the tutelage of the International Monetary Fund/World Bank since the mid 1980s, but the tempo of liberalization and SAP picked up from the mid 1990s (Mkenda, 2005). The government decision to liberalise trade and investment policies witnessed a number of challenges. Many companies were closed down in the 1980s as they could not withstand competition from imported textiles. For example, in the early 1980s there was a reduction of number of textile firms from 35 to 2 in 1996 (Mkenda, 2005). The sector also suffers serious constraints leading to under utilization of local cotton product and reduction in employment creation or income generating opportunities. These reforms have impact on the labour market in terms of employment and income. Thus, understanding the way in which employment has been affected by trade liberalization is crucial, especially with respect to income generating activities of people and its implications on poverty, welfare and standard of living.

The eroded purchasing power made textile consumption to fall and also resulted to increase in the cost of production. The effect also had an impact on cotton production, whereby the declining cotton consumption reduces its production due to high cost. These developments in Tanzania therefore raise one major research question. What are the transmission mechanisms of linking trade liberalization to employment and wages. In addressing this question, cointegration method of analysis is employed. The results of the analysis show that in the long-run, export intensity and import penetration affects demand of labour in the industry. However, the impact of import

penetration is stronger than that of export orientation, as the increase in import competition leads to decline in labour demand. It further shows that there has been a very low increase of wages during the period of liberalization. This implies that, in the short run, labour is paid less and remains poor and therefore becomes victims of trade reform and hence is likely to remain poor. The rest part of the paper is arranged as follows. Section two covers the review of the literature, while section three presents the theoretical models. Section four deals with data sources and empirical results and the last section covers summary and conclusion.

2. Literature Survey

The adoption of trade reforms is a complex issue that cannot be explained by a single school of thought. One of the basic arguments that Matusz and Tarr (1999) agree to in terms of trade reforms is that a regime of liberal trade leads to a more efficient allocation of resources and higher level of economic well being than a regime involving artificial distortions of trade. Thus, there is a need to differentiate between net adjustment costs and gross adjustment costs. The increase of gross adjustment costs reflect the rise in turnover cost of resources while net adjustment costs rise following changes in capital and labour. Furusawa (1999) analysis shows that trade reforms lead to changes in demand and tastes, technology change, natural conditions, regulatory changes and political instability or changes in international agreements, such as trade agreements. Hitherto, there is no any consensus on the definition of adjustment costs, but there exists a consensus that adjustment costs can be defined as both short run and long run effects which involves the transfer of resources from one sector to another. Adjustment costs are borne by both the public and private sector thus its burden can be felt at an individual or public level.

Occurrence of adjustment costs is associated with number of indicators. These indicators are reduction in employment and output, job displacement, personal costs, retraining costs and forgone earnings. They also include the loss of industry-specific and firm-specific human capital, and macroeconomic instability resulting from balance of payments difficulties or reductions in government revenue and loss of preference margin. However the adjustment costs in labour market can be accelerated by factors such as the degree of governmental support for unemployed workers, the demographics of the population, the distribution of skills, the share of economic activity undertaken by state-owned enterprises, laws restricting involuntary separations and the degree of unionization (Rutaiwa and Olayiwola 2010).

Theoretical linkages of trade liberalization and labour market are well documented in the literature. de Corboda and Serena (2004) model relies on the assumption that the economy is divided into three sectors, exportable, importable and non-tradable sectors and each sector is labeled with its price. The model explains this link by comparing two time-spans, the short run and the long run. In the short run the fixed capital amount of each sector is assumed to be specific to each sector, hence leading to an upward sloping supply curve under conventional assumptions. The prices of exportable and importable goods are determined by the world prices at the going exchange rate while prices for the importable sector are determined endogenously by domestic demand and supply. The model also looks on the state of technology which assumes the labour force and level of technology of a given sector is fixed. In their study of labour market demand and adjustment costs, they added another assumption which is the ranking in descending order of labour intensity in exports, non-tradables and imports.

According to de Melo and Tarr (1990), the worsening terms of trade leads to a diversification of production from exportable to importable sector. This is also associated with the movement of labour and capital stock from the sector. The real wage in exportable sector rise while in importable sector and the real product wage declines. The net effect on employment in the non-tradable sector is open to discussion under this circumstance because it may rise or fall depending on the income and substitution effects. Moreover the real wages for consumption will tend to fall in the importable sector while rising in the non-tradable and exportable sectors.

According to de Melo and Ronald-Horst (1994), the long run effect of standard theory is based on certain assumptions. First, capital stock is mobile in all sectors, thus the impact on non-tradable sector may either be positive or negative depending on the substitution in demand towards the non-tradable sector resulting from negative income effect originating from the worsening of terms of trade. As a result of this substitution, wages will decrease relative to all goods. Also, as there is predominant labour reallocation towards the more capital intensive sector, there will also be a fall in aggregate labour demand (de Melo and Ronald-Horst, 1994). The theory brings to the fore the fact that improvement in terms of trade will come from the increase in export price, but this may not be the case in long run where there is an increase in non-tradable production. The effects of an increase in tariffs is the same as that of an increase in the import price in the country, except there is less of the negative income effect because the government is able to keep tariff revenue. On the other, hand there will be an increase in employment in the non-tradable sector but this is associated with a decline in real production wage.

Moreover, the argument that growth of trade in the manufacturing sector will hurt unskilled labour in developing countries is derived from the Heckscher–Ohlin–Samuelson–Stopec Theory. The theory clearly shows that the domestic labour supply conditions will determine the relative price and wages. Hence relative wages for skilled and the price for skilled manufactured goods is higher in the South than in North. Reducing trade barriers leads to a fall in the relative price of labour intensive manufactures in North and to a fall in the relative price of skill intensive manufacture in the South (Ghose, 2004). As a result, each country specializes in the production of goods in which they have a comparative advantage.

Neoclassical theory also explains the link of trade reforms and employment. It discusses the link of trade reforms and employment in the short run and long run. According to Hoekman et al 2005, trade reforms aimed at integrating the economy in the global market may not have a long term effect on employment, although it might be accompanied by labour and other market reforms. They argue that in the long run, the labour market will clear in the absence of distortions, with the equilibrium wage being determined by the intersection of demand and supply (Hoekman et al, 2005).

According to Davies (2000), liberalization is associated with changes in industry conditions; hence economic adjustment influences wages, profits, altering income distribution. Haouas et al (2005) found that the wages on the exportable sectors such as textile are higher compared to importable sectors however the relative difference decline over time. Sarris (1990) analyzed labour market in one of two ways. First, he set nominal wages of various employments at fixed values and derived the short run demand for labour. Second, labour market adjustments apply equilibrium-clearing of the labour market independently for each employments type by varying the nominal wages so as to equate labour demand with supply (Sarris, 1990). Thus in a model where prices for the commodity are free to clear their markets, the application of equilibrium-clearing will imply that real wages varies, because prices of the commodity varies also in the face of rigid nominal wages. The other approach leads to relatively steady real wages. The difference is that labour market behavior entails taking into account differences in model behaviour while dealing with the same issue and this has been the subject of many discussion.

3. Theoretical Model

In achieving the basic objective of this paper, Njikam (2009) model is adopted to analyze the relationship between trade liberalization and employment in Tanzania. The Cobb-Douglas Production function in the following format is adopted.

$$q_i = A^{\lambda} K_i^{\alpha} L_i^{\beta} \dots\dots\dots 9$$

where A^{λ} represent technological efficiency index, Q represent output, K represent Capital stock, L represent Labour, α and β signify capital and labour factor inputs share coefficients while λ speed up the efficiency of production by allowing factors changing. As a point of departure from this model employment is assumed mobile within different sectors. Hence a profit maximizing firm employs capital up to the point where marginal revenue product of capital is equal to user costs ($MRP_K = Z$), and marginal revenue product of labour is equal to wage ($MRP_L = W$)

In order to eliminate capital in the specification of firm output, equation (9) is solved simultaneously hence the following expression

$$q_i = A^{\lambda} (\alpha L_i / \beta \times W / Z)^{\alpha} L_i \dots\dots\dots 10$$

Where q is output, L, total employment, Z user costs, other variables are defined as above.

By applying the natural logarithm (10), becomes firm and industry demand for Labour which is a derived demand becomes:

$$\ln L_i = q_0 + q_1 \ln \left(\frac{W}{Z} \right) + q_2 \ln q_i \dots\dots\dots 11$$

$$\text{Where } q_0 = -\left(\frac{\lambda \ln A + \alpha \ln \alpha - \alpha \ln \beta}{\alpha + \beta} \right), q_1 = -\alpha(\alpha + \beta), q_2 = \frac{1}{(\alpha + \beta)}$$

Theoretically, demand for Labour is negatively related to technology while positive related to output. Hence more improvement in technology reduces the demand for unskilled Labour.

Equation (11), assumes that the impact of technology in different industries is the same and uniform, but empirical evidences show that technology is determined by trade patterns. Thus, as stated by Njikam (2009) “technology depends on import penetration, domestic industry protection and export orientation”. Thus if technology is substituted in (11), the empirical equation is stated

$$\ln L_{it} = \ln \beta_0 + \beta_1 \ln IMP_{it} + \beta_2 \ln EXO_{it} + \beta_3 ERP_{it} + \beta_4 \ln Q_{it} + \beta_5 \ln W_{it} + \varepsilon_{it} \dots\dots\dots 12$$

The wage equation is derived using the same procedures adopted in deriving employment model. However wage is defined by the inverse labour supply function, other factors include efficiency wage. In the wage model, the degree of employee market and foreign competition are regarded as key factors in wage setting. To analyze these variables, the model introduces trade share which is captured by import penetration and export intensity. The empirical equation is

$$\ln W_{it} = \ln \beta_0 + \beta_1 \ln L_{it} + \beta_2 \ln Q_{it} + \beta_3 \ln IMP_{it} + \beta_4 \ln EXO_{it} + \beta_5 ERP_{it} + \varepsilon_{it} \dots\dots\dots 13$$

β_0 denotes the intercept term, L_{it} and W_{it} represent total employment and total wage of textile industry (i) in time period (t) respectively, Q_{it} is textile and clothing output, ERP is effective rate of protection (Tariff), EXO is the export intensity, IMP is the import penetration and ε_{it} is stochastic error term assumed to be purely random. $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ are unknown slope parameters to be estimated. With the exception of ERP all variables are transformed by taking natural logs because ERP is already measured as a rate.

In principle, it is important to test the order of integration of each variable in a model, to establish whether it is non-stationary and how many times the variable needs to be differenced to derive stationary series. There are several ways of testing for the presence of unit root. For the case of this study, emphasis is on the Augmented Dickey-Fuller (ADF). Philip and Perron (1988), propose a non parametric method of controlling for higher order serial correlation in a series. Contrary to ADF, Philip Perron test makes a correction to the t-statistic of the dependent variables in the autoregressive process to account for the serial correlation in random term. As with the ADF test, one has to specify whether to include a constant and linear trend, or neither in the test regression. For the PP test, the truncation lag q for the Newey-West correction is specified which is the number of periods of serial correlation to include in the analysis.

4. Data Sources and Empirical Results

4.1 Data Sources

An econometric analysis is carried out to analyze the effects of trade liberalization on employment and wages in the textile and clothing industry of Tanzania. Data is drawn from different documents of industries including annual reports, magazines and their website. Other sources are the Tanzanian Cotton Board, the Bank of Tanzania, Tanzanian Chamber of Commerce, Industry and Agriculture, Board of External Trade (B.E.T), Consortium Tanzania Industries, National Bureau of Statistics, Ministry of Industry, Trade and Marketing and Ministry of Agriculture.

Summary statistics of variables used for analysis is presented in Table 1. All variables except labour seem to follow a normal distribution at both 5% and 1% significance level as explained by Jarque-Bera test. According to the Jargue-Bera test, the higher the statistics, the higher the log likelihood that variables are normally distributed. The dependent variables are employment and wages in which the average employment in textile is about 10.20 per cent of employees with a standard deviation of 0.53 percent. The average wage in textile industry is 8.38 per cent of total wage in the industry with standard deviation of 1.69 per cent. This implies that most of textile and clothing industry workers earn about 1.69 per cent of total wage as earnings. The average import penetration is -0.15 with a standard deviation of 1.04. The export intensity has the value of 0.55 percent on the average and 2.12 as standard deviation. The average effective rate of protection in textile industry is 11.16 percent of total protection in textile industry with the standard deviation of 12.11 percent

4.2. Empirical Results

The second aspect of econometric analysis is to examine the integration order of each variable used in the empirical models. As a necessary but not sufficient condition for co- integration is that each of the variables must be integrated of the same order and the order of integration must be greater than zero. To achieve this, ADF unit root tests of stationarity is applied as shown in Table 2. The ADF controls for possible serial correlation in error terms by adding the lagged difference terms of the regressand. The asymptotic distributions of the two tests are the same. The figures show that each series is first difference stationary at one percent using ADF test, these results are impressive hence ADF test is used for co-integration Test.

4.2.1 Testing for Co-integration using Johansen approach

The main theoretical argument of co-integration analysis is that even if individual variable is non-stationary, the group of variables may drift together. This implies that a linear combination of two or more such variables (time series) can be stationary. As shown in Table 2, since variables are integrated at the same order, there is the need to test for co-integration relationships using Johansen approach. This approach is selected because the Engle and Granger two step procedure conceals information on the coefficients of the explanatory variables in the cointegrating vector, hence makes the approach inappropriate in many cases including this study. The results using

this approach are found to be sensitive to the lag length used. The Akaike information criterion is used in selecting lag length to be included in the estimation. Cointegration tests of the models assume quadratic deterministic trend in data. Both maximum eigenvalue test and the trace results indicate the existence of a unique co integrating vector between test variables for both employment and wage equations.

In Table 3, the first row tests the hypothesis of no cointegration, the second row tests the hypothesis of one cointegration, and the same applied to the remaining rows against the alternative hypothesis. The normalized cointegrating equation of employment reveals that in the long-run, export intensity has an insignificant positive impact on employment, while the effective rate of protection also has an insignificant impact on demand for labour. Only import penetration has a significant negative impact on employment. These results provide evidence to justify the fact that trade liberalization has a minimal positive impact on employment. Output variable also contribute positively to the employment creation, which is in support of Mkenda (2005). The normalized results of wage equation show that in long run, import concentration has a significant negative impact on wage, compared to export intensity that has an insignificant positive impact on wage. The result is justified as labour is less paid and becomes the major victims and hence likely to remain poor with trade reforms in Tanzania.

The existence of cointegration allows for derivation of the error-correction model from the cointegrating equations by including the lagged error-correction term, hence the long-run information lost through differencing are captured. To be theoretically meaningful the coefficient of the error term should be negative and range between zero and one in absolute term, this ensures the equilibrium error term is meaningful over time in the system. The error-correction term to be estimated stands for the short-run to long-run adjustment equilibrium trends. The next step is to examine the error correction model.

4.2.2 Vector Error Correction Modeling (VECM)

Since there is co-integration among dependent variables and its fundamentals, an error correction model has to be estimated by incorporating the lagged error correction term in the set of regressors. The error correction term is the residual from the static long run regression and it joins the set of differenced non-stationary variables to be estimated to capture both short run and long run dynamics. Before estimating the VECM, the variables in co integrated equations are considered as endogenous in the Vector Autoregressive (VAR) model. The model makes use of both differenced data and lagged differenced data of the chosen variables in a VAR model.

Using employment equation, diagnostic tests performed on various orders of the error correction model indicate that the model has negative sign. Various cases such as autocorrelation problem, heteroscedasticity and normality are tested. In addition, the magnitude of the coefficient of error correction term lies between zero and one. This shows that 14 per cent of the short run disequilibrium adjusts to the long run equilibrium each year and also indicate that the speed of employment to converge to the long run equilibrium point is slow. Generally, the estimated coefficients for employment equation in terms of sign and magnitude are significant and meet apriori expectation. The results are good enough to be used as the basis for analysis of the effects of trade liberalization on textile and clothing industry employment.

In terms of wage equation, diagnostic tests on the error correction model indicate that the model does not conform to the apriori expectation that requires the coefficient of the error term to be negative and range between zero to one in absolute term. The positive sign of error correction term implies that an disequilibrium in wage model may not converge to equilibrium in the long run. This is contrary to the efficiency wage and subsistence wage theories. The reason that can be adduced to this finding is the presence of labour union in the Tanzanian textile industry that constitute element of wage rigidity.

4.2.3 Variance Decomposition

This gives information about the relative importance of changes in the value of each variable in the VAR. It also provides the proportion of “the movements in the dependent variables that are due to their ‘own’ shock, versus shock to the other variables” (see Olayiwola and Okodua 2009). Furthermore it provides the proportion of movements between dependent variables caused by it and other variables. In the analysis of variance decomposition, a ten year forecasting horizon is employed.

As documented in Tables 5, a one standard deviation shock to labour force in forecast year 4 accounts for 87.23% of the variation in employment compared to a lower 6.3% variation in forecast year 10. During the same year, a one standard deviation shock to output will cause 1.42% variation in employment but the variation in employment increases to 6.36%. In term of wage, a one standard deviation shock leads to 6.25% variation in employment and this variation increases to 19.8% in forecast year 10. In terms of indicators of trade liberalization, a one standard deviation shock to import penetration in year 1 has no impact on variation of employment. In forecast year 4, it

accounts for 3.51% variation of employment and the impact on variation of employment increases to 9.20% in forecast year 10. Export orientation has a very minimal impact on employment, as its one standard deviation shock accounts for only 0.41% variation in employment in forecast year 4 and only 1.34% in forecast year 10. The trend is also the same in terms of effective rate of protection, as a one standard deviation shock accounts for 1.17% variation in employment in year 4 and 2.89% in forecast year 10. From the analysis, there appears to be no significant impact trade liberalization indicators on employment in forecast year 1, and the impact becomes more significant from period 4 to 10.

In terms of wage, as documented in Table 6, a one standard deviation shock to import penetration in forecast year 4 accounts for 2.57% variation in wage. During the same year, a one standard deviation shock to export concentration leads to 1.78% variation in wage. The effective rate of protection has a minimal impact in wage, as its one standard deviation accounts for a meager 0.45% variation in wage. In the forecast year 10, a one standard deviation shock to import penetration accounts for 10.2% variation in wage. During the same period, the result of one standard deviation shock to exports concentration accounts for 4.4% variation in wage. The effect of one standard deviation shock to effective rate of protection on variation in wage still remains very insignificant at 0.76% during the same period. The analysis of variance decomposition of wage model clearly shows that export concentration and import penetration account for more variation in wage compared to effective rate of protection.

5. Summary and Conclusion

The purpose of this study is to analyze the effects of trade liberalization on employment performance in the textile and clothing industry in Tanzania. To achieve this objective, econometric models of employment and wages are estimated using cointegration method of analysis. The results of the analysis show that in the long-run, export intensity and import penetration affects demand of labour in the industry. However, the impact of import penetration is stronger than that of export orientation, but the increase in import competition leads to a decline in labour demand. These findings suggest that trade reforms lead to less employment growth in the textile and clothing sector in Tanzania. In term of wage, only import penetration has a significant positive impact on wage, while both effective rate of protection and export concentration have an insignificant impact on wage. Also, export concentration and import penetration account for more variation in wage compared to effective rate of protection in the long run.

In Tanzania, the process of trade reforms should be more gradual in order to reap the benefits of trade reforms in terms of increase in employment and wage in textile and clothing industry. The reforms should go hand in hand with supply side support especially to develop the domestic private sector. Also, in implementing trade reforms, there is need for government to adopt and maintain selective protection within the WTO Agreements.

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Table 1. Summary Statistics of Tanzania Textile Industries 1980-2007

	LNL	LNIMP	LNEXO	ERP	LNQ	LNW
Mean	10.20102	-0.159705	0.549733	11.16393	11.17288	8.382526
Median	10.44616	0.322423	1.369774	9.300000	11.10831	8.515142
Maximum	10.67037	0.904421	2.939691	33.06000	11.89546	12.59349
Minimum	9.089528	-2.339249	-2.995732	-21.69000	10.34821	5.789960
Std. Dev.	0.535046	1.049301	2.129875	12.11309	0.396361	1.690404
Skewness	-1.348366	-1.069839	-0.546388	-0.315261	0.052675	0.530124
Kurtosis	2.944829	2.658116	1.740445	3.227622	2.441446	3.044431
Jarque-Bera	8.487981	5.477625	3.244079	0.524264	0.376928	1.313783
Probability	0.014350	0.064647	0.197495	0.769409	0.828230	0.518460

Source: computed from the data sourced from Tanzanian Cotton Board, the Bank of Tanzania, Tanzanian Chamber of Commerce, Industry and Agriculture, Board of External Trade (B.E.T), Consortium Tanzania Industries, National Bureau of Statistics, Ministry of Industry, Trade and Marketing and Ministry of Agriculture.

Table 2. Unit Root Test on Annual data (1980-2007)

ADF UNIT ROOT TEST					
Variables		ADF value (constant included)		ADF value (constant and linear trend included)	
		Level	First differenced	Level	First differenced
LNL		-1.128359	-5.712975*	-2.077446	-5.855750*
LNIMP		-1.572428	-4.327015*	-2.216095	-4.327015*
LNEXO		0.26337	-4.526889*	-1.973715	-4.657409*
ERP		-2.282882	-6.919416*	-2.575282	-6.952143*
LNQ		-0.965309	-4.921556*	-1.209564	-5.961665*
LNW		-3.835184*	-8.088510*	-4.045266**	-7.981195*
Critical Values	1%	-3.699871	-3.711457	-4.339330	-4.356068
	5%	-2.976263	-2.981038	-3.587527	-3.595026
	10%	-2.627420	-2.629906	-3.229230	-3.233456
TRACE TEST					
Eigenvalue		trace static	5 per cent critical level	Prob**	Hypothesized No. of CE(s)
0.969808		149.7181	107.3466	0.0000	None **
0.667125		58.71378	79.34145	0.6174	At most 1
0.422581		30.11409	55.24578	0.9270	At most 2
0.323753		15.83523	35.01090	0.9174	At most 3
0.149798		5.664115	18.39771	0.8938	At most 4
0.054053		1.444800	3.841466	0.2294	At most 5
MAXIMUM EIGENVALUE TEST					
Eigenvalue		Max-EigenStatistic	5 per cent critical level	Prob**	Hypothesized No. of CE(s)
0.969808		91.00437	43.41977	0.0000	None **
0.667125		28.59968	37.16359	0.3416	At most 1
0.422581		14.27886	30.81507	0.9313	At most 2
0.323753		10.17112	24.25202	0.8944	At most 3
0.149798		4.219314	17.14769	0.9513	At most 4
0.054053		1.444800	3.841466	0.2294	At most 5
Co integrating coefficient normalized on Employment (standard error in parentheses)					
L	Q	W	IMP	EXO	ERP
1.000000	-0.496970	0.112282	-18292.03	-1350.925	-168.4577
	(-0.01512)	(-0.00641)	(-952.633)	(-109.911)	(-30.0540)
W	L	Q	IMP	EXO	ERP
1.000000	8.906152	4.426089	162911.6	12031.55	1500.310
	(-0.48428)	(-0.19399)	(-8879.04)	(-983.050)	(-264.070)
Trace test indicates 5 co integrating eqn(s) at the 0.05 level					
*denotes rejection of the hypothesis at the 0.05 level					

Max-eigenvalue test indicates 5 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: computed from the data Source: computed from the data sourced from Tanzanian Cotton Board, the Bank of Tanzania, Tanzanian Chamber of Commerce, Industry and Agriculture, Board of External Trade (B.E.T), Consortium Tanzania Industries, National Bureau of Statistics, Ministry of Industry, Trade and Marketing and Ministry of Agriculture.

LN is a logarithm and ADF is the Augmented Dickey Fuller

Asterisk *, ** and *** indicate significance at the 1%, 5% and 10% significance levels respectively

Table 3. Vector Error Correction Model for Employment, Standard errors in () & t-statistics in []

Variable	D(lnL)	D(lnQ)	D(lnW)	D(lnIMP)	D(lnEXO)	D(ERP)
ECT_1	0.142351	0.266703	-0.177249	-9.50E-06	1.75E-05	2.57E-06
	(0.11467)	(0.22528)	(1.03885)	(3.1E-06)	(3.5E-05)	(0.00017)
	[1.24144]	[1.18385]	[-0.17062]	[-3.07803]	[0.49354]	[0.01515]

Source: computed from the data analysis

Table 4. Vector Error Correction Model for Wage, Standard errors in () & t-statistics in []

Variable	D(lnW)	D(lnL)	D(lnQ)	D(lnIMP)	D(lnEXO)	D(ERP)
ECT_1	0.025939	0.020832	-0.039029	-1.39E-06	2.56E-06	-3.76E-07
	(0.15203)	(0.01678)	(0.03297)	(4.5E-07)	(5.2E-06)	(2.5E-05)
	[0.17062]	[1.24144]	[-1.18385]	[-3.07803]	[0.49354]	[-0.01515]

Source: Extracted from data analysis

Table 5. Variance Decomposition for Employment

Decomposition of Variance for Employment							
Period	Std Err	InL	InQ	InW	InIMP	InEXO	ERP
1	7508.818	100.000	0.0000	0.0000	0.0000	0.000	0.0000
4	13693.31	87.23200	1.429090	6.232298	3.518940	0.410925	1.176749
7	19390.53	73.10679	3.867979	13.31861	6.678686	0.902446	2.125482
10	25301.98	60.31283	6.362356	19.88188	9.203389	1.341283	2.898269

Cholesky Ordering: InL InQ InW InIMP InEXO ER

Source: Data from the appendix Table A5

Table 6. Variance Decomposition for Wage

Decomposition of Variance for InW							
Period	Std Err	InW	InL	InQ	InIMP	InEXO	ERP
1	68028.43	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
4	94271.17	90.23383	0.331242	4.616795	2.577122	1.781831	0.459181
7	112452.3	80.59876	0.325773	9.595594	5.944119	3.088558	0.447197
10	129036.6	68.05954	0.280434	16.24917	10.23624	4.410239	0.764379

Cholesky Ordering: InW InL InQ InIMP InEXO ERP

Source: Table A5

Basic Education Investment Ratio Model and the Empirical Research

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Abstract

By predicting the condition of basic education teachers in western rural area, this paper establishes a mathematical model determining western basic education investment ratio.

Keywords: Education management, Basic education, Investment ratio, Mathematical model

1. Introduction

Since the reform and opening up, China has made significant achievements in economic and social development. However, the economy in western area develops slowly, compared to the eastern area. Due to financial constraints and insufficient investment in education, the education, especially the basic education, has been affected negatively. In some areas, especially in rural areas and poor areas, basic education conditions are poor and teachers are in serious short, what have already become chief factors stopping the development of basic education. Although the drop-out rate of students is less than 1% because of the spread of compulsory education, we must consider the out flow of students because students and parents have lost confidence in local education (Dennis C. Mueller, 2003). The outflow of students forces schools to cut staff, resulting in loss of teachers (He, Lifang, 2006). As described in this paper, the percentage of loss of students from primary school to junior high school reaches 8.72% in average in six counties. Accordingly, the number of junior high school teachers is smaller than that of primary school. It forms a vicious circle. Also, poor treatments will directly cause the loss of teachers. Therefore, to maintain the stability of teachers and improve the quality of teachers is particularly important. In recent years, the state invests more in basic education in western counties considering the poor conditions there. The boarding school work achieves significant results. Compulsory education is free in rural areas. However, education is not done overnight. The development of teachers in western areas needs more efforts.

Schultz (Schultz, T.W., 1971) proposed the "human capital" theory: to study the driving force of economic development, it is necessary to introduce the concept of capital, both physical capital and human capital (Schultz, T.W., 1971). In this level, human resource development, human capital accumulation, and physical capital accumulation have already become the main sources of economic growth. And the two are mutually reinforcing. Therefore, to promote the development of education, the first thing is to strengthen the development of human resource, namely the cultivation of teaching staff. To cultivate a teaching staff, we should explore the potential of existing teachers and stabilize the teaching staff. Besides, we can absorb more talents to enrich the teaching staff by state policies and local governments' investments. Although the problem of teacher shortage has already been improved, the overall quality of teachers needs to be promoted.

Firstly this paper makes a brief analysis of development of western basic education based on the cultivation of teaching staff in six counties in Shaanxi province from 2004 to 2008, discussing the existing problems from the quantity and the quality of teachers, concluding that the quality of teachers has not been improved along with the increase of the quantity of teachers or even declined. Then, this paper builds a difference equation according to the relations between the number of teachers, the number of students, and government investment and makes a prediction on the future five-year development of basic education in the six counties by the difference equation. The prediction shows that: with the improvement of economic conditions in western area, if the state and the local government do not invest more in the cultivation of teaching staff, the outflow of students will become more serious, and the basic education system will be in a vicious state. Finally, this paper suggests to increasing education investments in eastern area and presents a program for distributing education investments based on the principle of fairness and efficiency.

Most papers on the construction of western teaching staff are qualitative analyses based on few data. For example, Kongzhen Li and Li Zhang, in *Regional Education Development Strategy and Western Education Policy in Perspective of Experts*, analyze problems in constructing western teaching staff by questionnaire. Rui Zhang, in *The Public Policies in Collocating Western Education Resource in Transitional Period: Government, Market and Education*, makes a qualitative analysis of state investments in perspective of the simultaneous development of economy and education. Huaxiang Gu, in *A Study On the Development of Western Education and the Countermeasures*, probes into the shortcomings of western education by comparing the east and the west. Hailan Pan, in *An Analysis On the Development of Western Education and the Countermeasures*, analyzes the necessity of state investment by discussing the impacts of the overall quality of teachers on the Great West Exploration Program. Wenli Wang, in *The Problems in l Compulsory Education in Western Poor Rural Areas and the Sollutions*, points out the distance between China's investments in western education and developed countries' investments in education, by means of comparisons, emphasizing the importance of increasing investments. Weidong Wen, in *Suggestions on Funding for Western Rural Compulsory Education*, focuses on local governments' unfair distribution of investments in education. Generally speaking, few articles adopt mathematical model to analyze the construction of teaching staff in western counties and seldom present ways for the distribution of state investments based on data and mathematical model. That is the value of this paper.

2. Predict the development of basic education teachers in rural areas

We use the students – teacher ratio to analyze the size changes of basic education teachers in western area.

Students --- teacher ratio ($st_{ij}^{(k)}$) = the number of students in school / the number of teachers in school

Here are the size changes of teaching staff in six counties in Shaanxi province from 2004 to 2008.

Insert Figure 1 Here

According to Figure 1, the development of Great West Exploration Program, China's more investments in western education, and the carry-out of teachers' promotion policy in western area have absorb lots of young teachers dedicating to western education. It basically solves the problem of more children and less teachers in western area.

The quality of teachers is mainly reflected by teachers' age structure and professional title structure. Next, we will respectively discuss teachers' age structure and professional title structure.

2.1 Age structure

Age structure is mainly used to value the aging issue of teacher staff. We use the proportion of key teachers, namely the proportion of teachers aging from 30 to 45 to total teachers in one year, as the index. Here we calculate the figure out the proportions of key teachers in primary schools, junior high schools, and senior high schools in different counties (take Qingjian County and Shanyang County as examples)

Insert Figure 2 Here

According to Figure 2, along with changes of time, proportions of key teachers in the two counties do not change significantly. It indicates that the aging issue of teaching staff does not arouse necessary attentions for a long time.

2.2 Professional title structure

China has established the lowest proportion of middle and senior teachers. Here we use the proportion of middle and senior teachers to value the professional title structure. The higher the proportion is, the higher the quality is. And the teaching quality is higher accordingly. Now we define the proportions of middle and senior teachers at different education levels.

Primary school

Proportion of middle and senior teachers = number of teachers with senior titles + number of teachers with middle titles / number of teachers in primary schools

Junior and senior school

Proportion of middle and senior teachers = number of teachers with senior titles + number of teachers with middle titles / number of teachers in junior high schools and senior high schools

According to files from the Education Department of Shaanxi Provincial Government, we know the requirement for teachers' professional title structure: the proportion of middle and senior teachers should be higher than 60% (Education Department of Shaanxi Provincial Government, 2004). By calculation, we get the average proportion

of middle and senior teachers in the two counties (take Qingjian County and Shanyang County for examples) from 2004 to 2008.

Insert Figure 3 Here

According to Figure 3, the professional title structures in the two counties do not change a lot. Similar to the age structure, it does not arouse sufficient emphasis. Although China's support policies absorb lots of talents rushing into the west, which increases the number of teachers to a great degree, the quality does not improve significantly.

Based on problem analysis and correlation analysis by SPSS, we find that the most significant factor impacting the number of teachers is the number of students. The two is a 0.994 positive correlation. Meanwhile, the number of teachers, professional title structure, and age structure are inevitably under the influences of government's investments. Surely, the number of teachers, professional title structure, and age structure can affect the number of students in adverse. Therefore, we build a differential equation on the number of students and the number of teachers.

$$s_{ij}^{(k)} - s_{i(j-1)}^{(k)} = \mu_{i1}^{(k)} \cdot (st_{i(j-1)}^{(k)} - ST^{(k)}) + \mu_{i2}^{(k)} \cdot (co_{i(j-1)}^{(k)} - CO^{(k)}) + \mu_{i3}^{(k)} \cdot (mh_{i(j-1)}^{(k)} - MH^{(k)}) + r_i^{(k)} \quad (1)$$

$$t_{ij}^{(k)} - t_{i(j-1)}^{(k)} = v_1^{(k)} \left(\alpha_i^{(k)} \cdot \frac{M_{i(j-1)}^{(k)}}{s_{i(j-1)}^{(k)}} \cdot st_{i(j-1)}^{(k)} - M_j^{(k)} \right) + v_2^{(k)} (st_{i(j-1)}^{(k)} - ST) + \delta_i^{(k)} \quad (2)$$

$$st_{ij}^{(k)} = \frac{s_{ij}^{(k)}}{t_{ij}^{(k)}} \quad (3)$$

$$co_{ij}^{(k)} - co_{i(j-1)}^{(k)} = \left[\alpha_i^{(k)} \cdot \frac{M_{i(j-1)}^{(k)}}{s_{i(j-1)}^{(k)}} \cdot st_{i(j-1)}^{(k)} - M_j^{(k)} \right] \cdot \beta_1^{(k)} + (st_{i(j-1)}^{(k)} - ST) \cdot \beta_2^{(k)} \quad (4)$$

$$mh_{ij}^{(k)} - mh_{i(j-1)}^{(k)} = \left[\alpha_i^{(k)} \cdot \frac{M_{i(j-1)}^{(k)}}{s_{i(j-1)}^{(k)}} \cdot st_{i(j-1)}^{(k)} - M_j^{(k)} \right] \cdot \xi_1^{(k)} + (st_{i(j-1)}^{(k)} - ST) \cdot \xi_2^{(k)} \quad (5)$$

In the equation group, $s_{ij}^{(k)}$ and $t_{ij}^{(k)}$ respectively stands for the number of students and teachers in county i in the year j at the k education level. $st_{ij}^{(k)}$, $co_{ij}^{(k)}$, $mh_{ij}^{(k)}$ and $M_{ij}^{(k)}$ respectively stands for the students – teacher ratio, the proportion of key teachers, the proportion of teachers with middle and senior titles, and the government investments in county i in the year j at the k education level. $ST^{(k)}$, $CO^{(k)}$, $MH^{(k)}$ respectively stands for the widely-accepted students – teacher ratio, the proportion of key teachers, and the proportion of teachers with middle and senior titles. $M_j^{(k)}$ refers to the social average salary at the k education level.

In the equation (1), $\mu_1^{(k)}$, $\mu_2^{(k)}$, $\mu_3^{(k)}$ respectively stands for students and parents' attitudes toward the students – teacher ratio, the proportion of key teachers, and proportion of teachers with middle and senior titles in county i at the k education level. As the three indexes above are lower than social standard, the number of students will be decreasing. $\gamma_i^{(k)}$ is the natural growth of students at the k education level. Because the population of western area is rising, this index is positive.

In the equation (2), $\alpha_i^{(k)} \cdot \frac{M_{i(j-1)}^{(k)}}{s_{i(j-1)}^{(k)}} \cdot st_{i(j-1)}^{(k)}$ stands for teachers' real salary in county i in the year j at the

k education level. $\alpha_i^{(k)} \bullet \frac{M_{i(j-1)}^{(k)}}{S_{i(j-1)}^{(k)}} \bullet st_{i(j-1)}^{(k)} - M^{(k)}$ stands for the distance between teachers' real salary and ideal salary. $st_{i(j-1)}^{(k)} - ST$ means the distance of teachers' real burden (how many students are directed by one teacher) and the ideal burden. $\nu_1^{(k)}$ and $\nu_2^{(k)}$ reflect teachers' attitudes toward salary and burden. $\delta_i^{(k)}$ is the increasing number of teachers caused by counties' favorable policies for professional promotion.

In equation (4) and (5), $\beta_1^{(k)}$ and $\beta_2^{(k)}$ respectively stands for the effects of salary and burden on teachers' age structure. $\xi_1^{(k)}$ and $\xi_2^{(k)}$ respectively stands for the effects of salary and burden on teachers' professional title structure.

According to materials (Education Department of Shaanxi Provincial Government, 2007), we find the official regulation that the proportion of teachers with middle and senior professional titles should not be smaller than 60% in senior high school, junior high school, and primary school. Considering conditions in other western areas and in the east, we define $MH^{(1)}$, $MH^{(2)}$ and $MH^{(3)}$ as 0.6, 0.75, 0.8.

We can not get teachers' average salary by all means. Based on rough materials (Lin Yao, 2008), we suppose that teachers' average salary is equal to social average. Then, we can establish $M^{(k)}$.

Different counties have various economies, policies, geological, and human environment, parameters μ , ν , δ , γ , β and ξ in above equations are different (for example, in poor areas, students and parents emphasize few on education quality, because parents are incapable of supporting children to study in better environment). Therefore, we make a cluster analysis on the construction of teaching staff in six counties by SPSS. The results are as follow.

Insert Figure 4 Here

From Figure 4, Changwu County, Ningqiang County, Shanyang County, and Shenmu County belong to the first cluster. Qingjian County and Wugong County belong to the second cluster. A further investigation finds that Qingjian County and Wugong County have the worst economy, what indicates that the economic condition in one area has the most significant impact on education. Suppose all parameters in six counties are respectively equal. Use MATLAB to get the solution. The prediction is as follow.

Insert Figure 5 Here

According to Figure 5, in future five years, if we do not adopt effective measures to strengthen the quality construction of teaching staff, the quality of teaching staff will fluctuate or decline, which will inevitably cause the outflow of local students, forming a vicious circle.

3. Basic education investment ratio model

According to former prediction, we know that the quality of teaching staff in western area is rising stably, but the rising rate is slow. It is predicted that people's requirements for highly-qualified basic education and constantly-improved training mechanism for teachers will make the state invest more in western rural basic education (Stephen P. Robbins, 1982). At that time, considering the different conditions in different regions, how to distribute the investment will become a focus. For example, suppose the state invests S ten million RMB in improving the construction of teaching staff, how to distribute the money? Based on former difference equation, following the principle of efficiency and fairness (Authur M. Okun, 1975), we present a distribution program.

The target function:

$$\min = \sum_{i=1}^6 \sum_{k=1}^3 \left(\lambda_1 \bullet \frac{ST^{(k)} - st_{ij}^{(k)}}{ST^{(k)}} + \lambda_2 \bullet \frac{CO^{(k)} - co_{ij}^{(k)}}{CO^{(k)}} + \lambda_3 \bullet \frac{MH^{(k)} - mh_{ij}^{(k)}}{MH^{(k)}} \right) \quad (6)$$

ST.

$$s_{ij}^{(k)} = \mu_{i1}^{(k)} \cdot (st_{i(j-1)}^{(k)} - ST^{(k)}) + \mu_{i2}^{(k)} \cdot (co_{i(j-1)}^{(k)} - CO^{(k)}) + \mu_{i3}^{(k)} \cdot (mh_{i(j-1)}^{(k)} - MH^{(k)}) + r_i^{(k)} + s_{i(j-1)}^{(k)} \quad (7)$$

$$t_{ij}^{(k)} = \nu_1^{(k)} \left(\alpha_i^{(k)} \cdot \frac{M_{i(j-1)}^{(k)}}{s_{i(j-1)}^{(k)}} \cdot st_{i(j-1)}^{(k)} + \frac{N_{ij}^k}{t_{i(j-1)}^k} - M_j^{(k)} \right) + \nu_2^{(k)} (st_{i(j-1)}^{(k)} - ST) + \delta_i^{(k)} + t_{i(j-1)}^{(k)} \quad (8)$$

$$st_{ij}^{(k)} = \frac{s_{ij}^{(k)}}{t_{ij}^{(k)}} \quad (9)$$

$$co_{ij}^{(k)} = \left[\alpha_i^{(k)} \cdot \frac{M_{i(j-1)}^{(k)}}{s_{i(j-1)}^{(k)}} \cdot st_{i(j-1)}^{(k)} + \frac{N_{ij}^k}{t_{i(j-1)}^k} - M_j^{(k)} \right] \cdot \beta_1^{(k)} + (st_{i(j-1)}^{(k)} - ST) \cdot \beta_2^{(k)} + co_{i(j-1)}^{(k)} \quad (10)$$

$$mh_{ij}^{(k)} = \left[\alpha_i^{(k)} \cdot \frac{M_{i(j-1)}^{(k)}}{s_{i(j-1)}^{(k)}} \cdot st_{i(j-1)}^{(k)} + \frac{N_{ij}^k}{t_{i(j-1)}^k} - M_j^{(k)} \right] \cdot \xi_1^{(k)} + (st_{i(j-1)}^{(k)} - ST) \cdot \xi_2^{(k)} + mh_{i(j-1)}^{(k)} \quad (11)$$

$$\frac{ST^{(k)} - st_{ij}^{(k)}}{ST^{(k)}} \leq \alpha \quad (12)$$

$$\frac{CO^{(k)} - co_{ij}^{(k)}}{CO^{(k)}} \leq \alpha \quad (13)$$

$$\frac{MH^{(k)} - mh_{ij}^{(k)}}{MH^{(k)}} \leq \alpha \quad (14)$$

$$\sum_{i=1}^6 \sum_{k=1}^3 (N_{ij}^{(k)}) \leq S \quad (15)$$

In these equations, j stands for the distribution program at the year j . Because constraint conditions concern data in $j-1$ years, we can get the solution of the target function year by year.

In the above target function: $\frac{ST^{(k)} - st_{ij}^{(k)}}{ST^{(k)}}$, $\frac{CO^{(k)} - co_{ij}^{(k)}}{CO^{(k)}}$, $\frac{MH^{(k)} - mh_{ij}^{(k)}}{MH^{(k)}}$ respectively stands for the distance

between students – teacher ratio, proportion of key teachers, proportion of teachers with middle and senior titles and social standards. Multiply with their weights λ_i and get the target function. Suppose $\lambda_1 = -0.7$, $\lambda_2 = 0.1$ and $\lambda_3 = 0.2$. In the constraint conditions, conditions from (7) to (11) are the

deformations of difference equation. Here, $\frac{N_{ij}^k}{t_{i(j-1)}^k}$ stands for the increasing salary of teachers in county i in the

year j at the k education level due to the S ten million RMB investments. Conditions from (12) to (14) are fairness constraint conditions, ensuring the distance between practical values (concerning six counties' three education levels and three target values) and ideal values is less than α . Then, it will not focus too much on certain county or education level in distribution. The condition (15) is the constraint condition for total capital.

As for the parameter $M_j^{(k)}$, in this equation, namely teachers' social ideal income in the year j at the k education level, we can predict its value by China's present GDP growth.

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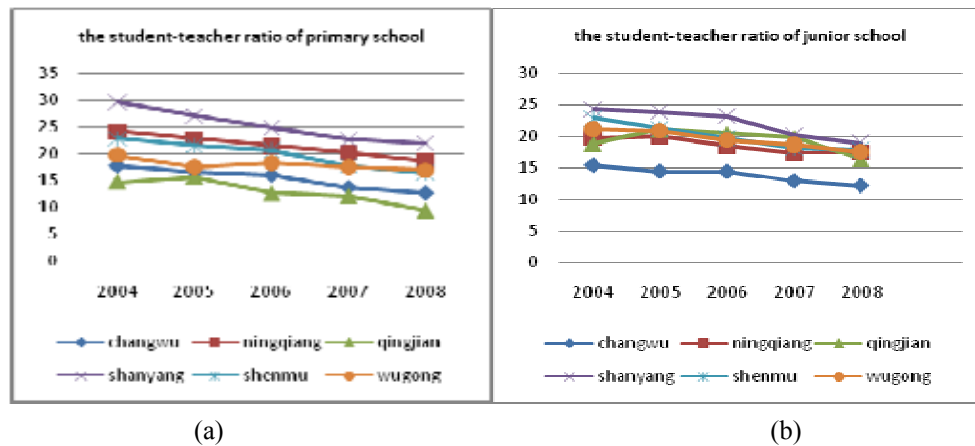


Figure 1. The Changing Trend of Students – Teacher Ratio in Primary Schools and Junior High Schools in Six Counties Year by Year

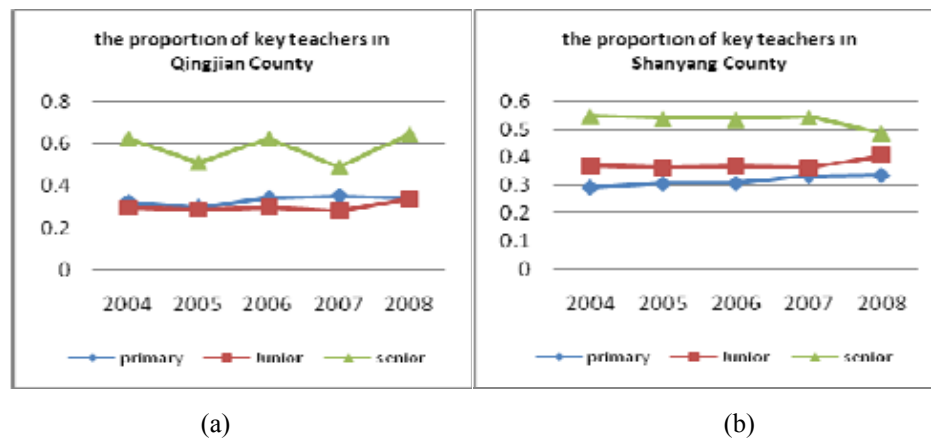


Figure 2. The Yearly Changes of Proportions of Key Teachers in Qingjian County and Shanyang County



Figure 3. The Yearly Changes of Proportions of Middle and Senior Teachers in Qingjian County and Shanyang County

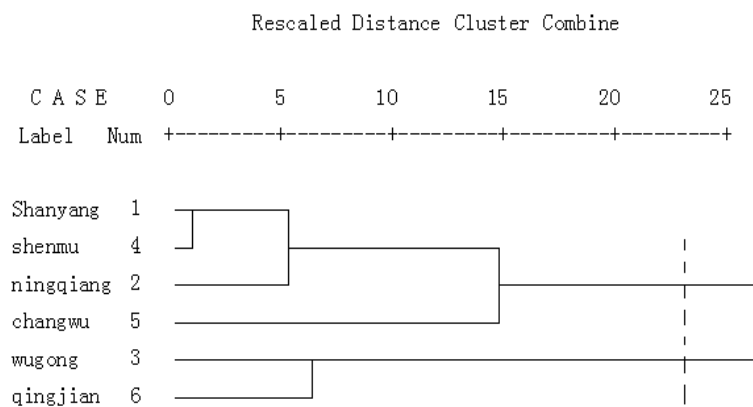


Figure 4. The Result of Cluster Analysis ----- A Tree Diagram

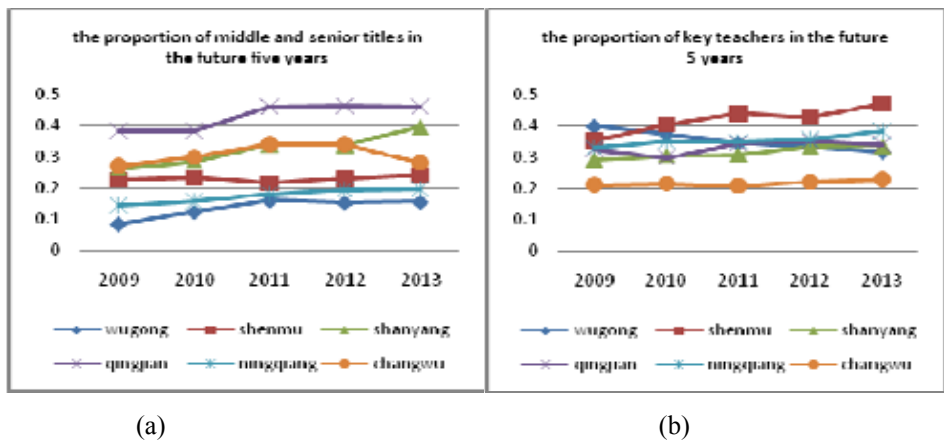


Figure 5. Prediction of the Proportion of Teachers with Middle and Senior Titles and the Proportion of Key Teachers

The Effects of Shopping Orientations, Online Trust and Prior Online Purchase Experience toward Customers' Online Purchase Intention

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Abstract

The advancement of the World Wide Web has resulted in the creation of a new form of retail transactions-electronic retailing (e-tailing) or web-shopping. Thus, customers' involvements in online purchasing have become an important trend. As such, it is vital to identify the determinants of the customer online purchase intention. The aim of this research is to evaluate the impacts of shopping orientations, online trust and prior online purchase experience to the customer online purchase intention. A total of 242 undergraduate information technology students from a private university in Malaysia participated in this research. The findings revealed that impulse purchase intention, quality orientation, brand orientation, online trust and prior online purchase experience were positively related to the customer online purchase intention.

Keywords: Shopping orientations, Online purchase intention, Online trust, Prior online purchase experience.

1. Introduction

The advancement of the World Wide Web has resulted in the creation of a new form of retail transactions-electronic retailing (e-tailing) or web-shopping. The rapid growth of the Internet technology has enabled Malaysian consumers to purchase products or services from the web-retailers and search product information from the Internet. However, web-retailers can only offer certain ranges of products and services to web-shoppers, including e-banking services, technology gadgets, cosmetics, clothing and the booking of airlines ticket. Wolfenbarger and Gilly (2001) assert that web-shopping presents different shopping experiences even when the same products are purchased. Through web shopping, consumers interact in a virtual environment via the website interface (Alba, Lynch, Weitz and Janiszewski, 1997; Hoffman and Novak, 1996). Therefore, web shopping is perceived to be more risky and therefore trust and risk play prominent roles in online transaction (Forsythe and Shi, 2003; Pavlou, 2003). Web-shopping behaviour does not necessarily follow traditional consumer behaviour in the bricks-or-mortar retailing environment, thus Internet marketers are advised to explore the determinants of customer online purchasing intention among the web shoppers. With a good understanding of the web shopper's online purchase intention, web-retailers will be able to develop effective and efficient web-shopping strategies to attract new and potential web-shopping customers.

Some models for examining web-shopper behaviour such as technology acceptance models (TAM) (Davis, Bagozzi and Warshaw, 1989) and online pre-purchase intentions models (Shim, Eastlick, Lotz and Warrington, 2001) have appeared in the extant literature. Forsythe and Shi (2003) argue that web shopping is perceived to be more risky than brick-or-mortar retailing transaction. Since consumer behaviour is cultural-specific, it is unclear whether the reported findings of the consumer online purchase intention in the western countries (which exhibit low uncertainty avoidance in the Hofstede cultural typology) can be directly applied in a cross-cultural context such as in Malaysia (which exhibit high uncertainty avoidance in the Hofstede cultural typology), particularly among Generation Y. Consequently, a gap is created in this research. Therefore, this study aims to

examine the impacts of shopping orientations, online trust and prior online purchase intention on the customer online purchase intentions in Malaysia, particularly among Generation Y.

2. Literature Review

2.1 Internet Subscription in Malaysia

Based on the research carried out by Maddox and Gong (2005), the Internet market penetration rate has increased dramatically in Asia region. According to the Malaysia Internet Usage and Telecommunication report (retrieved from <http://www.internetworldstats.com/asia/my.htm>), the number of Internet subscribers has increased from 2.9 million in year 2004 to close to 5 million in year 2006. Thus, there is a sight of positive growth in the Internet subscription and Internet purchase in Malaysia. Considering that web shopping is still at the development stage in Malaysia, not much information is known about consumer attitude toward web shopping and factors that affect customer online purchase intention in the web-shopping environment. Therefore, it is crucial to identify the determinants of consumer online purchase intention in the web-shopping environment in Malaysia context.

2.2 Web-Shopping

Advancement in the Internet technology has facilitated the growth of in-home shopping (Lumpkin & Hawes, 1985). Shim, Quereshi and Siegel (2000) define web shopping as the process consumers go through to purchase products or services over the Internet. The terms online-shop, Internet-shop, web-shop and online-store are used interchangeably in the extant literature. Web shopping is an e-commerce system used by shoppers in the context of business-to-consumer (B2C) or business-to-business (B2B).

From the consumer's viewpoint, web shopping allows web shopper to search and compare various product or service alternatives from different online stores that are located in different parts of the world. The interactive nature of the Internet offers opportunities for consumers to use the web shopping facilities effectively by improving the availability of product information, enabling direct multi attributes comparison, and reducing prospective buyers' information search costs (Alba, et. al., 1997).

The Internet can also provide benefits to companies. As consumers are increasingly using the Internet as a shopping approach in performing their purchasing activities, companies can take this opportunity to use the Internet as a medium to attract and maintain current and potential customers. In this vein, online retailers must understand consumers' perceptions of website characteristics and their online shopping behaviour. Thus, the research will try to explore the concept of customer online purchase intention and the antecedent relationship of shopping orientations, online trust and prior online purchase experience on customer online purchase intention.

2.3 Customer Online Purchase Intention

Customer online purchase intention was one of the intensive research areas in the extant literature. Customer online purchase intention in the web-shopping environment will determine the strength of a consumer's intention to carry out a specified purchasing behaviour via the Internet (Salisbury, Pearson, Pearson and Miller, 2001). Furthermore, the theory of reasoned action suggested that consumer behaviour can be predicted from intentions that correspond directly in terms of action, target and context to that consumer behaviour (Ajzen and Fishbein, 1980). According to Day (1969), the intentional measures can be more effective than behavioural measures to capture customer's mind as customer may make purchases due to constraints instead of real preference when purchase is considered.

Purchase intention can be classified as one of the components of consumer cognitive behaviour on how an individual intends to buy a specific brand. Laroche, Kim and Zhou (1996) assert that variables such as consideration in buying a brand and expectation to buy a brand can be used to measure consumer purchase intention. Based on the argument of Pavlou (2003), online purchase intention is the situation when a customer is willing and intends to become involved in online transaction. Online transactions can be considered as an activity in which the process of information retrieval, information transfer, and product purchase are taken place (Pavlou, 2003). The information retrieval and exchange steps are regarded as intentions to use a web site; however, product purchase is more applicable to an intention to handle a web-site (Pavlou, 2003). Therefore, it is crucial to evaluate the concept of online purchase intention in this study. In order to trigger customer online purchase intention, web retailers have to explore the impact of shopping orientations on the customer online purchase intention.

2.4 Shopping Orientations

Brown, Pope and Voges (2001) define shopping orientations as related to general predisposition toward the acts of shopping. This predisposition may be demonstrated in different forms such as information search, alternative

evaluation, and product selection. Li, Kuo and Russell (1999) conceptualise the concept of shopping orientations as a specific portion of lifestyle and operationalised by a range of activities, interests and opinion statements that are relevant to the acts of shopping.

With the emergence of online shopping activities, customers' online shopping behaviour may be different in terms of their shopping orientations. Swaminathan, Lepkowska-White and Rao (1999) suggest that shopping orientations is one of the important indicators of making online purchase. Based on the relationship study between shopping orientations and online shopping orientation, Vijayasarathy and Jones (2000) identify seven types of shopping orientations, such as in-home shoppers who liked to shop from home; economic shoppers who shopped around before making purchase decisions; mall shoppers who preferred to shop at malls; personalized shoppers who liked to shop where they knew the salespeople; ethical shoppers who liked to shop in local stores to promote the community; convenience shoppers who placed a premium on convenience when shopping; and enthusiastic shoppers who enjoyed shopping. As the result of the study, it was found that customers who prefer traditional in-home shopping, such as by mail order via catalogs, tended to show high intentions toward online shopping, whereas individuals with a preference for mall shopping tended to have low online shopping intentions.

In the emergence of diverse retail outlets and increasing competition in the marketplace, online retailers must understand customers' shopping orientations in order to maximize customers' online purchase intention that leads to the increase in online sales. Several researchers have demonstrated that shopping orientations have significant impact on customer online purchase intention (Vijayasarathy & Jones, 2000; Park, 2002; Brown, et. al., 2001; Seock, 2003; Gehrt, Onzo, Fujita and Rajan, 2007). Shopping orientations is regarded as a multi-dimensional construct. According to Gehrt, et. al. (2007), there are 7 types of shopping orientations which include recreation, novelty, impulse purchase, quality, brand, price, and convenience. However, the present research will only explore three types of shopping orientation that includes impulse purchase orientation, quality orientation, and brand orientation. Thus, impulse purchase orientation, quality orientation, and brand orientation will be grouped under the category of shopping orientations. This together with online trust and prior online purchase experience will be tested as the independent variables for customer online purchase intention.

2.5 Impulse Purchase Orientation

Piron (1991) defines impulse purchase as an unplanned action that result from a specific stimulus. Rook (1987) argues that impulse purchase takes place whenever customers experience a sudden urge to purchase something immediately, lack substantive additional evaluation, and act based on the urge. Several researchers have concluded that customers do not view impulse purchase as wrong; rather, customers retrospectively convey a favourable evaluation of their behaviour (Dittmar, Beattie, and Friese, 1996; Hausman, 2000; Rook, 1987). Therefore, Ko (1993) reports that impulse purchase behaviour is a reasonable unplanned behaviour when it is related to objective evaluation and emotional preferences in shopping.

Wolman (1973) frames impulsiveness as a psychological trait that result in response to a stimulus. Weinberg and Gottwald (1982) state that impulse purchase is generally emanated from purchase scenarios that feature higher emotional activation, less cognitive control, and largely reactive behaviour. Impulse purchasers also tend to be more emotional than non-purchasers. Consequently, some researchers have treated impulse purchase as an individual difference variable with the anticipation that it is likely to affect decision making across situations (Beatty and Ferrell, 1998; Rook and Fisher, 1995).

Given the ongoing development of the digital economy and the shopping convenience being delivered through digitalized exchanges, one might reason that more impulse individuals may be more prone to online shopping. Donthu and Garcia (1999) assert that online shoppers were more likely to be impulse oriented. The study from Zhang, Prybutok and Strutton (2007) conclude that impulse purchase is positively related to the customer online purchase intention.

2.6 Quality Orientation

Quality is regarded as a key strategic component of competitive advantage and therefore the enhancement of product or service quality has been a matter of main concern to firms (Daniel, Reitsperger, and Gregson, 1995; Foster and Sjoblom, 1996). Garvin (1987) identifies five approaches to define quality: transcendent, product-based, user-based, manufacturing-based, and value-based. Transcendent definition of quality is synonymous with innate excellence. The assumption of transcendent approach is that quality is both absolute and universally recognizable. The product-based approach has its roots in economics. Garvin (1984) argues that differences in the quantity of some ingredients or attributes possessed by the product are considered to reflect differences in quality. Whereas in the user-based definition, quality is the extent to which a product or service

meets or exceeds customers' expectations. The manufacturing-based approach has its roots in operation and production management. Its quality is defined as conformance to specifications (Crosby, 1979). Quality of conformance relates to the degree to which a product meets certain design standards. Besides, the value-based definition equates quality with performance at an acceptable price, or alternatively conformance at an acceptable cost.

The impact of quality orientation on online purchase intention is well documented in the extant literature. Bellenger and Korgaonkar (1980) state that recreational shoppers tended to consider quality, variety of product types and pleasant store atmosphere as important factors when choosing stores. In the context of web-shopping environment, Gehrt, et al. (2007) discovered that customers from the shopping enjoyment segment are positively inclined toward recreation, quality, and impulse orientations when making online purchase.

2.7 Brand Orientation

A brand is defined as a name or symbol, trademark and package design that uniquely identifies the products or services of a retailer, and differentiates them from those of its competitors (Aaker, 1991). In the cyber marketplace, a corporate brand identity is a cognitive anchor and a point of recognition where customers perceive a great deal of uncertainty (Rajshekhar, Radulovich, Pendleton and Scherer, 2005). For many online retailers, the brand name is the company name. In the e-commerce environment, trusted corporate and brand names are used by customers as substitutes for product information when they intent to make online purchase (Ward and Lee, 2000).

Several studies have found that brand loyalty exhibits strong impact on purchase intention in the traditional offline retailing world (Hawes and Lumpkin, 1984; Sproles and Kendall, 1986). A strong brand name not only attracts new customers, but also has the lock-in ability to make customers feel comfortable with their purchase decisions. A study carried out by Jayawardhena, Wright and Dennis (2007) conclude that brand orientation is positively related to the customer online purchase intention.

2.8 Online Trust

According to Kramer (1999), trust is a complex statement because individuals do not know what the motives and intentions of others are. Kimery and McCard (2002) define trust as customers' willingness to accept weakness in an online transaction based on their positive expectations regarding future online store behaviour. According to Barber (1983), trust is an expectation about individuals' behaviour within the society where they are living or by which they are ruled. Trust can be bestowed upon a person, an object (product), an organization (a business), an institution (the government) or a role (a professional of some kind).

Trust plays a key role in creating satisfied and expected outcomes in online transaction (Pavlou, 2003; Yousafzai, Pallister, and Foxall, 2003; Gefen and Straub, 2004; Wu and Cheng, 2005; Flavian and Guinaliu, 2006). According to the McCole and Palmer (2001), online purchasing necessitates online customer trust. Egger (2006) argues that sufficient trust needs to exist when placing an order online and when the customer submit his or her financial information and other personal data in undertaking financial transactions. Gefen (2000) asserts that the present of trust will increase the consumers' belief that the e-retailers will not engage in opportunistic behaviour. It has been demonstrated in the extant literature that trust beliefs positively influence customer online purchase intention (Verhagen, Meents, and Tan, 2006; Verhagen, Tan and Meents, 2004; McKnight, Choudhury and Kacmar, 2002; Lim, Sia, Lee and Benbasat, 2001; Jarvenpaa, Tractinsky, and Vitale, 1999). Jarvenpaa and Tractinsky (1999) and Gefen and Straub (2004) conclude that the higher the degrees of consumers' trust, the higher degree of consumers' purchase intentions of consumers.

Dimensions of online trust include security, privacy and reliability (Camp, 2001). Security is defined as the extent to which customers trust that the Internet is secure for them to transmit sensitive information to the business transaction (Kim and Shim, 2002). Security plays a crucial role in affecting the consumer attitudes and purchase intentions (Salisbury, et. al., 2001) because the present of perceived risk in transmitting sensitive information such as credit card numbers across the Internet (Janda, Trocchia, and Gwinner, 2002). Ernst and Young (cited in Lee and Turban, 2001) suggests that consumers may feel uncomfortable to release their personal information such as credit card and social security number through Internet because the consumers cannot physically check the quality of the products or monitor the safety and security of sending sensitive personal and financial information while shopping on the internet. Kim and Shim (2002) emphasize that the personal awareness of security has the significant influence on consumer attitudes and online purchase intentions.

Chen and Barnes (2007) define privacy as the consumers' trust about the performance of other party in the environment during the market transaction or consumption behaviour. Lee and Turban (2001) argue that high

level of security and privacy in the online shopping experience has a positive effect on consumer trust due to the perceived risk involved in the information exchange. Moreover, company reliability can influence the consumers' online trust and purchase intention (Balasubramanian, Konana, and Menon, 2003; Koufaris and Hampton-Sosa, 2004). In the web-shopping environment, most consumers assume that the large companies have better ability to increase their online trust (Koufaris and Hampton-Sosa, 2004). It is also proposed that a company with positive reputation does increase the consumers' trust (Doney and Cannon, 1997; Figueiredo, 2000).

2.9 Prior Online Purchase Experience

Helson (1964) argued that an individual's response to a judgmental task is based on three aspects, which are sum of the individual's past experiences, context or background, and stimulus. Web shopping is a relatively new activity for a wide range of consumers, online purchases are still perceived as riskier than terrestrial ones (Laroche, Yang, McDougall and Bergeron, 2005). Therefore, web-shopping consumers will depend heavily on experience quality in which the experience quality can be obtained only through prior purchase experience.

Prior experiences will strongly affect future behaviour. In the web-shopping context, customers evaluate their online purchase experiences in terms of perceptions regarding product information, form of payment, delivery terms, service offered, risk involved, privacy, security, personalization, visual appeal, navigation, entertainment and enjoyment (Burke, 2002; Parasuraman and Zinkhan, 2002; Mathwick, Malhotra, and Rigdon, 2001).

According to Elliot and Fowell (2000), customer experience with the Internet drives the growth of Internet shopping. Shim and Drake (1990) argue that customers with strong online purchase intention in web shopping usually have prior purchase experiences that assist in reducing their uncertainties. Therefore, customers will only purchase product from the Internet after they have already experienced them. In addition, customers who have prior online purchase experience will be more likely to purchase through online than those who lack such experience. Seckler (2000) explains this phenomenon that as individual gain experience with web-shopping, perhaps with small purchases at first, they will be more likely to develop confidence and skills that facilitate more ambitious buying through the Internet.

Dabholkar (1994) asserts that when an individual has less prior knowledge of the problems encountered, behavioural choice is mostly depended on expectancy-value model. Therefore, shoppers who have never done an online purchase before are more risk-averse than who have bought products through online means (Lee and Tan, 2003). If prior online purchase experiences resulted in satisfactory outcomes, this will lead customers to continue to shop on the Internet in the future (Shim, et. al., 2001). Unfortunately, if these past experiences are evaluated negatively, customers will be reluctant to engage in online shopping in the future. This explains the importance of turning existing Internet shoppers into repeat shoppers by providing them with satisfying online shopping experiences (Weber and Roehl, 1999).

Based on the vast extant literature, it can be concluded that customer's online purchase experience will have a significant effect on his or her future purchase intention for online shopping (Shim et al., 2001; So et al., 2005; Brown, et. al., 2001; Lynch and Ariely, 2000).

2.10 Hypotheses

Prior discussion has led to a brief examination of the existing literature and the development of the hypotheses in this research. The five hypotheses are:

- H1: Impulse purchase orientation is positively related to customer online purchase intention.
- H2: Quality orientation is positively related to customer online purchase intention.
- H3: Brand orientation is positively related to customer online purchase intention.
- H4: Online trust is positively related to the customer online purchase intention.
- H5: Prior online purchase experience is positively related to customer online purchase intention.

3. Methodology

3.1 Research Design

Positivism approach was adopted in this research because this method allowed the researcher to search for truths of the observation by empirical evidence via the hypothetico-deductive method (Jankowicz, 2005). Furthermore, descriptive research design was adopted as the study has clear problem statements, specific hypotheses and detailed body of knowledge (Malhotra, 2004).

3.2 Questionnaire Design

The first part (Part A) of the questionnaire provides general information about the online purchasing behaviour of the potential respondents. The second part of the questionnaire elaborates the independent variables and dependent variable that would be tested in the survey. Questions in the form of scaled-response questions were adopted in the second part of the questionnaire because “scaling permits measurement of the intensity of respondents’ answers” (Churchill and Brown, 2004, p.329). The third part of the questionnaire identifies demographic profile of the respondents.

The items of the questionnaire in this research were adopted from different sources of the extant literature.

The items for the independent variables “impulse purchase orientation”, “quality orientation”, and “brand orientation” are adapted from Gehrt, et. al. (2007) and Seock (2003). The items for the independent variable “online trust” are adapted from Chen and Barnes (2007). The items for the independent variable “prior online purchase intention” are adapted from Brunelle and Lapierre (2008). The items for the dependent variable “online purchase intention” are adapted from Chen and Barnes (2007). A 5-point Likert scale anchored by “strongly disagree” (1) to “strongly agree” (5) was used as the attitude measurement for the independent and dependent variables.

3.3 Sampling

Solomon, Dann, Dann and Russell-Bennett (2007, p.477) define Generation Y as “kids born between 1979 and 1994 (the younger siblings of Gen Xers)”. Since the study focused on Generation Y, the target population covered all the undergraduate students enrolled in University ‘A’ and the sampling unit included all the current full-time undergraduate information technology students in University ‘A’. All of these undergraduate students are born between 1986 and 1990. The university is one of the largest private universities in Malaysia; with an estimated student population of 18,000 pursuing 84 programs in nine faculties spread over four campuses. Students who had actual online purchase experience were targeted. The respondents were selected through the filtering question in the questionnaire. The targeted sample size was 250 and convenience-sampling technique was used to select potential respondents in this survey. Convenience sampling technique was adopted because the research looks for cross-cultural differences in consumer behaviour (ie., customer online purchase intention) (Zikmund, Babin, Carr and Griffin, 2010) and “convenience samples are best used for exploratory research when additional research will subsequently be conducted with a probability sample” (Zikmund, et al., 2010, p.396; Sekaran and Bougie, 2010). Respondents were instructed to answer the questions based on their most recent online purchase experience with one of the web-retailer via the Internet.

3.4 Administration of Survey

Self-administered survey method in the form of drop-off surveys technique was used to ensure the confidentiality and non-obligation aspects of participating in the survey. The survey was conducted in the lecture hall where respondents could return the questionnaires immediately into the box allocated. The voluntary nature of the participation was explained verbally as well as being indicated in the survey questionnaire. Students were invited to complete an anonymous survey questionnaire that took approximately 15 minutes of their time to complete.

A total of 250 sets of questionnaires were distributed and 248 questionnaires were collected. Out of that, 8 sets of questionnaires were considered unusable because they were incomplete. It was assumed that the respondents were either unwilling to cooperate or not serious with the survey. Therefore, subsequently only 242 usable questionnaires (96.8 percent) were used for data analysis using SPSS software version 14.

4. Research Results

4.1 Respondents’ Demographic Profile and Online Purchasing Behaviour

Based on the survey, male respondents represented 52.07 percent of the total respondents while female respondents 47.93 percent. In the case of age distribution, the majority of the respondents were between the ages of 21 to 23 (76.86 percent). In terms of ethnic compositions, the respondents were mainly Chinese ethnic group (91.74 percent). In the category of current year of study, most of the respondents study in year 3 (62.81%). Based on the survey, all the respondents (100%) have the experience of purchasing products and services via the online mode. Movie tickets (33.34%) and technology gadgets (21.43%) were the two most common items purchased by the respondents. At least half of the respondents (53.72%) use credit card as a mode of payment in the online purchasing process.

4.2 Reliability Test

The reliability of a measure indicates the stability and consistency with which the instrument measures the concept and helps to assess the ‘goodness’ of a measure (Cavana, Delahaye and Sekaran, 2001). All the

constructs were tested for the consistency reliability of the items within the constructs by using the Cronbach Alpha reliability analysis. In Table 1, the results indicated that the Cronbach alpha for all the constructs were well above 0.7 as recommended by Cavana, et. al. (2001). Cronbach alpha for the constructs ranged from the lowest of 0.797 (prior online purchase experience) to 0.880 (online trust). In conclusion, the results showed that the scores of the Cronbach alpha for all the constructs used in this research exceeded the preferable scores of 0.70 and this indicated that the measurement scales of the constructs were stable and consistent.

4.3 Validity Test

Construct validity was adopted as validity measurement and factor analysis was used to measure the construct validity (Cavana, et. al., 2001). The details of the factor analysis were presented in Table 1. Based on the output shown, factor analysis was appropriate because the value of Kaiser-Meyer-Olkin (KMO) was 0.867 (between 0.5 and 1.0) and the statistical test for Bartlett test of sphericity was significant ($p = 0.000$; d.f. = 325) for all the correlations within a correlation matrix (at least for some of the constructs). Based on the principal components analysis and VARIMAX procedure in orthogonal rotation, the results also showed that the Eigenvalues for all the constructs were greater than 1.0, ranging from the lowest 8.210 (online purchase intention) to the highest of 18.131 (online trust). In terms of convergent validity, the factor loadings for all items within a construct were more than 0.50. Discriminant validity indicated that all items were allocated according to the different constructs. Therefore, the items were not overlapping and they supported the respective constructs.

4.4 Regression Analyses

4.4.1 Multiple Regression Analysis

Before employing regression analysis, there are six assumptions to be addressed. The assumptions include: (1) normality; (2) linearity; (3) independence of error term; (4) free from multicollinearity; (5) free from heterocedasticity; and (6) free from outlier and influential observations (Field, 2005). Based on the normally distributed histogram that was generated from the SPSS analysis, the normality assumption was met because the distribution of the residuals appeared to be unimodal and symmetric. From the scatterplot diagram, both the conditions of linearity and free from heterocedasticity were met because the residuals appeared to be randomly scattered and showed no patterns or clumps when plotted against the predicted values. The independence of error term was also met because the value of Durbin-Watson was 1.886, which was close to 2 (the closer to the value to 2, the better the independence of error) (Field, 2005, p.189). From the multicollinearity statistics generated, VIF values were all well below 10 and the tolerance statistics were all well above 0.2; therefore the data was free from multicollinearity. Lastly, the normal p-p plot analysis indicated that the data was free from outlier and influential observations because the normal probability plot was seen to be a straight line and the spread of the residuals were uniformed when plotted against the predicted values.

The result of the multiple regression analysis was presented in Table 2. The p value of the impulse purchase orientation ($p = 0.000$) is less than the alpha value of 0.05. Therefore, the research concludes that an impulse purchase orientation is positively related to the customer online purchase intention. Hypothesis 1 is supported. This finding supports the existing literature which states that the shopping orientations in term of impulse purchase will positively affect the online purchase intention (Zhang, et. al., 2007).

The p value for the quality orientation ($p = 0.034$) is also less than the alpha value of 0.05. Therefore, it can be suggested that quality orientation is positively related to the customer online purchase intention. Hypothesis 2 is therefore supported. This finding supports the existing literature that quality orientations will positively influence the customer online purchase intention (Gehrt, et. al., 2007).

The result from the research also postulated that the brand orientation is positively related to the customer online purchase intention, as the alpha value is less than 0.05 (p value = 0.001). Hypothesis 3 is therefore supported. According to Jayawardhera, et. al. (2007), brand orientation is positively related to the customer online purchase intention.

Hypothesis 4 is supported in this research. The p value of the online trust ($p = 0.000$) is less than the alpha value of 0.05. Therefore the hypothesis that indicates the positive relationship between online trust and the customer online purchase intention is supported. According to McCole and Palmer (2001), online purchasing necessitates online trust.

Finally, the result from the research also indicated that the prior online purchase experience is positively related to the customer online purchase intention, as the alpha value is less than 0.05 (p value = 0.000). Hypothesis 5 is therefore supported. According to Shim and Drake (1990), customers with strong online purchase intention in web-shopping usually have prior purchase experiences that assist in reducing their uncertainties.

Based on the SPSS output, the following multiple regression equation was formed:

$$\text{Customer Online Purchase Intention} = -0.546 + 0.170 (\text{Impulse Purchase Orientation}) + 0.100 (\text{Quality Orientation}) + 0.130 (\text{Brand Orientation}) + 0.091 (\text{Online Trust}) + 0.279 (\text{Prior Online Purchase Experience})$$

The values of the un-standardized Beta coefficient among the independent variables ranges from the weakest relationship of 0.091 (online trust) to the strongest relationship of 0.279 (prior online purchase experience). Therefore, “prior online purchase experience” is the most important antecedent in affecting the customer online purchase intention. “Impulse purchase orientation” (0.170), “brand orientation” (0.130), and “quality orientation” (0.100) are ranked second, third and fourth most important antecedents affecting the customer online purchase intention. In addition, the customer online purchase intention is explained 48.2 percent by the combination of the five independent variables ($r^2 = 0.694$), which includes impulse purchase orientation, quality orientation, brand orientation, online trust and prior online purchase experience. Table 3 shows the summary of the five hypotheses and its outcomes.

5. Conclusion

5.1 Implications of the Research

The research findings have brought managerial implications to the various stakeholders. In terms of managerial implication, the research findings do provide some insights and feedbacks for the e-retailers to formulate and implement various business strategies to increase the customer online purchase intention. The research finding discovered that the antecedents of the customer online purchase intention could be applied in both low uncertainty avoidance countries and high uncertainty avoidance countries (especially in Malaysia), particularly among Generation Y. To create the condition for prior online purchasing experience, e-retailers can provide free samples or free subscription for the potential web shoppers to test the products or services. To increase the customer impulse purchase, e-retailers can provide e-mail updates on product development or offer special discounts for a limited time to the potential online customers. E-retailers may offer loyalty programmes or club memberships for those online customers who exhibit strong brand orientation. For targeting quality-orientated customers, e-retailers can provide full online version of product quality information and product search information through the website to them. To increase the level of online trust, e-retailers must provide honest and trustworthy information to the potential web shoppers at all time.

5.2 Limitations of the Research

Although the research findings provide some new insights to researchers, these findings should be viewed in light of some limitations. The study in this research is focusing on those respondents who have some experiences in engaging online purchase intention. Therefore, the study does not cover those potential customers who do not have experienced in online transaction but have the intention to engage in online purchase activities. By incorporating the potential online customers in the study, this will enhance the generalisability of the subsequent research. In addition, the study does not explore the impact of gender differences in moderating the relationship between shopping orientations and customer online purchase intention. The finding from Jayawardhena, et. al. (2007) discovered that gender has a significant influence on online purchase intention. By incorporating the gender construct in studying the relationship between shopping orientations, and customer online purchase intention may able to enrich the extant literature. Lastly, the adoption of convenience sampling technique may limit how well the research represents the intended population (Zikmund, et al., 2010, p.396). Consequently, the respondents may not be representative and the study not generalisable.

5.3 Recommendations for Further Research

Due to the limitations of this research, three recommendations are suggested for further research for the purpose of enhancing the study of the customer online purchase intention. It is proposed to evaluate the impacts of shopping orientations, online trust and prior online purchase experience on the customer online purchase intention among the potential customers who have strong intention to engage in online purchasing activities. Besides, it is recommended to evaluate the relationship between shopping orientations and customer online purchase intention based on gender differences as well as the role of gender in mediating the relationship between shopping orientations and customer online purchase intention. Lastly, it is suggested to utilize probability sampling technique to evaluate customer online purchase intention in the future research.

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Table 1. Factors Identified by the Principal Components Factor Analysis

Factor's Name	Variable	Factor Loading	Eigen-value	Percentage of Variance Explained	Cronbach's Reliability Coefficients
Impulse Purchase Orientation	I am impulsive when purchasing products/services through web-retailer.	0.729	2.388	10.308	0.798
	When my intention is to merely browse through the web site, I sometimes make a purchase.	0.769			
	When I purchase products/services spontaneously from the web-retailer, I feel released.	0.829			
	I plan my online purchase carefully.	0.719			
Online Purchase Intention	It is likely that I will transact with this web retailer in the near future.	0.756	1.064	8.210	0.867
	Given the chance, I intend to use this retailer's web site.	0.731			
	Given the chance, I predict that I should use this retailer's web site in the future.	0.714			
Brand Orientation	If I buy products/services from a web-retailer that I am familiar with, I would prefer to buy well-known brand name.	0.869	1.635	9.728	0.868
	It is important for me to buy products/services from the web-retailer with well-known brand names.	0.893			
	Once I find a brand I like through web-shopping, I stick with it.	0.822			
Quality Orientation	The availability of high-quality products/services provided by the web-retailer is very important to me.	0.832	1.568	8.695	0.803
	I find better quality products/services from the web-retailer.	0.795			
	My standards and expectations from the products/services I buy from web-retailer are very high.	0.849			
Prior Online Purchase Experience	I am experienced with the use of the web site.	0.686	3.115	10.362	0.797
	I feel competent of using the web site.	0.710			
	I feel comfortable of using the web site.	0.777			
	I feel that the web site is easy to use	0.742			
Online Trust	The web site of this web-retailer is trustworthy and honest.	0.696	7.242	18.131	0.880
	The web site of this web-retailer wants to keep promises and obligations.	0.703			
	The information provided by the web-retailer is plentiful and of sufficient quality.	0.737			
	The infrastructure of the web site of this web-retailer is dependable.	0.679			
	The web site of this web-retailer offers secure personal privacy.	0.720			
	The web site of this web-retailer keeps my best interests in mind.	0.676			
	Compared to other web site offered, the web site of this web-retailer is secure and reliable.	0.718			
	The web site of this web-retailer would not behave opportunistically (e.g., gaining money illegally).	0.683			
	The performance of the web site of this web-retailer fulfills my expectation.	0.618			

Note: KMO Measure of Sampling Adequacy = 0.867; $p = 0.000$ ($p < 0.05$); $df = 325$

Cumulative Percentage Rotation Sums of Squared Loadings = 65.434

Table 2. Result of Multiple Linear Regression Analysis

		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0.546	0.884		-0.617	0.538
	Impulse Purchase Orientation	0.170	0.040	0.216	4.264	0.000
	Quality Orientation	0.100	0.047	0.106	2.129	0.034
	Brand Orientation	0.130	0.039	0.166	3.337	0.001
	Online Trust	0.091	0.020	0.244	4.639	0.000
	Prior Online Purchase Experience	0.279	0.043	0.351	6.439	0.000

a Dependent Variable: Online Purchase Intention

Independent variables: Impulse purchase orientation, quality orientation, brand orientation, online trust and prior online purchase experience

R = 69.4 per cent; R Square = 48.2 per cent; Adjusted R Square = 47.1 per cent;

F = 43.970; P = 0.000 (p<0.05)

Table 3. Summary of the Five Hypotheses and Outcomes

Independent variables tested	Hypotheses	Outcome
Impulse Purchase Orientation	H1: Impulse purchase orientation is positively related to the customer online purchase intention.	Supported
Quality orientation	H2: Quality orientation is positively related to the customer online purchase intention.	Supported
Brand orientation	H3: Brand orientation is positively related to the customer online purchase intention.	Supported
Online Trust	H4: Online trust is positively related to the customer online purchase intention.	Supported
Prior Online Purchase Experience	H5: Prior online purchase experience is positively related to the customer online purchase intention.	Supported

Managing Human Capital: How to Use Knowledge Management to Transfer Knowledge in Today's Multi-Generational Workforce

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Abstract

The purpose of this exploratory study is to examine knowledge transfer strategies within the framework of a multi-generational workforce. It is common to consider different generational perspectives in the workplace and its impact on knowledge management and transfer strategy. This research compares differences in workforce generations and examines different methods to pass knowledge cross-generationally. Companies must design knowledge transfer strategies conducive to multi-generational workforce dynamics keeping in mind the generational diversity that exists in the workplace. The present study endeavors to provide insight into this issue.

Keywords: Organizational learning, Intellectual capital, Knowledge management, Multi-generational workforce

1. Introduction

Nonaka and Takeuchi (1995) consider knowledge and intellectual capital as a company's primary source of production and value. Human capital, recognized by organizations as the strategic value of the human assets, is the collective value of the workforce. Human capital is not the worker in a company- it is what that person brings and contributes to the success of the organization. Human capital is the collective value of the capabilities, knowledge, skills, life experiences, and motivation of the workforce (Aldisent, 2002). Also called intellectual capital to reflect the thinking, knowledge, creativity, and decision making that people in organizations contribute, human capital includes these organizational contributions (Kaplan & Norton, 2004).

Ulrich (1998) explained the importance of knowledge management within an organization - knowledge is an organization's only appreciable asset and knowledge work continues to increase. Knowledge and knowledge management are recognized as valuable corporate resources in the same vein as land, buildings, financial resources, people, capital equipment, and other tangible assets (Kipley, Lewis & Helm, 2008).

As employees in organizations progress with age, they acquire a set of knowledge that is customized to the firms' operations, structure and culture. More importantly, it is the unique insights and understood idiosyncrasies about the company that is developed over time which make the learning difficult to replicate or replace when aging employees transfer out of their positions (Lesser, 2006). It is this combination of explicit and tacit knowledge that mature workers possess which has become the most 'strategically significant resource of organizations' (Calo, 2008, p. 404).

To remain competitive companies need to develop strategies to retain this knowledge from older workers and transfer it successfully to other employees in the corporation (Calo, 2008). "As the Baby Boomer generation prepares for retirement, many firms want to be sure that the knowledge and experience gained by the current leadership does not walk out the door when they do" (Glick, 2007, p. 11). A growing concern among organizations is the vast wealth of knowledge and experience built by Baby Boomers walking out the door (Paton, 2008). Experienced executives contain important know-how, if this information were to be lost, it would result in a pricey undertaking for the organization to recover that information, if even at all (Martin, 2000).

This study explores generational diversity workplace variables that affect achieving optimal knowledge management within organizations. Further, this paper seeks to reflect upon knowledge management strategies from the perspective of knowledge transfer within multi-generational workforce environments.

2. Information versus Knowledge

Knowledge found within an organization's human capital must be first captured and then transferred in order to be exploited for advantage. But, what constitutes knowledge? According to Blanchard and Thacker (2009), knowledge is defined as 'an organized body of facts, principles, procedures and information acquired over time' (p. 18). According to Noe (2008), knowledge refers to what individuals or teams of employees know or know how to do (human and social knowledge) as well as a company's rules, processes, tools, and routines (structured knowledge).

When is information knowledge? Companies have information based on sales, inventory, and methods of payment but that has been primarily used to help with financial reporting. Information has potential if it properly managed. All knowledge is based on information but all information does not rise to the level of knowledge. Can knowledge management help make piles of information into trends, products, and increased profitability for businesses?

In the purest form, all robust knowledge management processes start with a database. But, information becomes knowledge when it is understood, manipulated and can become tied to a purpose and or idea. For example, businesses have used consumer purchase trends from previous years to try and order proper inventory. Data mining or looking for a correlation in information has been long included in most social science fields.

The relationship between a consumer and their shopping habits has psychological implications that can be managed and utilized by the businesses frequented by the consumer (Lacey & Sneath, 2006). Creating databases of information tying the purchase of an item to a specific consumer and including factors such as frequency of purchase and average amount spent required is a huge undertaking that requires a huge payoff for businesses to continue the practice.

Databases should help an employee learn from the information. "There should be a process for guaranteeing that the knowledge everyone carries around with them is retained in a permanent place for use by others" (Glick, 2007, p. 11). But, commitment to information technology infrastructures does not always lead to better business performance or significant return on investment (Malhotra, 2005).

Indeed, Booth (2008), states "information without context is simply raw data, which is not knowledge" (p. 22). When the Baby Boomers began to retire, many companies began to find silos of information throughout the company and began to crudely put together all the information with the hopes of helping but instead created a data monster that hindered the productive process (Booth, 2008). The use of the information within databases depends upon the need for the knowledge management process.

3. Knowledge Management

For many years, the exact definition of what knowledge management is has been ambiguous. The use of knowledge management across various fields has given the subject several different interpretations and meanings. Additionally, on the surface, knowledge management is difficult to define. This difficulty stems from the confusion existing in a term which is commonly used in organizations to describe the practice (and technology infrastructure system) of managing its knowledge - the process of collecting, codifying, accessing and transferring the totality of an organization's knowledge.

Knowledge management, an evolving term, has a glut of contributions surrounding a formal definition. Debates are ongoing as to concepts involved and how to properly convey it in a universal fashion (Slagter, 2007). Indeed, Sveiby (2001) states, knowledge cannot be managed and therefore knowledge management is a poor term. Sveiby (2001) offers that knowledge focus or knowledge creation, coined by Nonaka, are better terms because they describe a mindset in which knowledge is an activity not an object.

McInerney (2002) broadly described knowledge management as a common business practice and as a theoretical field of study. Others have simply concluded that knowledge management is the creation, transfer and retention of knowledge by organizations (Martin de Holan & Phillips, 2004). In practice, knowledge management is a conscious effort to gain from the knowledge that lies within in an organization by using it to achieve the organization's mission (McInerney, 2002). Thus, having knowledge about something, some process or method, can allow executives to make judgments and proceed in a manner that is just and coherent.

A more substantial definition was supplied by Gephart, Marsick, Van Buren, and Spiro (1996), 'knowledge management refers to the process of enhancing company performance by designing and implementing tools, process, systems, structures, and cultures to improve the creation, sharing and use of knowledge' (p. 71). Similarly, Rastogi (2000) defines knowledge management as a systematic and integrative process of coordinating organization-wide activities of acquiring, creating, storing, sharing, diffusing, developing, and deploying knowledge by individuals and groups in pursuit of major organizational goals. It is the process through which organizations create and use their institutional and collective knowledge. While many definitions stress system processes with an IT focus, Rastogi (2000) clearly points out the necessary human involvement beyond those processes.

Rastogi's (2000) rich definition also includes the process of knowledge from the creation or acquisition of knowledge to its use. Internal knowledge is knowledge that is created within the company through innovative attempts while external knowledge is gained from outside sources (Seidler-de Alwis & Hartmann, 2008).

Whichever way knowledge is acquired, it needs to have a way by which it can be stored, shared and ultimately deployed.

4. Workforce Demographic Trends

In the US, over the next ten years, a considerable number of experienced employees will be retiring, changing to part-time, or otherwise shifting their employment (Cotis, 2003). Workers ages 65 and above make up almost 30% of the labor market in America based on the September, 2009 U.S. Bureau of Labor Statistics (BLS) Current Population Survey (BLS, 2009).

The steadily aging workforce is a reflection of declining birth rates and the graying of the Baby Boomer generation. According a report by Forrester Research, 76 million Baby Boomers will retire in the next 10 years with only 46 million younger employees as replacements (Lesser, 2006). This means that the labor pool will have shrunk nearly 60% by 2016.

Shifting workforce demographics are having a notable effect on organizations across a variety of industries and geographies (Lesser, 2006). Hence, many organizations are looking to solve a number of important knowledge and learning related challenges. Industries, as diverse as electric utilities, oil and gas producers, healthcare and the public sector, are clearly feeling the effects of employee retirements and the difficulty in sourcing new talent.

In some companies, increasing numbers of employees are retiring, many leaving with sizable amounts of knowledge that can place the organization at risk. For others, the challenges include maintaining a productive workforce in the face of potentially shrinking labor pools and the increased mobility of the younger generation of employees. According to a joint study by American Society of Training and Development (ASTD) and International Business Machines (IBM), the majority of organizational learning executives report that the maturing workforce coupled with the smaller labor pools will impact their organization (Lesser & Rivera, 2006). The study period runs from 2005 through 2006. Basic descriptive statistics are provided in Figure 1.

4.1 Multi-Generational Workforce

Pre-Baby Boomers -also referred to as Silents, Traditionalists, and Veterans -were born between 1900 and 1945 during the grey market (Kyles, 2009). Some consider Pre-Baby Boomers as a split from the Baby Boomer generation, being the older cohort segmentation (Reisenwitz & Iyer, 2007). Able to witness the rise of television networks and mass marketing, Pre-Baby Boomers have purchasing power with money to spend (Reisenwitz & Iyer, 2007). Influenced by the Great Depression and World War II, they did not like to challenge authority, were very loyal, consistent, and conforming (Kyles, 2009). As a result they were “most comfortable with conformity and a top-down management style” and motivated by “verbal or written recognition, awards, and public acknowledgement” versus the next generations following (Kyles, 2009).

Baby Boomers, born between 1946 and 1964, are nicknamed the “forgotten generation” as some marketers have more aggressively begun to target other generations (Reisenwitz & Iyer, 2007). Being raised after the war, this generation was associated with optimism, team orientation, and personal gratification” (Westerman & Yamamura, 2007). As one of the largest cohorts in our history, Baby Boomers significantly impact our society, business, and the economy (Westerman & Yamamura, 2007). The Baby Boomer generation experienced post-war stress and, hence, was not willing to conform like pre-boomers. Their primary “focus was on work and were rewarded for their loyalty and commitment” (Cennamo & Gardener, 2009). One of their top values is relationship building.

The next generation entering the workplace, Generation X, is described as independent in comparison to the first two. Generation X, born from 1965 to 1979, witnessed the rise of technology and social changes representing financial, family, and social insecurity without expecting job security (Cennamo & Gardener, 2009). Mirroring this generation, organizations were also suffering from the economic downfalls from the oil shocks in 1973 and 1979 (Cappelli, 2008). Hence, Generation X is described as having more commitment to their own careers than to their organizations as they highly value skill development, and productivity (Cennamo & Gardener, 2009). However, due to their independence they are considered to be disloyal and do not care much about corporate politics (Kyles, 2009).

Generation X worked hard and was referred to as selfish; however, this was the first generation to start balancing work and family (Cennamo & Gardener, 2009). Baby Boomers experienced stay home moms; but Generation X had working parents and was the first generation to experience single parenthood. In addition, Generation X suffered from corporate lay-offs and economic recession; hence, they do not find building relationship with upper management as beneficial, but instead a “degree of bootlicking” (Kyles, 2009). They are mostly rewarded

by receiving career opportunities and having autonomy - a requirement for them to be happy and productive in the workplace (Kyles, 2009).

The next cohort, Generation Y, born from 1980 to 1999, is also referred to as Nexters or Millennials (Kyles, 2009). This generation witnessed economic crisis from the recession in 1981 (Cappelli, 2008). Generation Y members are changes – most notably in the “growth of the Internet” as they are very comfortable with the internet and technological advances (Cennamo & Gardener, 2009). Generation Y values being able to balance work and life, advances in the career world, and traveling more (Kyles, 2009). Similar to Generation X, they are also products of non traditional families. Generation Y, concerned with careers that better the world, want their contributions recognized and acknowledged (Kyles, 2009).

Wide age spreads present significant challenges and barriers to businesses as they encounter issues pertaining to age bias and differing values and work habits among their multi-generational workforce (Lesser, 2006). These differences create knowledge transfer barriers.

5. Facilitating Knowledge Transfer within a Multi-generational Workforce

Certainly, there are many methods to transfer knowledge. Companies which recognize the challenges of shifting workforce demographics are utilizing an assortment of knowledge management strategies to transfer knowledge from experts in the Baby Boomer cohort to members of Generation Y. And, while a variety of knowledge management strategies have been successfully implemented setting the stage for knowledge to be captured and shared, companies must design knowledge transfer strategies conducive to multi-generational workforce dynamics keeping in mind the generational diversity that exists in the workplace. Indeed, Lahaie (2005) states, effective knowledge management and knowledge transfer within the organization are fundamental for ongoing organizational effectiveness: but to transfer knowledge effectively, there has got to be planning. Organizations are challenged in gathering the best available knowledge. This is not always easy; organizations must understand who holds key knowledge; otherwise knowledge management loses all importance.

Piktials & Greenes (2008) examined knowledge loss gaps and stress two of the best methods to capture and pass knowledge cross-generationally are to customize knowledge transfer methods with regard to the present needs and to be clear as to how each generation prefers to learn. Similarly, Wagner (2009) states knowledge transfer methods need to be varied due to existing age- diversity of the workforce.

Further, Wagner (2009) suggests because of the diversity of learning styles among generations represented in the workforce, various methods of transfer should exist accommodating formal education and training, apprenticeships, simulations and games, storytelling and conferences, blogs and papers. Technology has further perpetuated the need for the diversity and presents opportunities to make use of what would be more appealing to Millennials. They may feel more comfortable utilizing Instant Messages, blogs or podcasts to transfer their knowledge to others in the workplace. This suggestion poses unique challenges. Although the Millennial generation is comfortable with technology; the Baby Boomer generation is not. Therefore consideration must also be given to how knowledge is converted when transferred.

A joint study conducted by International Business Machines Corporation and the American Society of Training and Development revealed that 60% of respondents utilize mentoring as a method of passing on knowledge, while approximately one-half still use document/heavy repositories as tools for capturing knowledge (IBM & ASTD, Lesser, 2006). The study also notes that mentoring is most effective in learn-while-doing scenarios where mentors offer guidance to students in realistic situations they may be encountering. Thus, the one-on-one relationship between the mentor and the mentee helps facilitate the transfer of experiential and tacit knowledge. However, mentoring, a valid experiential and tacit knowledge transfer method is time consuming. Furthermore, the pairing of mentor and mentee is of concern. The mentoring relationship must bridge the generational gap. If the mentoring relationship cannot be established, then knowledge transfer will not occur.

Other forms of knowledge transfer include classroom training led by older workers, fostering learning communities to encourage sharing of learning and experiences between young and older workers, and leveraging multimedia tools, such as audio/video interviewing and story telling to preserve significant learning from aging employees (IBM & ASTD, Lesser, 2006). These knowledge transfer strategies assume training and development resources. Additionally, organizational culture must be examined since the use of a storytelling and contextually based transfer design may create discomfort. One of the challenges to instructional designers who consider using storytelling and contextually based design techniques is the issue of whether such approaches will be accepted within the culture of the organization. Another challenge in storytelling is credibility. In some instances, workers may feel that they are inappropriate as an approach to knowledge transfer.

Wagner (2009) states, for companies to be most effective and make great strides- engagement needs to occur between Baby Boomers and Millennials within their work environment for two-way learning to occur. In today's multi-generational workforce, evidence of reverse mentoring where younger workers assist older workers in a particular area may prove to be a successful knowledge management strategy as well. Reverse mentoring is usually used when executives need to understand operations or technology that can be shared by younger front-line or tech-savvy employees. However, generational perspectives make it difficult to establish and cultivate a reverse mentoring mindset. In order to have a successful reverse mentoring relationship it is necessary to create and maintain an attitude of openness to the experience and dissolve barriers of status, power and position. Although challenges exist, reverse mentoring is critical for older workers. As workers advance in age, they will need to refresh important skills to remain productive and effective in the workplace.

6. Conclusion

Certainly, many managers ignore the importance of intellectual capital and fail to capitalize on its benefits; however, the most important rule is that knowledge needs to be managed, so it requires vision and strategy (Ulrich, 1998). Conversely, by integrating knowledge management into a company's business processes, or changing the corporate culture a company can support the open sharing of knowledge (Uelpenich & Bodendorf, 2003).

Successfully identifying and retaining valuable industry and company knowledge can be very challenging for organizations. But, current economic demands and changing workforce demographics have pressured companies into action. Moreover, since the Baby Boomer generation is the largest generation to enter the workforce, companies are scrambling to retain their knowledge.

Indeed, Lahaie (2005), *The Impact of Corporate Memory Loss*, claims 42 % of corporate knowledge resides in the brains of the workforce and the institutional knowledge that accompanies the person out the door is both explicit and tacit. Hence, companies are directly and severely affected by the knowledge loss of their departing senior executives.

An organization committed to capturing and transferring critical knowledge within their ever-changing workforce demographics is a company that can retain organizational knowledge and improve its workforce. Organizational leaders of today, managing multi-generational workforces, possess the opportunity to utilize knowledge management for strategic advantage. Indeed, growth-oriented organizations increasingly rely upon knowledge-based competitive strategies in which learning, innovation and continuous individual development play crucial roles (Matlay, 2000).

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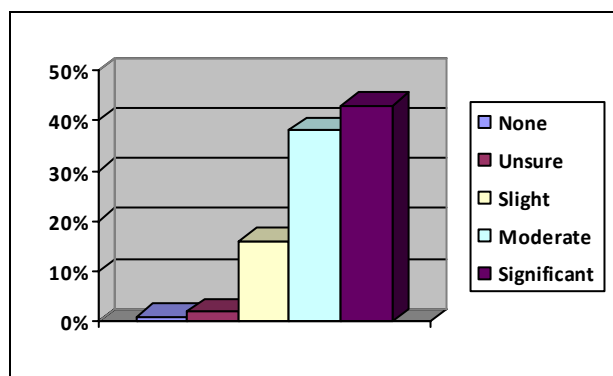


Figure 1. Organizational Impact of Changing Workforce Demographics. American Society of Training & Development & International Business Machines Learning and Changing Workforce Demographics Study. What impact will the changing workforce demographics have on your organization within the next 3-5 years?

Source: ASTD/IBM Learning and Changing Workforce Demographics Study. Closing the generational divide: shifting workforce demographics and the learning function. Source: American Society for Training and Development (ASTD) and International Business Machines (IBM). Learning and Changing Workforce Demographics Study. Lesser, E. & Rivera, R. IBM, 2006.

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Helm-Stevens received her MBA with specializations Leadership and Human and Organizational Development at Azusa Pacific University. Currently, she is in the dissertation stage of her doctorate in Strategic Management from Alliant International University. She has participated in national and international conferences, presenting and publishing on the topics of strategic business management, organizational behavior, educational leadership, and service-learning.

A Survey on the Role of System Dynamics Methodology on Fossil Fuel Resources Analysis

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Abstract

In today's world, fossil fuel resources are still the main source for energy supply. Many attempts have been done in order to develop alternative sources of energy, since fossil fuel resources are limited and will be depleted soon or late. Despite these efforts, as international energy organizations declare, fossil fuel resources have the largest share in the world's energy supply. Therefore, the study of exploration, production, and exploitation dynamics of these resources, has been considered a significant topic for many researchers. System dynamics, which is an appropriate method for dynamic studies and policy analysis, has been used as one of the most impressive methodologies in systemic research and application in this area. Besides the illustration of the role of system dynamics in fossil fuel resources analysis, this paper reviews the pioneering system dynamics models in this field. The results of this work would be helpful for researchers who are interested in the dynamic studies of fossil fuel resources' systems.

Keywords: Fossil fuel resources, Systems dynamics modeling, Policy analysis

1. Introduction

The overall economic growth of every country highly depends on its usage of renewable and nonrenewable energies; Energy is the lifeblood of modern industrial economies. For the last century, world economic growth has been largely affected by the supply of fossil fuel resources production and vice versa.

As the main basis for development, energy sector plays a fundamental role in socio-economic sectors of countries. Energy is one of the most important production factors, and has a remarkable effect on the increase of industrial production level. As it could be seen from figure 1, there is a significant and meaningful relationship between energy consumption and economic development; that is, energy is significant in explaining GDP, and restrictions in energy supply might affect the economic growth (Stern, 1993& 2000; Hondroyannis, Lolos and Papapetrou, 2002; Ghali and El-Sakka, 2004; Oh and Lee, 2004; Paula and Bhattacharya, 2004; Lee, 2005; Lee and Chang, 2005 & 2008; Narayan and Smyth, 2008).

(((Insert Figure1 Here)))

The use of fossil fuel resources will be the prevailing way for the energy supply for the time being. Based on annual surveys performed by energy-related companies, fossil fuels as fossil fuel resources will remain the dominant source of energy supply to 2030 (World Energy Outlook, 2006; World Oil Outlook, 2008).

All in all, the study of fossil fuel resources' systems is important, especially for economies open to the world markets. Based on diverse methodologies, many energy models have been developed. The mutual relationship between natural energy sector and economy, environment, politics, society, etc has been considered as a challenging issue in these researches. Jebaraj and Iniyen (2006) classified the energy-related models in the literature as follows:

- Energy planning;

- Energy supply–demand;
- Forecasting (Commercial energy, renewable energy);
- Optimization;
- Energy models based on neural networks and fuzzy theory; and
- Emission reduction

There are almost some system dynamics models in each group. Meanwhile, authors hold this view that the energy-related system dynamics models should be taken more into consideration because of the characteristics of energy systems especially in policy making.

Because of existing characteristics such as considerable delays in industry and new energy development, advanced and fast growing technology, resource limitations and depletions, price fluctuations, increasing costs, growing demand, pollution and environmental concerns, political issues, etc., energy sector has one of the most complicated systems in the world and should be seen holistically (McIntyre and Pradhan, 2003). Hence, decision makers must use transparent, holistic and practical tools to gain better understanding of these systems. They should analyze long term issues and examine various and possible assumptions and scenarios, and subsequently, adopt some effective policies and strategies. They should also be aware of what happens before implementing their programs since their actions are momentous, and the consequences might be costly and irrecoverable.

As a powerful methodology and computer-aided simulation modeling technique, system dynamics has the ability to take feedback loops, delays, effective factors, and their interactions into consideration and mix them deliberately with on hand experiences and data about the system.

It can, therefore, play an effective role in the analysis of energy-related issues. This paper is an effort to clarify this role, by reviewing the most important system dynamics models in this area.

The following section will introduce the system dynamics methodology and its role in fossil fuel resources studies. Main system dynamics models in this field will be reviewed concisely in section 3. Moreover, the key aspects of these models will be discussed in further details. Section 4 concludes the report, with suggestion for further study.

2. System dynamics and fossil fuel resources modeling

2.1. System dynamics (Note 1)

As one of the first responses to the shortcomings of Operation Research (OR) and other management science techniques for complex problems such as those having large number of variables and nonlinearities, an idea, which now is known as system dynamics, was introduced by J.W Forrester in the 1960s at the Massachusetts Institute of Technology (MIT) (Forrester, 1961). Based on models and tools which were used by control engineers in order to analyze the stability of mechanical and electrical control systems, he developed powerful methods and a set of tools, which were first suggested by Tustin (1953), to model and analyze problems in complex systems.

Successful approaches to learning about complex dynamic systems require (1) tools to elicit and represent the mental models we hold about the nature of difficult problems; (2) formal models and simulation methods to test and improve our mental models, design new policies, and practice new skills; and (3) methods to sharpen scientific reasoning skills, improve group processes, and overcome defensive routines for individuals and teams (Sterman, 2000). System dynamics prides itself on providing practitioners with all of these requirements.

System dynamics is a powerful method to gain useful insight into situations of dynamic complexity and policy resistance. Five steps of modeling process in system dynamics are as follows (Sterman, 2000):

- 1) **Problem articulation (boundary selection):** in this step problem, key variables, and time horizon, should be defined; moreover, the historical behavior and the most likely behavior of key concepts in the future should be studied.
- 2) **Formulation of dynamic hypothesis:** in this step current theories of the problematic behavior is considered at first; then, a dynamic hypothesis should be developed endogenously. Finally, maps of causal structure should be developed.
- 3) **Formulation of simulation model:** the decision rules, parameters, initial conditions and etc should be determined consistently.
- 4) **Testing:** there are some serious tests which should be done to assure that the model works correctly and effectively.

5) **Policy design and evaluation:** finally, changes in environmental conditions (scenarios), policy options and their interactions, and sensitivity of policies under different scenarios should be examined.

System dynamics is suitable to be used to design successful policies in companies and public policy settings. It can be applied to any dynamic system, with any time and scale. In the world of business and public policy, system dynamics has been applied to industries from aircraft to zinc and issues from AIDS to welfare reform (Sterman, 2000). System dynamics society states the span of applications as follows:

- Corporate planning and policy design
- Public management and policy
- Energy and the environment
- Theory development in the natural and social sciences
- Dynamic decision making
- Complex nonlinear dynamics
- Biological and medical modeling

There has been a conscientious fondness to study the dynamics of natural energy systems as an exact complex system because of important feedbacks, nonlinearities, significant delays, etc. These works studied different aspects of system, including exploration, production, investment, technology, demand, substitution, import and export, financial, and so on.

2.1. The dynamics of energy sector and contribution of system dynamics

Because of political, economic, environmental, and social factors, energy sector is one of the most complex systems in the world. Regarding increasing economic activities as extremely energy intensive efforts, energy demand is growing day by day. In the case of energy shortage, its price would go up. On the other hand, the increase of energy price with a constant purchasing power might result in the decrease of energy purchase and finally it restricts economic activities. This restriction causes a decrease in demand, and consequently, it would push down the prices.

On the other side, an increase in energy demand would result in the production increase which causes resource depletion because fossil fuel resources are limited and the excessive production will deplete the resources. Resource depletion results in the increase of production costs. Therefore, energy prices would increase. In addition, resource depletion results in the decrease of investment return and the decrease of investment would result in reduction of energy sector's strength. The returns of investments can lead the whole system to be more active in exploration and production activities as well as technology progresses.

Furthermore, the progress of technology to be used in energy sector has a remarkable effect; that is technology development could make noneconomic exploitations profitable.

The existence of substitutes for energy carriers is another effective factor; in other words, price increases could bring on the substitution of other energy resources. The above mentioned dynamic relations of energy sector are shown in figure 2.

(((Insert Figure2 Here)))

Energy sector has a distinguished role in energy exporting economies; that is, not only the industrial sector is directly influenced by the performance of this sector, but also since oil exports has a large contribution in national incomes, fluctuations in the sector's performance might gravely influence governments' financial power in domestic and external payments. Therefore, the energy sector plays a crucial role in economic growth of oil exporting countries.

For those countries which are dependent on imports of energy to meet their demand, the dynamics of international energy markets are more pivotal and influencing. Any change in the market, if not foresighted, might have irrecoverable effects on their economy.

All above mentioned was a concise review of dynamics and complexities of fossil fuel resources sector. Analyzing, policy planning, and decision making in this sector is such a consequential concern that governments spend a big deal of money on it. Studying such a multifaceted system requires a comprehensive research tool without which conducting a thorough analysis is impossible.

As a useful research tool, system dynamics is a methodology which takes available expertise as well as system's data and information, and with the help of computer's analytic power and simulation, it makes a single,

integrated framework. The framework presents and visualizes the results of different assumptions, scenarios, and policy options. The resulted system dynamics model helps decision makers to design reasonable policies and offer options to mitigate possible negative effects.

The next section will try to clarify the role of system dynamics modeling in fossil fuel resources analysis through a concise review of main models in this field.

3. The review of main system dynamics models of fossil fuel resources

In this section the most important system dynamics models in the field of fossil fuel resources are reviewed and explained. More details on models, which directly deal with the exploration and production of fossil fuel resources, are shown in Table1. Moreover, Table1 summarizes some strengths and weaknesses of these models.

The first attempts in the field of energy system dynamics modeling were initiated in the early 1970s at MIT in the System Dynamics Group by WORLD models. These models tried to explain “predicaments of mankind”; that is, the increasing demand on the usage of earth’s resources and its “limited sinks” for the disposal of pollutants owing to the exponential growth of the World’s population may result in global crisis in the future. World models showed how long-term socio-economic interactions would result in the exponential growth of world’s population and industrial output. Finally, the increasing exploitation of finite natural resources might bring on the overshoot and collapse behavior in the world’s socio-economic systems (Forrester, 1970; Meadows et al., 1972).

The first serious attempt in fossil fuel resources system dynamics modeling was conducted by Roger F. Naill (Naill, 1973). Naill’s model was built upon the idea of M. King Hubbert, an American geologist, who believed that natural resources are finite and the production of them appears to have gradual increase to a maximum output, then a long plateau and finally a slow decrease. This behavior forms a bell-shaped curve which is called Hubbert Curve. In this way, Hubbert successfully predicted the peak of oil production for the lower 48 states of U.S. between 1965 and 1970 (Hubbert, 1956; Hubbert, 1982).

As one of the most impressive bases for later model building in this field, Naill’s model tried to depict the factors controlling the discovery life cycle of a finite resource. He indicated in his case of U.S. natural gas the normal behavior mode of the system is an initial period of exponential growth in consumption; a period of rising prices where growth in consumption is halted; and finally, a decline in consumption. He found that U.S. natural gas system would have a production peak in 1973 and the decreasing production rate would continue well below the US natural gas discovery rate, between the last 20th century and the early 21st century where the domestic production rate would come to a stop. He also mentioned that the exact timing of the peak was determined by many factors, including, the growth rate of potential usage, the initial level of unproven reserves, the cost of exploration, and the occurrence of various policies such as subsidies or ceiling price regulations.

After his natural gas model, Roger F. Naill tried to develop a national energy model in order to response to this question that whether the economic growth of U.S. is influenced by energy limitations like those limits to growth which were mentioned in WORLD models. In his model, called COAL, all major US energy sources including oil, gas, coal, and electricity (produced by oil and gas, coal, nuclear, and solar energy) were included; moreover, energy demand was modeled (Naill, 1976). The model seeks the policy combinations which insure the smooth transition from finite domestic fuel sources (coal, nuclear, oil, and gas) to ultimate sources (fusion and solar). It estimates the annual demand for energy, the generation of electricity, and the production of coal. Furthermore, it determines the import requirements of oil and gas, and considers the economics of synthetic oil and gas production from coal. This model was named COAL since it found coal as the best fuel for the US to rely on during the energy transition which was the transition of the US economy from the dependence on domestic oil and gas to alternative energy sources (Radzicki and Taylor, 1997).

The improved and extended version of COAL model, called FOSSIL, was used to analyze and design US energy policy. The model effectively simulated the interactions between energy prices, financial markets, resource depletion, government regulation, changing technologies, and customer behavior which determine future patterns of energy production and consumption. The structure of FOSSIL is similar to COAL; Although, in this model energy sources were expanded to include oil shale, fusion, hydropower, and geothermal in addition to crude oil, natural gas, coal, nuclear, and solar energy. The model simulates the whole process in which a resource is transformed and finally is delivered to satisfy the end-user’s demands. During the late 1970s to the early 1990s, the modified version of FOSSIL was used to create and evaluate national energy plans in US department of energy (Budzik and Naill, 1976; FOSSIL2: Energy Policy Model Documentation, 1980).

After extensive improvements in FOSSIL’s transportation and electric utilities sectors, the model’s name turned

into IDEAS which stands for Integrated Dynamic Energy Analysis Simulation (Radzicki and Taylor, 1997). IDEAS is a dynamic long-term policy simulation model of the US energy supply and demand which was used as a tool for the integrated analysis of energy-related options. IDEAS provides detailed projections of US energy supply, demand, prices, cost and emissions for up to 40 years (Naill et al., 1991).

John D. Sterman (1980) worked on the feedbacks and interactions between energy sector and the US economy in his PhD dissertation. He endogenously modeled the influencing energy-economy interactions, which previously was considered exogenous or was not seen.

After Sterman, Thomas S. Fiddaman (1997), based on the last system dynamics energy models in the US, built a climate-economy model called FREE (Feedback-Rich Energy Economy model) which not only explicitly included the dynamics of oil and gas depletion as a source constraint on the energy-economy system, but also it took the dynamics of a “sink constraint like climate change” into account.

The last system dynamics model in the field of energy resources in the US is the Threshold 21 which is the result of the rigorous system dynamics modeling attempts in the US till now. It incorporates society, economy, environment and their interconnections with energy. The model is used to understand energy issues and to show how those issues relate to and impact society, the economy, and the environment. As a quantitative tool for integrated, comprehensive national planning, it supports the overall process of strategic planning by facilitating information collection and organization, in addition to analyzing the results of alternative strategies (Bassi, 2006).

After Naill's model of the US natural gas which was the first serious system dynamics model in the natural energy resource modeling, Sterman in collaboration with George P. Richardson and Pal I. Davidsen, inspired from Naill's model, tried to create system dynamics models of oil industry in the world as well as the US. At first, their question was about finding the accurate method of forecasting the world's ultimately recoverable supply of oil. To find the accurate forecasting method, they created a system dynamics model and compared Hubbert life cycle and USGS geologic analogy method in simulation results. To do so, they used a synthetic data experiment and found that Hubbert's method was clearly the most accurate (Sterman and Richardson, 1985).

Afterward, the model was used to evaluate the amount of ultimately recoverable oil in US (Sterman, Richardson and Davidsen, 1988). Finally, Davidsen, Sterman, and Richardson (1990) developed a model which endogenously generated the complete life cycle of the petroleum resource in the US. The only two major exogenous variables in the model are GNP and the international petroleum prices. The model considered the interactions between several disciplines, including geology, technology, and economics; moreover, it integrated exploration, production, pricing, demand, imports, and the development of substitutes. The model was used to show how the interaction between technological progress, depletion, imports, and the development of substitutes creates the life cycle by altering the dominance of the feedback process in the system.

Bodger, Hayes, and Baines (1989) developed a system dynamics model to study the dynamics of primary energy substitution in the world. This model considered world market penetrations of different primary energy sector over time, and it generated inter-substitution of one energy form for another; accordingly, the model used to evaluate the different future energy options. The model used with the same purpose in New Zealand in 1992 (Bodger, May, 1992); it forecasted the market share of different energy carriers in New Zealand with the passage of the time. The study provided policy makers with appropriate insights to accord national policies especially investments with energy sources' trends.

Choucri, Heye, and Lynch (1992) conducted a detailed simulation analysis to study Egypt's oil industry as a near-typical, non-OPEC, oil-producing developing country. This model was used to explore implications of alternative scenarios for government policies (which affect Egypt's domestic consumptions directly), world oil prices (which influence earnings from export), and geological parameters (which affect the condition of resources and reserves) on patterns of production, exports, and earnings. The model effectively distinguished foreign oil companies and government agents as well as oil-producing regions which disaggregated geologically, to represent the characteristics of oil production; moreover, it made a distinction between domestic consumptions and exports as well as the domestic and international prices. The model had three exogenous variables including export and subsidized domestic prices, discovery and development prices, and initial levels of reserves and undiscovered oil.

Chowdhury and Sahu (1992) developed a system dynamics model in order to study the long-term dynamic behavior of the Indian oil and gas (as finite and nonrenewable fossil fuel resources) exploration/exploitation industry. In compare with other system dynamics models in this field, they considered financial aspects deeply; that is, the model consisted of two sections, including technical and financial sections. The first section

investigates the exploration and exploitation processes of oil and gas reserves, and the financial section generates the likely future financial statements, namely, the income statement, balance sheet, and fund-flow statement for different activity levels. They studied interactions between important variables to choose alternative policies; moreover, the model could aid decision making by allocating limited financial resources in a satisfactory manner.

Chi, Nuttall, and Reiner (2009), based on Naill (1973; 1977) and Sterman and Richardson (1985), developed a system dynamics model of Natural gas system in UK to investigate the main effective factors on the long-term supply and demand and study the nature of the system's behavior; furthermore, the effect of different policies about the growing of import-dependence on unstable exports in the next decades were studied. Finally, they found that supply-side policies alone cannot effectively postpone the peaks in discovery, production, and consumption; Also, the reduction of UK's dependence on gas imports, a combination of domestic and international policies (about exporters), could be useful.

Table1 provides researchers with some useful information about different aspects of the important reviewed models.

(((Insert Table1 Here)))

4. Conclusion and suggestion for further research

The role of system dynamics methodology on fossil fuel resources analysis has been improved from 1973. In these studies, system dynamics shows a significant role in dynamic modeling of fossil fuel resources. Referring to strengths and weaknesses as well as major policies suggested by previous studies as explained in Table 1, one can conclude that system dynamics approach can be considered for a variety of decision makings procedures and is capable of studying the causal dynamic relations between different sectors of energy systems, such as considerable delays in industry and new energy development, advanced varying technology, resource limitation and depletion, price fluctuation, increasing costs, growing demand, pollution and environmental concerns, political issues, etc.

System dynamics, which is an appropriate method for dynamic studies and policy analysis, has been used as one of the impressive methodologies in systemic research in this area. In this paper, not only the role of system dynamics in fossil fuel resources analysis has been illustrated, but also the main system dynamics models in this field were reviewed which could be a proper study guide for those who want to further research in this area.

There are some areas which necessitate further researches, including energy market structure and regulations, investment dynamics, risk assessment, technology development, sustainable development and energy-environmental issues.

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Notes

Note 1. More detailed information about the methodology could be found in *Business Dynamics* (Sterman, 2000) which is a useful, dominant reference in this field.

Table 1. The review of fossil fuel resources system dynamics models

Row	Characteristics Authors	Year and Country	Energy sources studied	Main sectors of the model	Major scenarios and policies	Weaknesses and strengths
1	R. F. Naill	1973 - United States	Natural gas	<ul style="list-style-type: none"> - Exploration - Production - Demand - Investment 	<ul style="list-style-type: none"> - Unproven reserves - Wellhead price taxes - Demand rate growth - Investments - Technology factors - Regulations 	<ul style="list-style-type: none"> - This model is one of the first and also impressive attempts in the field of energy dynamics simulation. - Demand is modeled exogenously and the interaction between economy and energy sector is not studied. - Production loop is not modeled comprehensively. - The need for investment is not examined. - The existence of substitutions is not considered. - One of the wrong assumptions of model is the equality of production rate and consumption rate. - Exploration rate is usually determined by predictions of future production as well as demand, but in the model, this rate is determined by current rate of production.
2	J. D. Sterman and G. P. Richardson and P. I. Davidson	1985 - World - 1988 - United States 1990 - United States	Oil Oil	<ul style="list-style-type: none"> - Exploration and Discovery - Production and Usage - Technology - Price, Revenue, and Investment - Demand and Substitution <ul style="list-style-type: none"> - Demand, Import, and Substitution - Investment - Exploration - production - Technology - Revenue, Price, and Cost 	<ul style="list-style-type: none"> - Regulation and price controls - Tax - Internal economic growth - Exploration and recovery technology progress - Costs - The effect of substitution - Supply policies of OPEC and other suppliers - Import costs and restrictions - Reservation and strategic reserves 	<ul style="list-style-type: none"> - The use of simulation and synthetic data approach (Hubbert theory of natural resources life cycle and geologic analogy method) is one of the model's advantages. - These models resolve the mistakes of Naill's natural gas model over time.
3	N. Choucri	1990 - Egypt	Oil	<ul style="list-style-type: none"> - Exploration (by government and international oil companies) - Production (by government and international oil companies) - Investment (by government and international oil companies) - Internal Consumption and Export 	<ul style="list-style-type: none"> - Changes in international prices - Changes in domestic prices - Changes in Reserves - Changes in private company's share 	<ul style="list-style-type: none"> - This model is a perfect model which is used for a developing and oil producer country. - The main advantage of this model is the distinctions which made between: foreign oil companies and government agents, oil-producing regions, domestic consumptions and exports, and domestic and international prices.
4	S. Chowdhury and K. C. Sahu	1992 - India	Oil and gas	<ul style="list-style-type: none"> - Technical section (Exploration / Exploitation) - Financial section (Income Statement / Balance Sheet / Fund-Flow Statement) 	<ul style="list-style-type: none"> - Tax on Exploration - Production increase - Future exploration and exploitation activities - The invasion of oil substitutes into the market - Financial policies 	<ul style="list-style-type: none"> - The main approach of this model is considering financial aspects in modeling which is one of the advantages of this model as this aspect is not studied enough in other models. - The existence of aggressive oscillations does not seem to be realistic, and it seems that some factors are not considered completely in the modeling.
5	P. S. Bodger and D. G. May	1992 - New Zealand	wood, coal, oil, gas, nuclear, and sun	<ul style="list-style-type: none"> - Energy Resources - Energy Refining Industries - Producer / Consumer sectors of Society 	<ul style="list-style-type: none"> - The evaluation of alternative energy sources 	<ul style="list-style-type: none"> - This model examines the dynamics of primary energy substitution in a noteworthy manner which provides policy makers with useful insights to formulate national policies.
6	K. C. Chu and W. J. Nuttall and D. M. Reimer	2009 - United Kingdom	Natural gas	<ul style="list-style-type: none"> - Exploration - Production and Consumption - Demand projection and Substitution 	<ul style="list-style-type: none"> - Tax policies - Demand - Technology - Independence level of gas import 	<ul style="list-style-type: none"> - This model basically is built on Sterman and Richardson (1983)

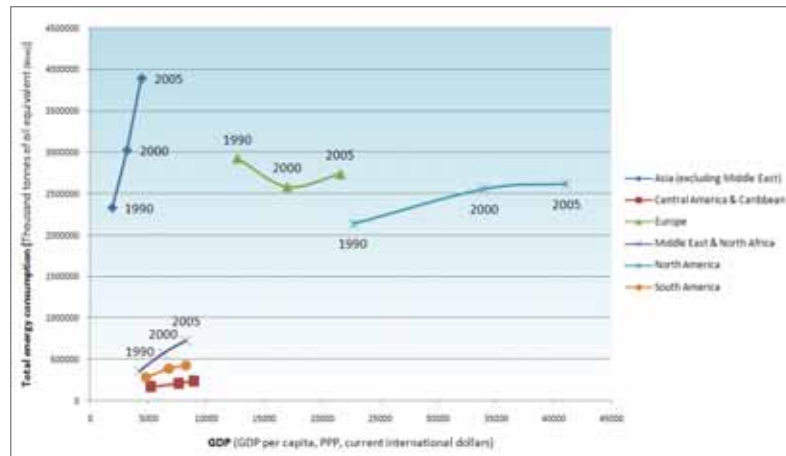


Figure 1. The relationship between energy consumption and GDP (Source: World Resources Institute)

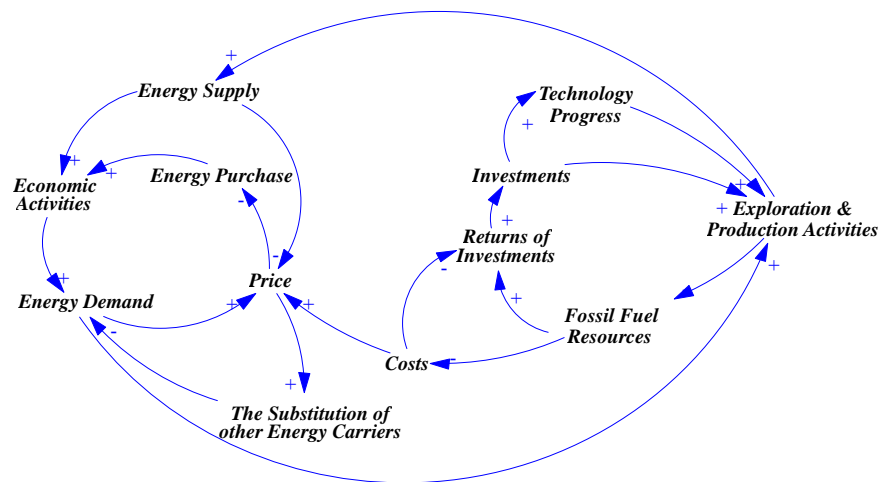


Figure 2. Dynamics of energy sector.

How to Start A New Business in France — Justify the Idea of Starting A Ski Service Company in Grenoble France

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Abstract

The paper is mainly concerning two crucial strategy question for starting a new business within today's French business environment. They are which sector will be appropriate point to start and how to form the company. Deductive method is adopted to analyze the former and inductive approach is employed to explore the later. To make the argument robust, economics model, organizational behavior theories and accounting knowledge are widely used. Through the research work, the paper indicates that providing ski service could be a profitable business idea in Grenoble France, and the company should be organized in terms of hierarchy structure with flatting form, which could be achieved by job-enrichment. Finally, the paper demonstrates to entrepreneurs that although the economy performance of France is weak now days, some business still can be start as long as they are well arranged.

Keywords: France, Enterprise, CBR, Ski Service

1. Introduction

This report mainly focus on two question sets: first one is to justify the idea of starting a company which provides a clouts of services to those who spend their holiday in Alpe d'Huez ski resorts and the firm running business on tourist sector; second purpose is that if the proposed business set up, how to arrange its business activities to achieve success. Thus, the research work try to explore under today's French economy situation and its business culture, how to integrate different discipline within management study to set up a new business in an appropriate way.

Integrating different disciplines, it is a challenge to management study and it is necessary to conduct business activities, especially to start a new company with relative small size. Since most influential large companies in today's business world stemmed from small organization, and the sector in which they operate might be ignored in that age. Hence, through investigating current French economy situation based on economics analysis will be help to justify the proposed ideas. However, executive any business activities need rely on an organizational base, thus, arrangement of an enterprise is going to be another crucial requirement.

In order to clearly address the topic set, this report will follow the structure as below: Part I: methodology. In this part, it will demonstrate the way used to collect information and the problem might occur as well as the methods and framework employed to explore the topic. Part II: justify the ideal of proposed business. In this part, the work will concentrate on the analyzing French economy situation through employing economics theory and models as well as using relevant data. Part III: How to arrange the new company to achieve success. In this part, the discussion will highlight the way to organize an effective enterprise within the social and culture context. At the end of the report, it will give a conclusion based on the previous research activities.

2. Methodology

The selected of framework and method

The report will follow the PSETEL framework. In part II justify the idea of proposed business. The analysis work largely relies on deductive method since economics analysis is based on data interpretation and theory analysis. Hence, in that part the discussion focus on P(political factors), E(economic factors) and E(environmental factors); In part II, how o arrange the new business inductive method will be employed, since this method is a common way to create a rational and feasible arrangement for a new company through understanding S(social-culture), L(legal system) and T(technology). Thus, it is a mixed approach that employed in the whole report.

The strength and weakness o the selected framework as well as the reliability of outcome

As R. Lynch argued that any PESTEL environmental analysis framework could provide two outcomes, they are proactive outcomes which can utilize/exploit opportunities or cope with/eliminate threats and reactive outcomes which is the awareness of events that cannot be controlled by organization but has to be reacted if it happens. In addition, according to current government models assumption, any successful plan is the result of analyzing and evaluating external environment. (Sorensen-Bentham T, 2006) All these points of view advocate PESTEL framework could be used to predict future through past and current events analysis. On the other hand, PESTEL framework inevitably has several backwards described by Johson & Scholes in their literature (Sorensen-Bentham T, 2006) as 'some of the factors are very general and their impact might be difficult to specify' and 'it need to be understand that the analysis is looking at future impact of environmental factors which might be different from past impact of similar factors.' Thus, the work based on this framework is meaningful to the topic set. However, the significance of the finding could be undermined in some degree since the dynamic environment.

3. Justify the idea of starting a ski resorts service company in Grenoble France

The idea of ski resorts services company can be defined as an organization that provides a wide range of service including ski training course, ski equipment renting, booking accommodation and ski pass as well as hotel-resorts transportation service. In this part, it will focus on E (environmental factors), E (economic factors) and P (political factors) three aspects to exam this idea.

The environment factors

Starting the business in Grenoble has following three environmental reasons: firstly Grenoble is a historical city located 56km far from Aple d'Huez – one of the most beautiful ski resorts in Europe. It is the nearest city around Aple d'Heuz. Secondly, Grenoble is a city connected by fast train (TGV), through TGV, from Paris to Grenoble only takes 3 hours and it only cost 1 hour to reach Lyon. In addition Grenoble is surrounded by the highly developed motor-way network. All these advantages create an optimal location to start ski resort service business.

The economics analysis

Someone maybe argue that it is not a suitable time to start any new business activities in France since during recent years, the performance of French economy is relatively weak, which can be indicted by high ratio of unemployment with large amount jobless. (Insert Figure 1 and 2 Here)

Since second half of year 2001, the unemployment ratio began to increase from 8.5% to around 10% at 2005, with the jobless from 2,300,000 to 2,700,000. This figure indirectly shows a number of small, median business collapses, for large organizations as Air France, Renault are still controlled by authority, which have not reduced large amount working opportunities. However, on account of high level of unemployment, it is the chance to find cheap labor to reduce cost and release the starting budge. This can be seen from the following labor participation model. (Insert Figure 3 Here)

Since French legal system only allows each labor work 39 hours a week, within minimum payment €8 per hour, the organization cannot prolong the working time with very low pay. Nevertheless, the high level unemployment which is characterized as structural or cyclical employment provides a large number of job-seekers. In the other word, the labor market does not clear because supply largely exceeds demand, so new firm access to hire ordinary labor with minimum payment. This could significantly reduce input cost.

Others might argue that the difficulties faced by French economy is caused by joining the Euro Zone, which make the monetary authority (basically it is central bank's responsibility) lose the ability to adjust interest rate and exercise inflation policy to active economy. The result of the effect includes insufficient demand that lead to slow GDP growth. In addition, the appreciation of Euro against US dollar even worsens this situation. Nevertheless, the paradox is the French real value of export in terms of US dollar increased from \$325 billions (2000) to \$419 billion (2004). (Insert Figure 4 Here)

Though the trend of Euro against other currency is still upward, to explain this phenomenon, it is worth of comparing the real GDP Growth ratio among main large economies. (Insert Figure 5, 6, 7, 8 Here)

According to these figures, China displays the highest growth rate at 9.1% in 2004, US was the second at 4.4%, even the UK was 1.1% higher than France at 3.2% in 2004. Thus, Euro is depreciate against other currency in terms of purchase power hold by the individual in those nations, thus the demand comes from outside of the France goes up. This can be displayed by demand – supply model. (Insert Figure 9 Here)

This model shows that the relationship between price and demand is negatively correlated, *ceteris paribus*, the decrease of price lead to go to right along the curve, however, the increase of purchase power of other large economics, especially, the tremendous growth in China causes the demand curve shift to right side at same price level. If the supply is not adjusted, the quantity goes up ($Q_3 - Q_1$) with the price increasing ($P_3 - P_1$), which can bring extra revenue ($P_1 P_3 O_1 O_3$). This could be proved by the boom in tourist factor in France. On account of ski resorts is closely related to tourist industry and the firms providing integrated ski services rarely found, it is possible for this type of firm enjoying big market with less competition.

The political factors

The taxation level exercise by fiscal policy may be the real factor that inhibits the development of new small and media companies. The 'tax wedge' in 2004 is 40%, including standard company tax 33.3%, company payroll tax 0.15%-1.5% and the rest is social charges. (Insert Table 1 Here) This is the why labor cost is very high in France compared with the UK and USA. (Insert Table 2 Here)

Hence, according to investigating above three aspects, although high taxation level is harmful for new business, which could be compensated in some degree through well arranging the company, in all, the advantages and potential profit brought by the proposed business largely outweigh the disadvantages, thus, ski resorts service could be a appropriate sector to start a new business.

4. How to arrange the new company to achieve success

Since start a ski resort service company is feasible and profitable, it still need consider the way to exercise this business activity with concerning L (legal factor), T (technology factor) and S (social culture) In a French background.

The legal factor

In France, it adopts a civil law system based on Roman law and with substantial reliance on codified law. There are 7 common company styles in France. (Gordon C, 1996) The most popular styles are the Societe Anonyme (SA) and the Societe a Responsabilite Limitee (SARL) form as well as the Societe en Nom Collectif (SNC). To a new small firm, SARL style might be more favorable for following three reasons:

Firstly, SARL and SA form are limited liability to their capital contribution, but SNC is unlimited liability. Thus, considering the risk avoidance, in case, the business collapse, SARL can protect the founders benefit.

Secondly, within limited liability firm legal structure; compared with SA style, SARL is not composed to set up board of directors, in this sense, it could remove one layer within company design (this will be discussed later in the next heading).

Thirdly, compared with SA form, the minimum capital register requirement for SARL is only approximate €9,000. According to accounting discipline, this will bring at least two advantages:

1). Deposit less amount of register capital could largely release the new company from financial constrain. Since French company are willing to use debt finance rather than other method, this could reduce interest payment, thus, the financial risk is lower. This result can be seen from high interest cover and cash interest cover ratio and low gearing ratio. When the account statement of financial year is available (on the account of new starting company, financial statement only can be see next year).

2). Another two figure so called 'trade debtors' and 'account payable' measure the period require for a company to receive payment from their customer and make payment to their supplier. To a new start business, the former criterion might be big; on contrast, the later could be small. This is seen as that the efficiency of a company is unfavorable. Less register capital in turn enlarges a firm initial cash flow; this could reduce the impact induced by account in-efficiency.

Thus, based on accounting knowledge and the objective legal system, for a new start small business, SARL structure will be more favorable.

The social culture and technological factor

Any business activities cannot operate without concerning its specific culture background and the technology available to them. So when a new start company designs their job and structure, they need pay more attention to these factors since once these arrangements created, changing them will be very difficult.

In order to understanding French business culture clearly, it is necessary to compare that of the UK within Hofstede 5D model. This model is a powerful tool to analysis culture difference since it use scores to measure five main business culture indicators – they are PDI (power distance index), IDV (individualism), MAS

(masculinity), UAI (uncertainty avoidance index) and LTO (long-term orientation) respectively, according to the comparison figure. (Insert Figure 10 Here)

IDV of French nearly fourfold that of the China, and the French are highly uncertainty avoidance reach the score 80, but they are very Feminist with low score in MAS indicator just above 40. This information at least unfold two management secret formulas that the hierarchy structure may be more suitable to a company with most staff are French, and job-enrichment may be necessary to motivate them to improve their performance.

According to the result of Hofstede 5D model and the factor that the new start business is relatively small, the ideology behind the set up phase is that the company need adopt entrepreneurial structure. In a very real sense power and authority within the organization lie with the owner/manager. (Insert Figure 11 Here) On account of the business activities embrace ski skill training, ski equipment rent, booking accommodation and ski pass and Hotel-resort transportation service. In effect, the small business is still need employ 20 -30 staffs, hence, bear initial entrepreneurial structure ideology, the exact arrangement of company structure could take product-based structure. (Insert Figure 12 Here)

Employ this structure at least could achieve three goals: Firstly, product focus. To this new business, one type of service could be regard as one product; this arrangement could avoid any overlapping and clear their job-description. Secondly, single head. Each service production has a unique person bear the responsibility of the unit performance. Thirdly, limited autonomy. Each divisional head will be accountable to the boss/manager for running of their business.

This kind of structure might be more compatible to the French business culture described by Hofstede 5D model scores, since it is high hierarchy controlled with job-role certain.

Organization structure significantly affect the job-design within the company, in turn job-design influence the decision of what kind of structure should be adopt or at least it impact on the efficiency of the created structure. The customer – hierarchy conflict model (Insert Figure 13 Here) clearly indicate that the customer experiences any organization horizontally, not vertically. However, the employees within an organization more care what they have done. To a firm providing service, customer service becomes very important. To solve this dilemma, job-enrichment needs to be concerned. According to Herzberg (1968, 1974), He identify six form of enrichment should be include in job-design; they are accountability, achievement, feedback, work pace, control over resources and personal growth and development. In practice with the proposed business here, job-enrichment could be taking from within each production unit. This might bring the following benefit:

- 1). Job-enrichment integrates job description in vertical direction, which shortens the top – bottom distance without changing whole structure design. It not only meets the need of hierarchy control but also match UAI indicator of French culture.
- 2). The original choice of SARL style is in order to remove unnecessary layer of the new small business, vertical combination of job could restrict the company at a necessary size, which could effectively reduce labor cost since higher wage is real factor harm the company's development in France.

In addition, a number of multinational IT companies like HP and XEROX located their European head-office or R&D department in Grenoble. This provides very strong IT service platform those businesses around this area. Thus, well – utilizing available IT platform to exercise business is another way to reduce cost. For instance, through own company web-page or e-business, it could deliver ski resorts service to every corner of the world without large human resource input.

5. Conclusion

The discussion is round political, environmental and economic factors. Through this investigation, it is clear that French taxation system is real element harmful for the development of new business, and it is the main reason cause high level unemployment as well as strong Euro negatively affect the market in some degree, however, high unemployment level in turn create the opportunity to purchase relative cheap labor. At the same, using different benchmark measure the impact of Euro, ski resort service business might face a large market with high profit and less competition. Indeed, once comprehensively and deeply analysis the economic situation, it is not impossible to find some new profit area, even in a relative weak economy circumstance.

This report highlight how to organize a new company within a particular legal and culture background, using the combination of accounting and organizational behavior knowledge is in order to design more efficient and cost less organization. In addition, appropriately arrange a firm could largely, at least partially offset some inevitable disadvantage create by the whole business environment. As Lynch motioned that one purpose the environment analysis is to discover reactive outcome.

Thus, another gain from this research activity emphasize that integrating different discipline is a crucial way to achieve appropriate business decision. Consolidating broad perspectives is not only the effective method for decision making but also a re-question for improving management skill.

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Table 1. Total tax burden in 2004 (% of GDP)

	fiscal	social
France	11.1	18.4
UK	15.6	8.2
Sweden	19.6	14.8
Latvia	8.0	9.0

Table 2. Unit labour cost in 2004 in terms of Euro (€)

Germany	27.9
France	27.7
UK	23.6
US	18.1

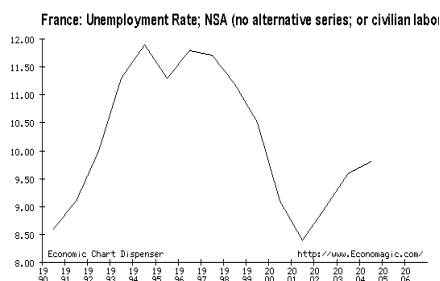


Figure 1

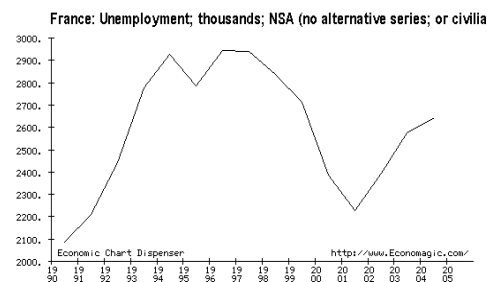


Figure 2

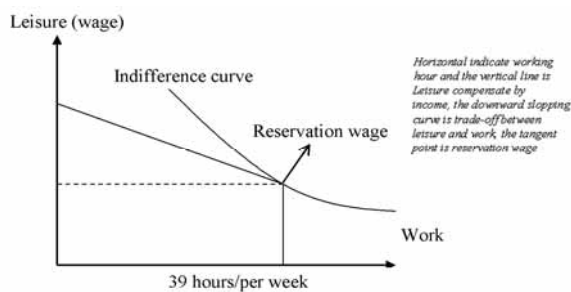


Figure 3

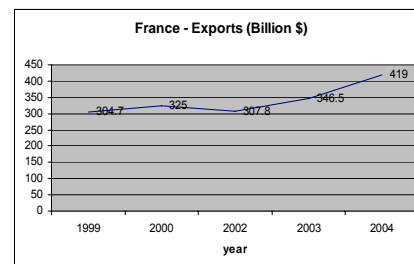


Figure 4

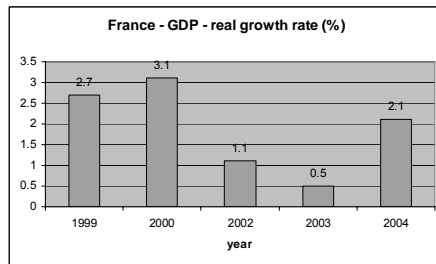


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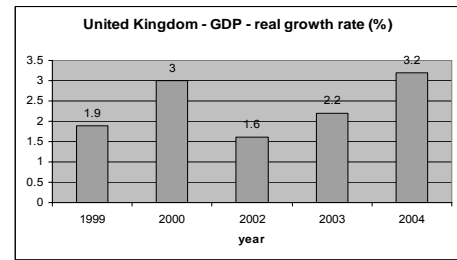


Figure 6

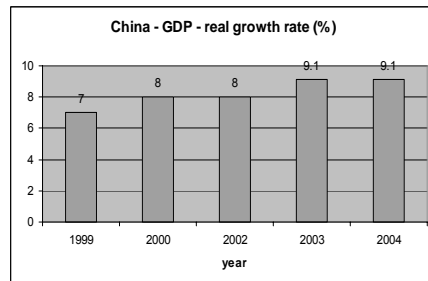


Figure 7

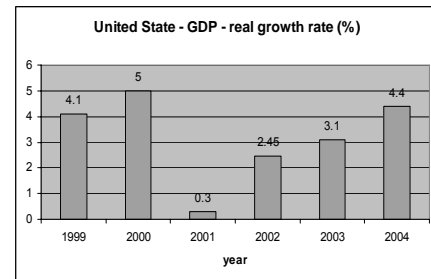


Figure 8

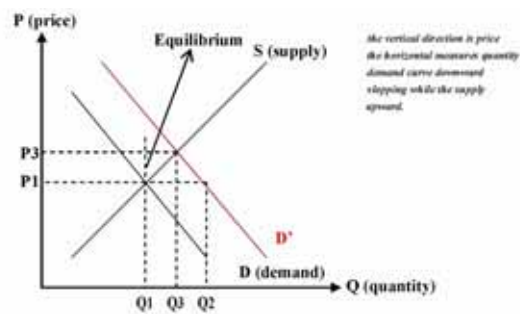


Figure 9

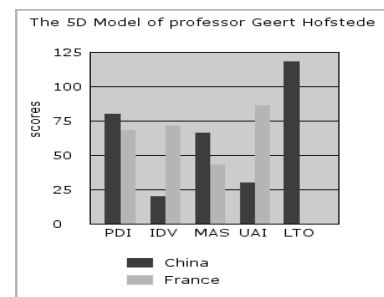


Figure 10

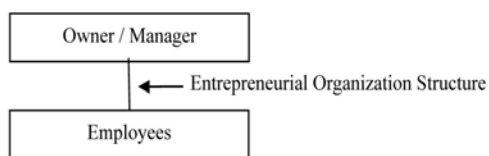


Figure 11

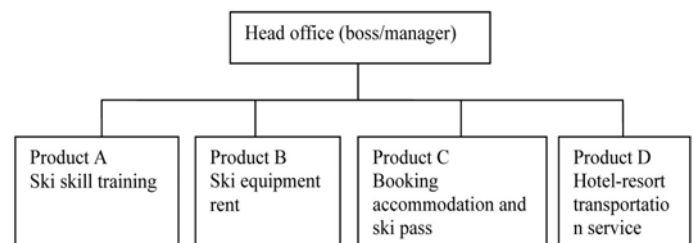


Figure 12

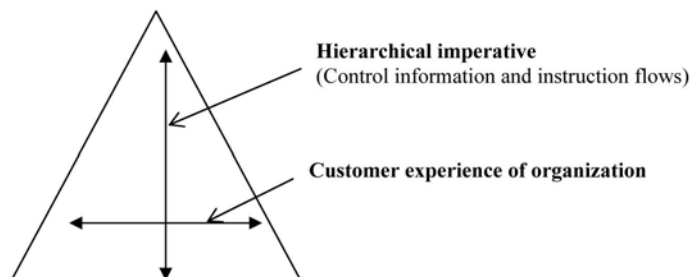


Figure 13

The Influence of Sustainable Development on Retail Store Image

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Abstract

This article explores young consumers' perceptions of the sustainable development (SD) initiatives of French food retailers and evaluates their impact on the brand image of the retailers and their relationships with consumers. The methodology incorporated the analysis of the websites of the main French food retailers, a press review, eight in-depth interviews and a face-to-face survey. The findings highlight that young consumers tend to link SD more to ecology and less to social and economic issues. When a retailer's SD actions are perceived and valued, young consumers show an emotional connection that is translated into positive attitudes, purchasing intentions and a willingness to recommend the retailer. When young consumers are not sensitive to SD actions, they continue to choose their retailer on the basis of geographical proximity. Five key dimensions seem to best describe brand image in relation to SD actions: Sympathy, Innovativeness, Human Touch, Responsibility and Opportunistic Behaviour. This last dimension is the only one with a negative connotation. This is because for some consumers, investments in SD are considered to be mostly driven by profit-seeking.

Keywords: Corporate Social Responsibility, Sustainable Development, Retailing, Brand Image, France

1. Introduction

Sustainable Development (SD) initially appears in the context of worldwide awareness on the harmful consequences of human activity for the future of our planet. Unfortunately, many companies began to feel concerned about SD only when their reputations suffered through non-performance or a negative rumour. An illustration of this is the collapse of Nike's sales in 1998 when the whole world discovered that its well-known sport shoes were made by exploited Asian children. Other brands, such as Coca Cola, Wal-Mart and Gap, have also been criticized for their lack of commitment to social responsibility (www.marketingweek.co.uk).

This is a strategic topic, since we know that consumers are assigning increasing importance to the responsible behaviour of brands. In France, 65% of French citizens said they prefer brands with an ethical commitment (Ethicity-Ademe, 2006). Consequently, communication about SD has become a strategic issue for many companies when they wish to emphasize their sense of ethics and social responsibility. When such brands fail to do so, public opinion may penalize their irresponsible corporate behaviour by damaging the relationships that brands have with their consumers.

In the case of Nike, the brand was able to correct the situation only by revising the nature of the housing of its workers and communicating its strategy changes to the media. However, these episodes can irreversibly harm a brand's image and change consumers' perceptions and behaviour concerning the brand (Louppe, 2006).

Nowadays, assessing how SD activities could affect consumers' perceptions and their relationships with retailers is an important issue to consider in the retailing sector. Nevertheless, most research initiatives tend to adopt a corporate perspective (Konrad, Steurer, Langer & Martinuzzi, 2006; Gupta & Pirsch, 2008) rather than a consumer perspective. Among the studies undertaken from a consumer perspective, Gupta and Pirsch have examined the effectiveness of corporate social responsibility programmes in influencing store image. These authors conclude that: *"a retailer's ability to offer up-to-date products and relevant selections in conjunction with their ability to do so in a socially responsible manner are both important in determining consumer's retail store image and contributing to the consumer's overall level of satisfaction and loyalty toward the store"*.

This research is a first attempt to examine how the incorporation of SD into a retailer's corporate strategy may affect the bonds between the consumer and the retailer's brand. Accordingly, the objectives of this investigative research in the French market are:

To explore how consumers perceive the notion of SD;

To understand how actions perceived as supporting SD could affect brand associations and relationships in the French food retailing sector.

2. Conceptual framework

The conceptual framework is built around two main themes. The first theme covers the literature on Corporate Social Responsibility (CSR) and incorporates Sustainable Development (SD) as one of its key aspects. The second theme includes an examination of consumer-brand relationships, brand image and brand associations.

2.1 Corporate Social Responsibility (CSR)

In 2001, the European Commission defined CSR as “*a concept whereby companies decide voluntarily to contribute to a better society and a cleaner environment*” (cited in Hartman, Rubin & Dhanda, 2007). It implies that a company, after identifying its stakeholder groups, e.g., investors, employees, customers, suppliers, and public organisations, should integrate its needs and values into its strategic and operational decision-making process. Those supporting a CSR approach should therefore go beyond a simple quest for profit maximization (an economic goal) and also look at corporate social performance (a non-economic goal). Achieving both types of goals, economic and non-economic, will enable the survival and success of the corporation. In this perspective, SD is positioned as a key facet of CSR (Férone, Debas & Genin, 2004; Blowfield & Murray, 2008).

2.2 Sustainable Development

Although it has been discussed by economists since the 1950s, the definition of the SD concept continues to evolve according to developments in the management sciences (Binninger & Robert, 2005; Blowfield & Murray, 2008). The SD term was used by the *Brundtland Commission* which stated what has become the most often-quoted definition of SD as development that “meets the needs of the present without compromising the ability of future generations to meet their own needs” (United Nations, 1987). Though often reduced to its ecological dimension alone, SD really refers to an overall approach, which states that long-term development is feasible only if we reconcile the following three aspects:

- 1) Respect for the environment;
- 2) Social equity;
- 3) Economic profitability.

Specifically, SD requires the maintenance or improvement of the quality of the natural environment to ensure the permanence of resources, to reduce differences in the quality of life among the populations of the world, to promote self-sufficiency among communities and to respect human rights, making it possible to transfer know-how and wealth (including natural resources) from one generation to the next. It is, therefore, the material representation of a close correlation between what it is known as the 3 Ps: *People, Planet and Profits* (Elkington, 1994).

The SD concept includes concerns for equity and social cohesion, as well as the need to avoid threats against the common good of humanity (Gabriel, 2003). Transposed to the corporate view, SD is based on the concept of overall quality at the human level. It leads management to ask itself questions about the foundations of the company, the corporate values, the use of manufactured products (in time and in space) and also the entire manufacturing and commercialization process.

SD is seen as a development process that reconciles economic, ecologic, and social aspects, establishing a virtuous circle between these three poles. This is ecologically sustainable development that is socially equitable but also economically feasible. In others words, the main objectives of the company may still be to minimize risks and generate returns for its shareholders. Yet, the company refocuses more on its workers and less on its profits. Thus defined, SD is not just applied to one aspect of the company; it should also be cross-functional. All functions of the company are affected and contribute at their own level to an overall policy of social responsibility.

For example, since 1990, the trading group *Monoprix* has undertaken an SD strategy that has become a true priority for the company’s 19,000 employees, with fifteen people carrying out SD projects. This is the only trading group that not only has a mascot, “the penguin”, to symbolize SD, but also has a true communication campaign on the subject aimed at the general public, claiming that “*The company thinks, buys and sells in a responsible way*”.

In 2002, the trading group began marketing the *Alter Eco* brand of fair-trade products, killing two birds with one stone, since this is what saved the young company from bankruptcy. The firm also launched its own “SD products” such as *Monoprix Bio* (organic products) in 1994 and *Monoprix Vert* (products stemming from plant chemistry) in 2005.

Monoprix is also concerned with the environment, and in 2000 launched its transparent carrier bags, which use less ink and solvents and are thus less polluting. The shops are concerned with savings on their energy and water consumption, sorting their waste and recycling it and using, among other items, recycled paper. The trading group also selects its suppliers in a way that allows it to ensure that its logistics are environmentally-friendly.

In fact, SD does not involve companies alone, but also investors and consumers. These three players can find simultaneous satisfaction in a policy guided by SD. As shown in Figure 1, the interaction of these key players is heavily influenced by ethical issues that are profitable for all of them.

INSERT FIGURE 1

2.3 Retailing, SD and brand image

Previous research has shown that a corporation’s involvement in SD actions could enhance its corporate image among consumers (Blumenthal & Bergstrom, 2003). However, Gupta and Pirsch (2008) point out that in the retailing literature, the constructs of “store image” or “store personality”, referring here to brand image or brand personality, do not take into account the role of CSR or SD actions. A retailer’s brand image is defined herein by considering only aspects such as geographic location, merchandising, customer service, prices, advertising, personal selling, sales incentives, loyalty programmes and the affective inferences arising from the store’s attributes. This omission in the evaluation of the retailer’s brand image is astonishing because these companies spend a lot of time and money on communicating about their SD commitments and therefore expect an improved valuation in terms of consumer attitudes and relational proximity. According to Lavorata and Pierre (2006), retailers should choose an SD policy since they know that such a decision would help them build a positive and responsible image.

Even though the notion of brand image is widespread in consumer research literature, both the overuse and the misuse of this construct have been the subject of some criticisms (Dobni & Zinkhan, 1990). According to Reynolds and Gutman (1984), the way in which a brand image is defined determines the nature of the research questions, the methodology and how the findings are expressed. Based on this, it seems wise to clarify its conceptualization. Dobni and Zinkhan’s brand image foundation analysis (1990) offers a clear picture of the meaning and structure of the construct:

concept of the brand perceived by the consumer;

subjective and perceptual phenomenon formed through consumer interpretation, whether reasoned or emotional;

not inherent in the technical, functional or physical aspects of the product but rather affected and shaped by marketing activities, by context variables and by the characteristics of the perceiver;

perception of reality is more important than the reality itself.

The literature review on brand image management, SD policy and retailing allowed the authors to retain some elements for the assessment of the retailer’s image that concern not only the physical attributes of the store, e.g., space, temperature and neatness, but also the more affective attributes such as the “*fit with store personnel*” or even some kind of “*love for the retailer itself*”. Therefore, evaluating the image of the retailer is, in fact, assessing what “attitude” the consumer develops toward the retailer, considering the three components of this attitude: cognitive, affective and behavioral.

2.4 Associations and relationships

The associative network memory theory defines brand image as “*perceptions about a brand reflected by the cluster of associations that consumers connect to the brand name in memory*” (Del Rio, Vazquez & Iglesias, 2001). Brand associations are conceptualized here as multi-dimensional constructs including brand image, perceived quality and brand attitudes (Low & Lamb, 2000). In this perspective, consumers develop stronger memory structures for familiar and well-known brands. Their familiarity with the retailer develops through proximity and the consumers’ frequent shopping experiences. Retailer knowledge will emerge as a result of this familiarity and will be reinforced by the retailer’s communication efforts. This implies that retailers who succeed in communicating their SD commitment will benefit from stronger and more positive brand associations.

Another possible explanation is given by the brand-relationship theory. This theory suggests that consumers develop ties with brands, not only for utilitarian or functional motives, such as geographical proximity, price,

product quality and sales incentives, but also for more emotional and identity-fostering reasons, for example, matching values such as empathy, honesty, trust and solidarity (Fournier, 1998; Roberts, 2005; Cacho-Elizondo, 2006; Thompson, Rindfleisch & Arsel, 2006).

When consumers identify themselves with the values that the brand supports, they will be more willing to establish stronger bonds. Previous research has found that positive brand attitudes, consumer satisfaction and purchasing intentions increase as the congruence between self-image and brand image increases (Graeff, 1996; 1997; Park & Lee, 2005).

3. Study context and research question

In France, food retailers are communicating more and more about their SD strategies through their corporate websites and other traditional media. This trend emerged in the 1990s as a result of societal and governmental pressure and has continued to advance in recent years. The question that arises here is whether SD initiatives are really noticed by consumers, and if they are, how they influence the way in which consumers interrelate with retailers. A first step in the research project was to look at consumers' associations with the brands of food retailers, based on perceived SD actions. A second step in the project was to analyze how these brand associations contribute to a reinforcement of the consumer-brand link.

4. Methodology

The research methodology covered three stages. The first stage covered an analysis of the websites of the main French food retailers and a review of the press. The objective in this phase was to identify the way in which French food retailers communicate their SD actions and whether their SD concern was explicitly linked to their corporate core values. The corporate websites of six French food retailers were evaluated: Auchan, Carrefour, Casino, Cora, Leclerc and Les Mousquetaires. Most of these retailing groups seem to regard their core values as being connected to their SD commitment.

In the second stage, eight in-depth interviews were conducted. Here, the aim was to explore how young consumers perceive SD actions as well as the potential associations that emerge from this perception. The sample used represents the number of respondents that were necessary to achieve a position in which each of the emergent categories and relationships was saturated (Glaser, 1978). This form of theoretical sampling ensures that the emergent theory is fully developed or is not lacking in density or precision (Strauss & Corbin, 1998). The sample was composed of male and female undergraduates, from eighteen to twenty-five years old, who voluntarily participated in the study without receiving any kind of financial compensation. All the interviews took place in a Paris business school. They lasted between thirty and forty-five minutes each and were audio-recorded and transcribed using word-processing software. Two researchers conducted the interviews, one of them directing the interview and the other taking notes and asking questions when necessary.

The interview guideline covered three main topics (see Appendix 2). The first topic examined how consumers perceive or interpret the SD concept. The second explored the perceived SD actions implemented by French food retailers. The third focused on specific retailers selected by the interviewee, and analyzed brand associations linked to the perceived SD actions and their impact on the relationship with this specific retailer. These selected retailers are the ones most associated with SD by the interviewee. For the data analysis, a classical content analysis was performed: sorting, categorizing and naming the main emerging themes. SD perception was categorized based on the three dimensions previously mentioned in the conceptual framework (ecologic/social/economic). Brand associations were separated into verbs, adjectives and nouns.

In the third stage, a face-to-face survey was conducted with 97 respondents. Participants were undergraduates from a Paris business school, eighteen to twenty-five years old. The procedure was as follows: first, respondents were given the list of associations linked to retailers that are carrying out SD actions as they emerged in the interviews (see Table 3); second, they were asked to pick out the three main ideas that, in their opinion, were the most relevant. The aim was to validate and grade the main brand associations that had appeared in the second stage of the research.

5. Main results

5.1 Evolving corporate values connected to SD

Table 1 presents a summary of the retailers' core values as they appeared at the time the research was conducted (See Appendix 1 for the full table). The values that are most closely related to the retailer's SD commitment are: responsibility (Carrefour), solidarity and equity (Casino), social utility (E. Leclerc), trust (Auchan and Les Mousquetaires) and respect (Cora). However, the words "social responsibility" or "sustainable development commitment" have not yet appeared as part of their message about their corporate values. Nevertheless, it is

important to highlight that retailers seem to be moving in this direction progressively (Lai, Cheng & Tang, 2010). Further longitudinal research could screen this trend in the retailing sector.

INSERT TABLE 1

5.2 Consumers' perceptions of the SD concept

The authors have found a misunderstanding of the SD concept. SD is mainly associated with ecology, environment, nature, pollution, and the use of energy and recycling. That is, the mental association that appears spontaneously is the ecological aspect of SD. The social and economic aspects appear only when an additional recall of information is requested (Loussaïef, 2007). The terms associated with the economic aspect do not refer to the profitability of SD but to overall development: *long-term development, third-world countries, continuous development and new technologies* (see Table 2).

There is, however, a general concern for the future of the planet as the following quotations from participants testify: "*think of tomorrow*" and "*make the effort to leave a better life to future generations*".

INSERT TABLE 2

5.3 Linking retailing and SD

The weaker accessibility of the social and economic aspects of SD in young people's minds could be explained by the fact that they still have problems in thinking about SD at a corporate level. For them, SD is more easily understood outside the business world. Although some sectors are more naturally associated with SD, such as industry and agriculture, the association is less clear for service sectors like retailing. One explanation is that the retailing-SD relationship is still weak.

Why should retailers be concerned about engaging in SD? As some participants stated: "*just to make more money*", but they also mentioned: "*I don't think they do anything about SD but it would be a worthwhile thing if they did it*".

In the French food retailing sector, the only SD-oriented action that interviewees recalled spontaneously was the elimination of plastic bags. When asked to think more deeply, they also mentioned other SD actions performed by retailers: *help small producers in developing countries, provide better working conditions, offer low prices, encourage recycling, care about family, and promote economies of energy, water and paper*. However, the identification of SD actions taken by retailers was not straightforward.

Even though some interviewees recognized that French food retailers make an effort to communicate about their SD engagement, they complained about the lack of visibility of these efforts. Furthermore, interviewees found it difficult to imagine other innovative SD projects that retailers could implement in the future, indicating a lack of knowledge of this topic. Another explanation could be that they do not easily make the retailing-SD link or that they do not feel a need to take a more active role in proposing SD actions to those companies. It is important to note that SD actions were considered in broad terms but not related to a specific programme. On the other hand, authors like Lai, Cheng and Tang (2010) have stated that retailers are more and more expected to embrace green practices for improving their value chain.

5.4 Impact of SD efforts on store image

Although young consumers did not seem to be fully aware of retailers' efforts concerning SD, when they were asked to describe retailers' engagement in SD, the associations emerged effortlessly. The first associations usually came in the form of descriptive adjectives rather than active verbs or nouns. These associations have a positive connotation, which implies reinforcement of brand-image.

However, SD was also associated with higher prices and therefore perceived, paradoxically, as jeopardizing low-income customers. Also, companies communicating about SD were perceived as caring about their brand image. Interviewees that manifested a lower concern for SD were less prone to suggest brand associations (positive or negative) than those that showed a higher concern for SD. Unexpectedly, trust did not appear to be related to SD. The authors premise was that SD in retailing could be associated to greater consumer trust toward the retailer; this link was not clearly established for young consumers. Nevertheless, other studies have found that corporate social responsibility could impact consumer trust (Swaen & Chumpitaz, 2008).

INSERT TABLE 3

5.5 The impact of SD initiatives on consumers' relationships with retailers

The effects of SD on consumers' relationships with retailers were identified through the three facets presented below:

• *The development of an affective bond between the consumer and the retailer*

Two views are noted. On the one hand, some consumers may feel an emotional connection with the company's perceived efficiency in its SD actions. This link is more or less strong and can range from simple sympathy for the retailer to a more complete identification. On the other hand, consumers may remain indifferent to SD efforts and argue that they feel no emotional connection with the retailer, only a functional one. For these consumers, "*a supermarket is just a supermarket*". Although this affective bond could be associated with various variables, the authors argue that one source of affective attachment could be related to the socially-conscious profile of the individual. A clear example of this attachment is given by "*La vie claire*", a French high-end retailer specialized in organic products and the identification that its "fan customers" have with the company. However, this retailer did not appear in our interviews. The students talked about organic products only in general terms.

• *The willingness to go, or to go more often to the retailer*

Consumer perceptions were moderated here by their sensitivity to the SD issue. For those not sensitive to SD efforts, there is no reason to go, or to go more often to retailers making SD efforts. For those who are more sensitive to SD actions, awareness of such actions becomes a motivation to do their shopping in these stores, whatever the constraints. However, willingness to go to SD-engaged retailers could also be limited by some practical constraints, in particular by geographic proximity, which remains a fundamental criterion for choosing a retailer.

• *The desire to recommend the retailer*

Two possibilities were observed: some consumers would be willing to encourage family and friends to go shopping in "SD retailers" while others would simply not do it, claiming that this is not relevant for a supermarket. One interpretation of these findings is to question how sensitive and "educated" the consumer is concerning this SD approach. Some participants declared that this sensitivity was encouraged mainly at home and not at school.

For others, this sensitivity comes from previous internships in which they worked for a retailer. However, most participants agreed that if they were more informed about SD actions, they would be more willing to recommend those companies. However, price remains a major issue, especially for students. The preference for a specific retailer is based firstly on price, secondly on geographic proximity and thirdly on "image".

5.6 Main brand associations linked with sustainable development

Table 4 presents a hierarchy of brand associations proposed by young consumers to describe retailers engaged in SD by ranking adjectives, verbs and nouns. "Proximity" and "Offer lower price" are excluded because they are not necessarily linked to SD actions. In this, it can be observed the variety of ideas most frequently associated with retailers perceived as engaged in SD. From the "Pleasant" to "Responsible", from "Human" to "Get close to customers", the consumers perceived retailers involved in SD in a largely positive way. However, some consumers (35 respondents out of 97) think that retailers' actions are not always driven by a philanthropic vision. Image improvement is also a reason why retailers choose to implement SD actions.

INSERT TABLE 4

6. Discussion

One of the main findings of this research is the hierarchy of brand associations brought about by SD actions. Store image is certainly affected by the influence of perceived SD actions. Analysing the associations that are mostly chosen by young consumers, authors explain this influence through five dimensions. On the one hand, there are four positive dimensions: Sympathy, Responsibility, Humanity, and Innovativeness. On the other hand, there is the Opportunistic dimension, which is related to the retailer's willingness to improve its image.

Figure 2 summarizes the five dimensions driving store image on the basis of SD actions.

INSERT FIGURE 2

Description of the five key dimensions explaining the influence of perceived SD actions:

Sympathy Dimension covers:

- Pleasant aspect
- Empathy

Responsibility Dimension is composed of these five facets:

- Responsible
- Citizen, socially aware
- Select SD-engaged suppliers

- Concerned
- Ambition for tomorrow

Human Dimension breaks down into:

- Non-discriminatory
- Care about family wellness
- Human

Innovative Dimension includes the three following aspects:

- Dynamic
- Innovative
- Different

Opportunistic Dimension is the one that involves a negative perception, i.e., seeking:

- Better image
- Profits

7. Limitations and future research

Among the limitations of this research, the authors may mention the qualitative and exploratory nature of the second stage, based on only eight interviews. However, one of the researchers had already conducted previous projects in this research area. Another limitation is that the research has not highlighted the potential effect of moderators such as consumer sensitivity to SD actions, the awareness of SD communication campaigns, the specific effects of the communication instrument used and the level of visibility of communication actions.

The specific nature of each type of French food retailer was not fully taken into account. Further research should test the proposed findings more deeply (qualitatively and quantitatively) by reference to a proposed theory, as well as the impact of possible moderators. It would also be relevant to explore the axes of SD differentiation that retailers should use in their communication strategies. Finally, it would be useful to apply these findings to a particular retailer, using its database of loyal clients and examine the impact of a specific programme on store image.

8. Conclusion

Retailers' corporate values should more directly reflect the CSR commitment of the corporation with respect to the expectations of all types of stakeholders. Although some retailers seem increasingly committed to implementing and promoting SD actions, they fail to establish a clear association between retailing and SD. One reason for this is a lack of an effective communication of their CSR programmes. Another reason is that the retailing-SD connection is not easily made in the minds of the consumers. For them, SD is more closely related to other sectors such as the production and use of power or agriculture.

If retailers want to be identified as socially responsible, they must create the "right" associations to reshape their new brand image. With this in mind, awareness of CSR efforts is an essential attribute in the systematic assessment of their brand image. By developing a social responsibility facet in their image-building programmes, retailers will better meet the expectations of an increasing number of socially-conscious consumers.

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Appendix 1: Corporate Values of Major French Food Retailers

Retailer Group	Food Retailer Brands	Corporate Values	Website
Carrefour	Carrefour Franprix Shopi Dia Ed Champion 8 à huit Ooshop (on line)	Freedom Responsibility Sharing Respect Integrity Solidarity Progress	Carrefour.com
Auchan	Auchan Les Halles d'Auchan Atac Simply Market Easymarché Fredy Eurobounta Auchandirect (on line)	Trust Sharing Progress	Groupe-auchan.com
E.Leclerc	E.Leclerc Système U	Independence Social utility	e-leclerc.com
Les Mousquetaires	Intermarché Ecomarché Netto	Engagement Trust Proximity	Mousquetaires.com
Cora	Cora Match Profi Houra.fr	Respect Honesty Cordiality Trust	Cora.fr
Casino	Géant Casino Super Casino Monoprix Monop' Inno Petit Casino Petit Casino 24h Vival Spar Leader Price	Quality Proximity & Adaptability Solidarity & Equity Dialogue Exchange & Listening	Groupe-casino.fr

Appendix 2: Interview Guideline**Topic 1: SD perception**

What does SD mean to you?

Could you please mention some other words to which you link SD?

If you need to transpose the SD concept to the corporate level, how would you translate/understand/define/describe it?

More precisely, could you give us some examples of actions that a company might undertake in order to subscribe to SD?

Topic 2: Retailer – SD link

Let's talk about retailers now. Do you think that there are retailers that are really committed to SD actions? Which retailers? What actions have they carried out?

If we now talk about the mass distribution of food (if the interviewee has not mentioned food retailers), do you think that there are some food retailers to which you could link SD actions?

Do you know these other food retailers? (Food retailers that have not been mentioned in the previous question). If yes, do you know whether they have implemented SD actions?

How did you hear about these SD actions by mass food retailers? (e.g., website, newspaper, TV, booklet, school, friends, family, etc.)

Topic 3: SD effect on consumers' brand associations and relationships

Is there a food retailer that you particularly think about when we discuss SD? Why?

If you take this food retailer, which nouns, verbs, or adjectives would you associate with it?

How have SD actions affected your relationship with the retailer?

Table 1. Corporate Values of the Main French Food Retailers

Retailer	Corporate Values
Carrefour	Freedom / Responsibility / Sharing / Respect / Integrity / Solidarity / Progress
Auchan	Trust / Sharing / Progress
E. Leclerc	Independence / Social Utility
Les Mousquetaires	Engagement / Trust / Proximity
Cora	Respect / Honesty/ Cordiality / Trust
Casino	Quality / Proximity & Adaptability / Solidarity & Equity / Dialogue / Exchange & Listening

Table 2. Perception of the Sustainable Development Concept

Ecologic	Social	Economic
Environmental protection	Equality of opportunity	Long-term development
Worldwide focus	Harmony	Third-world countries
Energy economy	Workforce diversity	Continuous development
Pollution reduction	Better working conditions	Fair commerce
Recycling	Human-factor oriented	Subcontracting
Energy companies	Equity among countries	New technologies
Water treatment	Sharing among generations	
Green political parties	Justice	
Planet, without frontiers	Respect for people	
New materials		
Waste sorting		
Biological products		

Table 3. Main Brand Associations mentioned to describe Retailers engaged in SD

Adjectives	Verbs	Nouns
Citizen, socially aware	Think about employees	Proximity
Responsible	Provide better working conditions	Affective proximity
Visionary	Select SD-engaged suppliers	Sympathy
Innovative	Care about family wellness	Protection
Non-discriminatory	Look at the future	Ambition for tomorrow
Different	Offer low prices	
Empathetic	Have social conscience	
Pleasant	Get close to consumers	
Human	Belong to the SD company's world	
Provident	Pay attention to others	
Concerned	Leave a better world	
Dynamic	Help others to be aware of SD	
Sharing	Look for a better image	
Building		
Protective		

Table 4. Hierarchy of Brand Associations mentioned to describe Retailers engaged in SD

Adjectives	n	Verbs	n	Nouns	n
Pleasant	49	Offer low prices	60	Proximity	59
Dynamic	44	Look for a better image	35	Sympathy	23
Innovative	38	Select SD-engaged suppliers	21	Ambition for tomorrow	21
Citizen, socially aware	30	Get close to consumers	21	Protection	12
Responsible	30	Care about family wellness	20	Affective proximity	9
Different	25	Look at the future	17		
Non-discriminatory	24	Think about employees	14		
Concerned	22	Provide better working conditions	10		
Protective	21	Leave a better world	10		
Human	20	Have social conscience	7		
Sharing	15	Help others to be aware of SD	6		
Building	14	Pay attention to others	5		
Visionary	12	Belong to the SD company's world	3		
Provident	8				
Empathetic	6				

n = number of observations; N= 97 respondents

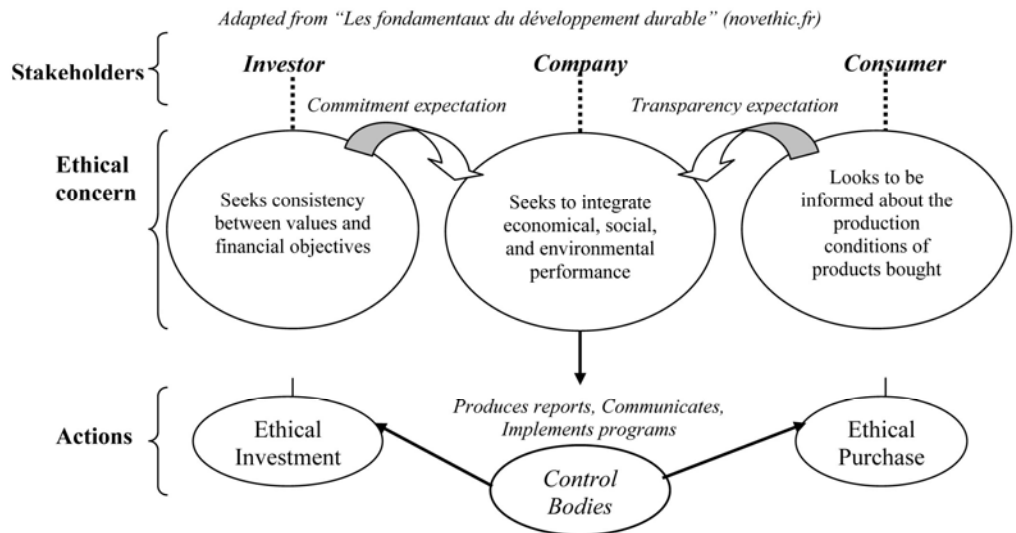


Figure 1. Sustainable Development & Stakeholders' Ethical Concerns

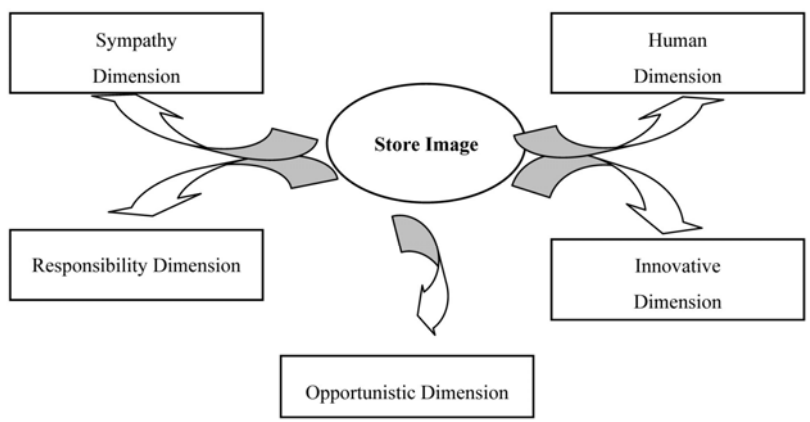


Figure 2. Impact of Sustainable development on key brand image dimensions

Energy Use in Agriculture Sector: Input-Output Analysis

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Abstract

Many sectors rely on energy as input to produce output. Even though the use of energy in agriculture sector is not as high as in other sectors, it is important to study the connectedness between the two sectors as there is no study done so far to show the linkages between them in Malaysia. Input-output analysis has been used to study the connectedness degree between the two sectors using input-output data for 1991-2000. The direct and total backward linkages analyses have shown that there is a significant increase in the use of energy in agriculture sector for the 1991-2000 period but the connectedness is still weak. Among the three energy-related sectors namely; crude oil, natural gas & coal, petrol & coal industries and electricity & gas, it was found that the agriculture sector depends more on inputs from petrol & coal industries as compared to the other two sectors. Based on these results, some policy implications have been proposed to help the decision-makers in economic planning especially on implementing policies related to energy and agriculture sectors.

Keywords: Input-Output, Linkages, Connectedness, Energy, Agriculture

1. Introduction

Malaysia has transformed itself since the 1970s from a producer of raw materials into an emerging multi-sector economy. For decades, the agriculture sector has been one of the economic pillars of the country, playing its role as a means for the development of remote and rural areas. It supplies food to the increasing population, reducing the dependence on import for food from abroad and at the same time become a source of national income through its exports, especially products produced from commodities such as oil palm and rubber. Most developing countries experience a declining contribution of agriculture sector to economic growth as they focusing on improving the performance of manufacturing and services sectors as the main contributors to economic development. However, since early 2008, in response to the global food crisis, especially for rice, securing adequate food supply has been one of the top agenda of these countries. Within 5 years, Malaysia's food import bill jumped by 80% from RM12billion in 2002 to RM23billion in 2007 (DOSM, 2007). The government has allocated RM5.6billion for the implementation of National Food Security Policy from 2008 to 2010. This allocation, among others, is to provide incentives to agriculture entrepreneurs to reduce production costs and encourage higher agriculture output (Malaysia's Budget 2009). Despite the fact that the contribution of agriculture sector to gross domestic product (GDP) is not as high as the contribution of services and manufacturing sectors, it is undeniable that agriculture sector play a very important role in economic development and sustaining the welfare of society. Figure 1 shows the contribution of each sector to GDP. The main contributor to GDP is services sector. It is followed by manufacturing, mining, agriculture and construction sectors. In terms of growth, it is found that the highest growth rate is for mining sector (8.7 percent), followed by manufacturing (8.39 percent) and services (7.19 percent) sectors. The least growth is for agriculture sector (2.66 percent) followed by construction sector (5.23 percent).

The government through its 3rd National Agriculture Policy (1998-2010) is putting efforts to maximize income through the optimal utilization of resources in agriculture sector. The specific objectives of the policy are to enhance food security; to increase productivity and competitiveness of the sector; to deepen interrelationship with other sectors; to create new sources of growth for the sector; and to conserve and utilize natural resources in a sustainable basis. In tandem with government objective through this policy, therefore, it is important to investigate the linkages between agriculture and energy sectors of this country. As all know, energy being the

capacity to do work is very important for all human activities, especially those concerning the production of goods and services. Furthermore, in addition to the limited supply of non-renewable sources of energy such as crude oil, natural gas and coal, the environmental impact from their usage have attracted the researchers to study the interrelationship between the two sectors in depth. The study on energy use patterns in Malaysia still needs more evidences and analysis. In the literature review, we found very few studies investigated the issues related to the use of energy. There is no study found to investigate the interrelationship between energy sector and agriculture sector.

2. Objectives of the Study

There are still very few studies on linkages between economic sectors in Malaysian economy. There is no single study has been done to investigate the linkages between energy and agriculture sectors in this country. It might not be of interest among researchers to discuss issues in agriculture sector as its contribution to economic growth is not as important as the contribution by services and manufacturing sectors. This study has taken an initiative to fill this gap and to take the responsibility to propose any policy implications that seems suitable for policy-makers to implement for the betterment of both agriculture and energy sectors based on the research findings.

The aim of this study is to provide an economic analysis of energy consumption in agriculture sector in Malaysia for the 1991-2000 period using input-output methods. So, the interdependency between agriculture and energy sectors will be analyzed. The direct and total backward linkages between the two sectors will be measured and analyzed. This analysis is important to perform necessary improvements in both sectors. It is expected that this study will help in determining a production system that involves sustainable use of energy in Malaysia's agriculture.

Based on the above-mentioned objectives, the hypotheses of this study could be formalized as follows:

There is a significant connectedness between agriculture and energy sector in Malaysia, on the one hand, and on the other hand, there is a significant change in the use of energy in agriculture sector in Malaysia.

3. Overview of Energy Sector

Malaysia is a significant Southeast Asian producer of crude oil and natural gas. Sustained economic growth has helped to make the country a growing energy consumer in its own right. From being an energy rich country a decade ago, Malaysia will gradually be joining other countries that have to rely on imports in order to meet domestic demand. Although blessed with crude oil resources, Malaysia is relatively a small producer at the international level. In fact, the oil and gas reserves are now depleting. In the case of natural gas, the production is declining at the rate of about 10 percent per annum (Ahmad, 2010). As of 1st January 2009, crude oil reserves were at 5.52 billion barrels and natural gas reserves stood at 87.9 trillion cubic feet and sufficient to last for 22 and 36 years respectively based on the current production level (Economic Report, 2009/2010). The growth rates for the production of crude oil, natural gas and electricity for the 1973-2006 period were 5.78, 17.28 and 9.51 percent respectively (See Figure 2).

Besides crude oil and natural gas, Malaysia also has some coal resources. However, due to remoteness and quality factors, only a small percentage of local coal is being mined while a sizeable amount is imported to meet the requirement for power generation (Ahmad, 2010). As of 31st December 2008, Malaysia's coal reserves were at 1938.4 million tonnes (Malaysian Energy Center, 2008). In addition, large hydro resources have also been developed over the years throughout the country but there remains some potential for future development. As for electricity, natural gas continued to remain the main fuel source for its generation followed by coal, hydropower, diesel and fuel oil. The calculated reserve margin for Peninsular Malaysia in 2008 was 43 percent and 13 percent for Sarawak with Sabah at 44 percent (Malaysian Energy Center, 2008).

On the demand side, in meeting increasing energy demand, Malaysia has been importing natural gas from the Malaysia-Thailand Joint Development Area (JDA) and West Natuna, Indonesia. Citing the fuel diversification policy, the country has also been increasing its import for coal so as to reduce its dependence on natural gas and to ensure a balance energy mix for power generation. For energy demand by sectors in 2008, the share in energy demand was highest for the industrial sector, followed by the transportation sector, residential & commercial sector, the non-energy sector and agriculture sector. Only non-energy use and residential & commercial sectors showed downward trends in energy demand (Malaysian Energy Center, 2008). Figure 3 shows energy demand by classification of sectors from the viewpoint of Malaysian Energy Centre. For the 1990-2008 period, the energy demand had been dominated by industrial and transportation sectors. Their growth rates were 6.96 percent and 6.54 percent respectively. Since 2007, the energy sector has expanded as expected following the execution of major projects under the 9th Malaysia Plan (Malaysian Energy Center, 2007).

Malaysia's energy consumption in agriculture sector has increased in recent years. Even though the usage in this sector is relatively small, it is still important to know the pattern of its energy usage in order to help for economic planning for both sectors (i.e agriculture and energy sectors). There are several reasons that might be resulted for increasing energy consumption in agriculture sector. Among the reasons are; the problem of labour shortage within the sector along with government policy to reduce the dependency on foreign labour and the limited availability of land for agricultural activities caused by rapid development for housing and industrial areas. Modernization of agriculture sector by the use of new technology in meeting the increasing demand on agriculture products has also led to increasing energy consumption.

Agriculture activities such as rubber, oil palm, coconut and tea plantations, livestock breeding and poultry, fishing and many others use input from energy sector to produce output. Input such as crude oil, natural gas, coal, petroleum products and electricity are crucial in the production of agriculture output. Table 1 shows that each agriculture activity absorbs an amount of each type of energy as input for its production. The highest amount of energy absorbed by each agriculture activity is from petrol & coal industries. Among all of the agriculture activities, fishing activity absorbs the highest amount of energy followed by forestry & logging and oil palm estates. In total, for the year of 2000, agriculture sector absorbs input from energy sector at the amount of near to RM2.5billion. Therefore, it is clear that there is a high connection between agriculture sector and energy sector. This study will investigate in detail on how strong is the connectedness between the two sectors using input-output methods.

4. Literature Review

Agriculture requires energy as an important input for production. Energy consumption by the agriculture sector can be broadly categorized into direct and indirect energy use. Agriculture uses energy directly as fuel or electricity to operate machinery and equipment, to heat or cool buildings and for lighting in the farm and indirectly in the fertilizers and chemicals produced off the farm (Uhlen, 1998). Energy's share in agriculture production varies widely by the kind of activities, production practices applied, geographic location of the production area and environmental conditions such as soil and climate factors (Esengun et al., 2007).

The agriculture sector, like other sectors, has become increasingly dependent on energy resources such as electricity, fuels, natural gas and coke. This increase in energy use and its associated increase in capital intensive technology can be partially attributed to low-energy prices in relation to the resource for which it was being substituted (Gowdy et al., 1987). Modernization of many operations in agriculture production increases its energy consumption. In order to sustain agriculture production, effective energy use is required, since it provide financial savings, preservation of fossil resources and reduction in air pollution (Pervanchon et al., 2002 and Pimentel, 1980). In addition, with the limited availability of suitable land for agriculture, the only chance for producers to increase total output will be using more input. The dependence of agriculture sector on energy sector to supply more food to increasing population and considering the limited natural resources, as well as the impact of using energy sources on environment and human health, it is substantial to investigate energy use patterns and energy efficiency in agriculture sector (Hatirli, Ozkan and Fert, 2005).

The analysis of linkages between sectors has a long history within the field of input-output analysis. The input-output analysis and the derivation of linkages indices were initially proposed by Leontief (1936). He considered the various economic sectors as a series of inputs of source materials (or services) and outputs of final or intermediate goods (or services). Rasmussen (1956) then developed the procedures for measuring inter-industry linkages using the inverse of Leontief input-output tables which takes into account both the direct and indirect effects of an increase in the output of an industry. Rasmussen's backward and forward linkages are known as power of dispersion index and sensitivity of dispersion index respectively. Chenery and Watanabe (1958) proposed using the column (or row) sums of the input coefficient matrix to calculate backward and forward linkages. However, this measure only captures direct effects and leaving out indirect impacts. Hirschman (1958) suggested that backward linkages effects are related to derived demand, while forward linkages effects are related to output utilization.

In the 1970s, the above-mentioned traditional measures were widely discussed. They have been improved and expanded in several ways, and many different methods have been proposed for the measurement of linkages coefficients (Hazari, 1970; Yotopoulos & Nugent, 1973; Laumas, 1976; Riedel, 1976; Jones, 1976; Schultz, 1977). More recently, linkages analysis methods have again attracted increasing attention from input-output analysts (Cella, 1984; Clements, 1990; Heimler, 1991; Sonis et al., 1995; Dietzenbacher & Linden, 1997). However, each has its own advantages and disadvantages.

The input-output modeling technique has been extensively used in decomposition analyses of sectoral energy consumption. This is mainly because an input-output table conveniently presents an exact quantitative

relationship between the energy sector and its users. Some recent studies in this regard include Mairet and Decellas (2009), Ray and Reddy (2007), Bhattacharyya and Ussanarassamee (2005), and Mukhopadhyay (2002). Energy input-output analysis is usually used to evaluate the efficiency and environmental impacts of production systems. Considerable studies have been conducted on energy use in agriculture using input-output analysis. For instance, studies done by Esengun et.al (2007); Karkacier & Goktolga (2005); Uhlin (1998), Singh et al. (1997) and Franzluebbbers & Fancis (1995). However, among all the studies available, there were very few using input-output tables as their sources of data. Instead, data were collected through survey questionnaires. The researchers of this study will only use data from input-output table which is more suitable for national economic planning as the data representing values aggregated at national level. The study on the interrelationship between the two sectors will be very useful to provide planners and policy-makers an opportunity to evaluate economic interactions between them.

5. Data and Methodology

5.1 Data

This study uses secondary data from Malaysia's Input-Output Tables for the year 1991 and 2000 which published by the Department of Statistics Malaysia (DOSM). Each table has been aggregated to 15 sectors. Among the 15 sectors there are 3 sectors which are related to energy; crude oil, natural gas & coal, petrol & coal industries, and electricity & gas. Since the researchers are concerned about energy use in agriculture sector, therefore, the 3 energy-related sectors are treated separately and there exists another important sector, namely agriculture. The detailed aggregation is shown in Table 2.

The researchers use Microsoft Excel for the calculation of \underline{A} coefficient matrix, $(\underline{I}-\underline{A})^{-1}$ inverse matrix and for the data analysis process. The period of study is 1991-2000 using the latest two input-output tables published by the Department of Statistics of Malaysia. The latest two tables i.e 1991 and 2000 are chosen for consistency of types of energy-related sectors available in these two tables. In other words, the earliest three tables published for 1978, 1983 and 1987 were ignored since there are inconsistencies in types of energy-related sectors. Data from input-output tables is not of the kind of time-series data. Normally, it is published for every 5 years consecutively. Therefore, the limitation of this study is the failure to investigate the changes in energy consumption using time-series data.

5.2 Methodology

Towards the achievement of research objectives, this research will employ method based on Leontief's input-output framework (e.g. Leontief, 1966; Miller & Blair, 1985) where the structure of an economy is analyzed in terms of connectedness between production sectors. Generally the input-output model which describes the transactions among economic sectors are described through the use of a system of linear equations, which represent for each sector the identity between the total output produced and the output purchased and consumed by all the other sectors of the system. In other words, everything produced by a sector is purchased and consumed respectively by the other ones as inputs or by the consumer as final demand. In matrix notation this system of linear equations is;

$$\underline{x} = (\underline{I} - \underline{A})^{-1} \underline{f} \quad (1)$$

Here \underline{x} is a column vector of output of order n ; \underline{f} is a column vector of final demand of order n ; \underline{I} represents an identity matrix and \underline{A} is the coefficient matrix. $(\underline{I}-\underline{A})^{-1}$ is known as 'Leontief inverse' matrix. This equation is the solution equation of the input-output analysis.

A study on connectedness between production sectors allows us to identify the most important sectors in an economy. This study will only focus on direct and total backward linkages which allow one to find the dependence of one industry on other industries in terms of the supply of inputs. In other words, it measures the extent to which an industry utilizes the outputs of other industries as input for its production process. In an input-output framework, purchases of industry B from industry A are recorded as B's backward linkages. One possible measure of backward connectedness is known as direct backward linkages which uses the column sum of technical coefficient matrix, \underline{A} , as proposed by Chenery (1958). Each value of the \underline{A} matrix is obtained by dividing each entry in the transaction table by its column total i.e the total input coefficient of the respective sector. In other words, the column sum of \underline{A} matrix will be used to measure the backward linkages. The direct backward linkages, U_j , can be calculated by:

$$U_j = \sum_{i=1}^n a_{ij} \quad (2)$$

The above method measures the first round effects generated by the connectedness between sectors since it is based on direct input coefficients, \underline{A} . Therefore, these indicators are called direct backward linkages indicators.

Unfortunately, the measurement on direct backward linkages ignores the indirect stimuli given to the economy if investment takes place. This measure has three deficiencies (Jones, 1976); double counting of causal linkages, neglect of indirect impacts and failure to distinguish the domestic effect from those operating on foreign economies. Therefore, this study will also measure both the direct and indirect linkages i.e total backward linkages using $(I-A)^{-1}$ matrix i.e the input inverse and find the sum of each column elements (Yotopoulos and Nugent, 1976). The formula which is used to calculate the total backward index can be written as follows:

$$l_j = i'(I-A)^{-1} \quad (3)$$

l_j is the sum of the elements in column j of the $(I-A)^{-1}$ matrix. Now, each element in column j measures the direct and indirect impact of the inverse of one unit in the final demand for industry j on each of the n industries. It must be noted that Equation (3) would be used also as a multiplier (Bekhet, 2009).

6. Results Analysis

Table 3 shows the direct and total backward linkages for Malaysian economic sectors for the year 1991-2000. For direct backward linkages, it is found that light manufacturing and petrol & coal industries are the most important sectors in the economy in terms of their connectedness with other industries for the period of 1991-2000. With regard to agriculture sector, its performance was at rank number 14 in 1991 but has jumped to rank number 10 in 2000. The value of 0.265 for agriculture sector in year 2000 means 26.5 percent inputs from intermediate demand has been used for the production of agriculture output. That is for each RM1 output produced by agriculture sector, it purchases 0.265 cents as inputs from intermediate demand in the economy such as inputs from petrol & coal industries, electricity & gas, water, and inputs produced by its own sector. There is a significant change in the direct backward linkages value for agriculture sector for 1991-2000 period which has increased from 20.4 percent to 26.5 percent.

Also, the results on total backward linkages for Malaysian economy indicate that the communication sector shows the highest total backward linkages (2.062) followed by petrol & coal industries (2.012) and light manufacturing sector (1.509). After 10 years i.e in 2000, the results have changed which had shown the light manufacturing at the first ranking (1.962) followed by hotel & restaurants sector (1.715) and buildings & constructions (1.616). For agriculture sector, its ranking has improved from number 14 (1.336) in 1991 to number 8 (1.406) in 2000. This results show that the connectedness of agriculture sector with other sectors has become stronger after the 10 years duration.

Table 4 shows the direct backward and total backward linkages between agriculture and energy-related sectors namely crude oil, natural gas & coal, petrol & coal industries and electricity & gas. In terms of direct backward linkages, it is shown that, among the three energy-related sectors, agriculture sector was relying more on petrol & coal industries output as its input compared to the other two energy-related sectors. The value of total energy use in agriculture sector was significantly increased by 440 percent in 2000 where it only used 1 percent of energy as input in 1991 and has jumped to 5.4 percent in 2000. For total backward linkages, petrol & coal industries remain at the first ranking for both the 1991 and 2000 as the main input of energy for agriculture sector. However, the ranks for crude oil, natural gas & coal and electricity & gas have interchanged between one another as the second and third rank in terms of supplying inputs to agriculture sector.

Finally, it can be concluded that within 10 years duration, agriculture sector connectedness with other sectors in the economy has become stronger. Its dependence on overall sectors in the economy to supply inputs for its production has increased. However, from the perspective of input-output analysis, the connectedness is still weak as all the values are below 0.5. Furthermore, there is a significant increase in the use of energy inputs by agriculture sector in terms of both direct and total backward linkages. Among the three energy-related sectors, it relies more on inputs from petrol & coal industries. However, again, from the input-output analysis point of view, the connectedness between agriculture and each of energy-related sectors is still weak. Thus, from the above results, the two hypotheses stated earlier can be accepted. Also, we can conclude that there is a significant connectedness between agriculture and energy sector and there is a significant change in the use of energy in agriculture sector.

7. Policy Implications

As shown by the above results, the linkages between agriculture and energy sectors have become stronger especially agriculture linkages with petrol and coal industries. As referred to the input-output table of Malaysia for the year 2000, the agriculture subsector which absorbed the highest amount of petrol & coal products was fisheries sector followed by forestry & logging and oil palm estates. Malaysia government has been implementing fuel subsidy system since 2002 and has been restructuring the system for several times to ensure the subsidy to reach the target group and preventing irresponsible parties from abusing the subsidy through

smuggling of the commodity i.e fuel. Selecting those involved in fisheries sector as among the recipients of the subsidy is the right decision made by Malaysia government. However, the problem of fuel i.e petrol and diesel smuggling into neighboring countries especially Thailand and the problem of abusing the subsidy system are still rampant. Therefore, the government should take appropriate steps to curb these problems seriously.

The result had shown that the values of direct backward linkages between agriculture sector and electricity & gas sector between 1991 and 2000 are the same. It means the linkages between the two are stagnant after 10 years duration. This paper recommends that the use of electricity and gas as inputs in agriculture sector should be increased wherever possible as their costs are cheaper compared to petrol products and this will result in increasing profits in that sector. This will indirectly benefit those low and middle income families by earning higher income compared to their earnings when using petrol products as inputs for agriculture production activities.

8. Conclusion and recommendation

This study has explored the direct and total backward linkages between all sectors in Malaysian economy and later emphasis the linkages between agriculture and energy sectors. Furthermore, it can be indicated that there is a connectedness between agriculture and energy sector in the Malaysian economy. It is also found that there is an increase in the connectedness between the two sectors for the 1991-2000 period. If we are comparing between the three energy-related sectors namely; crude petrol, natural gas & coal, petrol & coal industries and electricity & gas, the results show that agriculture sector depends more on petrol & coal industries products as inputs for its production process. For more evidence of the policy implication, we recommended that it might be suitable to be taken into consideration by policymakers to further enhance the linkages between sectors in Malaysia especially between agriculture and energy sectors by using multipliers indicators.

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Table 1. Absorption of Domestic Energy Production by Agriculture Activities at Basic Values, 2000 (RM '000)

	Agriculture other	Rubber planting	Oil Palm Estates	Coconut	Tea estates	Livestock breeding etc.	Forestry & logging	Fishing	Total
Crude oil, Natural gas & Coal	1,494	264	4,769	17	5	3,612	5,184	1,015	16,360
Petrol & Coal industries	66,740	3,120	483,994	42	482	60,895	784,507	939,544	2,339,324
Electricity & Gas	3,520	3,624	22,701	183	263	22,813	1,217	44,542	98,863
Total	71,754	7,008	511,464	242	750	87,320	790,908	985,101	2,454,547

Source: DOSM (2005), Input-Output Table for 2000, Malaysia.

Table 2. Aggregation of Sectors

Sector	Input-Output Tables
	1991-2000
1. Agriculture	1-8
2. Crude oil, natural gas & coal	9
3. Other mining & quarrying	10,11
4. Light manufacturing	12-36
5. Heavy manufacturing	37-41, 43-65
6. Petroleum & coal products	42
7. Electricity & gas	66
8. Water	67
9. Buildings & constructions	68
10. Wholesales & retail trade	69
11. Hotel & restaurant	70
12. Transport	71
13. Communication	72
14. Banks, finance, insurance, real estate & business services	73-78
15. Other services	79-94

Table 3. Direct Backward and Total Backward Linkages

Sector	Direct Backward Linkages (<i>Uj</i>)				Total Backward Linkages (<i>Ij</i>)			
	1991		2000		1991		2000	
	Value	Rank	Value	Rank	Value	Rank	Value	Rank
1. Agriculture	0.204	14	0.265	10	1.336	14	1.406	8
2. Crude oil, natural gas & coal	0.093	15	0.066	15	1.145	15	1.09	15
3. Other mining & quarrying	0.305	10	0.307	7	1.494	11	1.445	7
4. Light Manufacturing	0.583	2	0.587	1	1.941	3	1.962	1
5. Heavy Manufacturing	0.336	7	0.266	9	1.509	9	1.368	10
6. Petrol & coal industries	0.814	1	0.505	2	2.012	2	1.605	4
7. Electricity & Gas	0.305	9	0.270	8	1.544	7	1.382	9
8. Water	0.327	8	0.421	5	1.505	10	1.598	5
9. Buildings & constructions	0.413	5	0.440	4	1.653	5	1.616	3
10. Wholes. & retail trade	0.288	12	0.158	14	1.486	12	1.233	14
11. Hotel & restaurant	0.510	4	0.444	3	1.834	4	1.715	2
12. Transport	0.358	6	0.390	6	1.588	6	1.589	6
13. Communication	0.542	3	0.206	12	2.062	1	1.281	12
14. Banks, Fin., Insurance, R.Estate, Bus.services	0.286	13	0.183	13	1.515	8	1.249	13
15. Other Services	0.294	11	0.245	11	1.483	13	1.354	11

Source: DOSM, Input-Output Table for 1991 & 2000, Malaysia.

Table 4. Direct and Total Backward Linkages between Agriculture and Energy-Related Sectors

Sector	Direct Backward Linkages (<i>Uj</i>)				Total Backward Linkages(<i>Ij</i>)			
	1991		2000		1991		2000	
	Value	Rank	Value	Rank	Value	Rank	Value	Rank
Crude oil, natural gas & coal	0.000	3	0.000	3	0.008	2	0.024	2
Petrol & coal industries	0.008	1	0.051	1	0.011	1	0.064	1
Electricity & Gas	0.002	2	0.002	2	0.005	3	0.007	3
Total	0.010		0.054		0.025		0.095	

Source: DOSM, Input-Output Table for 1991 & 2000, Malaysia

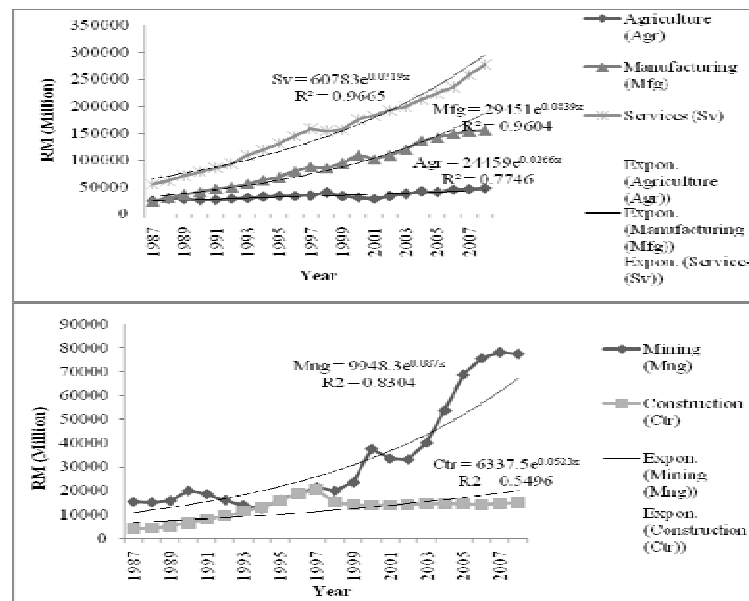


Figure 1. GDP by Sector (RM Million) Constant at 2000 Price

Source: DOSM, Annual National Account, Gross Domestic Product, 1987-2004 & 2000-2008

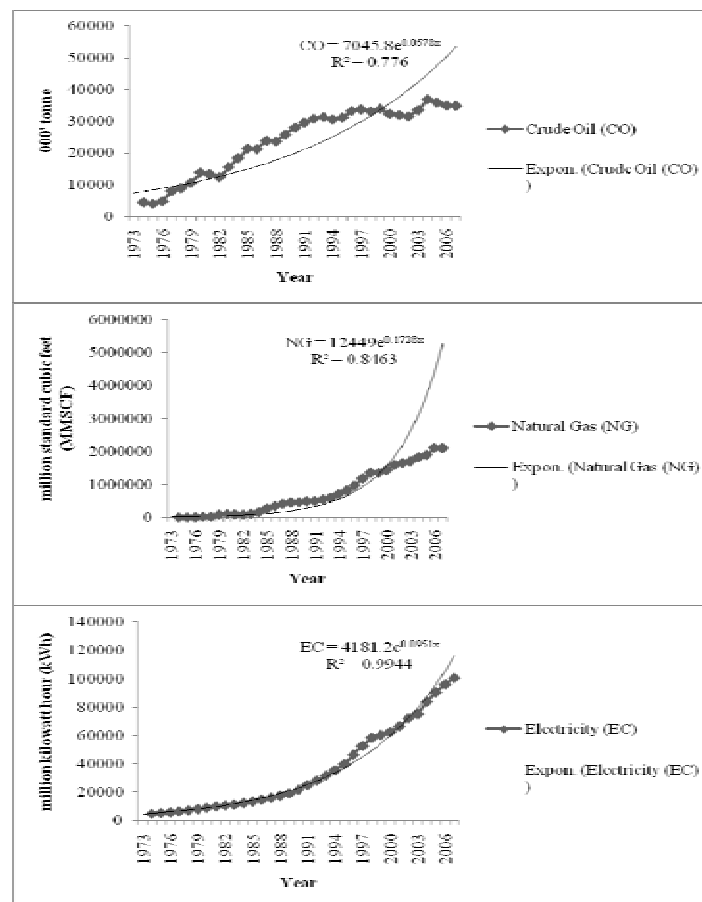


Figure 2. Crude Oil Production, Natural Gas Net Production, Electricity Generation

Source: DOSM (2007), Malaysia Economic Statistics – Time Series

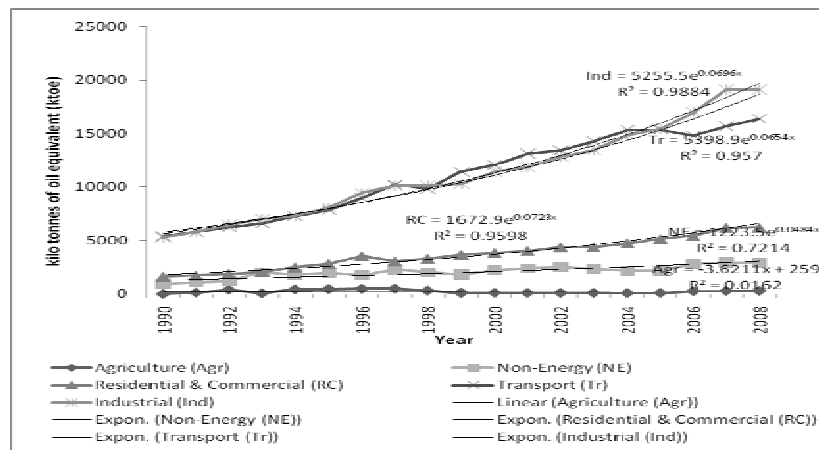


Figure 3. Energy Demand by Sector

Source: NEB (2008), Malaysia Energy Centre.

Study on Transferring Price Problem of Multinational Corporations

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Abstract

With the development of global economic integration trend, multinational corporations have already become the main body of economic activity in the world today, and the transferring price of the multinational corporations have already become the most attractive business secret weapon in the multinational corporations operating. At first, the paper discusses the definition, species and roles of the multinational corporations then analyses the motivation of the multinational corporations using transferring price. At last, the paper proposes the suggestions to consummate management mechanism of transferring price, based on analyzing the harm for the multinational corporations to misuse the transferring price.

Keywords: Multinational corporations, Transferring price, Problem

The 21st century is the century of economic globalization. With the development of the economic globalization, the marketing activities of many international enterprises change from the traditional form of import and export trade to the new form of cooperation, joint ventures and franchising and so on. The multinational corporations have developed rapidly since 1970. A number of powerful international corporations have set up subsidiaries or branches overseas. The parent company allocates all kinds of resources all over the world in order to use the resources effectively and improve the overall benefits. Because the parent company and its subsidiaries are all economic entities with dependent accounting at different levels, the corresponding price should be made to the goods and services transferred during the course of the transaction in order to reasonably determine the operation performance of each branch. Therefore, the transferring price in the international market appears. Multinational corporations have great advantages in the aspect of the trade and investment, and their business activities are all over the world, therefore, they become a key driver of economic globalization. As international market competition intensifies, transferring price of multinational corporations has an increasingly important role. Therefore, study on the transferring price problem of multinational corporations becomes an important task.

1. Introduction to the transferring price problem of multinational corporations

The transferring price of multinational corporations is the internal price that multinational corporations use to settle the transfer of the goods and intangible assets or services provision between the parent company and subsidiaries, or only between subsidiaries when the multinational corporations make its overall business strategy in order to achieve maximum profits. The transferring price is not affected by the market rules of support and demand. It is not decided by the independent competition principle in the open market, but decided by the top decision-makers in the corporation according to the global strategy objective and the aim to achieve the maximum profits.

The transferring price of multinational corporations can be divided into three kinds: (1) Capital circulation transferring price, which means that in the internal trade, multinational corporations improve the goods price imported from a parent or other subsidiaries in order to make the profit exported by the form of loan payment, then affect the cost of the related company and the profit level by the level of interest rates of borrowing funds. (2) Tangible assets transferring price, which means the allocation price of rental and transfer of tangible assets such as machines and equipments in the multinational corporations. (3) Intangible assets transferring price, which refers to the price that multinational corporations provide intangible assets such as management, technology and consulting service.

Transferring price provides a lawful and effective means for the multinational corporations to overcome trade barriers, reduce the tax burden, reduce transaction risk and improve economic efficiency; and make the multinational corporations achieve a competitive advantage in the market. Therefore, transferring price strategy is the favorable leverage for the multinational corporations to realize the centralized control, unified deployment of human, finance and material all over the world, and also the necessary tool to realize their global strategy.

2. The motive of multinational corporations to use transferring price strategy

The multinational corporations may achieve a lot of advantages and benefits by implementing the transferring price strategy, which is the motive of multinational corporations to use transferring price strategy. The motive can be divided into the following three kinds.

2.1 Evading tax

The multinational corporations often artificially raise or lower transaction price and transfer the profit from the

countries with higher tax rates to the countries with lower tax rates so that they can minimize corporate income tax burden by the use of national differences in tax rates, preference of free port, and other relevant laws and regulations about regional customs union. In addition, the multinational corporations still often use lower transaction price between internal enterprises to reduce the base of paying customs, or use regional customs union or the relevant preferential provision in the agreement to evade custom.

2.2 Dodging risk

The multinational corporations may face a number of risks in the course of operation, and they often use the transferring price to dodge risk. The first risk is the risk of exchange rate movements. In recent years, the foreign exchange market in the world is volatile, and currency parity in various countries fluctuate very largely and frequently, which makes international enterprises with companies all over the world exposed in the large foreign exchange risk. The multinational corporations not only face the risk of trade transactions, but also face the risk of foreign currency translation of assets. Multinational corporations usually take the opportunity to select the appropriate exchange rate to pay, and use the transferring price to enhance the effectiveness of this approach, so that the risk can be further reduced. Next, When the coup of a host country occurs and it affects the interests of multinational corporations, the multinational corporations may transfer the material and equipment confiscated by the local government to subsidiaries or affiliates at low prices, or acquire goods of other subsidiaries at high prices, which may realize the aim of transferring plenty of funds outside the host country and reduce the impact of political risk on multinational corporations. At last, when facing that some governments in host countries implement the policies of market price control in order to limit and manage the operations of multinational corporations in the local, multinational corporations often use transferring price as a counter measure to avoid the price limit.

2.3 Adjusting the flow of internal funds to gain competitive advantages

In order to improve the competitiveness of overseas subsidiaries, the multinational corporations often provide extremely low transferring price in granting their subsidiaries raw materials, components or finished products and so on, so that their subsidiaries can have a price advantage, improve the business reputation, and increase the market competitiveness in the host country in order to beat some opponents and expand the international status of the corporation. In addition, in order to avoid excessive profits to the investors in the host countries or acquisition of local shareholders, or the demand requested by the government in the host country and even the risk of retaliatory behavior, the multinational corporations can also depress the profitability of their subsidiaries, then they can buy goods from the subsidiaries with lower price or sell goods to the subsidiaries with higher price.

3. The hazard analysis to the abuse of multinational corporation transferring price

Through transferring price, multinational corporations control the subsidiaries all over the world, make the subsidiaries obey their global strategic objectives and ensure themselves to maximize the profits. However, when multinational corporations abuse transferring price to achieve their purpose, their actions would also bring about adverse effects to the economic development of the host countries. The adverse effects have the following main aspects.

3.1 Contrary to the principle of tax fairness, serious damage to the tax revenue interests of the host countries

Multinational corporations misuse transferring price to obtain extra illegal income, which is contrary to the principle of tax fairness, disrupts the fair and orderly running order of international economy, and not conducive to normal development of international trade and investment. In addition, multinational corporations use the 'high-low price' transferring price to transfer the profits of the subsidiaries outside the host countries, which will make the taxable income of multinational corporations in the host countries greatly reduced, and seriously damage the tax revenue interests of the host countries.

3.2 Deterioration of the international income and payments in the host countries

The 'high-low price' transferring price of the multinational corporations sharply deteriorates the international income and payments in the host countries. On the one hand, the use of transferring price can increase the overall profit of foreign businessmen thereby drive the foreign businessmen to import goods that can produce domestically, which will cause the host country to increase imported goods. On the other hand, when multinational corporations purchase the same number of produces, services, technology and so on from or sell the same number of products to the related companies abroad, the 'high-low price' of transferring price will cause the host countries to increase imported goods and intangible expenses, and to decrease exported goods, which will deteriorate the international income and payments in the host countries.

3.3 Undermining the market environment with fair competition

Sometimes in order to capture the market and suppress competitors, multinational corporations formulate lower

internal transferring price so that subsidiaries can sell products with a price that is less than a normal price and is even a production cost. Apparently, this action does not do harm to consumers and benefits consumers instead. However, in fact this action is the one that can seriously jeopardize market competition, bring about substantively harm or threat to similar enterprises, and obstruct or threaten the survival and development of competitors.

3.4 Damaging the image of the host countries when they absorb foreign investment

Through the 'high-low price' transferring price strategy, the multinational corporations transfer the profit from the host countries and make the book appear low profit or even loss, which creates a false impression that investment in the host countries is profitless. This false impression can affect the enthusiasm of foreign tradesmen who are willing to invest in the host countries, which not only does harm to the reputation of investment environment in the host countries all over the world, but also is harmful to import more foreign funds and advanced technology.

3.5 Dumping in disguise in the host countries market, and doing harm to the related industries in the host countries

When the enterprises avoid tax by the transferring price, they can obtain some unfair competitive advantages because their real tax is lower than normal tax level. Therefore, those honest and law-abiding taxpayers have fallen into a vulnerable competitive position. Some subsidiaries that the multinational corporations invest in the host countries use the transferring price strategy to import a lot of goods from the foreign production base of the parent corporations with the price that is lower than the cost. Then the multinational corporations dump those goods in the market of the host countries, which makes an impact for the similar characteristics enterprises in the host countries. Nowadays, many countries have already made the relevant anti-dumping laws or regulations in order to collect anti-dumping tax for the dumping goods with low prices.

3.6 affecting the macro-control in the host countries

The fiscal policy is an important means for the country to make the macroeconomic control, and the tax system is one important part in it. On the one hand, we can adjust the resources allocation among different industrial sectors by the tax system, and guide resources to flow to the industries that the states encourage. For example, the high-tech industries that the states encourage should use a lower tax rate. On the other hand, tax revenue is an important source for the fiscal revenue of one country and it can also adjust the process of revenue allocation. The multinational corporations use the transferring price to transfer the profit, avoid tax, make the real tax rate lower than the normal tax rate, or even regularly the same with the tax rate used by the industry that the state encourages. Therefore, the actions above reduce the enthusiasm for the resources to flow to the industry encouraged by the state, and make the industry structure adjustment not reach the expected effect. Revenue allocation refers to the allocation between the individual and group, domestic and foreign investment. Obviously, the tax evasion of the multinational corporations makes the revenue flow more to the foreign investment, and also increases the gap of revenue allocation.

4. Suggestions to consummate management mechanism of transferring price

According to the harm above, the author proposes the following suggestions.

4.1 Correctly understanding the necessity of the transferring price management

It is traditionally considered that control of transferring price may affect the use of foreign capital. However, from the international practice point of view, tax benefits and even tax avoidance through the transferring price is not the only incentive motivation for foreign tradesmen to do multinational investment. The most important factor to attract multinational investment in the host countries is whether there is an extremely superior investment environment in the host countries. If the transferring price legislation consists of the principles that are recognized all over the world just like normal trade principles and these principles have been implemented unifiedly and effectively, then we can make a conclusion that stable and clear legal system consists of a good investment environment in order to attract multinational investment, especially to attract high-tech investment.

4.2 Improving the tax legislation and strengthening tax intelligence work

One main purpose of multinational companies using the internal transferring price is tax avoidance. Therefore, the fundamental method of reducing the abuse of transferring price to avoid tax is to improve the tax legislation. At present, the United States is doing the best in this area. Therefore, other countries can partly learn from the successful experience of the United States. The current practice of the United States is to make a change to the transferring price from adjustment after the transaction to recognition before the transaction. The reason for this change is that adjustment after the transaction has much disadvantage such as large difficulties in practice that may cause controversy between tax side and tax payment side, a long time to deal with, consuming large

amounts of manpower and resources and so on. The main method to recognize before the transaction is the advanced pricing method, which means that before the transaction happens, taxpayers inform the tax authorities in relevant countries about the internal transferring price of the related parties and valuation calculation method, and make it as the tax price after confirmed by the tax authorities. Recognition before the transaction overcomes the disadvantages of adjustment after the transaction. Therefore, recognition before the transaction should be the main method to deal with transferring price.

At the same time, we should strengthen tax intelligence work and set up data information network. The host countries should establish an authoritative price information agency. Relevant departments should coordinate with each other, exchange information from each other, and set up perfect price information feedback mechanism which can provide the relevant domestic and foreign price information for national tax authorities and assist the smooth progress of the work of anti-avoidance.

4.3 Constructing high-quality tax team and ensuring effective enforcement of legislation

The first one is to set up special agencies to inspect transferring price, and design the work process of inspecting transferring price. This will help inspect the professionalization and scientification of the procedure. The second one is to review the work with international tax experts and professional assets appraisers. New employees should be strictly selected, required to attend training for a certain period, and be employed after passing the examination. When we have difficulties in evaluating the value of intangible assets and advanced technology, we can hire the professional advisory agency to complete. The third one is to train the employees regularly in order to improve the overall quality of reviewers and establish a high level foreign tax team that are familiar with tax law, international trade and multinational enterprises, and have ability to verify the transferring price.

4.4 Strengthening international cooperation, and controlling transferring price together

It is an international problem to restrict multinational corporations to use internal transferring price. It is very difficult to prevent the transferring price of multinational corporations thoroughly when we only depend on the law control of one country. Regularizing the multinational corporations as a whole can not be done by only one country, and need the international society regularize and coordinate the activities of the overall multinational corporations. Therefore, the transferring price can be effectively controlled only when countries strengthen the international corporation and take joint action. In addition, it is also an effective way to strengthen information collection work in the international market, set up intelligence information system, exchange intelligence in the international countries and assist mutually, which means that we can exchange the materials about the transferring price of the multinational corporations and assist the opposite side survey, audit and comprehensively review the situation about the multinational corporations in order to provide accurate and timely information materials for resisting the transferring price of multinational corporations.

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Information Content of Dividends: Evidence from Istanbul Stock Exchange

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Abstract

This study investigates the market reaction to dividend change announcements at the Istanbul Stock Exchange. A sample of 184 announcements made by 46 companies during the period 2005 to 2008 is analyzed by using the event study methodology. The results suggest that the market reacts positively to dividend increases, negatively to dividend decreases and does not react when dividends are not changed, consistent with the signaling hypothesis. Also, the results show pre-event information leakage for the decreasing dividends sample.

Keywords: Dividends, Information Content, Signaling Hypothesis, Event Study, Istanbul Stock Exchange

1. Introduction

A great deal of work has been done in the areas of market reaction to dividend announcements and “the information content of dividends hypothesis”, which states that dividends convey to the market participants information about future cash flows of a company. However, previous empirical studies of dividend signaling and information contents of dividends produced mixed results. Hence, a greater understanding of the issue is warranted.

This study contributes to the existing literature by testing the information content of dividends hypothesis for an emerging market, namely the Istanbul Stock Exchange (ISE). ISE has been founded in 1986 and played an important role in the financial development in Turkey. This study covers the period 2005 to 2008, and investigates 184 dividend announcements made by 46 selected companies. Specifically, the impact of positive, negative or constant dividend announcements on stock prices is investigated.

The remainder of the article is organized as follows. Section 2 presents the review of literature. The data and research methodology are described in section 3. Section 4 discusses the empirical results. Finally, section 5 summarizes the main findings of the study and concludes.

2. Literature Review

In a world where relevant information about the firm’s future prospects is rare and costly, dividends are considered an important source of information for investors. The information content of dividends theory indicates that managers use dividend announcements to signal their beliefs about the prospects of the firm. Since managers spend most of their time analyzing the firm’s operations, strategies and investment opportunities, they have better and timelier information about the firm’s performance. Therefore, an announcement of an increase in the dividend rate reflects the management’s view that the firm’s future earnings and cash flows are expected to rise. An increase in dividends conveys good information about a firm because it proves that a firm is able to generate cash. Similarly if a company announces a decrease in dividend, the investors would perceive it as a negative signal regarding the current and future performance. The information content of dividends is also called signaling effect of dividends.

Lintner was the first researcher to employ the term “information content of dividends”. In his study in 1956, he suggested that the managers only increase dividends when they believe that earnings of the firm have permanently increased.

Later in 1961, Miller and Modigliani also discussed the information content of dividends. According to their discussion of dividend policy under uncertainty, in the real world, a dividend rate change is often followed by a

change in the stock price change. But they argue that such a phenomenon would not be incompatible with their irrelevance proposition to the extent that it was merely a reflection of what might be called the “informational content” of dividends. They explained the information content of dividends as follows. If a firm has a generally appreciated “target payout ratio” and a stable dividend policy, investors are likely to interpret a change in the dividend rate as a change in management’s beliefs of future profit prospects for the firm.

One of the first empirical studies about the signaling effect of dividends was published in 1969 by Fama, Fisher, Jensen and Roll. In their paper, they examined whether and how common stock prices adjust to the information involved in a stock split. They hypothesized that stock splits might be interpreted as a message about dividend increases. The fact that the cumulative average residuals for both dividend classes (increasing and decreasing) rise sharply in the few months before the split, is consistent with the hypothesis that the market recognizes that splits are usually associated with higher dividend payments. Their result also supports that the stock market is “efficient” in the sense that stock prices adjust very rapidly to new information.

In another paper, Pettit (1972) attempted to offer further evidence about the validity of the efficient market hypothesis by estimating the speed and accuracy with which market prices react to announcements of changes in dividends. His results support the argument that market participants make considerable use of the information implicit in announcements of changes in dividend payments. He indicated that the market reacts very quickly to the announcements when dividends are reduced or increased substantially but the effect of a moderate increase or decrease is relatively less. He also mentioned that with few exceptions, largest single effect occurs in the announcement month and the market is reasonably efficient on both a monthly and daily basis. He concluded that the announcement of dividend changes convey significant information.

Number of empirical studies followed the work of Pettit (1972). In one of them, Watts (1973) examined the hypothesis that dividends contain information about the future earnings of the company and that knowledge of past and current dividends enables a good prediction about future earnings. He concluded that the potential information in dividends is very small. He concluded that the information in dividends could only be trivial.

In another study, Charest (1978) aimed to assess market efficiency with respect to dividend information and to document risk and return behavior of stocks around dividend changes by using monthly price data and quarterly dividend information. He found significant abnormal returns in months following the announcements of dividend changes. His investigations with daily data also supported his monthly results. But he concluded that daily evidence does not necessarily reveal the presence of information in dividend announcements since he made no effort to remove the effect of contemporaneous earning announcements.

Bhattacharya (1979) assumed that outside investors have imperfect information about a firm’s profitability and that cash dividends are taxed at a higher rate than capital gains. His findings showed that despite the tax disadvantage of paying dividends, firms might pay dividends because dividends function as a signal of expected cash flows.

Aharony and Swary (1980) aimed to verify whether quarterly dividend changes convey information beyond that already provided by the earnings number. Their findings indicated that stockholders of firms which did not change their dividends earned normal returns during the event period. The abnormal returns were not significantly different from zero. In the case of dividend increases, stockholders earned positive abnormal returns, and most of the statistically significant abnormal returns occurred during days -1 and 0. In case of dividend decreases, stockholders had negative abnormal returns during the twenty days surrounding announcement dates, and similar to the case of dividend increases, most of the significant abnormal returns occurred during days -1 and 0. They concluded that changes in quarterly cash dividends do provide information about changes in management’s assessment of firm’s future performance, so they supported the information content of dividend hypothesis.

In another study, Asquith and Mullins (1983) investigated the impact of dividends on stockholders’ wealth by analyzing 168 firms that paid no dividends either during their corporate histories or for at least the last ten years. They used daily data, and estimated abnormal returns for each firm around the announcement dates. Then they calculated the average excess returns and average cumulative excess returns. They also calculated the 2-day average excess return for each dividend announcement they examined, so as to capture the entire impact of a dividend announcement. Their results for the two-day announcement period indicated significant and large positive excess returns. Their results are several times larger than Charest’s (1978) and Aharony and Swary’s (1980) results.

In another empirical research, Kalay and Loewenstein (1985) had the purpose to demonstrate that traditionally measured excess returns over an event period, could reflect the higher compensation that risk averse investors

require to hold the asset over a riskier period. They chose dividend announcements as the event and tested the hypothesis that the mean returns on days in the event period are not significantly different from the means on any other random day. They constructed a sample of 302 dividend announcements and tested their hypothesis by using both the market model and mean adjusted returns model to estimate the abnormal returns. Their results showed that the mean excess returns over the event period were significantly higher than those on a random day. Their suggested explanation for these higher returns was higher risk per unit of time in the event period.

Michaely, Thaler, and Womack (1995) investigated the immediate and long-term market reactions to initiations and omissions of cash dividend payments. Their sample contained 561 cash dividend initiations and 887 cash dividend omissions between 1964 and 1988. By using buy and hold method they calculated the excess returns of the securities for a three-day event period, and for monthly periods before or after the event respectively. They found that immediate impact of dividend omissions is negative and immediate impact of dividend initiations is positive. Their findings stated that the stock prices continued to rise even after the initiation announcement. For the omissions, there is a drift in the negative direction. They also noted that the long-term results of the omission sample are more robust than those of the initiation sample.

In 1997, Benartzi, Michaely, and Thaler examined whether dividend changes give information about future earning changes. They argued that although there is much evidence about the market's response to dividend changes as newsworthy, there is less knowledge about the actual realization of future earnings. By taking 1025 firms and 7186 dividend announcements between years 1979-1991 as a sample, they tried to determine whether changes in dividends have information content about future earnings. Their empirical results were consistent with Watt's findings in 1973. They could not find much evidence of a positive relationship between dividend changes and future earnings changes. They also investigated Lintner's (1956) argument that dividend increases are a signal about a permanent shift in earnings rather than a signal about future earnings growth, and they found a strong past and concurrent link between earnings and dividend changes. They concluded that changes in dividends mostly tell something about what has happened and that Lintner's model of dividends remains the best description of the dividend setting process available.

Dyl and Weigand (1998) investigated the changes in firm risk following the initiation of cash dividends. They introduced the risk-information hypothesis that dividend initiation conveys information to the market about the firm's lower risk. They proposed that management's decision to initiate dividend payments per se provides the market with new information regarding the risk of the firm, and firm risk will be lower following dividend initiation. They tested their hypothesis and investigated whether the announcement of dividend payments is accompanied by a change in systematic risk by comparing firms' pre and post announcement betas by using the Fowler-Rorke methodology. Their findings indicated that both the total risk and the systematic risk of a sample firms that initiated dividends are significantly lower in the year following the dividend announcement.

Garrett and Priestly (2000) analyzed the dividend behavior of the aggregate stock market. They proposed a model that assumes managers minimize the costs of adjustment associated with being away from their target dividend payout and they found significant evidence of dividends conveying information regarding unexpected positive changes in current permanent earnings.

In 2001, Fama and French presented the phenomenon of the "disappearing dividend". They found that given their characteristics, firms become less likely to pay dividends. They used logit regressions and a portfolio approach to document that characteristics and propensity to pay make large separate contributions to the decline in the percent of payers.

Gunasekarage and Power (2002) reexamined the dividend-signaling hypothesis by examining the post-announcement performance of UK companies that disclose dividend and earnings news to the market on the same day. Their sample consisted of 1787 earnings and dividends changes announcements made on the same day between the years 1989-1993. They tested the hypothesis that dividend-increasing companies do not outperform their dividend decreasing counterparts during the post announcement years with respect to financial performance. By using the buy and hold method they calculated the abnormal returns for the year before the announcement, for the quarter before the announcement and for over the announcement period. Their findings did not provide a support for the signaling hypothesis.

In one a more recent paper, Grullon et al. (2005), contrary to the dividend signaling hypothesis, showed that dividend changes are uncorrelated with future earnings changes when controlling for the well-known nonlinearities in the earnings process.

Amihud and Li (2006) proposed an explanation for the "disappearing dividend" phenomenon which was presented by Fama and French in 2001. They found that a reason for a decline in the information content of

dividends is the rise in holdings by institutional investors that are more sophisticated and informed. They found a decline in abnormal returns around dividend change announcements since the mid-1970s. Across firms, abnormal returns are a decreasing function of institutional holdings. They argued that institutional investors exploit their superior information and buy before dividend increases and that dividends are less likely to rise in firms with high institutional holdings.

Recently, Yilmaz and Gunay (2006) examined the effects of cash dividend payments on stock returns and trading volumes in the Istanbul Stock Exchange from 1995 to 2003. They found that prices start to rise a few sessions before cash dividend payments, and fall less than dividend payments on the ex-dividend day, finally decreasing in the sessions following the payment. The results of trading volume analysis showed a considerable upward shift before the payment date and that the volume became stable after the ex-dividend date. The findings supported price-volume reaction discussions on the dividend payment date and the significant effect of cash dividends on the stock market.

As it becomes clear from the preceding discussion, previous empirical studies of dividend signaling and information contents of dividends produced mixed results.

3. Data and Methodology

The objective of this study is to investigate whether dividends have informational content. To accomplish this objective, an event study is conducted to measure whether any abnormal returns are earned by security holders around dividend announcements. The core assumption of the event study methodology is that if information communicated to the market contains any useful and surprising content, an abnormal return will occur. At the time of the event, the magnitude of the abnormal performance indicates the impact of that particular event on shareholders' wealth.

Following MacKinlay (1997), the first step of the analysis was to determine the sample of firms to be included in the analysis. For the purposes of this study, ISE-listed companies that regularly distributed cash dividends for the period 2005 to 2008 were selected. In order to mitigate the effect of other contemporaneous events on stock prices, any company with an announcement related to earnings, stock splits or merger and acquisitions around the dividend announcement were excluded from the analysis. Financial sector firms were also excluded as they are subject to different regulations, resulting in a final sample of 46 firms and 184 dividend announcements. The dividend announcement dates and amounts of dividends paid by these companies were collected from the daily bulletins of ISE. The dividend announcement date (day 0) was taken as the day on which dividend amount of a firm is announced to the public in the daily bulletin. Neither the ex-dividend day nor the day the dividend is paid was considered to be the announcement day.

As the second step of the event study, a three-day symmetric event window was chosen (1 day prior to the event day and 1 day after the event day). This window length is appropriate to capture any news that might have leaked shortly before the official announcement was made and also considers any short-term stock price reactions linked to the event after the announcement (Kothari and Warner, 2004). In addition, several other window lengths are analyzed to check the results.

The third step was the prediction of a "normal" return during the event window in the absence of the event. To estimate "normal" returns, this study uses 355 daily returns as the estimation period, from the day $T=-360$ to the day $T=-6$. The model used in this study to estimate the expected returns is the market model. It is a linear time-series model where dependent variable, security returns, is regressed against percentage changes in a market index. The market model used in this study for security i for the year j during period t can be expressed by the following linear time-series model.

$$R_{i,j,t} = \alpha_{i,j} + \beta_{i,j} R_{m,j,t} + e_{i,j,t}$$

where;

$R_{i,j,t}$ = daily return on the security i for year j during time t

$\alpha_{i,j}, \beta_{i,j}$ = market model parameters for security i for year j , security-specific intercept and slope coefficients

$R_{m,j,t}$ = return of the market (ISE-100 index) for year j during time t

$e_{i,j,t}$ = error term for security i for year j at period t . It is assumed that $e_{i,j,t}$ fulfills the assumptions of the linear regression model. Namely $e_{i,j,t}$ has the mean of zero over the regression period, and has a variance independent over time.

The fourth step was the calculation of the abnormal return within the event window, where the abnormal return is defined as the difference between the actual and predicted returns. Abnormal returns, $e_{i,j,t}$, for firm i , for year

j , on day t are estimated as the difference between the actual return on day t and the return expected from the market model. It thus represents the impact of firm specific event (dividend announcements in this study) on shareholder wealth, net of market effects. The abnormal returns are calculated as follows.

$$e_{i,j,t} = R_{i,j,t} - \alpha_{i,j} - \beta_{i,j} R_{m,j,t}$$

By using the preceding equation, daily abnormal returns for each firm for each of the years 2005, 2006, 2007, and 2008 were computed over several event windows. Then, for any day t within the event period the mean abnormal return (MAR) across sample members was calculated as follows.

$$MAR_t = \sum_{i=1}^N \frac{e_{i,j,t}}{N}$$

where;

$e_{i,j,t}$ = abnormal return of security i for year j on day t

N = number of securities

Finally, cumulative abnormal returns over several holding periods from day t_1 to day t_2 were calculated according to the following formula.

$$CAR_{t_1,t_2} = \sum_{t=t_1}^{t_2} MAR_t$$

Under the null hypothesis that dividend announcements have no impact on corresponding stock prices, cumulative abnormal returns have an expected value of zero. To test the hypothesis, parametric t -tests are used.

4. Empirical Results

As our aim was to investigate the market reaction to the change in dividends, the 184 announcements by 46 companies were divided into three groups by comparing the dividend per share (DPS) for each observation at time t to the previous dividend per share at time $t-1$. The groups were formed as follows.

If $DPS_t > DPS_{t-1}$, the observation is classified in the increasing dividends group

If $DPS_t < DPS_{t-1}$, the observation is classified in the decreasing dividends group

If $DPS_t = DPS_{t-1}$, the observation is classified in the constant dividends group

As a result, 88 announcements were classified as increasing dividends, 73 as decreasing dividends and 23 as constant dividends.

The result of t -test analysis on CAR values for these groups is presented on Table 1. As can be seen, for the three day event window surrounding the dividend announcement, CAR(-1,1) value is positive and statistically significant for the increasing dividends group, and negative and statistically significant for the decreasing dividends group. For the constant dividends group, the CAR value is not significantly different from zero. Therefore, the null hypothesis that dividends have no impact on stock prices can be rejected and our evidence is consistent with the signaling hypothesis. However, such a result was not obtained for longer event windows, which resulted in statistically insignificant CAR values for all three subsample of firms.

Moreover, the pre-event period (-5,-1) shows significantly negative CAR values. This means that the fact that an important announcement will take place is released to the public by the insiders before the actual announcement date. However, this only holds for decreasing dividends sample, suggesting that bad news generate more reaction among insiders, inciting them to disclose their knowledge earlier.

5. Conclusion

This study tested whether dividend announcements have an informational content for the Istanbul Stock Exchange. By applying the event study methodology on a sample of 184 dividend announcements made by 46 companies during the period 2005 to 2008, the average abnormal returns and cumulative abnormal returns were calculated. These calculations were done for three subsamples of securities, namely those with increasing dividends, those with decreasing dividends and those with constant dividends.

When a three-day (1 day prior to the event day and 1 day after the event day) event window was used, the results showed that the market reacted positively to dividend increases, negatively to dividend decreases and did not react when dividends were not changed. Therefore, the results were consistent with the signaling hypothesis.

However, cumulative abnormal returns were insignificant when longer event windows were used. Also, the results showed pre-event information leakage for the decreasing dividends sample.

Besides providing additional evidence consistent with the information content hypothesis, these results have important implications for companies. Specifically, firms should be careful when announcing changes in their dividend policies since such announcements have an impact on stock prices.

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Table 1. CAR Values for selected event windows

	Dividend no change (N=23)		Dividend increase (N=88)		Dividend decrease (N=73)	
	CAR (%)	t-stat	CAR (%)	t-stat	CAR (%)	t-stat
CAR(-5,5)	-0.30	-0.26	0.08	0.10	-0.13	-0.37
CAR(-3,3)	-1.23	-0.81	-0.87	-0.95	-0.32	-0.48
CAR(-2,2)	-1.14	-0.97	-0.58	-0.56	-0.27	-0.44
CAR(-1,1)	0.16	0.35	0.54	1.43*	-1.05	-1.62*
CAR(-5,-1)	0.25	0.36	-0.20	-0.41	-1.01	-2.90***
CAR(-3,-1)	-0.31	-0.39	-0.39	-0.71	-0.34	-0.94
CAR(-2,-1)	-0.32	-0.39	-0.21	-0.33	-0.22	-0.73
CAR(1,2)	0.27	0.39	-0.43	-1.14	-0.19	-0.54
CAR(1,3)	0.16	0.35	0.23	1.02	-0.13	-0.37
CAR(1,5)	0.54	0.80	0.22	0.53	-0.18	-0.44

*, **, and *** denote significance at 10%, 5%, and 1% respectively.

The Feasibility of Job Sharing as a Mechanism to Balance Work and Life of Female Entrepreneurs

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Abstract

Balancing life and work is the most important challenge of entrepreneurs. Entrepreneurs seek a logical balance between their job and life and this issue is of great importance to Iranian entrepreneur women. Inability to handle the contrast between work and family is the main source of job stress and ends in job and personal dissatisfaction. To overcome these problems we have to look for solutions that not only meet the organization needs but also imposes less stress on entrepreneurs and thus results in improving their productivity.

In this article we have studied female entrepreneurs situation and their share in labor market, as well as flexible methods of doing jobs especially job sharing method. We have done structured interviews with entrepreneurs of Azad University and their attitude to possibility of job sharing and its effect on female entrepreneurs at university has been expressed. After performing the qualitative methods, questionnaires were made and the attitude of female entrepreneurs towards job sharing was examined. The results of quantitative research show that they have a positive attitude towards job sharing but we have to notice that job sharing doesn't lead in weakening the bargaining ability of female entrepreneurs.

Keywords: Flexible method, Job-family conflict, Job sharing, Female entrepreneurs

Introduction

Human societies have experienced lots of ups and downs and faced amazing changes in modern age especially after renaissance, each of which has had lots of positive and negative consequences. These societies had to change their systems drastically to adapt with these changes. For instance we can name women's active presence in the society as one of these changes that has redefined their social character as an active one replacing the passive character they had in society.

Society has answered to the need of women's more active presence in society, following this change to reach an ideal society and to avoid women's presence as a crisis in society; there should be a change in societies systems which have been based on men as the only active members so that providing required conditions facilitates women's active presence in the society.

In recent years we have seen that women's presence has been stronger and more active in different social arenas. University training expansion in recent years and women's eagerness to study at universities has caused a remarkable increase in the number of working women who are highly educated. According to the census results in 2006, more than 36% of working women have studied at universities, while it is only 13% for working men. The increase in number of women who go to university shows that there will be a 25% increase in rate of women participation in the coming decade. The statistics show that in recent years the rate of women taking part in concur (university matriculation) has been 65% for women.

Although statistics and numbers show that the presence of women has increased in the society, due to the responsibilities at home and with the family, this important class are hindered from organizational development and they don't usually have the chance to promote to management and supervising positions. Losing women in these positions imposes potential, direct or indirect, short-term or long-term costs on the organization, like losing women senior managers' view about women's needs. We also have to take the cost and value of the lost knowledge, experiences and skills of women in the organizations into account (Nesbit and Seeger, 2007:3).

Regarding this trend and the importance of women's position and role in the family we should think of some solutions to use women's skills in organizations and facilitate their presence in social arenas. To do so there has been lots of researches and effort to invent some ways to balance the time between work and family matters. Due to changes in society, there is more need to family members' (men and women) activities and simultaneously each of them needs more time to spend on family matters (Budd and Mumford, 2006:22). For example lots of mothers go back to work after their child is born due to financial needs. Working full time makes problem balancing home responsibilities and work. Since they cannot reduce their responsibilities at home then they have to reduce their working hours thus they lose the chance to get good jobs because they are full time. These contrasts have ended in creating some plans as work/life in organizations, some of these plans are: flexible working pattern that includes: hob sharing, flexible hours, intensive working weeks, telecommunicating or volunteer part time jobs (Gholipour, 1386, 42).

When an individual's effort to perform tasks at work interferes his efforts playing his out of work roles (family), work-family conflict occurs (Carly et al., 2003). Thus work-family conflict is an inter-role conflict, a conflict between work roles and family roles (Ulla et al. 2003). Regarding this definition, this type of conflict has a two dimensional nature. First, work interface family, it is a situation in which work interfaces with family life and second, family interface work, in which family responsibilities interfaces with work. Recent researches on FIW and WFI express that these two concepts might have different causes and different consequences (Bayron, 2005). Although the two concepts seem highly similar, people mostly mistake WIF for FIW, because it is easier to define work problems and the characteristics of a good employee are clear and set. Therefore a good employee tires not to involve his family issues in work and attempts not to let his family problems interfere with his work. While this same good employee may spend time at home on work problems and issues or in the other words he may involve his family life with work problems. In this paper work-family conflict is studied, a conflict in which teachers' job is not ignored in family roles.

Work-family conflict is a concept to define the conflicts between work and family(Lazarova, et al., 2010). This conflict is being analyzed as an inter-role conflict in which work requisite is in conflict with family role requisites. Work-family conflict is a form of inter-role conflict in which the pressure of a task at work is against family duties. There are three dimensions to work-family conflict:

1. Time based conflict: when the allocated time for a role hinders spending time on the other roles and responsibilities.
2. Behavior based conflict: when the required behaviors of a role don't match the behavior patterns in another role.
3. Pressure based conflict: when the pressures of a role caused problem for another role (Carly, et al. 2002).

Most researches on work-family conflict have been mainly focused on the consequences of this type of conflict. The major theoretical approach on conflict is based on the theory of role and similar elements like role conflict, role ambiguity and over role. Another approach is based on Demographic elements like gender, family statues, the number of children and the number of working hours.

These findings show that the previous researches were mainly focused on the side of work-family conflict (work-family/family-work) or the form of conflict (time, behavior and pressure). This paper is studying both aspects of work-family conflict (side and form) in relation with work and demographic variants.

Conflict theory says that work and family territories are irreconcilable due to their different tasks and norms (Bayron, 2005). The related matters to an individual work (work variants) are influential on family responsibilities. For instance, those people who spend most of their time at work, their work interferes with their family life. Here the most important variables that are studied are being to intimate with work, stress and job satisfaction.

Research findings in field of work interface family show that people's role in family influences their role at work strongly and visa versa. Based on this interaction, there may be some problems for working people that is called work interface family (Byron, 2005; van Daalen, Willemsen, & Sanders, 2006). Work interface family means that a person is confused about his roles doing duties at work and at home and can not balance his family and work (Matthews et al., 2009).

Studying this field has attracted enthusiastic people to this topic for some decades. Some of the studies are merely about work-interface family(WIF) and some have also studied family interface work. After sometimes and doing more researches it became clear that it was not enough to study these two factors separately and this conflict hasn't been studied from all dimensions. This two elements have interactive relation and studying just one of them is an imperfect job.

Work interface family is a multi-dimensional concept that demands the researchers' dominant knowledge on many areas (Michel et al., 2009). For instance the researcher needs to know the key theories of this conflict so that he can study the root deeply. Boundary theory, compensation theory, ecological systems theory, social identity theory, and spillover theory are some of these theories that one may face in the literature of work interface family literature (Michel and Clark, 2009).

Another important point in work interface family is the influence of this issue on an individual's satisfaction from an organization. In the other words when a person has problem dealing with work interface family, he is dissatisfied with the organization and the activities they do there (Yildirim and Aycan,2009).

Flexible work arrangement

In the past twenty years, flexible working patterns have been controversial issues in Human Resource Management. Regarding challenges like rapid development of technology, heterogeneous labor market, price wars, increasing changes in market and financial changes in capital market, human resource managers are trying to use different means like flexible working patterns to help their organizations survive and besides they intend to use them to compete with their rivals and outshine their competitors (Arvanitis, 2005: 998).

Lots of organizations offer plans to their employees to balance their work with their family. These pioneer organizations could do well far beyond present rules like sick leave. These all show that there has been a belief in organizations in attracting and taking good care of productive employees which is not only morally admitted but also required. Due to presence of different generations in work force and their especial needs this issue is of importance nowadays (Harris, 2007: 34).

Flexible work arrangement includes floating working hours (employees decide the starting and finishing hours of their working time), intensive working weeks (for instance the employee works for 4 days and then gets a working day off), telephone connection or long distance (employees do their job at home or in a different site) and volunteer part time methods especially job sharing (sharing the job with another employee). These plans are attractive for people who run a family. A public poll in The USA shows that 79% of employees are eager to use flexible work arrangement (Bentley and Yoong, 2000: 347).

The result of different studies confirm this hypothesis that high flexibility in working time causes more demands, better quality, increased productivity and commitment and less absences on the side of employees to do it on the other hand these methods simultaneously causes employees to become more independent (they earn the ability to decide about their job) which are on the whole all good results and they leave a positive effect on people and their learning. Using these methods in American companies like General Electric, Microsoft and Google has made them lucrative and successful in gaining their goals. In fact, these plans are not only to the benefit of the employees but it is considered a mutual cooperation between the company and employees in which both parties are beneficiaries (Harris, 2007:34) (Kauffeld et al., 2004:79).

Job sharing

A new and innovative method of work arrangement is job sharing. This method lets 2 or 3 people share a 40-hour working week (full-time) between them. For instance one of them works 8 A.M.-12 noon and the other

works 1 P.M. -5 P.M. or each person works on specific day's full time (Robbins, 2007:232). In the other words in this method two or more people work voluntarily on one job and share the salary and benefits. Each of these people has an independent contract with the manager and their salary and bonus is clear. The job is usually shared based on the job and the people who are performing it in different ways. Depending on the real requirements of the job, the people who are sharing it can be from different genders, ages and generations. A married woman and a single woman or a young woman and an experienced woman or a man and woman may share a job and the type of cooperation depending on the job can be based on responsibilities or time. A time should be considered when both (or all) of them are present together to exchange ideas about their jobs (Branine, 2004: 2-3)

Although job sharing is nowadays practiced more in Europe, it was officially introduced in America in 1970s to do full time jobs which were usually done on one shift as part time. Teaching and nursing were the first jobs which were done as job sharing because they were mostly done by women who wanted to balance their jobs with their family. Both private sector and state sector presented their employees with this alternative (Eick, 2001: 890).

Job sharing has some types. Three types of it are as followed:

- ▲ Responsibility participation: in this method there is no sharing in responsibilities. Although there are some people interacting in doing a job, all of them are equally responsible about doing it correctly. This job sharing method is good for the jobs that are continuously active and demand high interaction and cooperation.
- ▲ Responsibility sharing: is proper when the job can be divided into different projects. Each participant is in charge of her own part and concentrates on her own part. This method is proper when participants do not know each other well.
- ▲ Unrelated responsibilities: participants do totally different jobs while they are in the same place. It is like two people doing a part time job.

Generally speaking, job sharing increases people's motivation and therefore their productivity due to equal job opportunities that it provides for everybody. There are various reasons to confirm the claim of increased productivity in case of increasing job sharing. Increased flexibility, having the opportunity to use experienced employees as well as a vaster area of skills, increased commitment and motivations are some of the reasons. In general we can admit that in compare with full time jobs, job sharing makes employees work more energetically and creatively (Harris, 1997:30).

Despite all the studies that have been done on this method admit the positive effects of it on organizations as well as employees, this method is not widely applied and it is because of managers' resistance, difficulty of planning it practically or difficulty of finding a proper partner or the old negative attitude of people about imperfect performance of the job or perfect communication with the managers (Robbins, 2007:234).

Based on studies done in England and Scotland public sectors, job sharing has some advantages and disadvantages that should be noticed while performing. These points are different from managerial point of view and job holders (Branine, 2004:140; Guglielmo 2008:106).

The advantages from managers' point of view can be classified as followed:

Operation flexibility, Keeping the staff, Less leave and absences and Increasing staff productivity.

From staff point of view who works with this method there are two major advantages in this:

- ▲ Better time management: the first advantage that everybody points out is the possibility to allocate some time to family commitments. In fact, working with this method enables the person to manage her time and catch up with all her responsibility by making a good plan. While, working full time make it impossible and the person is forced to be present in the organization on all working days.
- ▲ Increased learning: the second advantage is learning. A high percentage of these people have expressed that using this method they have been able to perceive their jobs better because they have the opportunity to learn from their partner.

Despite many advantages, there are some disadvantages as followed:

High expenses: The budget which is for training may also go high in this method, because when there is a new system or when a new task is added, two people should be trained, Hardship of managing and coordinating people: it should be noticed that when one person does the job it requires less coordination but when two or more people are doing it needs more coordination to succeed, Expecting job sharing in all occupations: some organizations are afraid that giving permit to job sharing will end in indolence and sloth or offering this possibility to an individual makes everybody want the same right and finally it may end in failure of all standard

processes and human resource procedures that the organization has tried so hard to achieve it, Ambiguity in taking responsibility: some companies think that job sharing would cause confusion in deciding the person in charge. But keep in mind that offering job flexibility has a great effect on people's motivation to do it better. Furthermore treating the team as an individual by team evaluation and team bonus guarantees the commitment of the team members towards the other partners.

Notice that having a good planning and management in job sharing can reduce its flaws and ambiguities to a great extent. To do so here is the steps of a complete plan for job sharing:

1. Which hours and which days each of the staff will be working?
2. How long do they need to spend together (for the overlapped responsibilities)?
3. How will the team mates arrange the meetings, conferences?
4. How will the team mates keep in touch?
5. How the benefits will be shared?
6. How the team work will be evaluated?

Methodology

This research enjoys the benefits of both qualitative and quantitative research method simultaneously to be better and experience minimum active error regarding the methodology. Using both methods makes the result more proper for generalization. To collect the data two methods of using questionnaires and interviews have been used. Sample includes the female entrepreneurs in education industry in Tehran. In the qualitative part of the research, the sample includes 18 female entrepreneurs. Regarding the quantitative research, the sample of this research has been estimated 223 female entrepreneurs based on unlimited society formula that all of them are women working at universities.

To collect data for the quantitative part of the research questionnaire have been used. The questionnaire contains 15 questions to evaluate female entrepreneurs attitude towards job sharing based on Likert scale as 1- strongly agree, 2-agree, 3- neither agree nor disagree, 4-disagree, 5- strongly disagree. 273 out of 300 questionnaires were handed back out of which 237 were complete and thus used in analysis. The rate of returning the questionnaires' was 91% and the rate of complete questionnaires was 86 % that was satisfactory.

To check the validity of the questions we have used specialist, professors and experts' opinion to make sure that the questions are simple and clear enough. At this phase the questions have been checked by the named people through interviews and consulting so that we make sure it has the required features. Also to determine the reliability of items, 30 questionnaires were distributed and completed as pretest. Cronbach's Alpha coefficient of women attitude to job sharing was .86 that shows the reliability of items is trustable. Factor analysis of questionnaire is evaluated by confirmative factor analysis and using of LISREL 8.53 software (Table 1).

Research finding

In the present research to analyze the data which was collected through quality method (interviews), Theme analysis was used. It is the most common approach to analyze data in human science studies (Roulston, 2001:6). Theme analysis is a method to determine, analyze and present the patterns (themes) that exist inside the data (Braun & Clarke, 2006:17).

To analyze the quality collected data that (interviews) LISEREL version 8.53 and SPSS version 16 software were used. Going through the interviews and coding them, various concepts were found in this research. These concepts were classified in separate groups according to their meanings. And these groups are presented in form of different themes and are discussed in different sections. Not devaluating the responsibility: almost 44% of people believed that job sharing wouldn't devalue the responsibility. Of course they believed that proper conditions should be provided and there should be exact planning.

"If there is good management and planning as well it wouldn't devalue the responsibility", "if the two partners cooperate with each other and regarding their conscience and sometimes professional sacrifice there won't be problems.", "we have to try to write down responsibilities and tasks".

Attracting and keeping elite women: over 75% believed that job sharing has an important role in attracting and keeping female entrepreneurs because it gives people the chance to plan and use their time and they feel free. It gives them the chance to continue their studies and if they are interested in study and research and they wish to be financially independent, job sharing can provide them with the chance to do it and to promote them.

"When the manager is competent, just and kind, female entrepreneurs can be innovative and flourish their talents. If women like their work atmosphere, they are going to love their jobs which is very important because if their job is not tiring regarding the time and environment, they can become creative and it is great for elite women.",

“for an elite woman, her family is prior and if there is a way to help her with her relationship with her family, she would like it”, “an elite woman who has a child may forget about working”.

Lessening work-family contrast: all people unanimously agreed on its positive effect on work-family relationship, because this method teaches us how to do team work. In the other words it also teaches lessons for life and influences the family unity and friendship, it makes the work atmosphere pleasant and gives people time to solve their problems at home. Moreover, most people emphasized its influence on children's education and peace. Presently, women and men both work and are tired, if the woman works part time, she will save energy and can spend it on her family life. Women will have peace of mind. Lots of employees suggest part time jobs to have a more comfortable family life.

Discussion and Conclusion

Most organizational expenses are on the human forces; therefore it is necessary to take policies that economize on costs and improves the organization management as well. The major policy is flexible working methods. These methods not only benefits from using a wider range of personnel and their abilities, but also motives them by providing better working conditions. Of course labor laws, insurance and retirement plans are not different from full time method.

The results of factor analysis confirms that appropriateness of the questionnaire, because the value of Q-Square, RMSEA and the proportion of Q-Square to its degree of freedom was low and also the value of GFI and AGFI was over 90%. All T values are meaningful (table 1). All these prove that the questionnaire is creditable and valid.

The data that was collected from the questionnaire shows the attitude towards job sharing. two hundred and three people believed that job sharing would reduce the contrast between work and family. 89% believed that job sharing would reduce the quality of work and would increase the chances of promotion and growth at work. As the result of the present research expressed, the three mentioned factors are the results of job sharing. Quality analysis of the data by using Structural Equations Modeling shows that job sharing causes 47% reduction in family-work contrast (t value=12.87 and p value=0.000), causes 32% attracting elites (t value=10.46 and p value=0.000) and 18% devaluates responsibility (t value=8.07 and p value=0.000).

Job sharing method is an advanced flexible working hours method that brings some advantages for both parties, that is employer and employee. Applying job sharing, we can keep the process of a job while an employee is sick or on holiday and also we can have a wide range of skills, experiences, opinions and viewpoints in a job all at the same time. It also avoids stress and illness of the employees and improves their commitment to the organization and keeps the precious employees with the organization.

If all working women do part of the job in a job sharing plan it seems devaluating the responsibility because everyone will blame the other. Depending on the situation, job sharing can be devaluating or not. In some jobs, job sharing is applicable for instance in a kindergarten it won't be devaluating the responsibility but in positions the person would like to blame another person it will be devaluating. Of course it depends how we divide the job and observe it.

Women's participation is a criterion of development in every country this make an increase in women's participation. Some believed that job sharing has no effect on attracting and keeping elite women: a strong person shouldn't go to these kinds of weak atmospheres, job sharing atmospheres are weak. Elite shouldn't work in weak atmospheres because she/he will deteriorate. Elite should work in strong places and beginners shouldn't be allowed there. Regarding our present culture there won't be any positive effect. To do so we need lots of practice and experience, more than what is usually required. If it is accepted it is effective otherwise there will be no use.

Experience has proven that children who are in kindergarten from morning since 4 p.m. are more depressed than those who spend only morning to noon in kindergartens. Children who feel their mother's presence feel more uncomfortable. Also the peace of mind which is a byproduct of job satisfaction reduces this contrast remarkable. For example if a woman feels safe about each of the atmospheres will work more efficiently because she is sure that if she doesn't go to work for some hours or a day, she will have her job. Of course there are still some people who believe it depends on the situation. “If it doesn't remove the contrast between family and work at least it will reduce it to a great extent. We have to keep in mind that if it is not done correctly, it will cause tension because people want to blame each other for problems.”

To make a good plan for job sharing especial attentions should be paid to constructing an efficient organizational culture to make sure about choosing the correct person, fair job sharing and interaction between people.

This method will cause women to maintain their true identity and not to feel lower than the others. If job sharing is practiced it will bring happiness both at home and at work. We shouldn't ignore all the defects and problems proposed by the people who participated in the research. Job sharing may end in mental fatigue, tension and stress and above all it may reduce women's ability to bargain in the organization. When to women share a job and enjoy the benefit of one job, their bargaining ability lessens.

Applying this method is easier in expert levels and jobs which have routine tasks, but it is also applicable to jobs in management level. In a big organization even for management positions, job sharing can be performed, because these jobs are more difficult it will make them easier with less stress and tiredness.

Thus it is recommended to take the following measures to expand and empower women at work. To apply job sharing to reduce work-home contrast so that we can enjoy both the presence of women while their personal life is not damaged. The presence of scholar women in an organization helps a lot but attracting them and then keeping them at work is difficult and job sharing will provide this opportunity. In our country that elite migration is very common it is a good solution to avoid brain drain.

Practicing job sharing may face resistance, because employees are afraid of losing their jobs. They may think that it is an excuse for redundancies. They may think that managers are doing it to make them redundant little by little and choose one of the two. Therefore to practice job sharing, its culture should be institutionalized which is a difficult task on managers. Maturation and culture of an organization is of great importance. Job sharing is possible for those who are mature regarding the organization. Some employees cannot even balance with lower or higher levels and don't share the information with the others. Job sharing is like a new technology that comes into an organization and it should be institutionalized. Of course we cannot generalize the result of this research to all Iranian women and same researches should be done in other organizations. At the moment no research has been done in this matter.

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Table 1. Factor analysis of the questionnaire of evaluating female entrepreneurs towards job sharing

Questions	Standard Coefficient	T-value
1- I usually recommend job sharing as a good alternative to my friends.	0.72	9.31
2- when two partners put their minds together, the problems are solved more easily.	0.71	8.23
3- job sharing provides the opportunity to share knowledge with your partner.	0.68	7.09
4- job sharing provides the opportunity to make balance between working life and personal life.	0.69	10.12
5- in job sharing there is less tiredness.	0.56	7.77
6- in compare with full time jobs in job sharing less problems occur.	0.57	10.74
7- in job sharing there is more time for the family.	0.82	9.29
8- in job sharing there is more commitment.	0.67	12.70
9- in job sharing there is more eagerness in compare with a full time job.	0.70	9.82
10- in job sharing there is less training opportunities in compare with a full time job(R)	0.66	8.61
11- in job sharing lots of weekly meeting are missed(R)	0.69	8.59
12- partner who have shared their jobs are less satisfied(R)	0.66	9.87
13- managing a job by two people is very difficult(R)	0.47	8.73
14- the quality of the services in job sharing is lower(R)	0.73	10.81
15- lots of people do not like to share a job they prefer to have a full time job(R)	0.78	11.23
$\chi^2=43.96$ RMSE=0.027 GFI=0.93 AGFI=0.95		

Primary Research of the Advantages and the Cost Control of the ABC & EVA Integrated System

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Abstract

The integrated product of Activity-Based Costing (ABC) and Economic Value Added (EVA) is the ABC & EVA system, i.e. the integrated cost system. Traditional ABC method gives priority to the interior activity chain of enterprise to implement the cost analysis, but ignores the capital cost, so the cost accounting is not complete. The ABC & EVA system brings the capital cost into the cost management, which could not only open out the real economic value created by the cost objects, but extend the pure cost computation of ABC to the performance evaluation. Based on the principle of the ABC & EVA system, the enterprise cost control strategies under the integrated cost system are proposed.

Keywords: Activity-Based Costing (ABC), Economic Value Added (EVA), Integrated cost system, Cost control

The occurrence of ABC was thought as a revolution of the cost accounting. Its special cost concept of “activities consume resources and products consume activities” could rectify failed product cost information in the traditional cost accounting, and largely enhance the serviceability of the decisions of cost information. However, in the drastic competitive environment at present, single ABC cost information has not made enterprise acquire and keep long-term competitive advantages and value creation ability. The research emphases of ABC are mainly centralized in the process producing indirect costs in the domains such as production and logistics, but it ignores the distribution process producing the indirect costs in other domains. Especially, when the enterprise evaluates the investment item or the profitability of the new product, it will find that the ABC method could not reflect the capital cost consumed by the investment item or the new product, and the enterprise can not control the investment risk. Therefore, it is necessary to combine ABC and EVA.

1. Integration of ABC and EVA

EVA is the economic profit of operating profit after tax minus all capital costs (including debt cost and equity cost). And it is the surplus cost minus all costs, and it is the index to measure the performance of the enterprise, and it could measure the shareholder fortune created by the enterprise, and it is a new index to evaluate the performance of the enterprise. Its basic idea could be described as that investors will invest capitals when they predict that the investment return rate is very high, and if the future return rate is very low, they may more select other investment opportunities. Therefore, the enterprise must create values for its shareholders, and managers have to make the enterprise produce sufficient values to compensate the capital cost, and if the investment return rate is lower than the capital cost, the shareholder fortune will be destroyed.

To improve the decision serviceability of the cost information of ABC, ABC should combine with EVA. To bring the principle of EVA into ABC will make the cost management and the performance evaluation system more perfect and complete, and rectify the situation that ABC ignores the capital cost and underestimate the product cost. The combination of ABC and EVA will produce the so-called “ABC & EVA integrated system”. The ABC module in the system emphasizes the management cost, and the EVA module emphasizes the capital cost, and the combination of both will compose a complete and effective management tool. And this tool could not only avoid the deficiencies of ABC, but make shareholders and managers realize the structure distribution and distribution base of the interior economic additional values, and confirm their own direction. Comparing with traditional cost computation methods and ABC, the product cost of the “ABC & EVA integrated system” is the real “complete cost” which includes not only the management cost, but also the capital cost.

2. Advantages of the ABC & EVA integrated system

The integrated management mode of ABC & EVA has the advantages of ABC and EVA, and the introduction of EVA could improve the deficiency that ABC could not completely reflect the capital cost, and it is very important for the management of the enterprise. Comparing with ABC or EVA, the advantages of the integrated mode include following aspects.

(1) The integrated system could distribute the cost and capitals into various activities and activity centers, and the production cost could completely reflect all costs. By introducing EVA in the cost accounting process, the integrated system could more completely reflect the cost information of product.

(2) The cost information provided by the integrated system is really “complete cost” which includes not only the management cost, but the capital cost, and it is propitious to make enterprise managers realize that the capital is precious and limited resource, and they will more effectively and reasonably utilize capitals and stop or reduce the wastes of capitals.

(3) More exact information of product cost could offer better base for the pricing of products. The cost is an important factor for the enterprise to price the product, and generally speaking, the reduction of cost will reduce the price of product, and the integrated system of ABC & EVA would have more sales and profits, and the cost decides the lower limit of the product. Exact cost information will help the enterprise to compute proper and reasonable product price, which will influence the competitive state and the market share of the product in the market.

(4) Through accounting the product cost by the integrated mode of ABC & EVA, those products would bring values for the enterprise would be confirmed. For those products, the enterprise could implement the cost control into each activity and make the activity analysis taking the activity as the center according to the requirements of ABC, and carry out the cost control based on the cost driver to more effectively and sustainably reduce the cost. For those products which could not bring values for the enterprise, the enterprise could pursue the value maximization by new product combination.

(5) The integrated mode could not only check and evaluate the activities like ABC, and the cost driver analysis could open out various important factors influencing the performance, and the measurement and evaluation of the performance could measure and evaluate the execution effect of activity, and it could also be applied in the management to check the management of the enterprise, promote the management to more accord with shareholders' benefits and make the management plan more effectively by the change of EVA.

(6) The integrated mode could associate activities with capitals by the pertinence analysis of activities and capitals to compute the EVA of each activity, so the managers of the enterprise could more deeply understand how to create the EVA of enterprise, and how to implement relative decisions about EVA to the level that the bottom organizations could operate.

(7) It is the reasonable judgment standard to take EVA as the cost object, which could strengthen managers' sensitivity for the value creation. Under ABC, the standard to judge the rationality of cost object is the profit, but the profit will not certainly create values, and it may even destroy value, and if the standard is EVA, it could guarantee the value creation of the management, and help the enterprise to realize the target of value maximization.

3. The cost control based on the ABC & EVA integrated cost system

The cost in the view of integrated cost is the integrated cost management concept integrating EVA and ABC, and to fulfill the strategic demand of cost control, the EVA needs to be introduced based on ABC to realize the target of the lowest week resource cost of product life. The enterprise cost control based on the integrated cost view is the concept of “complete cost”, and it includes the management costs and the capital costs in various activities, and it could compensate the structured deficiency that traditional activity cost view could not reflect the using cost and the opportunity cost, so the product cost will be controlled more completely and truly. The cost control based on the integrated cost view is the whole-process cost control concept to completely extend the range of cost control, and the cost control includes the pre-event control, the on-event control, and the past-event control.

3.1 Pre-event cost control in the view of integrated cost

The pre-event cost control is mainly to utilize the integrated cost view to control the design cost of product. The product design is the first part in the interior activity chain of enterprise, and it will decide the subsequent activities to large extent. The product design will largely influence the product performance, materials, technical flow, costs, and even the whole value chain. According to the estimation, 60%~80% of the costs in the lifecycle of product have been confirmed in the stage of product design. Therefore, the product design is the most important cost driver for the enterprise, and the cost is induced by the activity, and different product design plans need different activities, and various activities consume different costs. The cost control of product design based on the integrated cost view is to evaluate the value after analyzing the management cost and the capital cost consumed in various parts of the production activity, and it more accords with shareholders' beneficial target.

3.2 On-event cost control in the view of integrated cost

The on-event cost control is mainly to strengthen the control and management of stock cost, production cost, and sales cost of the product in the view of integrated cost. The capital cost control in the stock part is mainly to check and evaluate the capitals occupied by the stock and the repertory of materials, commodities, and low-value consumables in various stock parts such as purchasing activity, receiving activity, checking activity, and storing

activity, and confirm the optimal economic stock batches to maximally save capitals and reduce the stock cost and the capital cost. The cost control in the product part means the continual improvement activities in the production activities such as production preparation, equipment serving, production and assembly, and quality control for reducing the cost. By eliminating useless and low-efficient activities, continually improving the value-added activities, and continually researching new production modes to reduce the costs of the product manufacturing engineer with existing design and function, the existing production activities could be improved, and the efficiency would be further enhanced, and the production cost of product would be reduced finally. The cost control in the production stage in the view of integrated cost includes all costs such as components, parts, sets, activity centers, products, and capitals, and it would seek the cost control approach, eliminate the valueless activities, and realize the target of value maximization by the analysis of cost difference between the target economic profit with the actual executed profit. The cost control in the sales process mainly means to control the capitals consuming in the order-form disposal, package, transportation, and loading and unloading in the sales process, such as the price of account sale product, the taxation minus price, sales charge, taxation, and charges of storage for the sales department. The capital cost control is mainly to make the sales promotion well, withdraw the payments for goods, reduce the repertory, increase the charge consciousness, try to reduce the sales charges and payouts, prevent forming new "chain debts", and accordingly achieve the target of reducing the capital occupation, and quickening the capital circulation and turnover.

3.3 Post-event cost control in the view of integrated cost

The post-event cost control in the view of integrated cost mainly means the cost difference analysis of various activity centers and the value-added evaluation. The cost difference is the balance between the actual cost and the target cost. The control target index of certain cost charge is basically confirmed by taking the "quantity standard" to multiply the "price standard". The "quantity standard" is the consumption and man-hour needed to produce unit product in existing production technical condition, which is confirmed by the consumption ration and the labor ration required by the technical design department. The "price standard" is confirmed by the price and salary in the market.

The value-added evaluation is the most important method of the activity cost control, and it includes two basic approaches. The first one is to confirm whether each activity is the value-added activity or the non-value-added activity. And the second one is to eliminate the non-value-added activities or reduce the scale to the minimum degree according to the confirmation result. The value-added activity here includes three meanings. The first one is the custom value, and those activities which could finally fulfill the demand of customers are the value-added activities. And the second one is shareholders' rewards or values, and those activities which possess not only customer values and shareholders' value are the value-added activities. And the third one is the business value, i.e. though some activities have not customer value and shareholders' value, but they are the conditions to realize the customer value and shareholders' value, and these activities also belong to the value-added activities.

To sum up, in the view of integrated cost, the cost control includes the management cost and the capital cost in various activities, and it is the "complete cost", and it could compensate the structured deficiency that traditional activity cost view could not reflect the using cost and the opportunity cost. As viewed from the control process, the cost control is to control the costs from various activities including the design, stock, production, and sales. Based on the integrated cost view, the integrated cost control could realize the integration of cost control, enterprise strategy, management, resource allocation, and performance management, and accordingly enhance the cost control ability and the cost competition advantage for the enterprise, and help the enterprise to more effectively use the cost information and performance data to implement the enterprise strategy and enhance the competitive force of the enterprise.

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Organizational Culture and Technological Innovation Adoption in Private Hospitals

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Abstract

This paper portrays an empirically grounded theory research on the impact of organizational culture on technological innovation adoption in 8 private hospitals in Vietnam. It identifies the dimensions of organizational culture underlying technological innovation adoption, namely cause vision, organizational structure compound, support mechanisms, and innovation stimulators, as well as highlights the fashion in which these dimensions operate will either activate or inhibit technological innovation.

Keywords: Organizational culture, Technological innovation adoption, cause vision, Organizational structure compound, Support mechanism, Innovation stimulator, Grounded theory, Multiple case study

1. Introduction

Hospital managers have looked upon technology as a strategic momentum in hospital development (Ramakrishnan, 2005; McDonald and Srinivasan, 2004; Rauner and Heidenberger, 2002). They also realize the correlation between technological innovations and hospital performance (Li and Collier, 2000). Organisations and leaders try to create an institutional framework in which innovation will be accepted as fundamental cultural norms in the midst of technological and other changes. Researchers such as Ahmed (1998), Robbins (1996), and Pheysey (1993) have highlighted the significance of organisational culture in this setting. Organisational culture appears to have an influence on the degree to which innovation are stimulated in an organisation. Given the importance of the topic, there is a need for a deeper look into the nature of organizational culture and to explore its relationship to technological innovation adoption.

In some private hospitals, action is taken to stimulate innovation. The appropriate steps may have been taken, such as involving medical staff in decision making process, recruiting and appointing medical staff with innovative traits, setting standards for work performance and giving regular feedback, but innovation is still thwarted in some way. The culture of an organisation may be a contributing factor in the extent to which innovation occurs in an organisation (Judge *et al.*, 1997; Tesluk *et al.*, 1997; Tushman and O'Reilly, 1997; Johnson, 1996). The mismatches between current organisational culture and the demands of innovation may lead to a clash situation. This leads to the question:

What dimensions of organisational culture have an influence on technological innovation adoption in private hospitals?

The purpose of this article is to present, by means of a model, the dimensions of organisational culture which influence the degree of technological innovation adoption in a private hospital.

2. Literature review

Organizational Culture

Organizational culture is defined by Deshpandé and Webster (1989, p. 4) as "... the pattern of shared values and beliefs that help individuals understand organizational functioning and thus provides them with norms for behavior in the firm." This notion of culture is similar to the view that culture is an organizational trait manifested in the shared values and beliefs of its members (Hofstede, 1998; Trice and Beyer, 1993).

Furnham and Gunter (1993) summarise the functions of organisational culture as internal integration and coordination. Based on a literature study of the functions of organisational culture, internal integration can be depicted as the bonding of new members in the organisation, forming the boundaries of the organisation, the feeling of identity among personnel and commitment to the organisation. The coordinating function refers to creating a competitive edge, making sense of the environment in terms of acceptable behaviour and social system stability (which is the social glue that binds the organisation together) (Martins, 2000).

Schein's (1985) model describes the levels of organisational culture, namely artifacts, values and basic assumptions and their interaction. Schein's model is criticised for not addressing the dynamic role of assumptions and beliefs in creating and changing organisational culture (Hatch, 1993).

Against this background and the work of Schein (1985), Martins (1987) developed a model to depict organisational culture based on the typical ideal organisation and the importance of leadership in creating an ideal organisational culture. Martins' model is based on the interaction between the organisational sub-systems (goals and values, structural, managerial, technological and psycho-sociological sub-systems), the two survival functions, namely the external environment (social, industrial and corporate culture) and the internal systems (artifacts, values and basic assumptions), and the dimensions of culture. The dimensions of culture encompass the following (Martins, 1987, 1997):

- *Mission and vision* (determines personnel's understanding of the vision, mission and values of the organisation and how these can be transformed into measurable individual and team goals and objectives).
- *External environment* (determines the degree of focus on external and internal customers and also employees' perception of the effectiveness of community involvement).
- *Means to achieve objectives* (determines the way in which organisational structure and support mechanisms contribute to the effectiveness of the organisation).
- *Image of the organisation* (focuses on the image of the organisation to the outside world and whether it is a sought-after employer).
- *Management processes* (focuses on the way in which management processes take place in the organisation. It includes aspects such as decision making, formulating goals, innovation processes, control processes and communication).
- *Employee needs and objectives* (focuses on the integration of employees' needs and objectives with those of the organisation as perceived by employees/personnel).
- *Interpersonal relationships* (focuses on the relationship between managers and personnel and on the management of conflict).
- *Leadership* (focuses on specific areas that strengthen leadership, as perceived by personnel).

This model is a comprehensive model which encompasses all aspects of an organisation upon which organisational culture can have an influence, and vice versa. This model can thus be used to describe organisational culture in an organisation and therefore be employed as background to determine which dimensions of organisational culture influence the degree of innovation in organisations.

Innovation in Organisations

West and Farr (1990) define innovation as follows: "the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, organization or wider society". The context in which a new idea, product, service or activity is implemented apparently determines whether it can be regarded as an innovation within that specific context (Martins, 2000).

In the research under discussion innovation can be defined as the implementation of a new and possibly problem-solving idea, practice or material artifact (e.g. a product) which is regarded as new by the relevant unit of adoption and through which change is brought about (Martins, 2000).

The concept of innovation in the context of this research (determining which dimensions of organisational culture influence innovation) can be illustrated as in Figure 1.

Organisational culture appears to be a critical factor in the success of any organisation. Successful organisations have the capacity to absorb innovation into the organisational culture and management processes (Syrett and Lammiman, 1997; Tushman and O'Reilly, 1997). According to Tushman and O'Reilly (1997), organisational culture lies at the heart of organisation innovation.

The fundamental elements of organisational culture (shared values, beliefs and behaviour expected of members of an organisation) influence innovation in two ways:

- 1) Through socialisation processes in organisations, individuals learn what behaviour is acceptable and how activities should function. Norms develop and are accepted and shared by individuals. In accordance with shared norms, individuals will make assumptions about whether innovative behaviour forms part of the way in which the organisation operates (Chatman (1991) and Louis (1980) both cited in Tesluk *et al.*, 1997).

2) The basic values, assumptions and beliefs become enacted in established forms of behaviours and activity and are reflected as structures, policy, practices, management practices and procedures. These structures and so on impact directly on innovation in the workplace. For example, by providing resource support to pursue the development of new ideas (Tesluk *et al.*, 1997). In this way individuals in organisations come to perceive what is considered valuable and how they should act in the workplace.

Organisational culture affects the extent to which innovative solutions are encouraged, supported and implemented. A culture supportive of innovation encourages innovative ways of representing problems and finding solutions, regards innovation as both desirable and normal and favours innovators as models to be emulated (Lock and Kirkpatrick, 1995).

3. Research methodology

This study adopted a case research method, which is considered a particularly useful method for research in the business field (Yin, 2002; Buchanon, Iyer, and Karl, 1999). Using the multiple case study design allowed us to explore the linkages between organizational culture and technological innovation adoption in private hospitals in Vietnam. Other researchers who have utilized and benefited from this approach include Tellis (1997) and Herriott and Firestone (1983).

A study intended to capture the dynamic linkages between organizational culture and technological innovation adoption must be designed to explore richness while simultaneously being able to capture patterns across hospitals. Case-based research provides the richness, but cannot effectively identify the patterns. Our research objectives lend themselves best to a grounded theory methodological approach (Glaser and Strauss, 1967). By this, pattern of linkages is discovered from observational data and in-depth interviews in a systematic manner, rather than by quantitatively testing hypotheses.

Data was gathered from eight private hospitals in Vietnam on which overview data are provided in Table 1. The hospital categorization in Table 1 was based on research findings rather than *a priori* information. The reason for selecting these hospitals was the degree of cooperation extended by these hospitals during the research work and the trusting relationship between the author and respondents in these hospitals through snowball sampling approach (Robson, 1993).

Grounded theory approach through case research was preferred over quantitative method since the questionnaire survey approach did not offer profound insights into the hospital practices. To minimize research bias we combined observation, interview and desk research. The information was gathered by conducting multiple in-depth interviews with 72 individuals from various levels in these hospitals, observation during hospital visits, and by referring to hospital annual reports and internal documents. The data was collected between March 2009 and December 2009 and updated prior to writing this paper.

As a follow up to the interviews with the directors of each of these hospitals, a literature review was conducted to further identify pattern of linkages between organizational culture and technological innovation adoption. The issues and concepts identified in the literature review were used to develop the data collection approach including the interview guides.

The main source of data collection in this research was in-depth interviews. The interview guide used open-ended questions, as many researchers (e.g., Travers, 2001; Patton, 1987) prefer this approach for its power to produce rich and original data. In each case, the questions were structured to elicit information about dimensions of organizational culture linked to technological innovation adoption. Interview guides were updated from questions that evolved and new dimensions of organizational culture linked to technological innovation adoption identified during each interview. As new questions were added, person previously interviewed were recontacted to elicit responses to the new questions.

Moreover, during observation visits at hospitals, informal conversational interviews were conducted with operations-level employees to supplement and verify the information obtained during the formal interviews. Patton (1987) identified this as an appropriate way to increase the salience of information that emerges from the immediate context and to obtain information pertinent to a particular situation. During interviews, notes were taken and tape-recorders were used only with the interviewees' permission.

Reliability and validity were essential concerns in this study. Both Denzin and Lincoln (2003) and Guion (2002) have argued that establishing the validity of a qualitative research method requires implementing a triangulated evaluated design. In this research, two types of triangulation were applied: methodological triangulation, adopted by using multiple methods of data capture, and data triangulation, using a variety of data sources.

4. Findings and discussion

The advantage of selecting grounded theory as the methodology for this study is two-fold. First it assists in analyzing qualitative data. Second, it helps develop a theoretical account that not only facilitates discussion, but is grounded in the data collected. Thus theory is developed from data, rather than testing existing theories (Martin and Turner, 1986). Based on our observations and in-depth interviews noted above, we now advance and discuss four categories or dimensions. These addresses: (1) cause vision; (2) organizational structure compound; (3) support mechanisms; and (4) innovation stimulators.

First Dimension: Cause Vision

An innovation strategy is a strategy that promotes the development and implementation of new products and services (Robbins, 1996). Covey (1993) claims that the origin of innovation lies in a shared vision and mission, which are focused on the future.

Observations and desk research showed that all directors of the hospitals imparted technological innovation into their vision and mission. Interviews with medical staff in the hospitals including heads of departments, both clinical and subclinical, also demonstrated that most of the heads of departments shared this vision with their directors referring to technological innovation as a crucial means of medical treatment quality improvement. Some hospital directors referred to technology innovation as a tool to enhance hospital reputation and brand image and increase the credibility of its marketing effort whereas some hospital directors referred to patients as customers in the competitive environment.

As highlighted in CIMA Study Text (1996), the vision and mission of an innovative organisation are also customer- and market-oriented, focusing on solving customers' problems among other things.

However, the director of the hospital H4, emphasized that what H4 members are doing are contributions to themselves, patients, and society: "Our hospital has been trying to adopt new medical treatment technologies, but the most important thing is our medical staff's awareness of benefits of technological innovation adoption to themselves, patients and society."

The director's perspective was shared by almost all of medical staff at H4 during the interviews: "The director always tells us doctors to look at what patients complain about since it is where innovation arises."

Behind the director's view is cause related marketing defined as "strategic positioning and marketing tool that links a company or a brand to a relevant social cause or issue, for mutual benefit." (Pringle and Thompson, 1999).

Interviews with medical staff of low management levels in the hospitals H3 and H6 demonstrated that they didn't see clear goals in the concept of innovation, let alone technological innovation. What they had to do everyday as they expressed was to try to fulfil their routine responsibilities. Most of them referred to technological innovation as top-management's business, and would learn to use new technology when it came to their department.

A different observation, however, was encountered at the hospitals H2, H4, and H7 where every employee was encouraged to make change, whether minor or major, considered rewarding, as expressed by a doctor working at H4: "I have made more contributions here than in my last place. The director always tells me to search for new technology, whether it is in treatment or management scope, which is beneficial to patients and makes H4 distinctive."

Judge *et al.* (1997) describe successful innovation as chaos within guidelines; in other words top management prescribes a set of strategic goals, but allows personnel great freedom within the context of the goals.

Organisational goals and objectives reflect the priorities and values of organisations and as a result may promote or hamper innovation (Arad *et al.*, 1997). Hall (cited in Arad *et al.*, 1997) found that personal and organisational goals that accentuate quality rather than effectiveness enhance the levels of innovation.

Second Dimension: Organizational Structure Compound

Organisational culture has an influence on the organisational structure and operational systems in an organisation (Armstrong, 1995). The structure appears to highlight certain values which have an influence on the promotion or restriction of innovation in organisations.

In the innovation literature, much has been written about the structural characteristics of organisations and according to Arad *et al.* (1997) and the CIMA Study Text (1996) a flat structure, autonomy and work teams will

promote innovation, whereas specialisation, formalisation, standardisation and centralisation will inhibit innovation.

As for the impact of organisational culture on a structure that supports innovation, values like flexibility, freedom and cooperative teamwork will promote innovation. On the other hand, values like rigidity, control, predictability, stability and order (mostly associated with hierarchical structures) will hinder innovation (Arad *et al.*, 1997). All above discussion on such aspects of organizational structure as flexibility, freedom and collaboration leads to our conversion of the term into organizational structure compound since these aspects behave like the atoms of a chemical compound, both firmly bonding to one another (collaboration) and retaining their identities and distinctive properties (flexibility and freedom).

Most medical staff at the hospitals H3, H5, and H6 voiced that the notion of technological innovation pertained to upper middle management level upwards who are decision makers. Observations and interviews demonstrated that doctors and nurses outside management functions were reluctant to touch constraints such as time, budget, and innovation outcomes as a doctor at the hospital H6 expressed: "I don't think I can work innovatively if I find around me only constraints."

Also at H6, another doctor even showed negative attitude towards the way the hospital promoted and implemented technological innovation: "I have some technologically innovative ideas that can be applicable in this hospital, but I also know that it is none of my business. Ideas for the most part come from top management."

Freedom as a core value in stimulating innovation is manifested in autonomy, empowerment and decision making. This implies that personnel are free to achieve their goals in an automatic way within guidelines (described as "chaos within guidelines" by Judge *et al.* (1997)). Personnel therefore have the freedom to do their work and determine procedures as they see fit within the guidelines provided. Management should also believe in personnel and encourage them to be more innovative by allowing them more freedom, in other words empowering them instead of controlling them (Judge *et al.*, 1997, p. 76).

The literature survey revealed that the degree to which employees have freedom and authority to participate in decision making in solving problems determines the level of empowerment, which is positively related to the level of innovation in an organisation (Arad *et al.*, 1997, p. 4).

The speed of decision making can also promote or inhibit innovation. Tushman and O'Reilly (1997, p. 117) claim that cultural norms which lead to quick decision making (e.g. that speed is important and that the work rate is fast) should promote the implementation of innovation.

It was the case in several hospitals that there were a number of individual innovators but only a few innovative bondings. It could be found that there were varying speeds of technology innovation adoption in different departments in the hospitals as encountered at the hospital H3: "We have been applying this hospital management software for 6 months, but find it does not work well. Administration department and clinical departments are reluctant to collaborate."

On the contrary, the director at the hospital H4 encouraged collaboration in innovative groups: "When an individual comes up with a new idea on technological change, she or he automatically becomes project manager and leader of innovation team. She or he is also entitled to invite team members she or he can work well with. Normally the idea generator opens door for participants and this culture continues."

Co-operative teams are identified by some researchers as having an influence on the degree to which innovation take place in organisations. Well-established work teams which allow for diversity and individual talents that complement one another should promote innovation (Arad *et al.*, 1997). Cross-functional teams which encourage social and technical interaction between developers and implementers can improve and promote innovation. Another important aspect is that team members should be able to trust and respect one another, understand one another's perspectives and style of functioning, solve differences of opinion, communicate effectively, be open to new ideas and question new ideas. Such effective teamwork is partly based on team members' skills and abilities and partly on the shared values within the group (e.g. values about shared trust and solving differences) (Tushman and O'Reilly, 1997).

Among the researched hospitals, the hospitals H1, H2, H4, H7 and H8 proved to be more successful in technological innovation adoption due to rich communication between top management and medical staff as well as between individuals and heads of departments. Interviews with medical staff of the other hospitals revealed that it was lack of communication, especially trust, that led to hesitation and even apprehension of new idea generation.

An organisational culture that supports open and transparent communication, based on trust, will have a positive influence on promoting innovation (Barret, 1997; Robbins, 1996). Teaching personnel that disagreement is acceptable, since it offers the opportunity to expose paradoxes, conflict and dilemmas, can promote openness in communication. At the same time personnel must feel emotionally safe to be able to act innovatively and should therefore be able to trust one another, which in turn is promoted by open communication. An open-door communication policy, including open communication between individuals, teams and departments to gain new perspectives, is therefore necessary to create a culture supportive of innovation (Frohman and Pascarella, 1990; Samaha, 1996).

Third Dimension: Support mechanisms

Observations and interviews showed that most hospitals announced their recognition of innovations at meetings of hospital and department levels. The hospitals H2, H4 and H7 even put on bulletin-boards names of individuals and teams who made innovation contributions. In parallel to innovation recognition, individuals and teams received adequate rewards as shown in desk research data and through interviews. However, interviews also revealed that most doctors paid more attention to mental rewards than physical rewards, as expressed by some doctors at the hospital H4: "We don't learn and apply new technology for money, but for patients and for our knowledge. However, the director says we deserve a pay rise or bonus for our contribution to the patients and the hospital. He even says we need to knock the door of his office and ask for this if he forgets it."

Interviews disclosed that a few hospitals didn't provide adequate resources for innovation adoption. However, the contrast could be found at H4: "When we manage to convince the director about our innovation project, his question always is what the best support is you need from the hospital for the success of the project."

Most hospitals solely provided technologies required for innovation, but failed to spot an essential element of innovation – creative and innovative people. Such hospitals as H2, H4, and H7 even set up alliances with innovative experts from Medical Universities such as Dr. T., who is famous for information technology innovation in medicine.

Support mechanisms should be present in the culture of an organisation to create an environment that will promote innovation. The literature study revealed that rewards and recognition and the availability of resources, namely time, information technology and innovative people, are mechanisms that play this role.

Behaviour that is rewarded reflects the values of an organisation. If innovative behaviour is rewarded, it will become the general, dominant way of behaving (Arad *et al.*, 1997). The problem is that many organisations hope that personnel will think more innovatively and take risks, but they are rewarded for well-proven, trusted methods and fault-free work. Personnel should also be rewarded for risk taking, experimenting and generating ideas. Intrinsic rewards like increased autonomy and improved opportunities for personal and professional growth may support the innovation process (Shattow, 1996; Amabile and Gryskiewicz (1987) and Kanter (1983) cited in Arad *et al.*, 1997). It is also important to reward individuals as well as teams (Tushman and O'Reilly, 1997). Management should be sensitive to which methods of reward and recognition will inspire personnel in their specific organisation to be more innovative (Tushman and O'Reilly, 1997).

In some hospitals, interviews disclosed that organizational culture didn't favor creativity and innovation as reflected in individual attitudes towards innovation: "We don't want to make any change, because it means we have more work to do."

An organisational culture that promotes innovation should allow employees time to think innovatively and experiment (Shattow, 1996). In organisations where innovation are encouraged, personnel are, for example, allowed to spend 15 percent of their time on generating new ideas and working on their favourite projects. Emphasis on productivity and downsizing, which leads to more pressure on employees to work harder, is not conducive to innovation in organisation (Filipeczak, 1997).

Observations and interviews showed that most individuals took advantage of information technology to collaborate. The hospitals H1, H4 and H8 even set up videoconferencing for discussion with regional or overseas experts in the specific field of technology.

Information technology as a support mechanism is an important resource for successful innovation (Shattow, 1996). In organisations where it is part of the culture to use computer technology such as the Internet and intranet to communicate and exchange ideas, the chances of innovation taking place are improved (Bresnahan, 1997; Khalil, 1996).

Fourth Dimension: Innovation Stimulators

Values and norms that encourage innovation manifest themselves in specific behavioural forms that promote or inhibit innovation.

Doctors and nurses at the hospitals H1, H2, H4 and H7 reported that they were encouraged by top management to improve medical treatment quality, particularly by means of technological innovation. As a doctor at H4 stated: "The director always says you can call me any time especially in two cases: you find out a problem in this hospital or you have a new idea."

However, interviews also indicated that several departments of the hospitals, especially finance departments, appeared not to support an individual's or a team's new idea if they once failed, as explained by a few doctors at the hospitals H3 and H6: "We just do the way we do now. We used to make change and failed. And the management does not seem to back us when we suggest a change."

The way in which mistakes are handled in organisations will determine whether personnel feel free to act innovatively. Mistakes can be ignored, covered up, used to punish someone or perceived as a learning opportunity (Brodtrick, 1997). Tolerance of mistakes is an essential element in the development of an organisational culture that promotes innovation. Successful organisations reward success and acknowledge or celebrate failures, for example, by creating opportunities to openly discuss and learn from mistakes (Tushman and O'Reilly, 1997).

A few doctors at the hospitals H3 and H6 explained: "Our technological innovation, to some extent, improved treatment quality; however, it did not yield the margin the finance managers expected. Looking upon this as a risk, we are reluctant to try another new idea."

Some doctors even admitted that they didn't know how to deal with finance managers' questions such as "Do your team think this new technology will produce more profit than the current technology?" However, as doctors explained, they came up with this new idea just because they found this new technology could bring patients better treatment.

Taking risks and experimenting are behaviours that are associated with innovation. A culture in which too many management controls are applied will inhibit risk taking and consequently innovation (Judge *et al.*, 1997). The assumption that risks may be taken as long as they do not harm the organisation will not encourage personnel to be innovative by experimenting and taking risks (Filipcack, 1997, p. 37). It is important that a balance should be reached in the degree to which risk taking is allowed. This can be achieved by spelling out expected results, assigning the responsibility of monitoring and measuring risk taking to someone in the organisation, creating a tolerant atmosphere in which mistakes are accepted as part of taking the initiative, regarding mistakes as learning experiences, and assuming that there is a fair chance of risks being successful.

Except the hospital H4, researched hospitals didn't show apparent competitiveness for technological innovation. H4's director always encouraged departments: "Why don't you try to put your names, your departments' names on the bulletin-boards of technological innovators so that everybody, especially your patients, can recognize?" Medical staff at H4 added that as they brought to the meetings the conflicts between departments, the director always challenged: "If your two departments seem to compete for the similar technological innovation, why don't you make alliance with each other? Why don't your department and finance department sit back and compromise? Why does finance department not look at less physical profit and more medical benefit whereas department of cardiology tries to reduce the down time through use of this technology to produce more profit?"

Research by Nystrom (1990) indicates that the most innovative departments in an organisation regard competitiveness as an important aspect of their culture. According to Read (1996, p. 226), competitiveness in organisations has shifted to the creation and assimilation of knowledge. In creating a culture of competitiveness managers should reach out to internal and external knowledge, encourage debating of ideas, create an environment in which constructive conflict will lead to information flow, support projects based on information flow and actively manage the choice of organisational design.

Tolerance of conflict and handling conflict constructively are values that support innovative behaviour in organisations (Robbins, 1997; Judge *et al.*, 1997). When there is conflict between different ideas, perceptions and ways in which information is processed and evaluated, the process of handling conflict should be handled constructively to promote innovation. Understanding different individual thinking styles and training personnel in the process of constructive confrontation will create a culture supportive of innovation.

Four dimensions of organizational culture that influence technological innovation adoption are summarized in a model in Figure 2.

5. Concluding remarks

The model grounded in this research highlights the dimensions of organizational culture that play a role in promoting and implementing technological innovation. The research examined how the patterns between a

dimension of organizational culture and medical staff's technological innovative behaviors emerge. It also demonstrated that the way in which these dimensions, namely cause vision, organizational structure, support mechanisms, and innovation stimulators, operate will either support or inhibit technological innovation. The eight-case research design overcame the disadvantages of studying too wide a variety of health-care industries and technologies, yet provided sufficient diversity to explore patterns among hospitals with different organizational cultures and technological innovative capacities.

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Table 1. Overview of the sample

Hospital code	Number of employees	Level of technology	Performance
H1	164	H	M
H2	262	M	H
H3	115	L	L
H4	328	H	H
H5	197	M	M
H6	131	L	M
H7	280	M	H
H8	175	H	M

Key: H = High, M = Medium, L = Low

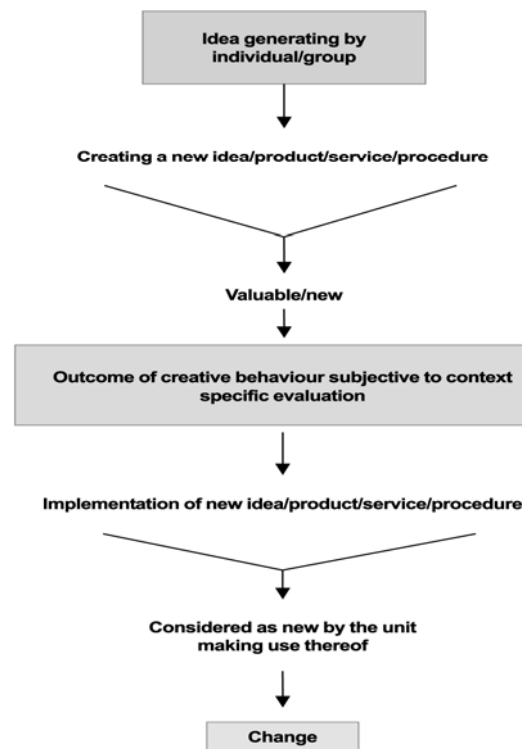


Figure 1. Defining innovation

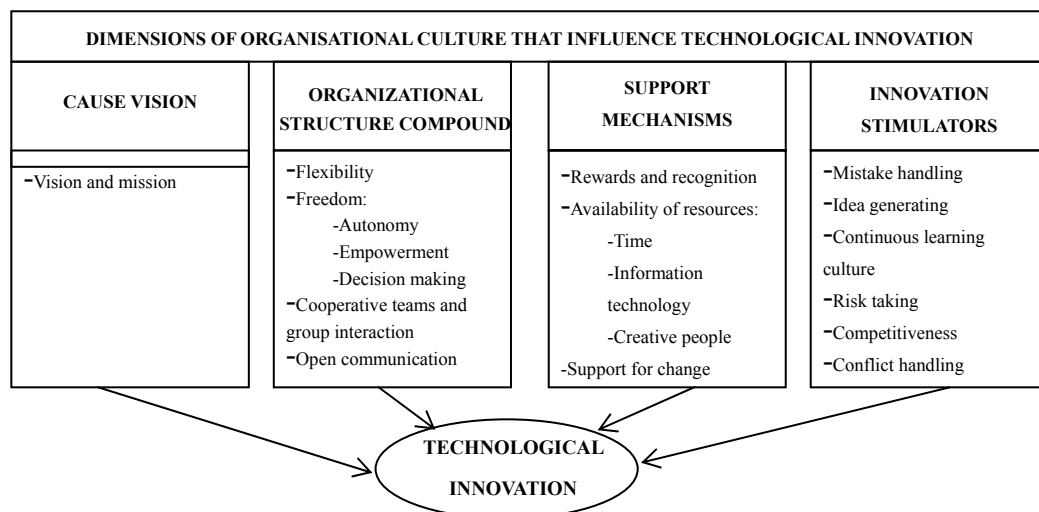


Figure 2. Influence of organizational culture on technological innovation

How Will Market Orientation and External Environment Influence the Performance among SMEs in the Agro-Food Sector in Malaysia?

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Abstract

Many researchers have explored the relationship between market orientation and firm performance in manufacturing and services industries but such studies in agro-food SMEs are scarce. Previous research conducted has conceptually and empirically supported the notion that market orientation independently or collectively have positive correlations with the business performance of organization (such as Narver and Slater, 1990; Jaworski and Kohli, 1993; Lee and Peterson, 2000). The aim of this paper is to examine the marketing practices and the marketing orientation-business performance relationship among SMEs in agri-food sector in Malaysia. This study also investigated the role of the external environment in the market orientation-performance linkage. From an analysis of a survey data of 102 agri-food organizations, three dimensions namely customer-competitor orientation, inter-functional coordination and information dissemination extracted from factor analysis result of market orientation. The study revealed that customer-competitor orientation and information dissemination were positively related to business performance. In terms of the role of external environment, two dimensions produced by factor analysis, market-technology turbulence and competitive intensity did not moderate the relationship between market orientation and business performance. Findings are discussed and implications are highlighted.

Keywords: Market Orientation, External Environment, Business Performance

1. Introduction

Market orientation is a popular term used by marketers as indicator of the extent to which organisation implements its marketing concept. A market-oriented organisation has a superior capability in achieving higher profits compared to non-market oriented organisation (Agarwal et al., 2003). A great deal of attention has been focused on the concept of market orientation in the literature since the topic was re-ignited by Kohli and Jaworski (1990) and Narver and Slater (1990). The link between market orientation and company performance is widely highlighted and contended that market orientation is important to firms because of its positive association with performance. Some studies find that market orientation associate positively with business performance (Pelham, 1997; Pelham & Wilson, 1996; Pitt et al., 1996; Pulendran et al., 2000; Ruekert, 1992; Kara et al., 2005; Kirca et al., 2005; Sin et al., 2005; Kaynak and Kara 2004; Verhees and Meulenbergh 2004; Langerak 2003; Shergill and Nargundkar, 2005). On the other hand, several studies do not find significant direct effect or weak relationships between market orientation and business performance (Diamantopoulos & Hart, 1993; Greenley, 1995; Han et al., 1998; Siguaw et al., 1998, Nwokah, 2008, Appiah-Adu, 1998, Bhuian (1997) and Sargeant and Mohamad, 1999).

Based on the findings there is a need to assess the hypothesized relationship between market orientation and business performance in other business environment. Moreover, the majority of studies results from samples of heterogeneous firms across several industrial sectors but are not industry specific. According to Kimery and Rinehart (1998), marketing concept may be better implemented through a new conceptualization, where the focus will be on customers, competitors, suppliers and determining of the roles play in influencing business performance within industries. In addition to the lack of industry specific focus, there has been limited research outside of Western cultures (such as Narver and Slater, 1990; Jaworski and Kohli, 1993; Greenley, 1995) which the findings may not apply or suitable to the Asia context. There are very few attempts to address this limitation in the Asian perspective (e.g Aziz and Yasin, 2004; Kwon and Hu, 2000; Chan and Ellis, 1998). Matsuno and Mentzer (2000) and Han et al. (1998) explain that the positive performance impact by applying market orientation has accumulated but there is the need to investigate more closely the potential moderators of the market orientation-performance relationship. Diamantopoulos and Hart (1993) conclude that the market orientation-business performance relationship is situation specific and subject to several moderating influences.

While market orientation and their antecedents and consequences have been investigated within, industrialized western business environments and their applicability and generalizability in a non-western context have not been well researched. Unfortunately, only few studies have investigated the potential moderating effects of external

environment on the business performance influence of market orientation. There is also a need to conduct a study on food and beverage oriented firms by obtaining perceptions from multiple respondents from firms, not just focus on the management assessment only (Agarwal et al., 2003). This study attempts to fill the gaps in the literature. Moreover, since the majority of existing studies have concentrated on the manufacturing sectors, this study extends the existing research to food and beverages industry namely local based companies in Malaysia.

The above underpins the importance of empirical examination of the concepts across regional boundaries and the need for Southeast Asia related perspective. By understanding and applying the concept of marketing orientation within the context of the food and beverages industry, the study will identify the role of marketing in the related organisations and its impact (if any) on food and beverage organizations. This study hopes to contribute to the understanding of market orientation practices in the food and beverage industry in developing country through the investigating of the moderating role of external environment/forces on market orientation - performance relationship. The study seeks to contribute to the knowledge concerning marketing orientation and business performance by applying the established model to food and beverage organisations in Malaysia. Anwar (2008) suggests that more research is needed to examine market orientation, the different kinds of effects the orientation may have over different periods of time and services. More over organization cannot assumed that market orientation in one company or culture work equally well in other countries with differentiation business cultures.

The primary purpose of the study is to contribute to the knowledge concerning market orientation and performance-competency concept by applying the established market orientation model in the food and beverage industry in Malaysia. The study also incorporated external environment as moderator on the business performance-competency effects of market orientation.

This study attempt to contribute to the literature by addressing the following research questions:

- What is the state of market orientation among Malaysian smaller agro-food companies?
- Do market orientation factors influence the business performance in smaller agro-food companies?
- Do environmental factors moderate the effects of market orientation on the business performance in smaller agro-food companies?

2. Literature Review

Kohli and Jaworski (1990) proposed the label of 'market-orientation' appears to be preferable if compared to 'marketing orientation'. Shapiro (1988) proposed market-orientation as the participation of variety of departments rather than exclusively a concern of the marketing function in generating, disseminating and taking actions in response to market intelligence. Since 'market driven' and 'customer oriented' are treated in the same construct (Shapiro 1988), the label also is seen as focusing to markets which includes customers and other forces affecting the markets (Kohli & Jaworski 1990). Consistent with the above arguments, Kohli and Jaworski (1990) proposed three elements of market orientation which are (1) intelligence generation, (2) intelligence dissemination, and (3) responsiveness.

In intelligence generation, Kohli and Jaworski (1990) suggested market intelligence as the starting point of market orientation. Thus, analysis on exogenous factors affecting customer needs and preferences such as regulation, technology, competitors and other environmental forces is included in market intelligence. Such environmental scanning activities are included in market intelligence generation. Customers are also need to be properly identified. Besides customer surveys, market intelligence can be generated through formal and informal means (e.g., discussion with trade partners) in which sometimes involve in primary data collection or consulting secondary data sources.

The importance of market intelligence dissemination is to provide 'a shared basis for concerted actions' by different departments. One form of intelligence dissemination within an organization is through horizontal communication (Ziethemel, 1996). Finally, responsiveness is the action taken in response to the generation and dissemination of market intelligence. Findings by Kohli and Jaworski (1990) suggest that market intelligence and responsiveness includes target market selection, "designing and offering products/services that cater to their current and anticipated needs", and product promotion in getting favourable end-customer response.

A high level of market orientation is theorized to lead to a high level of organizational performance. A number of empirical studies test the relationship of market orientation and firms' performance. Some studies find that market orientation associate positively with business performance (e.g., Jaworski & Kohli, 1993; Pelham, 1997; Pelham & Wilson, 1996; Pitt et al., 1996; Pulendran et al., 2000; Ruekert, 1992; Kara et al., 2005; Kirca et al., 2005; Sin et al. 2005; Kaynak and Kara 2004; Verhees and Meulenbergh 2004; Langerak 2003; Slater and Narver 1994; Shergill and Nargundkar, 2005).

The external environment in which organizations operate is complex and constantly changing; a significant characteristic of the external environment is competition (Wood *et al.*, 2000). Organizations that recognize the presence and intensity of competition have a greater tendency to seek out information about customers for the purpose of evaluation and to use such information to their advantage (Slater and Narver, 1994). Recognition of the threat from competition drives organizations to look to their customers for better ways to meet their needs, wants, and thereby enhances organizational performance (Wood and Bhuian, 1993). Accordingly, when competition is perceived as a threat by the organization, there is a greater tendency to adopt a market orientation (Wood *et al.*, 2000).

The perception of demand faced by the organization as under or over the capacity to serve also influences organizations' search for information. Demand under the organization's capacity to serve is a situation where the current demand for the organization's goods/services is below the desired demand level; demand over the organization's capacity to serve is where the current demand for the organization's goods/services is above the desired demand level or, more particularly, above the level that can be served (Wood *et al.*, 2000). In theory, organizations faced with either under or over demand situations tend to seek out information about customers and modify their market offerings based on consumer data in order to improve or rectify the situation (Bhuian, 1992; Wood and Bhuian, 1993).

Given the disparity of findings, others have suggests that the relationship between market orientation and performance may be moderated by additional variables such as market or technological turbulence (Greenley, 1995; Han *et al.*, 1998) and competitive intensity (Homburg and Pflesser, 2000; Jaworski and Kohli, 1993). This is strongly supported by the study conducted by Ellis (2006) who studied on a Meta analysis of market orientation and performance. The variations in results across the different regions, combined with the significant Q-statistics for the overall sample, Ellis suggested that moderators influence the market orientation-performance relationship.

There has been a long tradition of support for the assumption that environmental factors influence the effectiveness of organizational variables (Appiah-Adu, 1998). Indeed, several studies have investigated the association between different environmental factors and established the effects of moderating influences on organizational variables (e.g., Slater and Narver (1994; Jaworski and Kohli, 1993; Greenley, 1995 and Han *et al.*, 1998). Researchers have argued that firms should monitor their external environment when considering the development of a strong market-oriented culture (Kohli and Jaworski, 1990). To determine the influence of the external environment on market orientation in transition economies, Golden *et al.* (1995) examined four factors: demand changes, product obsolescence, competitive pressures and product technology. These variables appear to mirror, respectively, four external factors, namely market growth=demand, market turbulence, competitive intensity and technological turbulence, which were identified as potential moderators of the market orientation-performance link by Kohli and Jaworski (1990).

3. Research Model and Hypotheses

Figure 1 shows the research model of this study. The framework assumes that market orientation has a direct and indirect link with business performance. This study also aims to determine the influence of external environment on the relationship between market orientation and business performance.

The literature seems to suggest that market-oriented firms are committed to deliver superior value to customers in order to achieve marketing competency. In general, previous studies have found a positive relationship between market orientation and business performance and that the firms are better of than their competitors in terms of their market competency (Narver & Slater, 1990; Pelham & Wilson, 1996). In the context of exporting firms' performance, Prasad, Ramamurthy, & Naidu, 2001) also found that market orientation has a positive influence on marketing competency.

The possibility of a moderating effect is consistent with a long tradition of support for the theory that environment moderates the effectiveness of organizational characteristics. According to Slater and Narver (1994), the competitive environment might affect the market orientation-performance relationship. Day and Wensley (1988) suggest that the competitive environment (the number and power of competitors) could affect the necessary focus of the intelligence generation activity within a given magnitude of market orientation. Kohli and Jaworski (1990) propose that the degree of market orientation is influenced by the market environment (i.e., market turbulence, competitive intensity, and technological turbulence), and two factors (supply-side factors and demand-side factors) moderate the relationship between market orientation and business performance.

The study suggests the following hypotheses are based on the factor analysis results:

H1 Customer-competitor orientation (a), inter-functional coordination (b) and information dissemination (c) is positively related to business performance.

H2 The positive relationship between customer-competitor orientation (a), inter-functional coordination (b) and information dissemination (c) is moderated by market and technology turbulence.

H3 The positive relationship between customer-competitor orientation (a), inter-functional coordination (b) and information dissemination (c) is moderated by competitive intensity.

4. Methodology

4.1 Research Design

The data used for this research was collected from the survey of 300 Malaysian agri-food organizations. The organizations were randomly selected from Malaysia Food and Beverage Manufacturers Directory. A total of 102 organizations completed the surveys, yielding a usable response rate of 34%. Since the main objective of this study is to clarify the domain constructs, the unit of analysis is conducted at the organizational level. The top management or the senior executives' perceptions are regarded as the main source of information because they are directly responsible for planning and management of the company. Self-administered questionnaires were distributed to the managers of the selected agri-food companies.

The data collection instrument is a structured questionnaire, which was first developed and pre-tested among a small group of respondents, who are academics and have significant expertise in marketing and financial services. The questionnaire contains two parts: Part I deal with the firm's perception of market orientation. These measurements were adopted from Narver and Slater's (1990). Ten items mainly adopted from Jaworski and Kohli (1993) measured external environment. All the items were measured using six-point Likert scale items with anchor points 1 = strongly disagree and 6 = strongly agree.

The business performance was measured using subjective approach and Dess and Robinson (1984) add that this approach is commonly used in research when it is impossible to obtain data (e.g. Greenlay, 1995; Slater and Narver, 1994). This approach consisted of asking respondents for their assessment of their company's performance competency. Miles and Snow (1978) explain that competency refers to an assessment of how well or poorly firms perform marketing related activities compared with their competitors.

Previous studies (e.g. Robinson and Pearce, 1988; Venkatraman and Ramanujam, 1986) that using both approaches subjective and objective measures found that subjective approaches were closely correlated with objective measures. It was measured using a 6-point Likert scale measured on a 1= well below average to 6 = well above average, consisting of 10 items borrowed from Prasad et al. (2001), Jaworski and Kohli (1993) and Slater and Narver (1994). Most of the above items were adapted and modified to make items suitable for the study. The 6-point Likert scale was used to anchor each item statement was chosen in order to avoid the clustering of responses at the neutral point and remain non-committal (Quee, 2002).

Part II obtains information on the firms' characteristics in terms of number of employees, age, ownership, percentage of employment in market, market area responded, decision making orientation etc.

4.2 Measures

In order to ascertain whether the measures retained construct validity (i.e. measure what they are supposed to) an exploratory factor analysis using principal components and varimax rotation technique was conducted to examine the underlying dimension of market orientation and market competency. In determining the factor/s, common decision rules employed in empirical research were applied: (i) minimum eigenvalue of 1 (ii) KMO measure of sampling adequacy greater than 0.5 and the Bartlett's test of sphericity should be significant which indicate that the items for consumption factor are appropriate for factor analysis. (iii) minimum factor loading of 0.5 for each indicator variable. The cut-off value of 0.5 and higher is assigned such that only items with loadings of at least 0.50 are retained in order to obtain a power level at 80% at 0.05 significant levels (Hair *et al.*, 1998). Items with loadings exceeding 0.50 on two or more dimensions are removed and have to retest (King and Teo, 1996). (iv) simplicity of factor structure, and (v) exclusion of single item factor structure. v) reliability analysis is carried out to eliminate items that are not strongly related to other items in the construct and construct reliability was assessed using Cronbach's alpha. As suggested by Nunnally (1978), the reliability of a construct between 0.6 and 0.8 is acceptable.

5. Findings and Discussions

5.1 Descriptive Statistic

Table 1 shows the study sample comprises of 102 organizations which vary on such characteristics as company main business, ownership structure, age of company, number of employees, incentive scheme and quality and safety certification.

The results shown in Table 2 indicates the highest score of respondents is on the statement of the company's objectives are driven by customer satisfaction with a mean score of 5.24 followed by the statement that the company is constantly monitor to serve customer needs (5.23) and the company is constantly create value for their customers (5.17). There is a substantial degree of agreement with all the statements.

5.2 Factor Analysis.

Table 3 shows the factor analysis results on market orientation construct resulted in three factors explaining 61.28% of the overall variance. Table 4 shows the factor analysis results on external environment that produced two distinct factors explaining 50% of the overall variance. One of the factors was excluded for further analysis because it has only a single item. Meanwhile, factor analysis conducted on business performance resulted of one significant component with eigenvalue of 3.466 that explained 69.32% of the overall variance.

5.3 Regression Analysis

The regression analysis, the variables were tested significant with ($p < 0.01$) and $F = 6.964$. The regression tests had presented R square of 0.176. Approximately 17.6% variations of business performance can be explained by customer-competitor orientation, inter-functional coordination and information dissemination. The adjusted R^2 value is 0.150. The multiple regression analysis indicates that customer-competitor orientation is positively related to business performance with the beta value of 0.299, significant at $p < 0.05$, 95% degree of confidence. This supported the study done by Day and Wensley (1988), Narver and Slater (1990), emphasized the significance of customers and competitors for business success. Information dissemination also found significant at $p < 0.10$ -a 90% degree of confidence. The beta value of information dissemination ($\beta = 0.179$) indicates that the independent variable is positively related to business performance. Inter-functional coordination was found not to be significant. Hence, Hypothesis 1a and 1c was accepted at $p < 0.05$ and $p < 0.10$ respectively. Hypothesis 1b was rejected.

Previous studies have shown that organizations that employed a market orientation approach relatively achieve a better business performance. The most significant predictor of the performance measure in this study is customer and competitor orientation followed by information dissemination. The study's result validate the other findings in the literature as those Atuahene-Gima, 1996; Dend and Dart, 1994; Deshpande et al., 1993; Egeren and O'Connor, 1998; Horng and Chen, 1998; Jaworski and Kohli, 1993; Kumar et al 1998; Kara et al., 2005; Kaynak and Kara 2004; Kirca et al, 2005; Langerak 2003; Matear et al, 2002. Megicks and Warnaby, 2008; Narver and Slater, 1990; Ngai and Ellis, 1998; Pelham, 1997; Pelham & Wilson, 1996; Pitt et al., 1996; Pulendran et al., 2000; Raju et al, 1995; Ruekert, 1992; Sin et al. 2005; Slater and Narver 1994 and Verhees and Meulenberg 2004. This implies that organizations need to be customer and competitor oriented and need to disseminate information to perform well in business.

This study investigates the role of external environments integration in the linkage between market orientation variables and business performance, labelled as market-technology turbulence and competitive intensity. The market-technology turbulence did not improve the strength of the influence of customer-competitor orientation and information dissemination toward business performance. Therefore, hypothesis 2a and 2c were not supported by the present study as shown in Table 5.

Table 6 shows the hierarchical regression result, the competitive intensity as a moderator in the relationship between customer & competitor orientation, information dissemination and business performance. The hierarchical regression tested hypotheses 3a, and 3c. The hierarchical regression shows that competitive intensity did not moderate the relationship between both market orientation variables and business performance Thus hypotheses 3a and 3c were rejected. The findings of our study do not support the study of Day and Wensley (1988), Doyle and Wong (1996), Gray et al. (1998), Greenley 1995), Narver and Slater (1994).

This study has contributed to our understanding of the interplay between market orientation and business performance with investigating on the role of external environment. Our findings manifest that business performance is affected by customer-competitor orientation and information dissemination. The study also found that market-technology turbulence and competitive-intensity do not moderate the relationship between customer-competitor orientation and business performance as well as the relationship between information dissemination and business performance.

In managerial decision-making, it is important for the decision should proactively seek new ideas and ability to consider options and select an appropriate one. Which this involves motivation in evaluating the different options in relation to company operation, creativity is assessing priorities, eliminating irrelevant or incompatible ideas. In enhancing company's performance, decision making should allow for changes in the market place with managers keeping open minded, flexible approach to solving problems and ready to adapt to market and customers

expectations. Management must consistently motivate the team players in the firm so that they will analyse customers' needs and seek ways to satisfy them. Besides that, try to adapt the products to these needs and react to competitors' actions and responses. The management team also should collaborate with the firm's workers and share information about customers and competitors that direct them to firm's goals.

The competences of knowledge and experience will need to be built on and expanded to develop distinctive expertise using motivation, communication, coordination, and leadership. Management should be able to demonstrate responsibility by their proactive behaviour and a positive outlook in searching for better way of carrying out task and delivery of marketing activity such as through the usage of the Internet to gain market information. Understand how employees can create customer needs, the communication from customer-staff-management decision makers should be practiced in the firm in allowing and ensuring firm's customers have relevant and necessary information for product consumption. The main factor, which is significantly related to business performance are sharing information about competitor and rapid response to competitor actions. This will definitely need the management to focus on maintaining communication with all functional units/departments in the organization and gathering information about competitors and customers. The management needs to recognize and compile useful information and must have the ability to interpret and draw useful and timely conclusions from competitor information. At the same time, ability to learn from mistakes is another important aspect in the development of business performance.

6. Conclusion

This study establishes the importance of market orientation for smaller agro-food organizations in order to obtain a sustainable competitive advantage by relating the degree of market orientation to the extent of success in achieving critical performance outcomes. This provides relevant and interesting insights to the understanding of the impacts of market orientation on business performance in a Southeast Asia business environment particularly in Malaysia. The implication for practicing managers is clear. An awareness of changes in the marketplace such as consumer perception and competitors' activity in order the firms can create product differentiation and carve out new market. Management commitment should involve the whole firm in building long-term commitment through activities such as inspiring and enthusing staff, feeding them with appropriate information and obtaining feedback in order to achieve better company's performance.

Implementation of a market orientation leads to improved financial and marketing performance. In terms of future research, remains a lot to be done in understanding the importance of agro-food companies in Asia. The limited attention given to marketing and business performance studies in this sector, provide ample scope for further study. Future studies should improve the model by incorporating other relevant independent variables and dependent variables. Research should seek out and examine various contexts where the meaning and conceptualization of market orientation might differ from each other.

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Table 1. Description of Study Sample

	Frequency	Percentage
<u>Role in Industry</u>		
Manufacturer	79	77.5
Exporter	4	3.9
Wholesaler	4	3.9
Supplier	6	5.9
Distributor	9	8.8
<u>Main Business</u>		
Snack food	39	38.2
Sauces/spices	12	11.8
Dairy products	4	3.9
Cereal products	1	1.0
Frozen food	16	15.7
Beverage	13	12.7
Other	17	16.7
<u>Ownership Structure</u>		
Independent owned	75	73.5
Subsidiary of local company	14	13.7
Subsidiary of foreign company	3	2.9
Joint venture of with local company	3	2.9
Joint venture of with foreign company	4	3.9
Other	3	2.9
<u>% marketing experienced employees</u>		
0-20%	38	37.3
21-40%	26	25.5
41-60%	21	20.6
61-80%	15	14.7
81-100%	2	2.0
<u>Concern in food manufacturing</u>		
quality	81	79.4
low fat	5	4.9
variety of flavours	7	6.9
ingredients	4	3.9
price	2	2.0
packaging	1	1.0
others	2	2.0

<u>Age of Company</u>		
Less than 5 years	30	29.4
5-9 years	21	20.6
10-14 years	16	15.7
15-24 years	16	15.7
25 years and above	19	18.6
<u>No of Employees</u>		
Less than 5	17	16.7
5-10	21	20.6
11-24	19	18.6
26-50	18	17.6
Over 50	27	26.5
<u>Incentive</u>		
Export incentive	9	8.8
Research & Development incentive	12	11.8
Training incentive	29	28.4
General incentive	9	8.8
Other	40	39.2
None	3	2.9
<u>Relationship with government agencies</u>		
SMIDEC	25	24.5
MARA	11	10.8
FAMA	10	9.8
MITI	5	4.9
MARDI	10	9.8
Ministry of Agriculture	7	6.9
Others	27	26.5
None	7	6.9
<u>Quality & Safety Certification</u>		
Good manufacturing practice (GMP)	14	13.7
HACCP	16	15.7
ISO	45	44.1
JAKIM (halal)	16	15.7
Other	2	2.0
None	9	8.8

Table 2. Descriptive statistic for market orientation

Items	Mean	Standard Deviation
Business Strategy to increase customer value	4.99	0.814
Frequent measure customer satisfaction	4.94	0.877
Competitive advantage base on customer's need	4.85	0.948
Respond to competitive actions	4.85	0.883
Objective are driven by customer satisfaction	5.24	0.869
Monitor customer needs	5.23	0.743
Business functions are integrated	4.96	0.807
After sale service	4.89	0.964
Management discuss competitor strategy	4.75	0.961
Share resources with business units	4.61	1.016
Opportunities for competitive advantage	4.93	0.859
Create value for customers	5.17	0.746
Customer info freely communicated	4.39	1.351
Share competitor info	4.72	1.120

Table 3. Factor Analysis for Market Orientation

Variables	F1	F2	F3
<u>Factor 1: Customer & Competitor Orientation</u>			
Business strategy to increase customer value	0.784		
Frequent measure customer satisfaction	0.745		
Competitive advantage base on customer's need	0.692		
Respond to competitive actions	0.659		
Objective are driven by customer satisfaction	0.633		
Monitor customer needs	0.624		
Business functions are integrated	0.616		
After sale service	0.500		
Management discuss competitor strategy	0.549		
<u>Factor 2: Inter-functional Coordination</u>			
Share resources with business units		0.832	
Opportunities for competitive advantage		0.623	
Create value for customers		0.623	
<u>Factor 3: Information Dissemination</u>			
Customer info freely communicated			0.803
Share competitor info			0.755
Eigenvalue	4.295	2.248	2.037
Percentage variance (Cumulative :61.283%)	30.681	16.055	14.547
Cronbach Alpha (Reliability)	0.885	0.719	0.600
KMO: 0.868			

Table 4. Factor Analysis for External Environment

Variables	F1	F2
<u>Factor 1: Market and technology turbulence</u>		
Customers' product preference change quite a bit over time	0.818	
Our customers tend to look for new varieties of food all the time	0.753	
The technology in our industry is changing rapidly	0.752	
Technology changes provide big opportunities in our industry	0.657	
<u>Factor 2: Competitive Intensity</u>		
We are witnessing demand for our food products from customers who never bought before		
Price competition is common in our industry		0.833
Sometimes our customers are very price sensitive but on other occasions, price is relatively unimportant.		0.657
There are many promotions wars in our industry		0.652
		0.503
Eigenvalue	2.720	2.268
Percentage variance (Cummulative:50%)	27.30	22.70
Cronbach Alpha(Reliability)	0.786	0.670
KMO:0.826		

Table 5. The Moderating Effect of Market & Technology Turbulence on the Relationship between Market Orientation and Business Performance.

Independent Variable	Std beta Model 1	Std beta Model 2	Std beta Model 3
F1	.299	.235*	.477
F3	.179	.191*	.175
Moderating variable			
EE1		.162	-1.186
EE2			
Interaction Terms			
F1xEE1			-.507
F3xEE1			.013
R ²	.176	.198	.241
Adjusted R ²	.150	.165	.184
R ² change	.176	.022	.043
F change	6.964	2.695	1.763
Sig. F change	0.000	0.104	0.160

Note** p<0.05, *p<0.10

F1= Customer and competitor orientation

F3= Information dissemination

EE1= Market and technology turbulence

BF=Business Performance

Table 6. The Moderating Effect of Competitive Intensity on the Relationship between Market Orientation and Business Performance.

Independent Variable	Std beta Model 1	Std beta Model 2	Std beta Model 3
F1	.299**	.251**	.166
F3	.179*	.177*	.076
Moderating variable			
EE2		.183*	-.150
Interaction Terms			
F1xEE2			.152
F3xEE2			.132
R ²	.176	.202	.204
Adjusted R ²	.150	.169	.144
R ² change	.176	.026	.002
F change	6.964	3.218	0.061
Sig. F change	0.000	0.076	0.980

Note** p<0.05, *p<0.10

F1= Customer and competitor orientation

F3= Information dissemination

EE2= Competitive intensity

BP=Business Performance

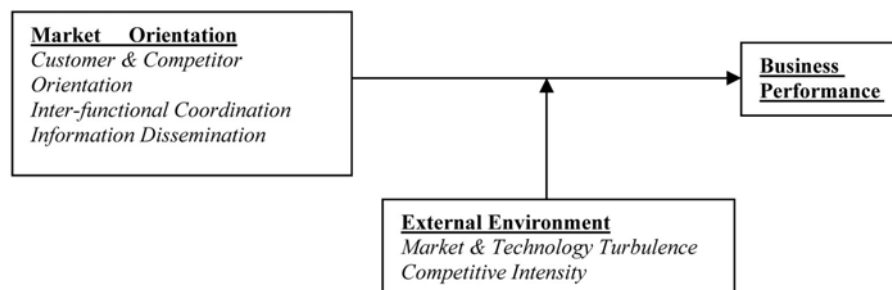


Figure 1. Research Model

Analysis of the International Competitiveness of Chinese Medicine Industry Based on the Diamond Model

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Abstract

The Chinese medicine industry always holds the balance in the Chinese medicine market of China. At present, the medicine industry has gradually formed the special industry system and group. By Porter's "Diamond Model" theory, the international competitive advantages and disadvantages of Chinese medicine industry are analyzed in this article, and corresponding suggestions about the industry development are provided.

Keywords: Chinese medicine, Diamond model, Competitiveness

Chinese medicine is the treasure of Chinese people, with the history of 5000 years. China is always has the name of "Kingdom of Chinese Medicine", and for a long time, there are about 130 countries in the world which import raw materials or patent medicines from China. According to the statistics of Chinese Ministry of Commerce, China has been the biggest country which produces and exports raw materials of medicines in the world, and China could produce about 1500 kinds of chemical medicines and middle medicines, and the total output has exceeded 8 ten thousand tons. Porter's diamond model is used in this article to analyze the international competitiveness of Chinese medicine industry of China, and the result shows that many challenges still exist when enhancing the competitiveness. Relative suggestions will be provided in this article.

1. Diamond model

In 1990, Michael Porter established a new analysis standard about the nation competitiveness in his book of "The Competitive Advantage of Nations", i.e. the "Diamond Model (Porter ME, 1990, P.64-117)". Porter's diamond model was composed by four basic decisive factors and 2 assistant factors (seen in Figure 1). Basic decisive factors include the production factor, the demand condition, the enterprise strategy, structure and competitiveness, and relative and supporting industries. Assistant factors are opportunity and government. These factors influence themselves each other, and compose the dynamic system of analyzing the industry competitive ability.

2. Analysis of the international competitiveness of Chinese medicine industry

2.1 Production factors

2.1.1 Natural resources

The Chinese medicine source of China is very abundant, and according to the statistics of Chinese medicine source survey up to data, the recorded Chinese medicine source amount in China has achieved 12807 (seen in Table 1). Only for 320 usual plant medicine materials, the total content achieves 8.5 million tons, and there are about 5000 kinds of Chinese herbal medicines which could be confirmed. There are over 700 production bases of Chinese medicines in China, and there are about 5 million mu lands to plant Chinese medicines (not including wood-medicines), and the output is about 0.4 million tons each year. Because of special geographical condition of China, the quality of medicines is very high, which could not be exceeded by other countries. At present, except a part of Chinese medicine materials are used to fulfill the domestic demands, quite part of medicine materials is exported. Relatively speaking, the medicine resources in foreign countries are deficient.

In recent years, because of excessive collection and the depravation of biological environment, many breeds of Chinese medicine are quickly reducing or disappearing, and in addition, the planting breeds begun to degenerate because of multiple plantings, and the quality and output of medicines all reduced (Zhu, 2000). According to relative statistics, in nearly 3000 rare and endangered plants, about 60%-70% of them has medicine values, and 168 sorts of plants have been listed in the List of Rare and Endangered Plants under State Protection of China, and 162 sorts of medicine animals were listed in the List of Intense National Protection of Wild Animal of China, where, Linfang, black bear, red deer, Gejie, and other forty kinds of animal significantly reduced, and the resource of muskiness has reduced 70% than 1950s, and the endangered status of tiger bones and rhinoceros horn has significantly influence the market supply of nearly 30 kinds of animal medicines, which are all challenging the development of the Chinese medicine industry of China.

2.1.2 Knowledge resources

At present, China has formed complete Chinese medicine theory system, and about 0.3 million prescriptions of Chinese medicines have been saved. For Chinese medicines, China has abundant products with proprietary intellectual property rights, and in the international market competition, the Chinese medicine industry has the potential advantage to form the proprietary intellectual property rights.

But for a long time, China had not emphasized the intellectual property rights of Chinese medicine, and many knowledge fortunes of Chinese medicine have been lost, and in addition, the current patent system was established to protect chemical medicines by developed countries, and many domains about Chinese medicine could not be protected. For example, some ways of diagnosis such as acupuncture, Qigong, looking, listening, questioning, and feeling the pulse all could not be protected by the Patent Law. And the “herbal medicine” defined by the WHO only included raw materials of plant, and the Patent Law lacked in concrete operation rules for drinking dose, frying dose, and soup dose. On the one hand, developed countries utilized abundant experiences in the intellectual property rights to contest the intellectual property rights of Chinese medicine with China in the name of cooperation and development. On the other hand, they used the intellectual property rights as the weapon to monopolize the fortune of some intellectual property rights of Chinese medicine.

2.1.3 Development of science and technology

At present, most Chinese medicine production enterprises in China are middle and small enterprises which are difficult to realize the production of Chinese medicines with high efficiency and quality, but will waste the resources which have not been utilized reasonably. These enterprises which consume the resource of medicine materials to survive would not pay attention to science and technology, and become the principal part to support the technical innovation of the Chinese medicine research. Many researches and developments either repeat past researches in lower level, or could not form medicines or commodities to bring benefits.

The medicine industry is an industry with technical innovation. In recent years, many developed countries such as US, Japan, and Korea all strengthened the development and investment of traditional medicines, and their scientific research and production have entered into the orbit of modernization. But the Chinese medicine enterprises and academies of China still lack in sufficient investment of R&D, especially for the research of drug nature, the confirmation and abstraction of effective component, and the alteration of new doses. According to the statistics of US PHRMA, in 2003, the R&D charge about medicine in this association achieved 33 billion dollars, 15.6% of the sales, but this proportion in China was only about 1%. In foreign countries, one medicine scientific and research person's charge is about from 125 thousand dollar to 226 thousand dollar each year, but in China, only 5000 dollar to 6000 dollar could be ensured. Low-level R&D investment makes enterprise lack in the extension of new products, and with the competition of foreign chemical medicines and biological medicines, the market share of Chinese medicines could not increase continually. In addition, for the innovation of dose medicine, the traditional doses only include pill, pulvis, electuary, sublimed preparation, and decoction, but good breeds with quick, long, and high efficiency, small toxicity, side-effect, and dosage, and convenient storage, carrying, and taking are still rare, which is far from the popular tendency of international dose forms.

2.1.4 Human resources

Talents are the first condition of the R&D of medicines. Deficient professional talents and weak innovational ability are common problems in the management layer of Chinese medicine enterprises in China. Though up to 2000, there were 30 Chinese medicine colleges and schools, and 14 undergraduate and specialized specialties, and 37000 students, 51 secondary Chinese medicine schools and 29000 students (Zhang, 2007), but comparing with the whole medicine market, the professional talents are still deficient, especially those talents with high and new scientific technologies and innovational spirit, and many pharmacy enterprises have deficient strengths and less R&D investments, and the cultivation of talents are limited, and the innovational ability is weak. At the same time, most Chinese medicine enterprises lack in complete sales network and trained sales group. Above factors largely restrain the development of Chinese medicine industry of China, and seriously influence the production and sale of Chinese medicine (Chen, 2001, P.1-4).

Furthermore, in some specialties, the talents are so deficient, for example, for the medicine plant cultivation and relative subjects, the scientific technology staffs are reducing gradually in various scientific research academies of China, which is directly influencing the research of GAP, and becoming an obstacle in the course of Chinese medicine modernization.

2.2 Demand conditions

2.2.1 International market

The extension of the international market demand has provided extensive stage and space for the development of

the Chinese medicine industry of China. The products of Chinese medicine of China are increasing stably, and many products have exported to 135 countries and regions, and parts of them have entered into the market through the enrollment of international drugs. In 2007, the imports and exports of Chinese medicine products of China achieved 1.18 billion dollar, which was the top year in the history.

But, because of different histories and cultural backgrounds, the western medical theory is different with Chinese medical theory in principle and thinking method. This difference between western culture and eastern culture brings “cultural bulwark” for the internationalization of Chinese medicine which could not be eliminated. At present, Chinese medicine is only legal in a few countries such as Australia and Singapore, and it is still rejected by most European and American countries from the normal medicine, and it lacks in legal status, and only exists by the mode of substitute medicine. And if it enters into these markets by the health-food supplement or the food additive, there are many strict limitations such as heavy metal content, pesticide residuals, toxicity component, and except for many components such as Hg, arsenic, and lead, it could not be marked by the adaptability and medical range of medicines, and it could not be sold in the drugstore, which all will influence the Chinese medicine industry to enhance its international competitiveness.

2.2.2 Domestic market

The quick growth of Chinese population promotes the increase of the drug demand, and from 2003, China had entered into the “old age”, and large old group established the base for the extension of the drug market. The statistical data indicated that there were 72% Chinese consumers who could accept Chinese medicines, and this proportion would be higher in rural regions and old group. In the future, with the development of economy, the enhancement of people’s life level and self-health protection, the development space of the drug market could be enlarged further. In Porter’s national competitive advantage theory, quickly growing domestic demand could strengthen the national competitiveness of the industry, and could encourage manufacturers to introduce science and technology, renovate facilities, build larger and more efficiently workshops (Shi, 2002).

In Jan to May of 2007, the medicine manufacture had completed 214.624 billion Yuan of sale together, where, the sales amounts of the drink-pill of Chinese medicine and the Chinese medicines respectively were 9.342 billion Yuan and 47.661 billion Yuan, comparatively increasing 32.91% and 19.69%, and the whole sale of the industry could keep the quick growth level. The investment circle of some industries in China universally emphasized the industry of Chinese medicine, and many listed companies take the investment of Chinese medicine as the new direction of transformation and extension, and many investments from tobacco, real estate, and daily health product are flowing to the domain of Chinese medicine. Shanghai JAHWA United Co. Ltd, Shanghai Fortune Industrial Co. Ltd, Green-valley Group, successively invested in the industry of Chinese medicine, and Thunis, Haier, and many enterprises begin to extend to the domain of Chinese medicine. Many chemical pharmacy manufacturers such as Shijiazhuang Pharmaceutical Co. Ltd and Shenzhen Neptunus Bioengineering Holdings Co. Ltd also begin to invest and develop Chinese medicines.

2.3 Relative and supporting industries

The industry chain of Chinese medicine industry is very long, and it covers many industries, and the upstream industry is the R&D of new Chinese medicines, the mid-stream industry is the production of Chinese medicine, and the low-stream industry is the circulation of Chinese medicine, which all compose the main chain of the Chinese industry chain. In addition, many suited service systems such as traffic, wrapper, pharmacy machines, and Chinese medicine information consultation also could provide relative services for the development of the Chinese medicine industry, and exert important promotion function.

The production of the Chinese medicinal materials is the key part for the R&D of new Chinese medicine, the clinic application, the production of Chinese preparation, and the foreign and domestic trade and its competitiveness will directly influence the international competitiveness of the Chinese medicine industry. Most upstream industries adopt the mode combining the Chinese medicine manufacturing enterprises with the medicinal materials supply source, and most large medicinal materials bases adopt the mode of cooperation contract, and enterprises would assume main market risk, so farmers’ risk will be reduced, and the large fluctuation of the medicinal materials price could be avoided. The distribution and service of the low-stream industry are the key part, and its organization mode is the lever to win for Chinese medicine enterprises. Therefore, many Chinese medicine enterprises of China have paid more attention to the low-stream industry of the operation flow, i.e. the marketing stage extends to the upstream industry, and established powerful marketing network to win in the market competition.

2.4 Enterprise strategies, structure and competitiveness

2.4.1 Organization and management of enterprises

Chinese medicine production enterprises of China are numerous, dispersive, and small, and the research and

development of the international market is far deficient, and many enterprises could not actively invest in the innovational of technology and products, which is largely different with foreign pharmacy enterprises (Li, 2003, P.48-51).

To implement modernization management, Chinese medicine enterprises of China should compete in the international market, and the standardization of Chinese medicine is the basic and first condition for the modernization and internationalization of Chinese medicine. In many years' management practice, European and American developed countries have established a set of complete, strict, and standard quality control standard including GAP, GCP, GSP, GLP, and GMP. But at present, the standardization of Chinese medicine in China is only in the start. For the source of Chinese medicine, the Chinese medicinal materials planting management criterion was issued in 2002, and it has not been implemented in the whole China. For the making and abstracting technology of Chinese herbal medicines, the standards of only about 70 kinds of Chinese drink medicine have been accomplished, and the abstracting technique of Chinese medicinal materials are not standard, and the control of the product quality has not been perfected. For the quality test of Chinese medicines, most tests are still only in the level of determining the nature and testing individual components. For the evaluation of drug nature, drug effect, and toxicity of Chinese medicines, the domestic GCP and GLP have not been implemented for a long time, and the mutual unity with international current standards only begins, and various experiment data have not been recognized by the international society. It is obvious that China needs to use standardization to promote the modernization of Chinese medicine, and enhance the international competitiveness.

2.4.2 Competitive opponents

Because of the attraction of the development foreground of Chinese medicine industry, many countries such as southeast Asia, Korea, and Japan have adopt modern technology to research Chinese medicines and occupy the international market of Chinese herbal medicine. In the future, the Chinese medicine industry competitors of China will come from three regions (Guo, 2003, P.97-100).

The first regions is US which is the largest country consuming the plant medicines in the world. At present, GNC and other companies have not only international resources, production and development ability, but also large plant medicine groups with sales network. the second region is western Europe, and the countries in this region have the history to use and produce plant medicines, and the enterprises in these countries have large capitals, product development ability and advanced production technology, and they have powerful competitiveness in the international market of herbal medicine. The third region includes Japan and Korea. Their Chinese medicines will impact the Chinese market with the decrease of the custom of Chinese medicine, and their perfect market operation mechanism, marketing strategy, management experience, and advanced technology, will also bring large threats to Chinese medicine enterprises. The yearly total production value of Japanese Chinese medicines has exceeded 100 billion Yen, and many Chinese medicines such as Jiu Xin Wan have successfully occupied the international market. At the same time, Japan is building the base of herbal medicinal materials, and has established large plan of Chinese medicinal materials development. About 100 medicinal materials in the Korean market could be produced in the Korea, and many of them could export to other countries. Only for the ginseng, the sale could achieve 0.2 billion dollar each year for Korea, which is tens of times than Chinese ginseng.

2.5 Opportunities

The first opportunity is the economic globalization. Chinese medicinal materials are the traditional export products of China, and after China joined into WTO, China could attract more foreign capitals, technologies and management experiences, change and enhance traditional industry of Chinese medicinal materials. And the quick enterprise differentiation will create good opportunity for the sale and intensive development of Chinese medicine industry. After China joined into the multilateral trade system, the export environment of Chinese medicinal materials has been largely widened. Many principles such as the most-favored-nation clause, the market admittance, the elimination of "trade bulwark" are also very rare chances for the development of the Chinese medicine industry.

The second opportunity is the tide of returning to the nature and the new demand of healthy. Quick life mode induces many psychological diseases, and the modern medical modern has turned from simple disease treatment to the mode integrating prevention, health protection, treatment, and healing (Me, 2003). In the influence of "returning to the nature", people begin turning to the nature medicinal materials for the prevention and treatment of diseases, and the Chinese herbal medicines with long clinic history. The market capacity of corresponding products of plant raw materials is increasing largely.

The third opportunity is the development of modern science. In recent 20 years, a series of chemical separation

and analysis identification technologies such as molecule biology, biological engineering technology, and micro-electronics technology, and various new filtering technologies have largely strengthened the R&D ability of chemical medicines, and the invention of a series of medicines with high efficiency and minimum content has brought revolutionary change for the research of chemical medicines. These new biological technologies could be used to enhance the effect and veracity of the Chinese medicine treatment, and confirm the gene treatment method of Chinese medicine.

2.6 Government

The government is the factor with important influence. Chinese government has highly emphasized the development of Chinese medicine industry all along, and largely supported this industry. As the main content, the Chinese medicine industry has been listed in the “Eleventh Five-year Plan”, and the modernization of Chinese medicine has been one of important contents of high technology industry. “Developing Chinese herbal medicines and biological medicines” has also been listed in the key works of the strategy of develop-the-west. In addition, to support the R&D of new medicines, in the period of “the Ninth Five-year Plan”, China had established the new medicine selection center, the drug safety evaluation center, and the new medicine clinic base according to international standard. Various local governments also started from the advantages of local resources, and largely develop the industries with special characteristics. At present, the modern Chinese medicine industry chain of China has gradually gone to perfection, and the scale and benefit of Chinese medicine industry enterprise are being enhanced continually. These aspects are all related with the industry support policies of the government.

Of course, the Chinese medicine industry is also limited by many governmental policies. Aiming at various parts of the Chinese medicine industry chain, the government has constituted a series of standard and criterion, such as GAP, GEP, GMP, GCP, GLP, and GSP. These policies put forward higher requests for the Chinese medicine industry, and all Chinese medicine enterprises should actively face the challenge, and continually enhance their own qualities.

3. Conclusions

According to above analyses, following challenges should be emphasized when enhancing the international competitiveness of Chinese medicine industry, (1) incomplete quality standard of Chinese medicine product, (2) different cultural backgrounds, (3) lower technical innovational ability, (4) weak intellectual property rights production, (5) serious technical trade bulwark limitation, (6) Japanese and Korean relative advantage which has been formed in the global natural medicine market, (7) the large impact of foreign Chinese medicines in the domestic market, (8) the problem about the sustainable utilization of Chinese medicine resource.

To enhance the international competitiveness of Chinese medicine industry, following points should be concerned, (1) paying attention to developing the senior breeds and strengthening the standardization and good quality, and building more famous brands, (2) increasing the R&D investment of Chinese medicines and adjusting the planting breeds of Chinese medicines, and enhancing the additive values of products, (3) extending the application range of Chinese medicines and enhance the comprehensive utilization value, (4) strengthening the marketing power and perfecting the circulation channel of medicinal materials, (5) integrating the resources of Chinese medicine industry when necessary, and regrouping Chinese medical enterprises, (6) starting from trademark protection and strengthening the protection of the intellectual property rights of Chinese medicine, (7) perfecting relative supporting industries and suited establishments, (8) strengthening the international communication and development of Chinese medicine culture, and perfecting the standard system which could not only accord with the characteristics of Chinese medicine, but also be accepted by the world.

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Table 1. Statistics of Chinese medicine resources in China

Sort	Kind	Amount
According to sources	Plant	11145
	Animal	1586
	Mineral	80
According to uses	Chinese Traditional Medicines	1200
	National Medicines	4000
	Civil Medicines	7000

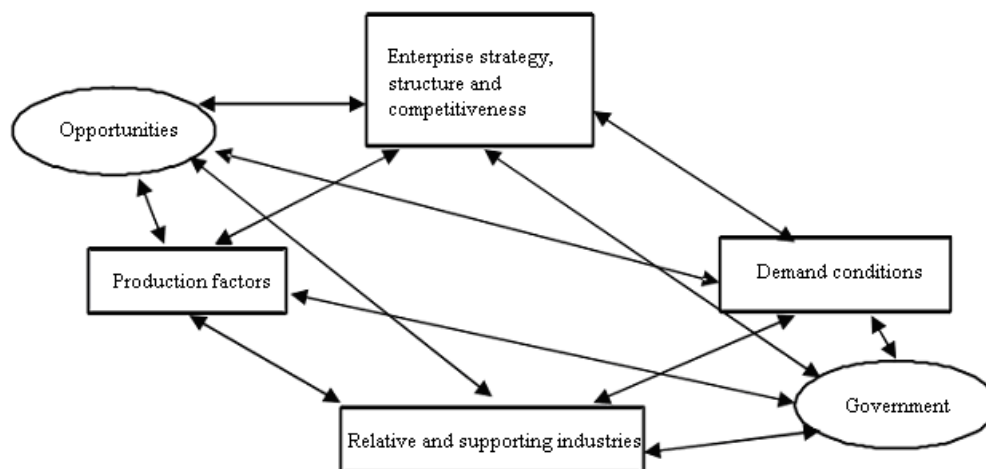


Figure 1. Porter's Diamond Model

Measuring the Customer Perceived Service Quality for Life Insurance Services: An Empirical Investigation

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Abstract

Liberalization of the financial services sector has led to insurance companies functioning increasingly under competitive pressures; so companies are consequently directing their strategies towards increasing customer satisfaction and loyalty through improved service quality. The present study strives to develop a valid and reliable instrument to measure customer perceived service quality in life-insurance sector. The resulting validated instrument comprised of six dimensions: assurance, personalized financial planning, competence, corporate image, tangibles and technology. Further the results of analytical hierarchy process highlighted the priority areas of service instrument with *assurance* is the best predictor, followed by *competence* and *personalized financial planning*. The gap scores show that there is ample room for improvement in all the aspects related to service quality. These results would help the service managers to efficiently allocate attention and resources among these dimensions on the differential basis, consistent with the customer priorities. These findings can be transformed into effective strategies and actions for achieving competitive advantage through customer satisfaction and retention.

Keywords: Service Quality, Life Insurance services, Service quality dimensions, Exploratory factor analysis, GAP analysis, Analytical hierarchy process

1. Introduction

With the liberalization and internationalization in insurance, service quality has become an important means of differentiation and path to achieve business success. Such differentiation based on service quality can be a key source of competitiveness for insurance companies and hence have implication for leadership in such organizations.

With the increasing demands of customer, insurance sector has become competitive. The one for all or all for one syndrome is being given a go- by. Customers are becoming increasingly aware of their expectations, and demand higher standards of services, as technology is enabling them to make comparisons quickly and accurately. Their perceptions and expectations are continually evolving, making it difficult for service providers to measure and manage services effectively.

The trend of insurance companies shifting from a product-focused view to a customer-focused one has been developing recently as insurance products become increasingly hard to differentiate in fiercely competitive markets. Insurance companies in India are consequently directing their strategies towards increasing customer satisfaction and loyalty through improved service quality. It is becoming desirable for insurance companies to develop a customer centric approach for future survival and growth. The awareness has already dawned that prompt, efficient and speedy service alone will tempt the existing customers to continue and induce new customers to try the services of the company.

In the life insurance sector, most of the companies have equivalent offerings. Service marketers have realized over past few years that competition can be well managed through quality. Thus service quality is imperative to achieve competitive advantage. Poor quality places a firm at a competitive disadvantage. Service quality offers a way of achieving success among competing services, particularly in case of firms that offer nearly identical services, such as life insurance, where establishing service quality may be the only way of differentiating oneself.

Such differentiation can yield a higher proportion of consumer's choices, and hence mean the difference between financial success and failure.

2. Theoretical Observations

Over the past few years, there has been a considerable research on different aspects of service quality leading to a sound conceptual base for both practitioners and researchers. Authors (Parasuraman *et al.*, 1988; 1991; Carman, 1990) agree that service quality is an abstract concept, difficult to define and measure. Some of the contemporary definitions of service quality are summarized in Table 1. On service quality modeling, Gronroos (1984) divides the customer's perceptions of any particular service into two dimensions, namely technical and functional quality. Parasuraman *et al.* (1985) proposed the gap model of service quality that operationalised service quality as the gap between expectation and performance perception of the customer.

Later on, service quality has also been defined broadly as "consumers' assessment of the overall excellence or superiority of the service" (Zeithaml *et al.*, 1993). It is viewed as an attitude or global judgment about the overall excellence of a service, with comparison of expectations and performance as the measuring tools. Researchers have tried to operationalize service quality from different perspectives for different service applications. Based on their conceptual and empirical studies, researchers derived and proposed different service quality dimensions for various service applications, as illustrated in Table 2.

However, the most widely used service quality measurement tools include SERVQUAL (Parasuraman *et al.*, 1988; Boulding *et al.*, 1993) and SERVPERF (Cronin and Taylor, 1992). SERVQUAL scale measures service quality, based on difference between expectation and performance perception of customers using 22 items and five-dimensional structure. In the SERVPERF scale, service quality is operationalised through performance only score based on the same 22 items and five dimensional structure of SERVQUAL.

2.1 Service quality in Life Insurance

Life insurance providers offer services that are credence products with very few cues to signal quality. It has been suggested that consumers usually rely on extrinsic cues like brand image to ascertain and perceive service quality (Gronroos, 1984). This factor is especially true for a "pure" service such as insurance, which has minor tangible representations of its quality and is highly relational during most transactions. There is also a lack of price signal in the market due to specialized customer needs and difficulty in comparing prices; thus consumers cannot rely solely on price as an extrinsic cue to signal quality.

The outcomes of life insurance purchase are often delayed, and thus do not allow immediate post-purchase valuation. As such, the consequences of a purchase do not produce an immediate reaction towards overall satisfaction. This situation is more apparent as the future benefits of the "product" purchased are difficult to foresee and take a long time to "prove" its effects (Crosby and Stephens, 1987). Infrequent purchase and "usage" of such credence products by consumers would mean an inability or difficulty in forming service expectations due to limited understanding of and familiarity with the service (Johnston *et al.*, 1984). At the same time, because of the amount of money that is typically invested in an insurance policy, customers seek long-term relationships with their insurance companies and respective agents in order to reduce risks and uncertainties (Berry, 1995). Pure services like insurance may, therefore, conjure different expectations than that of services that include tangible products (Toran, 1993). An insurance policy is almost always sold by an agent who, in 80% of the cases, is the customer's only contact (Richard and Allaway, 1993; Clow and Vorhies, 1993; Crosby and Cowles, 1986). Customers are, therefore, likely to place a high value on their agent's integrity and advise (Zeithaml *et al.*, 1993) The quality of the agent's service and his/her relationship with the customer serves to either mitigate or aggravate the perceived risk in purchasing the life insurance product. Putting the customer first, and, exhibiting trust and integrity have found to be essential in selling insurance (Slattery, 1989). Sherden (1987) laments that high quality service (defined as exceeding "customers' expectations") is rare in the life insurance industry but increasingly demanded by customers.

Toran (1993) points out that quality should be at the core of what the insurance industry does. Customer surveys by Prudential have identified that customer want more responsive agents with better contact, personalized communications from the insurer, accurate transactions, and quickly solved problems (Pointek, 1992). A different study by the National Association of Life Underwriters found other important factors such as financial stability of the company, reputation of the insurer, agent integrity and the quality of information and guidance from the agent (King, 1992). Clearly, understanding consumers' expectations of life insurance agent's service is crucial as expectations serve as standards or reference points against which service performance is assessed (Walker and Baker, 2000). Technology has also become an important factor in how the agent operates in the field including other functions such as distribution, claim costs and administration (Anonymous, 2004).

Research has shown that the quality of services and the achievement of customer satisfaction and loyalty are fundamental for the survival of insurers. The quality of after sales services, in particular, can lead to very positive results through customer loyalty, positive WOM, repetitive sales and cross-selling (Taylor, 2001). However, many insurers appear unwilling to take the necessary actions to improve their image. This creates problems for them as the market is extremely competitive and continuously becomes more so (Taylor, 2001).

Previous studies, notably those of Wells and Stafford (1995), the Quality Insurance Congress (QIC) and the Risk and Insurance Management Society (RIMS) (Friedman, 2001a, 2001b), and the Chartered Property Casualty Underwriters (CPCU) longitudinal studies (Cooper and Frank, 2001), have confirmed widespread customer dissatisfaction in the insurance industry, stemming from poor service design and delivery. Ignorance of customers' insurance needs (the inability to match customers perceptions with expectations), and inferior quality of services largely account for this. The American Customer Satisfaction Index shows that, between 1994 and 2002, the average customer satisfaction had gone down by 2.5% for life insurance and 6.1% for personal property insurance respectively (www.theacsi.org). In Greece, for example, 48% of consumers consider that the industry as a whole is characterized by lack of professionalism.

It is therefore not surprising that measurement of service quality has generated, and continues to generate, a lot of interest in the industry (Wells and Stafford, 1995). Several metrics have been used to gauge service quality. In the United States, for example, the industry and state regulators have used "complaint ratios" in this respect (www.ins.state.ny.us). The "Quality Score Card", developed by QIC and RIMS, has also been used. However, both the complaints ratios and the quality scorecards have been found to be deficient in measuring service quality and so a more robust metric is needed.

Although service quality structure is found rich in empirical studies on different service sectors, service quality modeling in life insurance services is not adequately investigated. Further, for service quality modeling, a set of dimensions is required, but there seems to be no universal dimension; it needs to be modified as per the service in consideration. Thus, the dimensions issue of service quality requires reexamination in context of life insurance services.

3. Objective of the Study

Although numerous researchers have made theoretical and empirical contribution to the study of service quality in various industries, (like banking, healthcare, education etc) the area of life insurance is not adequately researched.

Some previous studies in this area focused exclusively on relational qualities (Crosby and Stephens, 1987) and on the generic SERVQUAL format of quality measurement (Parasuraman *et al.*, 1994).

In the light of this, the objective of this paper is to first investigate service quality structure for life insurance and then relative importance of these service quality dimensions from customers' perspective, so as to ensure optimal deployment of resources among these dimensions, and thereby best value to the customers. Further, the paper tries to measure as to how well services are being delivered i.e. up-to what level performances are meeting the expectations.

A review of literature revealed that the earlier studies on measurement of customer perceived service quality were very few for the life insurance sector, more so in the Indian context. The topic therefore needs to be investigated.

4. Research Methodology

In order to develop a reliable and valid service quality measurement scale, an empirical study was undertaken based on methodology shown in Figure 1

We have used Conclusive Cross-sectional Descriptive Research Design to study the service quality structure and its key dimensions in life insurance sector. The survey instrument was a SERVQUAL type questionnaire relevant to insurance industry. The questionnaire was divided into two sections. In the first part information related to different socioeconomic and demographic criteria like income, age, profession, educational qualification, etc was collected. In the second part, respondents were asked to evaluate parameters on service quality relevant to insurance industry (on a 5 point scale anchored at "strongly agree" and "strongly disagree"). This part consists of 26 statements for both expectations and perception scores, regarding various aspects of service quality.

These service quality aspects were identified by a detailed exploratory identification process. This included five focus group discussions (with 40 life insurance policyholders); eight in-depth interviews (three with branch managers and five with agents of various life insurance companies). Content analysis of focus group discussions

and depth interviews was performed. In content analysis, the responses (oral as well as written) were categorized and classified. Then they are coded for tabulation purpose. Thereafter the frequency counts (of different categories) were compared. The method deployed was qualitative content analysis (inductive category development and deductive category application) (Maring, 2000). These responses were augmented from current literature in order to draw a wider and more in-depth inventory of service quality items in life insurance context. Finally, 26 attributes of service quality in life insurance sector were identified after the process.

A pilot study was conducted with a small sample size of 60, to clarify the overall structure of questionnaire. The respondents provided comments on clarity of some items and confirmed face validity of items in the questionnaire. These respondents are chosen by shopping mall intercept sampling method. In order to ensure authenticity of the data, the pilot survey was carried out on a wide (demographic) variety of life insurance policyholders.

Quota (multi stage) and shopping mall intercept sampling schemes have been employed with the questionnaires being sent to approximately 1000 respondents (policyholders). However 868 questionnaires were found complete in all respects. The response rate was 86.8%. An attempt has been made to keep the sample fairly representative across the demographic variables by constructing quotas according to various demographic characteristics, discussed above (Table 3).

The areas of our sampling are various cities like Lucknow, Delhi, Mumbai, Bangalore and Kolkata. The time frame of the study was December 2008 to May 2009.

Primary- stage sampling units were the respondents who purchased at least one life insurance product in the last three years from any agent and the exact product purchased should have been either a whole life insurance policy and/or an endowment policy. The secondary stage sampling units were markets, shopping malls, institutions and localities of the above mentioned cities. The questionnaires were administered personally to ensure the authenticity of information provided by the respondents.

4.1 Validity Analysis

Content validity: For the present study, the content validity of the instrument was ensured as the service quality dimensions and items were identified from the literature and exploratory investigations, and were thoroughly reviewed by professionals and academicians.

4.2 Reliability Analysis

We examined the reliability of the data to check whether random error causing inconsistency and in turn lower reliability is at a manageable level or not, by running reliability test. For various set of important associated factors used in the questionnaire, values of coefficient alpha (Cronbach's alpha) have been obtained. Amongst the reliability tests that were run, the minimum value of coefficient alpha (for both expectations and performance scores) obtained was 0.714 (Table 4), (substantially higher than 0.6) which shows that data has satisfactory internal consistency reliability.

5. Analysis and Results

Data collected were analyzed through a series of validated tools and procedures. The results of the analysis are described in the following sub sections:

5.1 Exploratory factor analysis

5.1.1 Expectation scores

In order to explore the underlying dimensions of consumer expectations of service quality vis-à-vis life insurance sector (as expressed by expectation scores on 26 statements), exploratory factor analysis was performed. The factor analysis results are shown in Tables 5.1, 5.2, and 5.3. The results from Table 5.1 shows that value of KMO statistic is very high (.955) and Bartlett's test of Sphericity is significant (sig= .000), which reveals that data is appropriate for factor analysis. The total variance shown in this Table, accounted for by all of the six components explains nearly 78.3 per cent of the variability in the original 26 variables (Table 5.1). So, we can reduce the original dataset by using these six components (Eigen values greater than 1 as shown in Table 5.1.) with only 21 per cent loss of information.

The Rotated Component Matrix reveals six factors (which represent the six broad perceptual dimensions of service quality) derived from 26 variables (which represent the expectations of life insurance policy-holders vis-à-vis service quality). The components of each factor have been highlighted in Table 5.3.

Factor 1 incorporates the variables- "Trained and well-informed agents", "Approaching from customer's point of view", "Trusting agents when explaining policies", "Clarity in explaining policy's terms and conditions" and

“Understanding intimately specific needs”. Since all these variables assure the policyholder of knowledge of agents and their ability to inspire trust and confidence, this factor was labeled as ‘assurance.’

Factor 2 has variables- “Provision of Flexible payment schedule”, “Availability of flexible product solution”, “Provisions for Convertibility of products”, “Supplementary services”. Life insurance involves long term association, hence policyholder moves through different life cycle stages in this long period and his needs and preferences change accordingly. Here, all these variables are depicting handling of these changing preferences, by providing flexible solutions and convertibility options and giving personalized services. So, this factor can be labeled as ‘personalized financial planning’.

Factor 3 has variables- “Staff dependable in handling customer’s problems”, “Efficient staff”, “Easy access to information”, “Prompt & Efficient Grievance handling mechanism” and “Prompt and hassle free claims settlement”. Since these components talk about the ability of the service provider to perform service dependably and efficiently and also about their willingness to provide hassle-free and prompt services. So, this factor can be labeled as ‘competence’.

Factor 4 has variables- “Adequate No. of branches”, “Accessible location of the branch”, “Good ambience of the branch”, and “Possessing good certification and credentials”. Since all these components are related to providing physical facilities and communication materials. So, this factor can be labeled as ‘tangibles’.

Factor 5 has variables- “Innovativeness in introducing new products”, “Courteous Agents”, “Value for money”, “Simple and Less time consuming Procedure for purchasing a policy”, and “Financially stable company”. Since all these components are related to creating an overall image of the organization in the eyes of the customers. So, this factor can be labeled as ‘corporate image’.

Factor 6 has variables- “Easy online transaction”, “Prompt complaint handling, online”, and “Proactive information through e-mail or SMS”. Since all these components are related to use of modern aids in providing service. So, this factor can be labeled as ‘technology’.

5.1.2 Performance scores

As with Expectation scores, for explaining the underlying dimensions of consumer perceptions of service quality vis-à-vis life insurance sector (as expressed by performance scores on 26 statements), exploratory factor analysis was again performed. The factor analysis results are shown in Tables 6.1, 6.2, and 6.3. The results from Table 6.1 shows that value of KMO statistic is very high (.946) and Bartlett’s test of Sphericity is significant ($\text{sig} = .000$), which reveals that data is appropriate for factor analysis. The total variance shown in this Table, accounted for by all of the three components explains nearly 62.2 per cent of the variability in the original 26 variables (Table 6.2). So, we can reduce the original dataset by using these six components (Eigen values greater than 1 as shown in Table 6.3) with 38 per cent loss of information.

The Rotated Component Matrix reveals the same set of six factors (which represent the six broad perceived dimensions of service quality) derived from 26 variables (which represent the perception of policyholders with respect to services being delivered). The components of each factor have been highlighted in Table 6.3.

5.2 Prioritization of Service Quality Dimensions

Life insurance is a professional service which is characterized by high involvement of the consumers due to the importance of tailoring specific needs, the variability of products available, the complexity involved in the policies and processes and the need to involve consumer in every aspect of the transaction. All these characteristics cause the customer to seek long term relationships with their insurance agents, their service providers, in order to reduce risks and uncertainties (Berry, 1995).

Since there is such a high involvement of customers and since the associated risks are so high, it becomes imperative for the service provider to understand how sensitive the customers are to various dimensions of service quality. This would decide the deployment of resources among these dimensions so that best value is provided to the customers. The service attribute that is valued higher by the customers must be given attention and resource support more than less valued ones.

The data collected from the sample was analyzed, so as to prioritize dimensions of service Quality, using qualitative analysis tool Analytic Hierarchy Process (AHP). AHP, developed by Saaty (1990; 2001), is designed for situations in which ideas, feelings and emotions are to be quantified and decision alternatives based on them are prioritized. It develops a hierarchical structure of the decision alternatives based on the relative importance placed on each criterion as well as the rating of each alternative on each criterion. AHP is used due to its suitability for undertaking quantitative as well as qualitative analysis. This approach differs from other

multi-criteria methods as subjective judgments are readily included and any inconsistencies are dealt with appropriately. The collected data was analyzed using Expert-Choice 11.0 Software.

The weights of each factor (representing the relative importance of service quality attribute) are used to rank the decision alternatives, providing their relative importance. Results (as obtained from AHP) revealed that there is a hierarchy of service quality factors, with *assurance* as the most important factor, followed by competence, personalized financial planning, corporate image, tangibles and technology (Figure2).

Customers perceive *assurance* (with a relative weight of 36%) as the most important dimension of overall expectations of service-quality. This finding makes sense because insurance represents a huge investment and customers evaluate highly those agents who are perceived to be trustworthy and make customers feel assured that they made the correct decision. In the personalized selling process of whole life insurance, Loo (2000) cited the views of industry observers and experts that insurance products are a very personal matter where people enjoy the comfort of talking to experts who are knowledgeable on insurance. Moreover, the nature of the products was described as varied, making it difficult to judge the appropriateness of the products and creating a preference to talk to someone when a claim arises. These ideas confirm the critical role of the agent-policyholder relationship and the role of assurance in that relationship. Assurance implies that the agent will be prepared to deliver on the terms of the life insurance policy when it is redeemed. Next to *assurance*, *competence* (relative weight = 26%) and *personalized financial planning* (relative weight = 20%) were perceived to be the next important dimensions of service quality expectations. *Competence* implies that the agent will be prepared to deliver on the terms of the life insurance policy when it is redeemed. *Competence* also means that the customer can count on the agent to resolve any problems should they arise, and that too promptly and efficiently. *Personalized financial planning* implies that the agent is prepared to restructure the policies as per the changing needs of the customer (like providing information about convertibility of products, flexible payment and product solutions).

They were followed by *corporate image* (relative weight = 9%) at the fourth place of the hierarchy. The lowest place in the hierarchy was taken by *tangibles* (relative weight = 5%) and *technology* (relative weight = 4%).

5.3 GAP analysis

Gap analysis (Gap 5 = perception minus expectation) was performed to measure the service quality in life insurance industry. In services, quality is measured by the perception of the customer on how well the service has been delivered (Hampton, 1993; Lewis, 1983). It is important to test the policyholders' perceptions (actual experience) to see whether the service quality provided by the life insurance industry was meeting, exceeding or falling below the expectations. In turn, it can also be a measurement of satisfaction/dissatisfaction with the delivery of services. Therefore, the study of Gap 5 can be a useful tool for management in monitoring the service delivery in life insurance industry.

The results revealed that in all the service quality dimensions of life insurance industry in India the gap-scores are negative and for each of six factors, the gap scores were statistically significant (sig. <.05) (Table 7). This can be interpreted as a gap between what was expected and perceived, thus indicating a failure in service delivery and service quality at all the levels vis-à-vis life insurance industry in India.

Analyzing the 'gaps', we can conclude that insurers have the opportunity to take the appropriate actions to improve the quality of their services, giving priority to factors with the largest gap scores. We can say that there are gaps in all the dimensions so there is room for improvement in all the aspects of service quality in life insurance industry.

The maximum gap in *competence* dimension reiterates the deficiencies in delivery of promised services during claims settlement, and in general, in handling customer problems. Also there are large differences in performance and expectation levels in the dimensions of *personalized financial planning* and *corporate image*. It reflects wide dissatisfaction regarding non delivery of personalized attention to the varied and changing needs of policyholders as well as not being able to prove as value for money, innovative or financially stable company. Prioritized deployment of resources to these dimensions is necessary to accomplish the desired results.

6. Discussion and Managerial Implication

The most important aspect of the relationship between service providers and customers is that the service providers lack an in-depth insight into customer preferences. Often there is a disconnect between what customers want and what service providers offer. This is particularly true in case of services like life insurance because of the intangibility element associated with it. The present study has been undertaken to first identify the various attributes of service quality construct with respect to life insurance industry and then to determine hierarchical framework of these attributes as perceived by customers.

The present study attempts to develop an instrument to measure customer perceived service quality in life insurance sector. Accordingly, a six dimensional instrument comprising of *assurance*, *personalized financial planning*, *competence*, *corporate image*, *tangibles* and *technology* is suggested. Undeniably, the factors have many elements of the old SERVQUAL dimensions except the *technology* dimension. However, this is expected, as the SERVQUAL instrument has undergone rigorous testing and serves as an important platform for exploratory contextual investigations in Service Quality measurement. Emergence of Technology as a factor clearly indicates towards the growing sophistication of customers.

Further the results of Analytical Hierarchy Process highlight the priority areas of service improvement and reveal that not all dimensions contribute equally to overall expectations of service quality in life insurance context i.e. there is a hierarchy of service quality factors in this industry.

The study indicates that among the various service quality dimensions in the life insurance industry, *assurance* is the most important determinant of service quality, followed by *personalized financial planning*, *competence*, *corporate image*, *tangibles* and *technology*, in that order.

Hence the Life Insurance companies needs to comprehend *assurance* in customer terms and deliver the same. The life insurance policyholders have primarily defined *assurance* in terms of well trained and informed agents, who understand intimately specific needs, approach from customer's point of view show clarity in explaining policy's terms and conditions and thereby inspire trust and confidence. Therefore, it is imperative for the service providers to provide adequate training to their agents to improve their customer interaction skills and knowledge.

Additionally, *competence* factor, as the second most important determinant, appeared to play an important role in influencing the overall service quality as expected by the customer. Within the purview of this attribute the policyholders accorded the highest priority to 'efficient claims settlement'. Beyond this, the service providers need to focus on promptness in 'grievance handling', that too by efficient and dependable staff. This implies that life insurance providers should invest in empowering the agents and employees with adequate resources so that they can take prompt actions.

Thereafter at the third place in the worth hierarchy is the attribute of *personalized financial planning*. Customers of life insurance policies seek personalized services and constant support in financial planning e.g. flexible payment schedule, flexible product solution, provisions for convertibility of products and supplementary services etc. So, service providers should encourage the agents to assume wider roles, that of financial consultants.

The *corporate image* is at the fourth place in the overall rating of the service quality dimensions. In this case, it is imperative for the service providers to focus on having courteous agents who represent a financially stable company, on being innovative in introducing new products, and in general proving to be value for money in the long run.

In the hierarchical preference structure of service quality instrument, *tangibles* and *technology* dimensions are at the lowest place, but these factors may also contributes towards satisfaction/dissatisfaction with the services.

Regarding *tangibles*, it is required that service providers should have good certification and credentials and adequate number of accessible branches. This is more important than investing large sums of money for creating magnificent structures alone. There is need, therefore for insurers to rethink their strategies in this aspect.

Technology is the new dimension identified in this study. In this case, service providers should focus on ensuring ease of online transaction, prompt complaint handling, online and availability of proactive information through e-mail or SMS.

From the management perspective, the study provides information on service quality dimensions and their relative importance to the service providers in life insurance industry. This information can be used by service providers for adding value to their relationship with the current and prospective policyholders, by performing on differential strategies aimed at improving the service quality in this sector. Thus the service providers are required to focus more on important dimensions to achieve high level of service quality and also aim at reaching acceptable limits for not so important dimensions.

Results from the gap analysis indicate that there is much to be done with respect to service quality in this industry. Insurers have the opportunity to take the appropriate actions to improve the quality of their services, giving priority to factors with the largest gap scores. On these grounds, insurers should deal with competence, personalized financial planning, corporate image, assurance, tangibles, technology in that order, since this is the order of decreasing gap scores. A sound quality improvement strategy for the individual companies should focus on fixing quality flaws in the same order.

In the life insurance industry, perception of service on the competence, personalized financial planning and corporate image dimensions is largely below that of expectation level. This finding is clearly disturbing since these dimensions have strong correlation with expectations of quality. Clearly, if some customers feel that they are not getting personalized services for planning their finances or if they feel that their company is not competent enough or if they feel that they are not getting value for money or have to deal with inefficient agents, such customers will defect.

The decision making authorities in the life insurance companies can also assess the gaps provided by the study, to appropriately bridge them by developing corrective action plans. Such corrective actions will ensure greater customer satisfaction as well as a differentiable competitive advantage.

It is very clear from the above discussions that insurers have to shed a lot of old ideas, bring changes in practices, and adopt a distinct approach to meet the challenges of the emerging situation ahead. Hence it is desirable for insurance companies to develop a customer centric approach for future survival and growth.

The major managerial implications of the study include the following:

- The service quality instrument so developed can be used by the managers for periodic monitoring of service quality as perceived by the customers.
- The study also provides directions to service providers as to which particular dimensions require attention in terms of their importance. This would enable the service providers to focus resources in accordance with the importance of these dimensions.
- Further, the study helps the service providers to identify quality gaps in the industry and thereby helps them in devising strategies, so as to plug these.

7. Conclusions

The research resulted in the development of a reliable and valid instrument for assessing customer perceived service quality for life insurance services. Here, service quality needs to be measured using a six dimensional hierarchical structure consisting of assurance, competence, personalized financial planning, corporate image, tangibles and technology dimensions. This would help the service managers to efficiently allocate resources, by focusing on important dimensions first. The gap scores show that there is ample room for service quality improvement in life insurance industry in India. In the competitive insurance sector, these findings can be transformed into effective strategies and actions for achieving competitive advantage through customer satisfaction and retention.

Although this study focuses on life insurance industry in India, however the results and recommendations of this paper can be used for service quality improvements of life insurance industries of other countries as well. This can be performed by incorporating necessary changes in service quality aspects in accordance with socio-economic environment of that nation.

There are, some scope for further research. Future studies in this area should also measure changes in service quality expectations over time in order to have a better understanding of how perceptions about service quality relate to satisfaction and loyalty. This is because service expectations and perceptions are known to be affected by customers' immediate reaction to specific service encounters. Cross-sectional studies that measure service expectations at one point in time may understate or overstate true service expectations, depending on whether customers had a positive or negative experience with the service provider.

The usefulness of segmenting customers on the basis of demographics is worth exploring. A future research aimed at determining whether distinct, identifiable service quality segments exist on the basis of customer demographics will be valuable from a service marketer's viewpoint. Insight from customer surveys or even more informal means of research could be used as a valuable information base in this regard.

The study can be further extended to investigate the causal relationship between service quality, customer satisfaction, loyalty and retention. Such a study would enhance the level of understanding for managers and academicians.

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Table1. Select definitions of Service Quality

S.No.	Author, Year	Definitions
1.	Parasuraman, Zeithaml and Berry, 1988	Global judgement or attitude, relating to superiority of service.
2.	Bitner, Booms and Tetreault, 1990	The customer's overall impression of the relative inferiority/superiority of the organization and its services.
3.	Asubonteng, McCleary and Swan, 1996	The difference between customer's expectations for service performance prior to the service encounter and their perceptions of the service received.

Table 2. Select service quality dimensions

Authors (Year)	Parasuraman, Zeithaml and Berry (1988)	Lehtinen and Lehtinen (1991)	Rosen and Karwan (1994)	Johnson, Tsiros and Lancioni (1995)	Siu and Cheung (2001)	Mehta and Lobo (2002)
Application areas	Telephone co., brokerage, insurance co., banks and repair and maintenance	Lunch restaurants, Disco, Pub type restaurants	Teaching, restaurants, bookstore and healthcare.	Bank customer UK	Service quality delivery of a department store chain	Life Insurance
Dimensions	Reliability	Physical quality	Reliability	Input quality	Personal interaction	Assurance
	Responsiveness	Corporate quality	Responsiveness	Output quality	Policy	Personalised financial planning
	Assurance	Interactive quality	Tangibles	Process quality	Physical appearance	Similarity with Agent
	Empathy	Process quality	Access		Promises	Tangibles
						Competence
	Tangibles	Output quality	Knowing the customer		Problem solving	Corporate Image
			Assurance		Convenience	

Table 3. Demographic Characteristics of the Respondents:

S. No.	Respondent's characteristics	% of respondents
1	Gender	
	Male	60.4
	Female	39.6
2	Age Group	
	<30	27.6
	31-45	50.7
	46-60	13.8
	>60	7.8
3	Education	
	Upto HSC	9.4
	Graduate	35.0
	Post graduate	35.9
	Professional and others	19.6
4	Occupation	
	Salaried	41.2
	Professional	27.8
	Business	13.1
	Student	2.8
	Retired	7.4
	Housewife	6.9
5	Income	
	<10,000	11.8
	10001-20000	15.0
	20001-30000	34.6
	30001-40000	23.0
	>40000	15.7
6	Access to modern aids	
	Mobile-phone	57.6
	Internet	13.8
	Combination	13.4

Table 4. Reliability Analysis

Dimensions of Service Quality	No. of Items	Expectation (Cronbach's alpha)	Perception (Cronbach's alpha)
Assurance	5	.821	.880
Competence	4	.934	.904
Personalized financial planning	5	.789	.823
Corporate image	4	.882	.845
Tangibles	5	.811	.776
Technology	3	.714	.743

Table 5.1. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.955
Bartlett's Test of Sphericity	Approx. Chi-Square	10568.886
	Df	325
	Sig.	.000

Table5.2. Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	13.65	52.501	52.501	13.65	52.501	52.501	8.198	31.532	31.532
2	3.329	12.803	65.305	3.329	12.803	65.305	5.887	22.644	54.176
3	1.434	5.515	70.82	1.434	5.515	70.82	2.173	8.358	62.534
4	0.774	2.976	73.796	0.774	2.976	73.796	1.961	7.542	70.076
5	0.63	2.422	76.218	0.63	2.422	76.218	1.19	4.575	74.651
6	0.548	2.106	78.324	0.548	2.106	78.324	0.955	3.673	78.324
7	0.513	1.974	80.299						
8	0.496	1.906	82.205						
9	0.459	1.765	83.97						
10	0.394	1.514	85.484						
11	0.391	1.503	86.987						
12	0.376	1.444	88.431						
13	0.359	1.382	89.813						
14	0.333	1.28	91.093						
15	0.324	1.245	92.339						
16	0.282	1.086	93.425						
17	0.262	1.009	94.434						
18	0.251	0.967	95.401						
19	0.227	0.874	96.275						
20	0.209	0.806	97.081						
21	0.163	0.627	97.708						
22	0.157	0.605	98.314						
23	0.127	0.49	98.804						
24	0.113	0.433	99.237						
25	0.107	0.412	99.649						
26	0.091	0.351	100						

Table 5.3. Rotated Component Matrix (a)

	Component					
	1	2	3	4	5	6
Adequate No. of branches	.219	.277	.304	.707	.213	.153
Trained and well-informed agents	.758	.397	.163	.276	.065	.256
Approaching from customer's point of view	.683	.459	.182	.193	.012	.133
Accessible location of the branch	.228	.374	.025	.704	.052	.122
Staff dependable in handling customer's problems	.234	.217	.739	.237	.105	.184
Good ambience of the branch	.232	.404	.453	.685	.214	-.062
Efficient Staff	.220	.239	.688	.197	.356	-.028
Easy access to information	.218	.204	.851	.158	-.042	.201
Provision of Flexible payment schedule	.270	.768	.225	.187	-.153	.022
Innovativeness in introducing new products	.245	.184	.223	.210	.697	.067
Possessing good certification and credentials	.211	.093	.143	.617	.478	.127
Courteous Agents	.223	.250	.445	.374	.787	.211
Value for money	.210	.418	.437	.264	.640	-.052
Availability of flexible product solution	.218	.845	.079	.049	.082	.029
Provisions for Convertibility of products	.274	.818	.104	.070	.198	.094
Supplementary services	.459	.781	.057	.062	-.004	.080
Prompt & Efficient Grievance handling mechanism	.014	.425	.806	.115	-.010	.095
Simple & Less time consuming Procedure for purchasing a policy	.082	.382	.050	.119	.780	.088
Trusting agents when explaining policies	.854	.296	.100	.112	.075	.066
Financially stable company	-.031	.137	.166	-.044	.792	.230
Clarity in explaining policy's terms and conditions	.813	.209	.166	.090	.064	-.042
Easy online transaction	-.065	.187	.091	.235	.049	.844
Complaint handling should be prompt, online	-.105	.232	.107	.213	.097	.851
Proactive information through e-mail or SMS	.034	.182	.137	.171	.077	.867
Prompt and hassle free claims settlement	.116	.016	.830	.045	.229	.243
Understanding intimately specific needs	.796	.053	.129	.115	.285	.102

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 6.1. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.946
Bartlett's Test of Sphericity	Approx. Chi-Square	5222.535
	Df	325
	Sig.	.000

Table 6.2. Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.237	39.373	39.373	10.237	39.373	39.373	3.853	14.818	14.818
2	2.015	7.750	47.124	2.015	7.750	47.124	3.690	14.190	29.008
3	1.181	4.543	51.667	1.181	4.543	51.667	3.107	11.949	40.958
4	.973	3.741	55.407	.973	3.741	55.407	2.452	9.431	50.389
5	.925	3.557	58.964	.925	3.557	58.964	1.944	7.476	57.864
6	.838	3.223	62.188	.838	3.223	62.188	1.124	4.323	62.188
7	.775	2.980	65.168						
8	.742	2.855	68.023						
9	.688	2.647	70.669						
10	.660	2.537	73.207						
11	.644	2.478	75.685						
12	.619	2.381	78.066						
13	.577	2.219	80.285						
14	.543	2.088	82.373						
15	.510	1.960	84.333						
16	.485	1.865	86.198						
17	.449	1.727	87.925						
18	.435	1.672	89.597						
19	.419	1.610	91.207						
20	.390	1.500	92.706						
21	.372	1.432	94.138						
22	.356	1.371	95.509						
23	.334	1.287	96.796						
24	.310	1.192	97.988						
25	.283	1.090	99.078						
26	.240	.922	100.000						

Table 6.3. Rotated Component Matrix (a)

	Component					
	1	2	3	4	5	6
Adequate No. of branches	.321	.148	.739	.105	.030	-.057
Trained and well-informed agents	.648	.081	.217	.178	.209	.318
Approaching from customer's point of view	.698	.168	.165	.209	.225	-.044
Accessible location of the branch	.405	.256	.472	.247	.077	.213
Staff dependable in handling customer's problems	.322	.100	.753	.255	.270	.190
Good ambience of the branch	.247	.108	.358	.723	.333	.017
Efficient Staff	.197	.128	.699	.215	.322	.040
Easy access to information	.199	.164	.735	.111	.123	.125
Provision of Flexible payment schedule	.437	.680	.300	.136	.243	.267
Innovativeness in introducing new products	.422	.127	.173	.120	.628	.029
Possessing good certification and credentials	.232	.172	.118	.753	.107	-.059
Courteous Agents	.249	.192	.204	.225	.640	.151
Value for money	.243	.115	.342	.060	.644	-.073
Availability of flexible product solution	.299	.644	.192	.270	.137	.172
Provisions for Convertibility of products	.299	.705	.011	.094	.313	.274
Supplementary services	.143	.779	.240	.187	.034	.247
Prompt & Efficient Grievance handling mechanism	.228	.246	.777	.166	.186	.086
Simple & Less time consuming Procedure for purchasing a policy	.206	.298	.242	.294	.696	-.071
Trusting agents when explaining policies	.667	.389	.159	.352	.333	-.204
Financially stable company	.054	.187	.331	.283	.707	.004
Clarity in explaining policy's terms and conditions	.665	.179	.290	.249	.165	.085
Easy online transaction	.158	.261	.086	.074	-.048	.638
Complaint handling should be prompt, online	.209	-.252	.041	.104	-.050	.753
Proactive information through e-mail or SMS	-.006	.192	.067	.272	.120	.695
Prompt and hassle free claims settlement	.122	.249	.660	.141	.159	-.101
Understanding intimately specific needs	.737	.072	-.042	.318	.368	-.025

Table 7. Gap Analysis of Service Quality Dimensions in Life Insurance Industry

Dimension	Expectations -Mean	Expectations-St . Dev.	Perceptions-Me an	Perceptions-St. Dev	Gap scores	Sig
Tangibles	4.5433	.7443	3.5101	.6453	-1.0332	.000
Personalized financial planning	4.6308	1.1356	3.3888	.9986	-1.242	.000
Corporate Image	4.5608	.7725	3.4387	.6654	-1.1221	.000
Technology	4.4712	.7881	3.5565	.7003	-0.9147	.000
Competence	4.6341	.9962	3.3169	.8012	-1.3172	.000
Assurance	4.6882	1.0231	3.568	.8721	-1.1202	.000

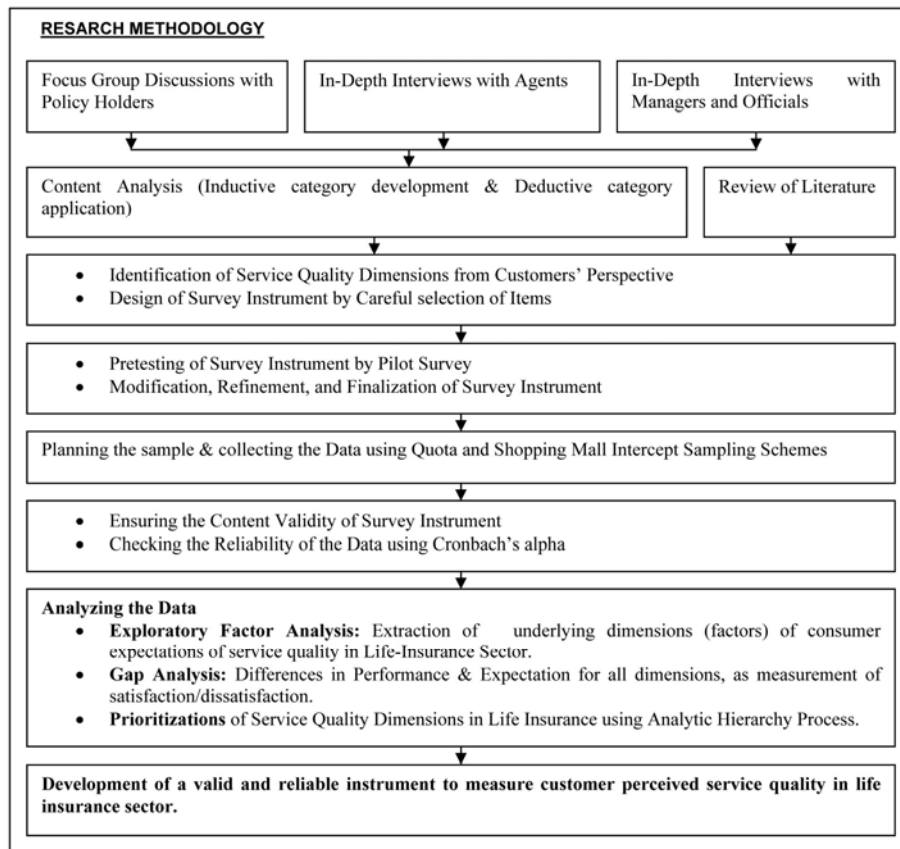


Figure 1. Research Methodology

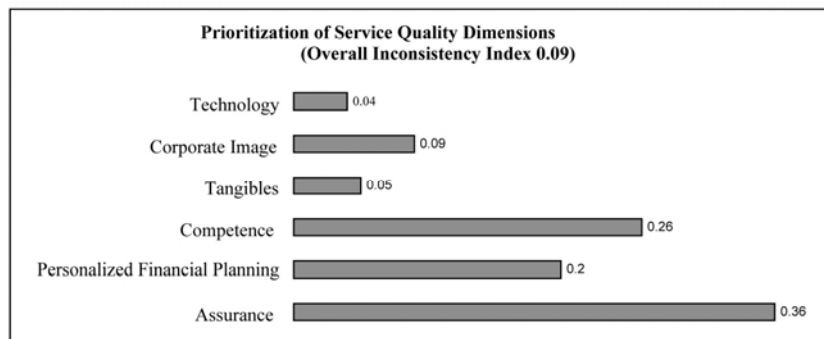


Figure 2. Relative Importance of service quality dimensions in Life Insurance Industry:

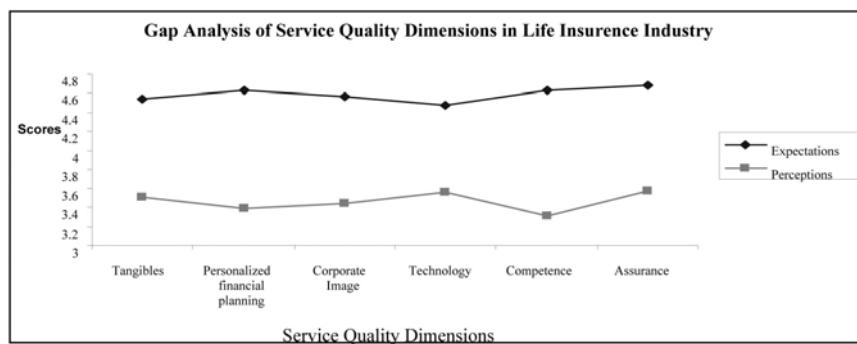


Figure3. Gap analysis of Service Quality Dimensions

Issues on *Takaful* Affecting the Choice of Accounting Policies: A Case Study of Two *Takaful* Companies in Malaysia

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Abstract

The paper adopts a descriptive case study method to examine the impact of juristic views on the operations of two Malaysian *takaful* companies. In order to achieve this objective, the annual financial reports of both companies were analysed. Interviews with each company's finance managers and with a member of the Malaysian Shariah Advisory Council were undertaken for a more in-depth coverage. Also a written correspondence with a senior official of the central bank was accomplished. Similarities and differences between the two companies were identified and it is concluded that the differences are serious enough to warrant interventions from the regulators in the form of mandatory disclosures in the annual reports.

Keywords: *Takaful*, Islamic insurance, Malaysia, Accounting policy, Mudharabah, Wakalah, Shariah, Madhahib

1. Introduction

The insurance industry is one of the pivotal financial intermediaries that mobilises economic resources of a country. In Malaysia, in line with the drive towards the Islamisation of the financial sector, Islamic insurance (*takaful*) services were made available to the public in 1983. (Note 1) To date, the potential growth of the industry, especially in the life business is tremendous, with majority of the Malaysian public, especially the Malaysian Muslims, uninsured. *Takaful* main attraction is that it falls within the principles prescribed by Islam, and this has encouraged the Muslims especially, to take up *takaful* coverage to fulfil their insurance needs without going against the *Shariah*. (Note 2) The industry, though, is still in its formative years and there are many areas which remains unresolved (Bhatti, 2001). Some of the unresolved areas that this paper will attempt to highlight include those within the domain of the business model, marketing, and accounting and financial reporting.

Islamic Financial Institutions (IFIs), such as the *takaful* companies, are bound to operate their businesses within the precept of the *Shariah*, the knowledge sourced from divine revelations. The revelations contain two category of knowledge which can be classified as the specific and the general. Many of the specifics and detailed rulings govern the area of interactions between man and God, whereas many of the general principles are that of between man and man, including business transactions. The general principles, being not specific, would have to undergo the process of *ijtihad* before they can be utilized according to current times and situations. (Note 3) The *ijtihad* process can take more than one method of conducting jurisprudence in understanding the *Qur'an* and *Sunnah* and might consequently leads to disagreement among scholars, particularly in the details of practical application, resulting in the establishment of several legal systems or schools of Islamic jurisprudence called *madhahib* (Bakar, 2000). (Note 4) Currently there are four *madhahibs*, each named after its founder, and all four legal systems impact the business practices, policies and strategies of IFIs in Malaysia in one way or another. (Note 5) Accounting wise, as highlighted by Karim (1990), the interpretations of the different schools influence the differences and similarities of the accounting policies adopted by different Islamic banks of different countries.

This paper seeks to add to that knowledge by bringing to light a case study of Malaysia, whereby differences in juristic view (*khilaf*) has not only affected the accounting and financial reporting policy but other operational aspects of two *takaful* companies. The differences that have been identified include:

- i). the marketing approach in selling the *takaful* schemes (plans), i.e. the use of sales agents against walk-in customers;
- ii). the *takaful* modes adopted (or planned to be adopted), i.e. *mudharabah* against modified *mudharabah* model; (Note 6)

- iii). the benefits accorded by the plans, i.e. either protection or savings and
- iv). accounting issues regarding methods of distribution and bases of income recognition.

An interesting aspect of this study is that, although both companies are based in the same country, the policies chosen vastly differ, which in turn would allow a within-country type of evaluation to be carried out. In contrast to this, the policies of Islamic banks in Malaysia are the same and differ only with those of other countries. This paper will present among the pertinent issues of the Malaysian *takaful* industry that the central bank of Malaysia, Bank Negara Malaysia (BNM), as the regulator, has to face in standardising the accounting and financial reporting policies of *takaful* companies. BNM has admitted that currently, the monitoring of the companies especially in terms of performances for instance is fraught with difficulties and unnecessary activities such as requiring and compiling additional reports from the companies to derive additional information, which could and should have been easily obtained from the annual reports. It is also hoped that this paper will stimulate further discussions and research on *takaful*, so that it will share the same significance and meaning as to the Islamic banking.

The paper is structured as follows. The next section provides a brief overview on the background of the two companies and the similarities that they share. The penultimate section discusses the different features, unique to each company, which in turn led to the differences in the aspect of accounting and financial reporting. The final section concludes.

2. Companies background and areas of similarities

At the time this study was conducted, there were two established *takaful* companies, namely, *Syarikat Takaful Malaysia Berhad (STMB)* and *Takaful Nasional Sdn Bhd (TNSB)*. The former is a public listed company and a subsidiary of *BIMB Holdings Berhad* (BIMB Holdings) group of companies. BIMB Holdings also owns *Bank Islam Malaysia Berhad* (BIMB), the first Islamic Bank in Malaysia to be given the license to operate in accordance with the requirement of *Shariah*. The latter is unlisted and a subsidiary of Malaysia National Insurance (MNI) *Berhad*. It began its *takaful* operations in 1993, with the birth of *MNI Takaful Sdn Bhd.*, which changed its name to TNSB in 1998.

A major similarity between the two companies lies in the *takaful* model adopted by them. A *takaful* model depicts the relationship between the company and the participants. The model is based upon the concept of *mudharabah* where the company and the participants share any profits made from investments based upon a pre-agreed ratio. This model is used for the family as well as the general *takaful* business. (Note 7)

Apart from this, both companies focus on the retail side of the *takaful* business, by providing only the life and general *takaful* schemes or plans. (Note 8) To differentiate from conventional insurance, the *takaful* plans take up specific names. Generically, *takaful keluarga* (family *takaful*) is life insurance in its conventional sense while general *takaful* represents the Islamic alternative to general insurance. STMB's and TNSB's mission and objectives, although worded differently, are basically projected towards providing the Malaysian public with the alternative to conventional insurance. Both companies compete predominantly in the Malaysian market, as they have not aggressively ventured overseas. Hence, the Malaysian population, regardless of their religions, is the companies' target market; although currently, individual non- Muslims and Non-Muslims managed companies, in that order, make up a small percentage of all policy-holders (participants).

Both companies again mirror each other in terms of the internal organisational structure. The *Takaful Act 1984* and the guidelines issued by BNM, shaped the organisational structure especially at the highest level of the organisation. The Act requires the establishment of the *Shariah* Advisory Council (SAC), an independent body comprises of experts in the *Shariah* and which oversees the *Shariah* aspect of *takaful* operations. The guidelines meanwhile, affect mostly the composition of the board of directors and senior management, as well as the establishment of committees such as the audit and remuneration committees.

On the investment front, by being IFIs, the liquid investment portfolios of both companies are limited to investment opportunities in green counters of KLSE, the Islamic bond markets and the government Islamic certificates. Hence, optimum returns on investment would largely depend on the expertise and skills of the investment managers, as there are lesser avenues to manoeuvre as compared to non-IFIs.

It can be concluded then that the internal and external factors facing both companies are the same. Majority of the Malaysian public would not be able to tell differences between them to the extent that many thought that one company is a subsidiary of the other and vice-versa.

However, there are still certain aspects that differentiate them, some of which are quite clear while some others are not that visible to the public. These aspects would also affect the accounting and financial reporting practices

of the companies, which makes comparative analysis of the two companies much more difficult. These differences will be discussed in detail in the next section.

3. Difference in the treatment of management expenses

It was mentioned in the previous section that the companies apply the *mudharabah* model. Although the chosen model is the same, the rules and regulations which govern the *mudharabah* contract of each company is based upon the interpretation of different schools of Islamic jurisprudence. Furthermore, recent developments indicate that the future orientation of TNSB's model would no longer be based solely upon *mudharabah*. These two issues will be dealt with separately henceforth.

The four Islamic legal schools have their own sets of rules pertaining to business matters with varying degrees of agreement and disagreement among them and this include the operationalisation of the *mudharabah* concept. One of the rules that do not receive a full unanimous backing from all the schools pertains to the treatment of management expenses. The *Shafi'is* view is that covering such expenses from the *mudharabah* capital or its realised profits will lead to the element of *gharar* (uncertainty) and the presence of *gharar* makes the *mudharabah* contract to be null and void. The other schools of law have held the view that expenses can be deducted from the business account or realised profits depending on the nature of the expenses. The *Hanafis* and *Malikis* would confine the permissibility to the case of journey and its related expenses to cover both the lodging and food. *Hanbalis*, on the other hand, do not limit it to the case of journey whereby the manager i.e. the *mudharib* may deduct his management expenses from the account even during his stay in his hometown. These expenses are related to necessary expenses such as food, cloth, lodging, salaries of employees and the like, but must be at the standard norms of the society or industry. From analysis of annual reports, STMB adopts the *Shafi'is* interpretation. Hence, all management expenses are solely borne by the company. In contrast, TNSB follows the interpretation of other schools of thought and charges the portion of management expenses related and traceable to the *takaful* funds, as well as commissions of sales intermediaries, against the funds. That leaves only the portion of management expenses not related to the *takaful* funds to be borne by the company through shareholders' funds.

A recent development has occurred that would provide TNSB with a newer justification to charging the expenses against the *takaful* funds. A member of TNSB *Shariah* council reveals that the future orientation of TNSB's family *takaful* model might be amended as a consequence of this. In the future, the charge, instead of depending upon the interpretation of Islamic scholars, will be regarded as an agent's (*wakalah*) fees, taken as a compensation by the company for procuring and managing the funds. When the SAC passes a *fatwa* (religious ruling), TNSB's family *takaful* model will no longer be based purely on *mudharabah*, but will be known as a modified *mudharabah* through the combination of *wakalah* and *mudharabah*. In fact this new orientation of the family *takaful* is already unofficially taking its course within the company, garnered through few interviews, helped in part by the fact that changes had already taken place within the general *takaful* model.

With regards to general *takaful*, a *fatwa* has been passed which has changed the model from pure *mudharabah* to a pure *wakalah*. This is to ensure that the surpluses of general *takaful* (instead of returns from investments) which the company shares with, is not based upon *mudharabah*, but is taken as a form of an agent's fees. The *Shariah* prohibits surpluses (in contrast to returns from investments) from being shared under the *mudharabah* concept, although the *Takaful* Act 1983 does not disallow any sharing of surpluses. A written statement from the central bank showed that BNM does not have any reservation with the types of model adopted as long as the models do not run contrary to the *Shariah*.

3.1 Difference in marketing approach

A dissimilarity that is beginning to gain awareness among the public lies in the marketing approach of the companies in soliciting and procuring premiums (contributions), in other words in selling their plans. TNSB's main channel of business is the agency system (*al wakalah* in Arabic). It uses sales agents, individual and companies such as banks and brokers, to bring in the premiums, with individual agents, which currently numbered close to 7000, accounting for the bulk of the business. STMB, on the other hand does not use any intermediaries in their approach. Instead, in their place, it has full time marketing personnel to promote its plans, and at the same time persuading potential participants to walk-in into any of STMB branches located throughout the country in order to buy the plans. Previously, many had thought that STMB decision in not using sales agents might be attributed to a *Shariah* prohibition. It has been ascertained through the interviews that this is not the case. Agency is in-fact approved by the *Shariah*, as verses from the *Quran* testify. One of the verses that testify this approval is *Surah Al Kahf*, Verse 19, which tells of the episode when one of the companions of the cave was chosen to buy food from the city:

“...Now send ye then one of you with this money of yours to the town, let him find out which is the best food (to be had) and bring some to you, that (ye may) satisfy your hunger therewith...”

Shariah scholars have unanimously agreed that this relates to the permissibility of the agency system. As *al wakalah* is permissible in Islam, this is not the reason for the differences in the company's sales and marketing operation.

STMB's decision is due more to its own analysis on the productivity of sales agents. Through comparative analysis between agents' statistics released by BNM and STMB's report on performance of its marketing officers, it found out that the agents' productivity is lower than that of its marketing officers. In the case of TNSB, it believes in the combination of effective cost management (the Pareto principle) and the motivational aspect of the agency system, where the harder the agents work in bringing in the premium, the more commission that they will earn and consequently the more profitable the company will be. TNSB thinks that by having fixed salaried marketing officers would not make a good business sense as it feels that fixed costs of a company should be kept to the minimum.

The difference in the marketing approach is also related to the interpretation governing the concept of *mudharabah* explained in the previous section. Recall that TNSB can charge the commission against the *takaful* funds. Hence it would not affect the profitability of the company to the same extent of STMB, if STMB decides to use agents. However, since STMB does not use agents, it incurs other fixed costs apart from salary of the marketing officers. These include the fixed overhead expenses of operating its numerous branches, which would in the end still affect its profitability. Thus, the higher profitability of TNSB, is not only due to its ability to charge part of the expenses to the *takaful* funds, but also of its lower fixed costs helped by the higher portion of its variable costs, especially in terms of agents commissions.

3.2 Difference in the benefits of family *takaful* plans

A further aspect of the business that differentiates the two companies is in the benefits that the family *takaful* plans provide. The benefits a *takaful* plan provides are in terms of the amount received upon claims compared to the total savings upon maturity in the event that no claims have been made. An important distinction between *takaful* and conventional insurance is the allocation of the premiums into 2 separate accounts, namely the Special Participants and the Participants Accounts. Using a fix percentage, a portion of the premium is placed into the special participants accounts (SPA) and this represents the amount which will be paid for claims made. This amount cannot be reimbursed upon maturity as it represents a contribution of the participants. The balance of the premium is placed into the participants accounts (PA), which represents the amount for savings, and will be paid out to the participants upon maturity. (Note 9) Although the schemes or plans of both companies are similar to one another, the benefits are structured slightly differently. This difference in the benefits stems from the difference in the percentage of allocating the premiums into the PA and SPA. For STMB, from the first month onwards, a maximum of 15% of the premium goes into the SPA with the balance of 85% going into the PA. This is regarded by STMB as being more beneficial to the participants, as it emphasise in terms of more savings upon maturity. Even if the participants were to surrender the plans in the first year itself, they will get at least 85% of their money back in terms of the surrender value. Nonetheless, the main element of any insurance schemes, conventional or Islamic is the element of protection. Therefore in the case of STMB, due to the smaller allocation into the SPA, participants will have to buy additional plans (riders) to increase protection.

TNSB, on the other hand focus more on protection, as has been observed that in the first three years, more than 50% of the premiums goes into the SPA. Thereafter, at least 25% goes to SPA with the balance of 75% going to the PA. This means that upon maturity, participants will get lesser amount of savings as compared to taking from STMB, but will get more through claims, if calamities were to happen (other factors such as returns on investments remain constant). If participants surrender their policy in the first few years, they could only collect back less than 50% of their money. TNSB, thus mirrors the conventional way of running insurance business. (Note 10)

This difference in the benefits relates back to the juristic interpretation chosen by each company. Due to the charging of expenses to the *takaful* funds, TNSB allocates more into the SPA for the first three years at least, to pay for commissions of agents and management expenses relating to the *takaful* funds. From past experience, claims of old and new plans can be covered by the funds, resulting in underwriting surplus to pay for the commissions and management expenses relating to the *takaful* funds. Thus, if TNSB were to put more of the premiums into the PA instead of the contributed SPA, it may not be able to pay these expenses.

3.3 Differences accounting and financial reporting

The juristic interpretation chosen by both companies directly impact the distributional aspect of their accounting. By bearing all the management expenses solely, STMB is practicing the separate investment method, while the

case of TNSB is best represented by the pooling method. (Note 11) Asked if by not being able to charge part of the expenses against the *takaful* funds would depress STMB's earnings, the STMB finance manager agrees that it does to a certain extent. Nonetheless, he continues that STMB will continue to use the *Shafi'is* interpretation, despite the profit concern and despite the fact that it is perfectly alright to change to other schools' interpretation. STMB is not willing to change for two reasons. Firstly, it has the interest of the participants as its main concern as it prefers to make sacrifices in terms of its profitability, for the benefits of the participants. Secondly, and of a more business in sense, is that up till now, STMB is still very much profitable and maintaining a strong presence in the *takaful* industry, helped by virtue of being the first in the industry. (Note 12)

As for TNSB, the interpretation that it has chosen seems to take more from the participants through the charging of specific expenses to the funds and to share in the profits from investment at the same time. TNSB justification is that, firstly, it is permissible by the *Shariah*. Secondly, the charging of the expenses made up of sales agents' commissions (Note 13) and management expenses relating to the *takaful* funds are necessary inducements, because the company, as an agent (Note 14) to the participants, first and foremost is required to acquire the premiums on the participants' behalf. Thirdly, the sharing in profits made from investments is a fair reflection of the efforts that the company puts in, in managing the funds to its fullest potential. Then again the portion of TNSB's share is only 20% of the returns, with the balance going back into the funds. (Note 15) And the fact revealed earlier that this charge will be taken as an agency fee in the future cemented TNSB's stand.

The second accounting issue that was identified is the basis use in recognising the premiums, in other words the debates on the use of cash against accruals basis. The accounting recognition that is adopted flows directly from the type of *mudharabah* model in place. Both companies in their 2003 annual reports, recognises the premiums and investment incomes based upon the cash basis. Due to the *mudharabah* model, profits from investment can only be shared and distributed based on actual cash receipt. That is, recognising the premiums by using the cash basis, allows the meaningful implementation of the *mudharabah* principle (Yusoff, 1996). The expenses, in contrast, is recognised using the accrual basis, making the recognition principle to be more of a modified cash basis, and hence very conservative. The accrual basis in recognising the expenses is consistent with the Islamic principle that all debts should be put in writing.

However information derived from the interview, disclosed that the future reporting of TNSB would move away from the cash basis of recognition. Beginning with financial year end 2004, all items will be reported under the accrual convention, and this has been approved by the SAC and the board. This decision to convert to the accrual basis is based upon two important rationales. Firstly, the move will be consistent with the future outlook of BNM. In its statement, BNM said that it is moving towards this basis, which provides a matching of income against expenditure, in order to be in line with the Accounting and Auditing of Islamic Financial Institutions (AAOIFI) standards as well as other internationally accepted accounting standards. In the meantime it is still allowing the choice of either cash, modified cash or accrual bases.

4. Conclusions

As was shown, the similarities and differences between the two companies relay back to divine back to divine sources of revelation or the *Shariah*, specifically to the general rulings which went through various scholars' interpretation. This should be seen in a positive light of the dynamism of the process of *ijtihad* that shows how the *Shariah* is relevant for all times. Hence, the differences are inevitable and on the company level, the respective SAC can choose any one interpretation.

Of all the differences explained above, the serious one concerns the accounting and financial reporting aspects as these affect many number of stakeholders, internally and externally, as compared to other differences.

The fact that BNM is moving towards the accrual basis, showed its concern in regulating the industry. But the problem is that there cannot be uniformity unless there is also uniformity in the chosen interpretation. Now that TNSB is moving towards a new model (modified *mudharabah*) the problem will magnify. The point here is that if the *Shariah* allows different interpretations, BNM will find it tough to standardise. It has to take into perspective of international scale as well in order to be internationally standardised due to the presence of different models in other countries. On the national level, the standardisation can be done by passing a *fatwa* for each company to implement the same accounting policy. But this is easier said than done. The future intention of BNM is against what STMB is currently doing. Being the first to be established, STMB have the clout and ability to hold on to what it has been doing. This will be concerned with regulations if it affects STMB and it thinks that if the *Shariah* allows it, the number of models of interpretation should not be restricted.

As such the advice to BNM is that instead of implementing a straight changeover to form coherent standards, it should be maintain the current approaches with improvement on another aspect of reporting. This aspect which

needs the improvement is regarding the level of transparency of the companies, particularly the level of disclosures apparent in the annual reports. Compromise will be easily achieved if BNM would argue in favour of higher disclosure. A higher level of disclosure will solve many things especially with improve transparency. Secondly, most if not all stakeholders' needs will be satisfied. For instance BNM shall require lesser amount of special reports, analysts and researchers will be able to make better comparisons between the two companies, the participants will be aware of their rights and the public at large will be more informed of the companies.

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Notes

Note 1. Takaful is an Islamic insurance concept by observing the rules and regulations of Islamic law. This concept has been practised in various forms for over 1400 years.

Note 2. Shariah refers to the sacred law of Islam. All Shariah is derived from two primary sources, the divine revelations set forth in the Qur'an, and the sayings and example set by the Prophet Muhammad in the Sunnah.

Note 3. Ijtihad is a technical term of Islamic law that describes the process of making a legal decision by independent interpretation of the legal sources, the Qur'an and the Sunnah

Note 4. Quran is is the central religious verbal text of Islam. Sunnah refers to the sayings and living habits of Muhammad, the last prophet of Islam. Madhab refers to Islamic schools of law, or fiqh (religious jurisprudence).

Note 5. They are, in the order of time (beginning with the oldest), the Hanafi, the Maliki, the Shafi'i and the Hanbali.

Note 6. Mudharabah is a special kind of partnership where one partner gives money to another for investing it in a commercial enterprise. The investment comes from the first partner who is called "rabb-ul-mal", while the management and work is an exclusive responsibility of the other, who is called "mudharib".

Note 7. Apart from the this model, other models are also in operation, which significantly differ from the *mudharabah* model chosen by the two *takaful* companies. For example a model used by Sudan is based on 100% co-operative. *Takaful* participant must join the co-operative in order to purchase the *takaful* coverage. The co-operative will elect some of the participants to manage the co-operative. Due to lack of expertise and business acumen among the elected participants, the *takaful* business in Sudan does not grow as compared to Malaysia. This shows that the co-operative model, unlike the Malaysian model, does not work. In Kuwait, the *takaful* model is based on the concept of *wakalah*, where instead of sharing in the profits from investment, the *takaful* company would charge agency fees.

Note 8. The retail business provides a smaller risk and consequently results in a good underwriting guideline, lower retention of premiums and higher profits. The retention is lower if the associated risk is higher due to *retakaful* (reinsurance), as the company needs other insurance company to back it up resulting in the profits being transferred to the reinsurer.

Note 9. For the purpose of investments, the two accounts will be joined, with any income made from the investments credited to each account using the same fix percentage used to allocate the premiums.

Note 10. In conventional insurance, the SPA account does not exist. Hence, on average, if policyholders were to surrender their policy in the first few years, they will not get their money back, i.e. zero surrender value.

Note 11. Both finance managers though, are unaware of the specific accounting terms (i.e. separate investment vs pooling methods) which emerged as a results of the different treatment on part of the management expenses and the sales commissions.

Note 12. Annuar, et al (2003) showed that the position of STMB as the leading player in the *takaful* business is being challenged in terms of its small yearly growth in premiums and steady growth in expenses. On the contrary, TNSB recorded very strong growth in premiums and profitability.

Note 13. TNSB commissions are derived from guidelines on commission on insurance business issued by the BNM. To date, BNM has not issued any guidelines to regulate the commission payment of *takaful* companies. However, in the absence of any specific guidelines issued for the *takaful* industry, the *takaful* company should abide by the guidelines on insurance business which are also applicable on *takaful* business.

Note 14. The agents or *wakil* are to be remunerated by the payments of wages or *ujur* which can be in the form of a fee. All Muslim jurists agree that agents must be remunerated.

Note 15. Newer *takaful* companies such as Mayban *Takaful*, a subsidiary of Maybank and *Takaful Ikhlas*, a subsidiary of Malaysian National Reinsurance *Berhad*, cannot adopt the interpretation chosen by STMB. Being newcomers into the industry, they could not afford to bear all of the expenses. *Takaful Ikhlas* has forecasted that even then, it will only make profits by the fourth year.

Development Mode of Automotive Logistics and Optimizing Countermeasure of China's Automotive Enterprises

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Abstract

With the rapid development of automotive industry and Logistics, automotive logistics which is the most complicated in logistics develops rapidly, but there is a wide gap in automotive logistics between China and foreign countries. In this paper, major logistics operation modes of domestic and foreign automotive industry are introduced, and many problems of Chinese automotive logistics are summarized on the basis of comparison and analysis. The optimizing countermeasure is brought forward to instruct China's automotive logistics to develop better and more rapidly.

Keywords: Automotive Logistics, Logistics Mode, Optimizing Countermeasure

With the development of China's economy and improvement of people's living condition, automotive consumption in China increases rapidly, the annual increase rate of automotive sales volume will reach 36%, which is the second largest in the world. Therefore, the supply of automotive components and vehicle logistics becomes larger. Upon entering the WTO, a plenty of foreign automotive enterprises swarm into China and join the competition of automotive market, bringing huge business opportunities to the automotive logistics market, and meanwhile it brings dramatic challenges to automotive enterprises and automotive logistics market as well, since the development of logistics in China starts late. As a result, in order to improve the logistics service level and reduce the logistics cost to take part into the fierce competition of automotive market in a better way, our automotive enterprises need to build a high-effective logistics mode urgently to confront with the fiercer competition. The optimizing countermeasure is brought forward to automotive enterprises on the basis of research on domestic and foreign automotive logistics mode in this paper, which provides a certain theory reference for our logistics operation of automotive enterprises.

1. Concept and Composition of Automotive Logistics

Automotive logistics is entity flow of automotive producer's raw materials, components, vehicle and spare parts on steps of automotive purchase, production, sales (Fig.1). Automotive logistics include inbound logistics of raw materials and components, garage logistics of production process, sales logistics of vehicle and spare parts logistics, that is including object purchasing, transportation, storage, loading and unloading, distribution processing delivery and information processing. In macro way, Logistics includes recycle of waste as well.

Insert Figure 1 Here

Automotive Logistics is an important composing part of automotive enterprises, and also is a logistic activity with highly complex degree in logistics industry. Comparing to other logistic activities, Automotive Logistics have characteristics of capital-intensive, technology intensive and knowledge intensive. With rapid development of our automotive industry and fierceness of competition of automotive market after entering WTO, Automotive Logistics must play a much more important role in automotive industry, and reduction of automotive cost.

2. Introduction of Typical Logistics Mode of Foreign Automotive Enterprises

Automotive had been invented in late 19th Century in abroad, and had been produced since early 20th Century. Each automotive group has formed each logistics mode, the main logistics modes are followings:

2.1 Vender Zone Mode

As Fig.2 shows, Vender zone mode is that, in order to reduce the transportation cost, the group of components vendors near the automotive plant establishes the large production and supply centre which is the vender zone. The main components vendors of automotive concentrate in the Zone, and they deliver the components to assembly line on time, and meet the requirements of quality and quantity according to the producing plan of automotive factory. Vender zone mode can lower the total cost and shortage risk, and improve utility rate of resource and logistics operation level. But the disadvantage of this kind of mode is that it cannot concentrate all

venders, so it has higher logistics risk and higher requirements for coordination.

Insert Figure 2 Here

Schenker Company built a vender zone in Hanoverian of Germany for VolksWagen Automotive Company, which concentrated main components venders in it and was in charge of the supply of VolksWagen components directly, managing completely on the procedure of vender zone by SAP system, which reduced the transportation cost and increased the operation efficiency.

2.2 Lean Logistics Mode Based on JIT

This mode applies thought of lean production to logistics industry, which can remove some unnecessary wastes and non-value added activities from logistics supply chain. It begins with customers' benefits, according to the whole value to confirm the logistics procedure of supply, production and sales, creates value added activities of nonstop, no detour, no waiting and no backflow, equip and utilize resource of enterprise reasonably, and get the profit at the max limitation. Adopting lean logistics mode can realize zero inventory management and reduce logistics cost, but it is hard to carry out and has higher requirements to information technology. Toyota, Honda, and Nissan have built the system of Lean Logistics Mode Based on JIT, utilized information technology of ITS, GPS, ID to realize lean logistics, and carried out the purchasing, producing and sales.

2.3 Meeting and Parting Mode of High Coordination in Supply Chain

This mode refers to that automotive manufacture enterprises build public data platform, which concentrate information of components vender, third party logistics company, fourth party logistics, automotive distributors and other relative vendors. These enterprises gain each data and information needed by public data platform, highly share information mutually, and make sure supply chain highly public. For example, Volvo Group invested positively on telecommunication infrastructures, and built a highly effective website of AD4 export logistics information system to manage the logistics operation, which collected manufacturer, clients and market seller organically to realize high efficient operation of logistics service. Each enterprise and department on export chain can visit this website's electronic data platform freely, so that cooperation between enterprises and relationship between clients and enterprises will be much closer. The advantage of this mode is that can improve logistics operation efficiency to realize the win-win situation of two parties, and form strategy alliance. But the logistics risk increases because cooperated enterprises are more, and this mode needs the enterprises own higher management ability and information technology level.

Automotive manufacturers, which regard Benz, VolksWagen BMW as representatives, have built their own public platform of data, and realized logistics mode of Meeting and Parting Mode of High Coordination in Supply Chain.

2.4 Fourth Party Logistics Mode

Anderson (altered its name as Accenture in 2001) Consultant Company brought forward the concept about fourth party logistics which is: fourth party logistics vender is a compound vender of a supply chain, which will integrate and manage the resources of company and cooperation enterprises in supply chain, and provide a set of solution of improving the supply chain, including analysis, optimizing and design of logistics system. Such a mode can take advantages of resources effectively, reduce logistics cost, and improve customer service level and logistics operation rate, but the enterprise is bad at self-control and might be at risk. For example, Shanghai General Motors has built fourth party logistics mode with Vector and succeed.

3. Typical Logistics Mode Analysis of Chinese Automotive enterprises

Our automotive logistics develops gradually along with the rapid development of automotive industry, but our logistics industry started in a later time and it is not complete and doesn't form a high-effective logistics mode. Currently, the main logistics modes of automotive enterprises in China are the followings:

3.1 Logistics Integrity Operation Mode Based on self-management (Fig.3)

The automotive enterprises take over all the logistics business, establish their own logistics company or logistics department, set up the warehouse and delivery centre or goods collection centre, and assume the delivery of all raw materials, components and vehicles. This mode is helpful to manage, with strong self-control and less risk; but it increases the investment and cost for enterprises, and has high requirements for logistics management ability, which is not good for the development of enterprise's core business. At present, many our automotive enterprises adopt this mode.

Insert Figure 3 Here

3.2 Third Party Logistics Mode (TPL Mode, Fig.4)

TPL mode is that automotive manufacturer will entrust part of or all the logistics business to third party company for operation, and enterprises are responsible for part of logistics business by themselves or concentrate on their business development completely. And two parties of enterprises highly coordinate and become steady strategy alliance for long term, make logistics solution together, realize highly effective logistics operation, and reach the win-win situation. Such mode has been adopted by more and more automotive enterprises.

Third party automotive logistics enterprises have rich logistics resources, professional logistics management talents and rich logistics operation experience, which can take full advantages of industry distribution. Automotive enterprises can improve logistics operation efficiency by helping from third party logistics enterprises, and implementing the integrity operation of outsourcing to third party logistics company completely has improved logistics service level dramatically, and is helpful for automotive enterprises to concentrate energy to utilize the core advantage. But this mode's enterprise self-control is not strong relatively, and is lacking of client response in time, and has the risk of cooperation with third party logistics enterprise.

Shanghai General Motors has gave third party logistics enterprise the whole supply chain business, it's third party logistics company to manage the whole supply chain procedure directly by dashboard. Faw-volkswagen has outsourced the inbound logistics of import components to third party, while Shanghai-VolksWagen has fully outsourced the supply logistics of components to third party.

Insert Figure 4 Here

3.3 Co-delivery Mode(Fig.5)

Co-delivery mode has two kinds of mode, one is that many enterprises make contributions together to build delivery centre in order to reduce cost and realize the reasonability of logistics delivery, and run the centre together, providing the enterprises with unite, highly efficient logistics service; the other one is that one enterprise takes into consideration of logistics business requirements of many enterprises in a certain area, arranges delivery time, route, and amount of goods reasonably, and delivers them reasonably. This mode is beneficial for utilizing resource advantage, saving investment, decreasing cost, but it's deeply limited by channels.

CITROEN automotive company has adopted co-delivery mode based on JIT, which makes logistics operation highly effective, and reduces logistics cost.

Insert Figure 5 Here

3.4 VMI Logistics Mode (Fig.6)

VMI is vendor managed inventory. Vender manages inventory of automotive company, mastering its inventory information, and carries out JIT delivery according to the company's requirement, as a result, which can decrease the inventory risk of automotive company, and improve its market responsibility. This mode can save inventory cost, increase speed of market responsibility and low down company's risk, but it has a higher requirement for vendor, and vendor has a larger inventory risk, and should deliver goods in small amounts, which may increase cost.

DONGFENG automotive company has adopted this logistics mode. For the local vendor, it's the vendor to monitor in real time the inventory of DONGFENG automotive company, and deliver the goods to a specific correct address on time, by meeting the requirement of quality and quantity; For non-local vendor, DONGFENG automotive company encourages the manufacturers of raw materials and components build warehouse in supplying place and send professionals manage it.

Insert Figure 6 Here

4. Problems existing in our development of automotive logistics

Our automotive logistics industry develops rapidly, compare with that in abroad, our automotive logistics enterprises fall behind in service concept, service quality, service cost, service efficiency, service reputation, service brand and information convey. As the development of globalization and E-business, the logistics modes cannot meet the requirements of logistics business. Main problems existing in our automotive logistics modes are the followings:

4.1 Monotonous and out-fashion Logistics Mode

Our automotive industry and logistics industry develop at a late time, and enterprises fail to be aware of importance if logistics, so they don't form a complete logistics mode. Most of the enterprises adopt self logistics

of unity of manufacture, supply and sales, which is a monotonous logistics mode. As the rapid development of automotive industry, the current logistics modes cannot meet logistics requirements of high efficiency.

4.2 High operation cost

Our automotive logistics lacks of unite plan, barriers of region and system are serious, each automotive group has its own policy, lacking of unite logistics standard and reasonable equipment of resource. Therefore, current automotive logistics modes fail to integrate resource, which repeat building logistics facilities and keep the high cost.

4.3 Low level of operation efficiency and service for clients

Currently, we lack of complete logistics infra-construction and logistics delivery network in domestic, and comprehensive automotive logistics service company. What's more, logistics resource isn't concentrated, and has been wasted seriously. As a result, the efficiency of automotive logistics operation is low, as well as the service level, which can't satisfy the increasing requirements of automotive logistics gradually.

4.4 Deficiency of Top Management Talents

Automotive logistics management people need understand not only logistics knowledge but also logistics technology and business procedure such as automotive manufacture, so comprehensive quality requirements for the logistics management people are very high. Since our automotive industry develop at a late time and lacks of full knowledge of logistics, and we fail to pay enough attention to the training of logistics talents, therefore, the Top Management Talents are lacked of.

4.5 Deficiency of Advanced IT Technology

Internet and information technology develop rapidly these years in China, but the foundation of them is weak, especially in automotive industry with complicated supply chain, they don't penetrate fully, the information technology and information system which are suitable for automotive industry are not complete yet. Automotive logistics fail to implement complete informatization, which makes low efficiency and high cost of automotive logistics management.

5. Optimizing Countermeasure of China's Automotive Enterprises

In view of the problems existing in our automotive logistics, in order to accelerate the development of automotive logistics industry and meet the requirements of logistics service well, the automotive industry has to break current mode and build a new comprehensive logistics mode as the development of time, realizing the manufacture and logistics mainly based on customers-oriented, which refers to build JIT co-delivery and Lean logistics mode based on E-business platform. (See fig.7)

Insert Figure 7 Here

This mode is following the fashion of E-business development, automotive enterprises use advanced information technology to build E-business platform, realizing sharing information with third party Logistics Company, cooperation enterprises and clients, coordinate logistics operation. What's more, in order to increase the logistics operation rate and implement automotive lean manufacture, the enterprises need reduce the cost by carrying out JIT coordinate delivery and lean logistics, and realize logistics operation on time, by meeting the requirement of quality and quantity. To connect each step in logistics into a organic integrity and carry it on, which makes the whole logistics operation process become a value chain of non value added activity, and realize highly effective logistics operation.

Through this operation mode, automotive enterprises, third party logistics company and clients can do the logistics information inquiry and communication by E-business platform, which realize follow-up service of logistics operation. And the enterprises carry out JIT manufacture and purchase by customer-oriented, realize zero inventory operation, remove non value added activity in logistics operation, which reduce logistics operation cost dramatically and improve logistics operation efficiency.

To make this logistics mode carry out smoothly, we need to take logistics measurements which come with the mode:

5.1 Build a strategic alliance relationship

Automotive manufacture enterprises select appropriate third party logistics enterprise by calling for bid publicly, and two parties sign a contract to confirm their rights and obligation, the stronger enterprises could build logistics company by themselves to do the logistics operation of the whole enterprise. Two parties of cooperation become the strategic alliance with mutual win-win situation and moving on the same step, and they won't be not

only a relationship by contract, but take over the logistics risks and develop together.

5.2 Foster and introduce advanced management talents

Enterprises should pay highly attention of introduction and foster of logistics management talents, enhance the training energy for talents, which make enterprises have a group of high quality comprehensive logistics operation talents who know not only management but technology and manufacture procedure, and improve the logistics operation efficiency.

5.3 Improve logistics information level

Enterprises need to introduce advanced logistics technology, and build suitable E-business platform to conduct the full information management on the all logistics procedures, realizing integrity of logistics, information flow and capital flow, and share information with cooperation enterprises to do follow-up service of all logistics procedures.

5.4 Build standardized, professional and normalized automotive logistics companies

To improve logistics standardization and establishment of automotive components standardization, integrate optimization arrangement logistics resource in whole society, further build professional, comprehensive automotive logistics enterprises, forming complete logistics network, as a result, it can provide professional logistics service for automotive enterprises, and realize regional economic effect and improve logistics service level.

5.5 Accelerate the development of third party and fourth party

The enterprises outsource logistics business completely to third party logistics enterprise, and concentrate all energy on core business, which realize the advantage of distribution and promote competitive and core capability of enterprise. Meanwhile, since our third party logistics develops in a late time, so we need to develop fourth party logistics positively, which is that integrate resource in society, relying on excellent 3PL vendor, technology vendor, management consultant and other value added service vendor, and providing unique and extensive logistics solutions for automotive enterprises.

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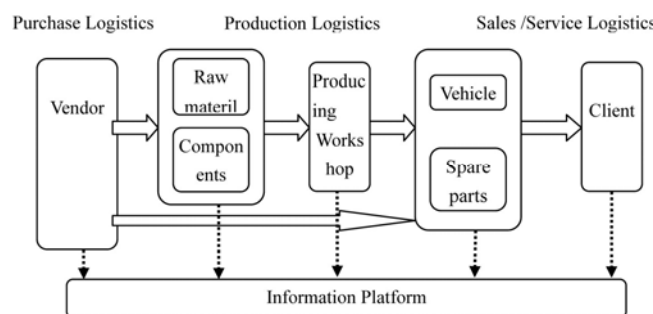


Figure 1. Procedure of Automotive Logistics

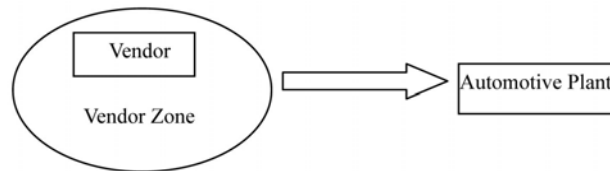


Figure 2. Vendor Zone Mode

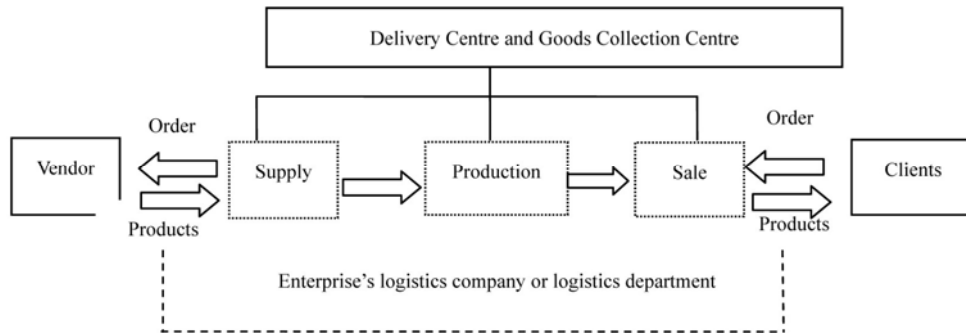


Figure 3. Self-management Delivery Logistics Mode

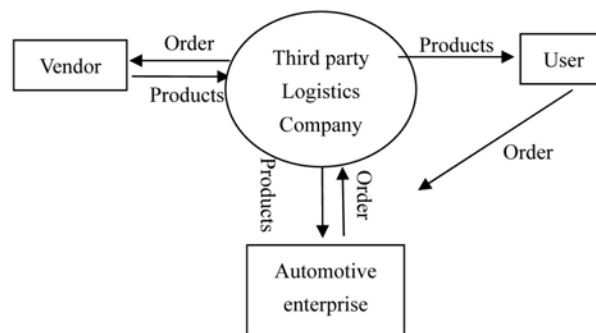


Figure 4. Third Party Logistics Mode

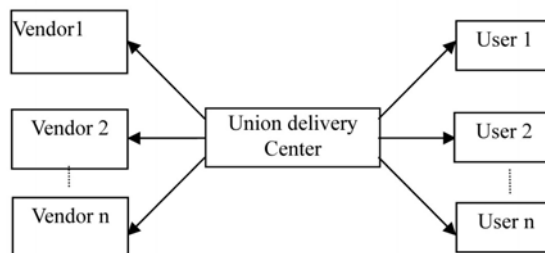


Figure 5. Co-delivery Mode

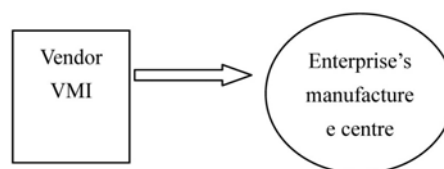


Figure 6. VMI Logistics Mode

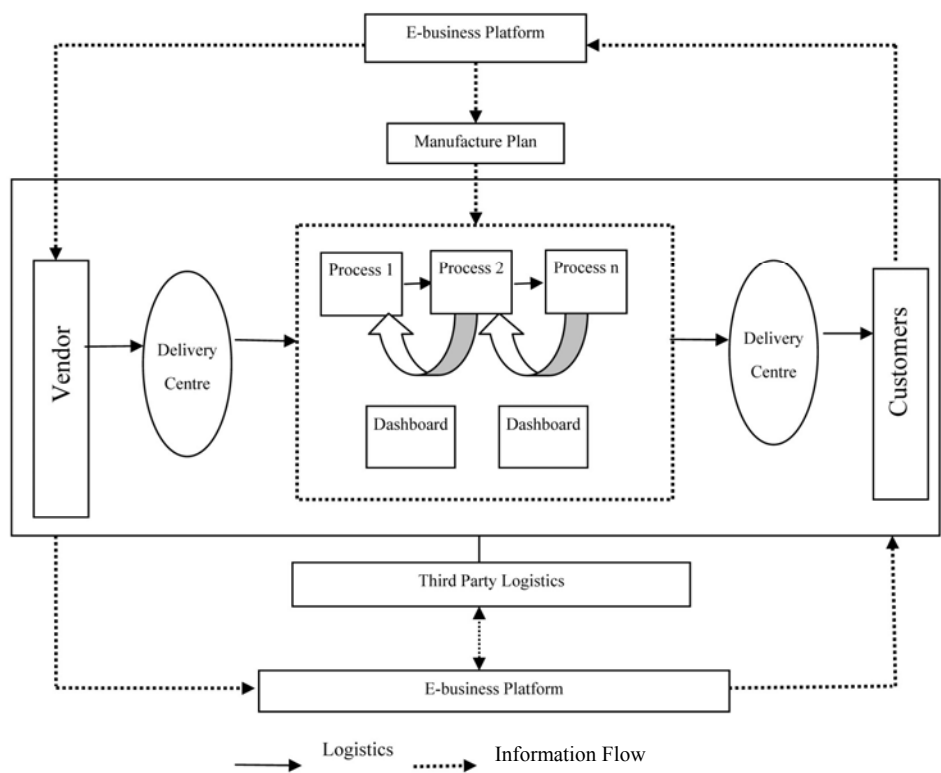


Figure 7. JIT co-delivery and Lean logistics mode based on E-business platform

Intellectual Property Rights, Investment Climate and FDI in Developing Countries

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Abstract

What is the impact of intellectual property rights (IPR) protection on foreign direct investment (FDI)? Has the coming into effect of the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) had any impact on FDI inflows in developing countries? This paper answers these questions by the use of panel data for a cross – section of 75 developing countries over a period of 19 years (1985 – 2003). The results of the study indicate that: 1) strengthening IPR has a positive effect on FDI; 2) the impact of patent protection on FDI after the TRIPS agreement is far and above that of the pre – TRIPS era; 3) the degree of openness, growth rate of the economy and investment are also key determinants of FDI. The findings of the study suggest that strengthening IPR is only one component of the many factors needed to maximize the potential of developing countries to attract FDI.

Keywords: Intellectual property rights, Foreign direct investment, Investment climate, Risk, Developing countries

1. Introduction

Intellectual property rights (IPR) reform has been underway since the 1990s and actively pursued by most developing countries after the World Trade Organization's (WTO) Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) came into effect on January 1, 1995 (Commission on Intellectual Property Rights [CIPR], 2002). Under the terms of TRIPS, current and future members of WTO must adopt and enforce strong non-discriminatory minimum standards of intellectual property protection in each of the areas commonly associated with IPRs including patents, copyrights, trademarks, and trade secrets. Beyond strengthening of IPR, the TRIPS Agreement is the first multilateral trade accord that aims at achieving partial harmonization in an extensive area of business regulation, as it seeks to establish deep integration of domestic regulatory policies across countries (Maskus, 2000a).

Advocates of IPR have promoted its strengthening, in part, by underscoring the incentives that IPR generate for innovation and its real world application (Lippoldt, 2006). Obviously, the strengthening of IPR globally benefits the developed nations who own most of the intellectual property, however, developing countries are also expected to benefit in terms of FDI and technology transfer where there is an incentive to disseminate and share in the benefits of Research and Development (R & D) (Asid et al., 2004).

IPR has therefore become part of the infrastructure supporting investments in Research and development that are important in innovation and new business development. By granting temporary exclusive rights on inventions, IPR allows the right holders to price their products above marginal cost, and hence recoup their initial research investment costs (Leger, 2006). Accordingly, the creation of an effective IPR regime has an effect not only on the incentive for new knowledge creation and its dissemination, but even more importantly the business location decision of firms, prices, and the market structure. Kalande (2002), for example, noted that most multinational enterprises (MNEs) are willing to invest in non-manufacturing sectors or extractive industries rather than invest in technology intensive activities in countries with inadequate IPR protection. Similarly, Nicholson (2002) claimed that an enhanced IPR protection encourages firms to undertake overseas production due to the expanded protection of their ownership advantages.

Understanding how FDI inflows are impacted by IPR is important because many studies do show that FDI plays an important role in the development process (Kalande, 2002). Apparently, the flow of FDI to developing countries in the right sectors of the economy would provide these countries with the opportunity to benefit from technological change. The Global Development Finance (2005) indicates that FDI has become one of the stable sources of development finance in developing countries. For instance, by the end of 2004, the total foreign aid (grants) and net official flows (aid and debt) to developing countries were \$47.4 billion and \$22.6 billion respectively, while net FDI flows was \$165 billion dollars. UNCTAD report (2003) indicates that the emergence of Botswana from a least developed country into a middle – income country status between one generation was

mainly driven by the influx of FDI; an effect which is unmatched by any other country of similar size or level of economic development.

The objective of this paper is to examine the impact of IPR on FDI inflows for 75 developing countries between 1985 and 2003. The period was chosen to help to identify not just the impact of IPR, but also to examine whether the coming into effect of the TRIPS agreement in 1995 have had any effect on FDI inflows. It is important to note that the study's sample is made up of only developing countries as most studies have shown differential effects of IPR on FDI for developing and developed countries (Seyoum, 1996; Park and Lippoldt, 2003; Kalande, 2002; Falvey et al., 2006). The study also examines how other important factors like political and economic risk, return on investment, growth rate, and trade affect the inflow of FDI in developing countries.

The rest of the paper is organized as follows: Section 2 reviews both the theoretical and empirical literature on the IPR–FDI relationship. Section 3 presents the empirical methodology and data used in the analysis and Section 4 presents and discusses the results of the study. Section 5 offers policy implications, directions for future research, and concluding remarks.

2. Literature Review

Supporters of a strong IPR system attribute its importance to its double function of promoting innovation and FDI inflows, which are important determinants of growth. This is because strong IPR encourages holders of intellectual property to trade and invest, as adequate protection of IPR assure foreign investors that their technology will not be leaked to competitors. As a result, the smaller risk of imitation leads to a larger net demand for protected products (Mansfield, 1994; Seyoum, 2006). A country that enhances its IPR regime may attract additional knowledge intensive products, which will otherwise be unavailable on the local market or it may attract FDI; in either case, international technology transfer is likely to flow (Lippoldt, 2006).

To further understand how property rights protection affects a firm's decision to invest abroad, it is useful to appreciate the economic incentives firms have in investing abroad or becoming multinational. The most widely accepted framework in this regard is Dunning's (1981) OLI model. Dunning's (1981) OLI paradigm explains the activities of multinational enterprises (MNEs) in terms of ownership (O), Location (L), and internalization (I) advantages. The ownership advantages are generally intangible assets in the form of superior technology, organizational skills, trademark, trade secrets, patent, reputation, and innovative capacity, which other firms do not have. Such advantages confer market power and costs efficiencies that provide incentives to undertake multinational organization and operation (Maskus, 1998).

However, ownership advantages by themselves are not enough for overseas investment because many firms that possess intangible assets may choose to serve foreign markets by arm's length trade relationships (Braga and Fink, 1998). Even with ownership advantages, MNEs must still decide on where to invest. These decisions depend on the country conditions or characteristics, called the location advantages, which include factors like market size, transportation and communication infrastructure, skilled labor and favorable local government regulatory environment. Such advantages make it profitable to locate a business abroad. This means that FDI is not only "pushed" by firm specific advantages of the investor but may also be "pulled" to locations that are important sites of innovation activities (Seyoum, 2006). Further, it might be more profitable for the firm to internalize production rather than license or export goods on the open market. By being able to exploit their knowledge-based assets (KBA) within the confines of international operations, firms are able to overcome the high transaction costs associated with regulating and enforcing contracts and protecting quality (Braga and Fink, 1998; Maskus, 1998; Smarzynska, 2004). Thus, internalization explains why a foreign firm prefers to retain full control over the production process or try to acquire a subsidiary rather than license its intangible assets to local firms or an independent foreign firm.

The discussion above shows that firms that create intellectual property are less likely to engage in foreign production in countries with an inadequate IPR regime. This is because weak IPR protection increases the probability of imitation and risk of the licensee acting in direct competition with the seller. Park and Lippoldt (2005) argued that intellectual property owners will have weak incentives to market their technologies in developing regions with poor IPR regime due to risks of infringement.

On the other hand, a strong IPR system could provide knowledge based firms with market power and might actually cause firms to divest and reduce their services to foreign countries (Braga and Fink, 1998). Furthermore, a strong IPR system may have a negative effect on FDI, as it might encourage MNEs to shift from local production to licensing. Also, the ways in which IPR influence FDI are multifaceted and strong IPR alone is not adequate for firms to invest in a country. If they were, large amounts of FDI would have gone to Eastern Europe and Sub-Saharan Africa. On the contrary, China, Brazil, and other high-growth, large market developing countries with weak protection have attracted most of the FDI to developing countries (Maskus, 2000b). The net effect of higher levels of IPR protection on FDI is thus theoretically ambiguous. The inability to make strong

qualitative predictions stems from the fact that a firm's decision to invest stems not only from the efficiency of patent protection, but also the interplay of market power, free riding, contracting uncertainties, and other features of the international markets for information (Maskus (2000a)). It is therefore not surprising that in recent times some empirical studies have been done to ascertain the relationship between the protection of intellectual property and FDI.

Like the theoretical studies, the empirical studies have also given inconsistent results. While Lesser (2002), Lee and Mansfield (1996), and Smarzynska (2004) found a positive effect of IPR on FDI, Kondo (1995), Nicholson (2007), and Seyoum (1996) reported otherwise. Based on a survey of patent attorneys and licensing executives, Lesser (2002) used a cross sectional design to examine the relationship between IPR and FDI for a sample of 44 developing countries and found that strong property right protection was positively associated with FDI inflows. Similarly, Smarzynska (2004) used 1995 data to study the impact of IPR on FDI inflows in Eastern European countries and reported that weak IPR deterred FDI and rather encouraged investors to focus on distribution of imported products.

However, an investigation of the interaction of industry characteristics and IPR on multinational firm behavior by Nicholson (2007) showed that firms in industries with high capital costs are more likely to maintain control over production knowledge in countries with less IPR protection by engaging in FDI. Moreover, Nicholson (2007) reported that when IPR is strong, firms with high investment in R&D are more likely to enter a market by licensing to an unaffiliated host firm. Smith (2001) also found that strong positive effect of IPR on both FDI and licensing, while Park and Lippoldt (2005) reported that developing countries that have moved to improve their IPR system have tended to experience enhanced access to technology through licensing. Clearly, the decision to trade, undertake FDI, or license is a complex process, which is affected by many decision criteria and therefore different firms choose different modes of entry due to their relative sensitivity to protection. Firms with natural barriers to imitation tend to choose licensing, and vulnerable firms choose FDI, but stronger IPR may cause substitution between these modes (Nicholson, 2007).

On the other hand, Seyoum (1996) studied 27 countries from 1975 to 1990 and demonstrated that patent protection was positively correlated with FDI inflows in developed but not in less developed countries. Likewise, Kondo (1995) analyzed the flow of US FDI to 33 European, Asian and Latin American countries between 1976 and 1990 and found patent protection to be insignificantly correlated with FDI inflows. Though Kondo's (1995) study sample was made up of developed countries, the author claimed that there was no evidence that patent protection facilitated FDI and suggested that the least developed countries should be aware of the study's results.

Nonetheless, Park and Lippoldt (2003) argued that the earlier studies do not capture the benefits of the TRIPS agreement, which came into effect in 1995. As a result, they used data (between 1990 and 2000) that captures the post TRIPS agreement and found that strengthening IPR has a positive effect on FDI inflows. However, they also noted that IPR's effect is dependent on the level of development and other relevant unobserved country-specific characteristics (e.g., culture and quality of institutions). In addition, Park and Lippoldt (2003) showed that IPR's effect was largest in the least developed countries and second largest in developing nations (where IPR regimes are next weakest). This finding is consistent with the view that IPR's effect on FDI is influenced by a country's level of development.

The review of the empirical literature indicates that the effect of IPR on FDI is influenced by data heterogeneity, observed and unobserved country-specific effects, and the TRIPS agreement. Accordingly, we control for these factors in our analysis of the impact of IPR on FDI by using a panel data set of developing countries over the period 1985 - 2003. This period allows us to identify the differential effects, if any, of IPR on FDI before and after the TRIPS agreement came into effect in 1995. The data and empirical methodology used are described below.

3. Data and Methodology

The data for the study comes from various sources. The data on FDI inflows comes from the World Development Indicators CD - ROM (2006), and is measured as the net FDI inflows share in GDP. The net FDI are the net inflows of investment to acquire a lasting management interest (10% or more of voting stock) in an enterprise other than that of the investor. This is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. The strength of intellectual property rights protection (IPR) is measured by the Ginarte – Park index of patent rights, which is based on five categories of patent laws: (1) extent of coverage, (2) membership in international patent agreements, (3) provisions for loss of protection, (4) enforcement mechanism, and (5) duration of protection. Each of these categories (per country, per time period) is scored a value ranging from 0 to 1, and the outweighed sum of these five values constitutes the overall value of the patent rights index. The index therefore ranges from 0 to 5, with higher numbers indicating stronger protection.

Data on Real GDP per capita growth rate (ARG) and real GDP per capita were obtained from World Economic Outlook (2000) and Global Development Network Growth Database. Data on inflation, openness, population, and mainline telephone per 100 people (Tel) were obtained from the Global Development Network Growth Database. Openness (OPEN) is a measure of the level of integration into the world economy and is measured as trade (exports plus imports) as a percentage of GDP and the rate of inflation (INF) is used as a proxy for macroeconomic stability. Population (POP) is used as a measure of market size and mainline telephone per 100 people represents the level of infrastructure development. Return on investment (ROI), which is a measure of profitability is proxied by the inverse of GDP per capita (Asiedu, 2002; Nganga, 2005; Naude and Krugell, 2003). This is based on the assumption that investments in countries with a lower per capita income should yield a higher rate of return.

The risk variable (RISK) is a composite measure of the investment climate, which is obtained from the Political Risk Services' Country Risk Guide. It is made up of three measures: political, financial, and economic risk and it includes factors like law and order, government stability, bureaucratic quality and corruption. It is rated on a scale of zero to 100, with zero meaning highest risk and 100 referring to the lowest risk. The average FDI and IPR for the countries in the study sample are listed in Tables 1 and 2.

Insert Table 1, Table 2 Here.

Model Specification

The empirical analysis is based on a panel data set consisting of four separate 5-year periods (the last period is 4 years), 1985-1989, 1990-1994, 1995-1999, and 2000-2003. All variables represent the average over the sub-periods, except the IPR variable, for which we use the initial values because it is assumed that it takes time for the IPR reform to have an effect on FDI inflows. The equation we estimated is specified as follows:

$$FDI = \beta_0 + \beta_1 ARG_{it} + \beta_2 OPEN_{it} + \beta_3 INF_{it} + \beta_4 LGPOP_{it} + \beta_5 ROI_{it} + \beta_6 RISK_{it} + \beta_7 Tel_{it} + \beta_8 IPR_{it} + \beta_9 IPRSQ_{it} + \beta_{10} IPR*TRIPS_{it} + \mu_i + \varepsilon_{it}$$

where, i signifies a country in year t ; β_0 is the constant term; β_i s are the coefficients to be estimated; μ_i represents the country-specific effect which is assumed to be time invariant, and ε_{it} is the classical disturbance error component. In addition to the variables explained earlier, the square of IPR (IPRSQ) is included to capture any nonlinear relationship between IPR and FDI; and TRIPS represent the TRIPS dummy (1 for post TRIPS era and 0 otherwise) and the interaction of IPR and TRIPS dummy (IPR*TRIPS) is included to examine whether there is a differential effect of IPR before and after the TRIPS agreement came into effect in 1995.

We estimate a system of four equations using the seemingly unrelated regressions (SUR) method. The SUR estimation allows for different error variances in each equation and for correlation of these errors across equations (Makki and Somwaru, 2004). To eliminate any country – specific effects or unobserved heterogeneity we first - differenced the data. To further eliminate or reduce heteroscedasticity problems we used SUR with cross section weights.

4. Results

The purpose of our study is to analyze the effect of IPR on FDI inflows and to determine whether the TRIPS agreement that came into effect in 1995 has any effect on FDI inflows in developing countries. The equation is estimated by seemingly unrelated Regressions (SUR) in order to exploit interrelationships among the equations. The regression results are reported in Table 3. The results show that the IPR variable is significant and positively correlated with FDI at the 1% and 5% levels respectively (Columns 3 and 5). The study's findings contradict the earlier studies of Seyoum (1996) and Kondo (1995), which suggest that patent protection does not promote FDI inflows to developing countries. These two studies' time periods were in the late 1980s and early 1990s when IPR in these countries were relatively low as seen in Table 2

Table 2 shows the average IPR for both 1985 and 1990 was 2.14, but this increased to 2.43 in 1995 and 2.83 in 2000 after TRIPS agreement. Thus, it could be argued that the IPR levels of most countries had not reached the necessary threshold needed to impact FDI inflows. This is to some extent supported by the study's finding as indicated by the IPR*TRIPS cross – product (Column 5), which suggests that IPR's effect on FDI in the post – TRIPS era (after 1995) is far and above the pre –TRIPS period (before 1995). Clearly, the TRIPS agreement, which came into effect in 1995 led to the strengthening of IPR in most developing countries and subsequently led to a significant increase in FDI for most developing countries. As shown in Table 2, the average FDI share in GDP increased from just about 1% in 1985 to an average of 3.16% between 2000 and 2003. It is also important to note that in a recent study, Seymour (2006) reported a significant positive effect of patent protection on FDI, although the study's sample was made up of both developed and developing countries.

Insert Table Here

Additionally, we tested for nonlinear effects of IPRs on FDI by including the power term of the patent protection variable (IPRSQ). The results show that both IPR and IPRSQ are positive but not significant and hence, unlike the Asid et al.'s (2004) study, we do not find support for a nonlinear relationship or diminishing returns of IPR on FDI for developing countries as a whole. It is important to note that the Asid et al.'s (2004) study examined the period between 1996 and 2000 and the sample was made up of both developed and developing countries, and thus, it can be argued that the presence of threshold effects could be sensitive to the type of countries included in the analysis.

Growth rate is positive and significantly correlated with FDI, which is consistent with the findings of Kobrin (2005) and Nunnenkamp (2002) that showed that the growth rate of an economy, which is an indication of the market growth and potential, is an important determinant of FDI. The degree of openness is positive and significantly correlated with FDI at the 5% and 1% level in various specifications of the model (Columns 1 through 5). The findings reported here support Chakrabarti (2001) and Morisset's (2000) argument that openness to trade has a greater likelihood to be correlated with FDI inflows than any other variable.

Both population and inflation are not significantly correlated with FDI. Return on investment is positive and significantly correlated with FDI. Obviously, strengthening IPR allows firms to be better able to appropriate a return on their technological investments and therefore they have greater incentive to promote local production in those markets. The risk variable, which is a measure of the investment climate, is positive and significantly related with FDI at the 1% level in all the model specifications, which implies that the investment climate is one of the most important determinants of FDI inflows. This finding is consistent with Nunnenkamp and Spatz's (2003) claim that country-specific conditions may be more important than IPR per se in attracting FDI, and it is also likely to influence the IPR–FDI relationship.

Telephone mainline per 100 people is negative but insignificantly correlated with FDI inflows. This could be due to the fact that the communications infrastructure of most developing countries has not reached the necessary threshold required to positively affect FDI inflows. For instance, the average mainline telephone for Sub-Saharan Africa (SSA), which makes about 40% of the study's sample, is only 1.5 per 100 people (World Development Report, 2004). Thus, Manhattan has more telephones than the whole of Africa (Kenny and Keremane, 2007). It is not surprising that SSA ranks higher than other developing countries in terms of their IPR, yet they receive the least FDI.

5. Policy Implications

The study's results show that IPR and other social, economic, and institutional factors influence the inflow of FDI into developing countries. Also, the strengthening of IPR in most developing countries has resulted in an increase in FDI inflows. These results have important policy implications. First, developing countries are likely to benefit from the reform of their intellectual property system at the least in terms of increased FDI inflows. Nevertheless, the means by which IPR influences FDI is subtle and complex, and therefore strong IPR alone does not sufficiently generate the desired incentives for firms to invest in a foreign country. Obviously, if that were the case, most FDI inflows to developing countries would have gone to SSA. In contrast, China and other high growth, large market developing countries with weak IPR have received the bulk of FDI in recent years. Thus, from a policy perspective, IPR reform must be accompanied by proactive policies that encourage improvements in physical and institutional or governance infrastructure, and business climate to improve the chances of attracting more FDI (Dunning and Hamdani, 1997). This is especially important because MNEs are looking for locational advantages and are continuously examining how they can operate their production processes more efficiently (Dunning, 2002; UNCTAD, 1998, 2001).

Second, FDI should be seen as a means and not an end in itself. The way forward for most developing countries is not only to intensify their move toward a more efficient IPR regime, but also intensify their technological R & D (Asid et al., 2004) to maximize their growth potential. Clearly, the bigger challenge is not just how to attract FDI, but more importantly, how to utilize it in generating the growth that is so much needed to reduce poverty. It must be noted that FDI's growth enhancing effect is possible only when it stimulates domestic capacity of the host country. Consequently, policymakers seeking to strengthen their IPR system must also emphasize FDI that generates externalities to the local economy.

Third, the review of the literature illustrates that where developing countries move to address weaknesses in their IPR system, they tend to experience enhanced access to technology through FDI and licensing (Park and Lippoldt, 2003, 2005). However, an important component of any program to attract high-quality FDI and promote technology transfer is the development of a competent indigenous technological capacity. As noted by Maskus (2000b), developing countries can benefit from IPR reform by developing policies to promote competitive markets, but even more importantly, enhance their capacity to use IPR. Developing countries would

therefore need to invest in education and training, which will help to enhance the absorptive capacity of domestic firms to utilize technology from the developed countries to improve their productivity.

In discussing the results of the study, it is worth mentioning a few of its limitations. First, the study examined the effect of IPR on the total volume of FDI and not its composition and hence the study's findings are limited to the extent that IPR has differential effects on sectoral composition of FDI. Second, both country-specific and regional factors influence the effect of IPRs on FDI, and therefore more regional and country-specific studies should be done to validate the findings of this study. As noted by Lesser (2002), determinate results of the effect of IPR on FDI may only be possible on a country – by – country basis. The inconsistency in most of the results reported also suggests that quantitative methods will need to be supplemented with qualitative methods to better understand how IPR affect FDI inflows.

The evidence of this study indicates that, at the least, developing countries benefited from strengthening their IPR through increased inflow of FDI. Consequently, while it is true that lower IPR in the context of developing countries facilitate imitation of foreign technologies, developing countries can also strengthen their IPR in order to increase FDI and technology transfer to facilitate the innovative capabilities of its citizens and domestic firms. As the study's results show, owners of technology of intellectual property rights place the issue of intellectual property protection high on their list of factors that would influence their decision as to where to invest. It can therefore be argued that if developing countries establish strong IPR regimes supported by measures aimed at improving the investment climate, communications infrastructure, and human resources capacity, they are likely to benefit from an increased flow of the right type of FDI essential for stimulating economic growth.

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Table 1. Average FDI and Patent Protection Index (1985-2003).

Country	IPR	FDI	Country	IPR	FDI
Algeria	3.42	0.54	Liberia	2.98	2.52
Angola	0.86	8.90	Madagascar	0.63	2.07
Argentina	2.60	1.88	Malawi	0.59	3.32
Bangladesh	2.28	0.13	Malaysia	4.15	3.02
Benin	2.86	1.77	Mali	1.69	2.74
Bolivia	2.17	4.49	Mauritania	3.18	2.74
Botswana	1.99	1.69	Mauritius	1.11	3.01
Brazil	2.18	1.88	Mexico	2.11	2.19
Burkina F	2.40	0.28	Morocco	1.96	2.50
Burundi	2.94	0.16	Mozambique	3.19	0.00
Cameroon	2.65	0.48	Nepal	0.07	2.69
Central African Rep	2.65	0.25	Nicaragua	2.15	1.09
Chad	2.80	8.67	Niger	0.52	2.57
Chile	2.82	4.56	Nigeria	3.36	3.13
Colombia	1.98	2.13	Pakistan	11.95	1.99
Congo	2.69	4.43	panama	2.68	2.88
Congo DR	2.86	0.48	Papua New Guinea	3.31	0.00
Costa Rica	1.79	2.83	Paraguay	1.20	2.30
Cote d'Ivoire	2.69	1.31	Peru	2.18	1.87
Dom Rep	2.61	2.76	Philippines	1.56	2.67
Ecuador	2.11	2.95	Rwanda	0.37	2.89
Egypt	2.11	1.58	Senegal	0.97	2.74
El Salvador	2.73	1.20	Sierra Leone	-0.55	2.64
Ethiopia	0.25	0.82	South Africa	0.76	3.69
Fiji	2.10	2.17	Sri Lanka	1.03	3.24
Gabon	-0.32	2.81	Sudan	1.44	3.52
Ghana	1.38	3.02	Swaziland	5.72	2.52
Grenada	8.07	1.91	Syria	2.36	2.58
Guatemala	1.20	1.20	Tanzania	1.69	2.90
Guyana	7.71	1.54	Thailand	2.10	1.88
Haiti	0.19	3.23	Togo	1.61	2.57
Honduras	2.01	2.05	Tunisia	2.13	1.99
India	0.38	1.70	Uganda	1.55	2.74
Indonesia	0.25	1.04	Uruguay	0.79	2.55
Iran	0.06	2.17	Venezuela	2.05	2.13
Jamaica	3.55	2.72	Zambia	3.45	3.52
Jordan	1.60	2.22	Zimbabwe	0.98	2.99
Kenya	0.37	2.64			

Table 2. Summary of Sub - Periods FDI and IPR

Period	IPR	FDI
1985 -1989	2.14	1.00
1990 -1994	2.14	0.68
1995 -1999	2.43	2.88
2000 -2003	2.84	3.16

Table 3. Intellectual Property Rights and Foreign Direct Investment Regressions

	1	2	3	4	5
ARG	0.078*** (0.01)	0.078*** (0.011)	0.071*** (0.013)	0.068*** (0.012)	0.050** (0.023)
OPEN	0.011** (0.004)	0.009*** (0.004)	0.011*** (0.004)	0.011*** (0.004)	0.011** (0.005)
INF	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
LPOP	0.000 (0.080)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
RETURN	2.507** (11.000)	8.448 (10.543)	20.776* (10.790)	20.751* (11.101)	20.208* (10.779)
RISK	0.043*** (0.006)	0.039*** (0.006)	0.045*** (0.006)	0.046*** (0.007)	0.040*** (0.008)
TEL		0.006 (0.004)	-0.003 (0.004)	-0.003 (0.004)	-0.004 (0.003)
IPR			1.011*** (0.172)	0.905 (0.716)	0.796*** (0.190)
IPRSQ				0.009 (0.139)	
IPR*TRIPS					0.126** (0.057)
Constant	0.231*** (0.038)	0.180*** (0.055)	0.056 (0.068)	0.055 (0.066)	0.027 (0.094)
N	194	192	179	179	179
DW	2.21	2.17	2.04	2.10	2.05
R ² -adjusted	0.42	0.42	0.40	0.38	0.36

*Significant at the 10% level. **Significant at the 5% level. ***Significant at the 1% level

Ownership Structure and Cash Flows As Determinants of Corporate Dividend Policy in Pakistan

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Abstracts

Dividend Policy is among the widely addressed topics in modern financial literature. The inconclusiveness of the theories on importance of dividend in determining firm's value has made it one of the most debatable topics for the researchers (see for example, Ramcharan, 2001; Frankfurter et. al 2002; Al-Malkawi, 2007). The present study investigates the impact of firm specific characteristics on corporate dividend behavior in emerging economy of Pakistan. Three years data (2005-2007) of 100 companies listed at Karachi Stock Exchange (KSE) has been analyzed using Ordinary Least Square (OLS) regression. The results show that managerial and individual ownership, cash flow sensitivity, size and leverage are negatively whereas, operating cash-flow and profitability are positively related to cash dividend. Managerial ownership, individual ownership, operating cash flow and size are the most significant determinants of dividend behavior whereas, leverage and cash flow sensitivity do not contribute significantly in determining the level of corporate dividend payment in the firms studied in our sample. Estimated results are robust to alternative proxy of dividend behavior i.e. dividend intensity.

Keywords: Dividend Policy, Ownership Structure, Cash Flow, OLS Regression

1. Introduction

Dividend policy is among the widely addressed topics in modern financial literature. The inconclusiveness of the theories on perceived importance of dividend policy in determining firm's value has made it one of the most debatable topics for researchers. This debate is rooted back to the seminal work of Modigliani and Miller (1961), in which they challenged the common belief that payment of dividend increases firm's value and argued that in perfect capital market a firm's dividend decision does not affect its value. But on the other hand, Lintner (1962) and Gordon (1963) supported "Bird-in-the-hand" theory and argued that in the world of uncertainty and imperfect information, high dividend payment is associated with high firm value. The above debate has now turned into voluminous financial literature, but the issue seems to be stagnant at the same point where Black (1976) called it a "Puzzle" whose pieces do not fit together. There is emerging consensus that no single factor alone can explain dividend behavior (Anil and Sujata, 2008). Financial researchers have identified a variety of firm specific factors, which are important in making dividend decision including the ownership structure.

The existing corporate theories support the relationship between ownership structure and dividend behavior due to "Agency problem" (Easterbrook, 1984; Jensen, 1986), which argue that dividend provides indirect benefit of control where active monitoring of a firm's management by its shareholders is missing (Rozef, 1982). Dividends can potentially mitigate this problem by curtailing the funds under manager's control and force management to the capital market more frequently for acquisition of funds, thus putting them under the strict scrutiny of funds suppliers in external capital market. Jensen and Meckling (1976) argued that agency cost might be reduced if insiders increase their ownership in the firm, because this will align the interest of both managers and shareholders by making the managers, ultimate owners of company but on the other hand, this ultimate ownership by management will give rise to new conflicts of interest between insiders and outsiders, as managers will try to accumulate more funds under their control either by reducing dividend payments or by maintaining payout at low level. Furthermore, "Clientele Effect Model", argues that investors are attracted towards the company whose payout policy best suits their investment objectives because investors face different tax treatments on dividend and capital gain and incur cost when they trade securities. Therefore, their preference towards dividend and capital gain create clienteles which force them to select a company whose dividend policy is aligned with their investment strategy. In the context of Pakistani taxation system, tax on dividend is deducted at source whereas, capital gain is totally exempted from tax. Therefore, it is not surprising to note that investors,

especially individuals having small holdings prefer capital gain over dividends.

In addition to ownership structure, company's financial and liquidity position also plays an important role in determining the level of dividend. If a company is facing liquidity problem then it may prefer to choose stock dividend rather than cash dividends. According to Jensen's (1986) Free Cash Flow Hypothesis, companies prefer to use their cash resources to invest in profitable projects first and dividends are paid out of residual. Berle and Means (1932), who first time introduced the concept of separation of ownership and management (cited in Afza and Slahudin, 2009), argued that the inefficient use of cash resources, in excess of profitable investment opportunities by management, causes conflict of interest between ownership and management. Dividend and interest payment reduces the free cash flow available to management, hence reducing the chance of using it in less profitable projects or on managers' prerequisites. From companies' point of view, cash generated from operations plays an important role in deciding the amount of payout, companies having greater cash flow generated from operations are expected to be in a better position to pay cash dividends rather than companies having negative operating cash flows. From cash flow sensitivity point of view prior studies reported that financially constrained firms accumulate higher cash holdings and retain greater portion of the cash earned during the period, which means that liquidity is more important when firms cannot raise funds from external market and liquid resources are required for investment in future profitable projects (Khurana et. al., 2006). Almeida et. al. (2004) pointed out that firms facing financial constraints will save more cash today to fund future investment opportunities. Intuitively, increasing tendency of saving cash out of free cash flows will indicate the availability of profitable projects and financial constraints and hence will reduce the payout ratio of the firm, provided that firms' access to external finance is limited to a certain level.

The level of financial constraints a company is facing also depends on its size which is an important factor in determining the payouts of company since large size firms have easy access to external capital market due to the higher value of their assets and positive growth prospective and do not reduce their dividends in order to finance the future profitable projects unless it became absolutely unavoidable for them. This argument assumes the availability of established debt market from where these firms can acquire loan. Small firms on the contrary, having limited access to external market try to increase the level of internally generated funds by increasing their retention ratio which potentially reduces the small firm's capability of paying dividend as they are financially more constrained. Not only the size but also firm's capital structure affects its dividend decisions. Darling (1957) argued that firms with higher debt ratio require more liquidity to allow for payoffs on potential claims. Debts besides leveraging up company's profit also put the company in danger of insolvency due to non-payment of interest and have an adverse affect on firm's liquid position. Payment of interest potentially reduces the company's cash flows available for dividend payments because of which companies having high debt ratio pay low dividends (Rozef, 1982). On the other hand, profitability is also considered to be among the prime determinants of dividend payout. Lintner (1956) in his classical study found that a firm's net earnings are the critical determinant of dividend change and DeAngelo et. al (1992) argued that current income is a critical determinant of dividend decision that is why managers are reluctant to reduce dividend payments except during periods when earnings are very poor (Mayers and Frank, 2008). Fama and French (2002) also reported that more profitable firms pay higher dividends.

Since ownership structure is taken as one of the key variables influencing the corporate dividend behavior it seems necessary to highlight some characteristics of Pakistan's Corporate and Economic scenario. Pakistan's corporations are dominated by concentrated family ownership, which is opposite to the Anglo-American structure of dispersed ownership due to which in Pakistan majority shareholders not only retain control of the company but also are engaged in managing it (Ibrahim, 2005). Generally, companies are small in size primarily because of limited access to external capital market. Moreover, management is reluctant to use equity financing because this could potentially reduce management's ownership in the company. Shareholder's rights are not fully protected by Companies Ordinance 1984 which requires shareholders to have 20% or more shares in order to take necessary action through court against any negligence in company's affairs by management. Shareholders having less than 20% but greater than 10% shares can apply to Security and Exchange Commission of Pakistan (SECP) for appointment of inspector to investigate the company's affairs. Shareholders having less than 10% shares cannot apply to court or SECP (Ibrahim, 2005). Furthermore, corporate taxation policy adversely affects the preference of small investors towards dividends because dividends are taxed at source at the rate of 10% and companies are taxed at the rate of 35% on their earnings which makes dividend subject to double taxation. Whereas, capital gains are exempted from tax as result capital gains seem more attractive for investors rather than dividends.

Furthermore, Pakistan was among the best performing economies of the south Asian region till 2007. According to Economic Survey of Pakistan 2007-08, in last 6 years Pakistan's economy has shown a record growth in its

Gross Domestic Product (GDP) and Equity Market Indices. In the year 2007 it's GDP grew at the rate of 6.9% but declined again to 5.8% in 2008. KSE broke a series of records and became the sixth best performer among the emerging markets in the calendar year 2007 (Economic Survey of Pakistan 2007-08). KSE 100 index stood at 1,366.44 in 2001 and reached to 14,075.83 on December 2007. From this we can conclude that the period under study (2005 to 2007) was in general a period of high growth opportunities for the companies.

The empirical findings on the impact of firm specific characteristics on dividend behavior are inconclusive. Existing studies have focused on the dividend behaviors of companies in developed economies like USA and UK, but the evidence from emerging economies is very limited. In the context of Pakistan, recently Ayub (2005) and Ahmed and Attiya (2009) has studied determinants of dividend policy but both studies did not consider the cash flow aspect, which is argued by many researchers as a potential determinant of dividend policy (See for example, Lawson, 1996; DeAngelo and DeAngelo, 2006;). Furthermore, the evidence on impact of ownership structures on payout of Pakistani companies is also very limited. Therefore, present study attempts to extend this literature by examining the impact of cash flows and ownership structure on corporate payouts.

The present study is different from the previous Pakistani studies based on the variables used as determinants of dividend payout. Impact of ownership structure i.e. managerial and individual ownership, on dividend payout behavior is to be analyzed further and cash flow sensitivity and operating cash flow as determinants of dividend payout behavior are yet to be studied in Pakistani context. Therefore, this study is an attempt to explore the impact of these corporate characteristics on dividend behavior of companies in emerging economy of Pakistan. It is expected that the results of this study will provide an insight into the trends and dynamics of dividend policy and its determinants.

Rest of the article is organized as follows. Section 2 provides the review of relevant literature. Research methodology is presented in Section 3. Section 4 reports the results and final section gives conclusion and some policy implications.

2. Literature Review

Existing literature is enriched with theoretical explanations and empirical evidence on the behavior of corporate dividend policy. Many researchers have analyzed the impact of ownership structure on dividend payouts but very few have considered proportion of shares held by managers and cash flow sensitivity as determinants of dividend payout policy. The literature on determinants of dividend policy has its roots in the legendary paper of Lintner (1956) in which he found the changes in earnings and existing dividend rates are the most important determinants of a company's dividend decision. Afterwards, Miller and Modigliani (1961) presented the irrelevance proposition and proved that in a perfect capital market firm's dividend decision is not a thing of value at all. During the last fifty years, the enduring nature of debate on dividend policy has generated a rich body of literature in which the majority of the researchers support that the payment of dividends has a positive impact on firms' value but on the other hand many researchers have argued that payment of dividends affect the firm's value negatively, still many others believe that dividend decisions is not a thing of value and have no significant impact on firms' perceived financial position.

Jensen and Meckling (1976) focused on the issue of Agency Cost Hypothesis and reported that dividend curtails the funds under management control, thus putting them under strict capital market scrutiny. This reduces the owner's responsibility to manage the quality of investment and to control the expenditure on manager prerequisites. Baker and Wurgler (1963) presented the other side of the picture in their Catering Theory and argued that management should give incentives to shareholders according to their demands, this is the way to cater the investors by paying smooth dividends when investors put premium on dividend paying companies and by not paying dividends when they prefer non-paying companies. Easterbrook (1984) argued that payment of dividend keeps the company in capital market where monitoring is less costly and it also reduces the level of risk taken by managers and different classes of investors. Mayers (1984) presented Pecking Order Theory, according to which a company follows a sequence in utilization of funds for investments, primarily retained earnings are used which are less costly source of funds followed by debt and equity as the sources of funds. Fama and French (2002) tested Pecking Order and Trade-Off theories simultaneously and concluded that more profitable firms have higher dividend payouts, firms with more investment have lower payouts and the relationship between leverage and payout is negative. Gordon and Walter (1985) presented Bird In Hand Theory and argued that investors prefer cash in hand (dividend) than realizable future expected profits (Capital Gain). Bhattacharya (1980) supported Signaling Hypothesis, according to which dividend reduces the information asymmetry between managers and shareholders by providing information regarding the firm's future growth prospects.

In addition to the dividend payouts theories, existing literature also provides empirical evidence on determinants of dividend policy from almost every part of the world. Purnanadam and Rao (1965) used Lintner's Dividend

Model to test long run desired dividend payout in Indian Cotton Textile Industry from a sample of 50 companies having paid up capital of more than Rs. 1 million over the period from 1946 to 1963 and found that the long term desired dividend payout ratio and reaction coefficient are inversely related. He argued that target payout is explainable in terms of variance of net income, the extent of managerial conservatism, and the amount of importance attached to dividend stability.

Bradley et. al. (1998) explored the role of expected cash flow volatility as a determinant of dividend policy both theoretically and empirically on the sample of 75 REIT firms from 1985 to 1992 and found that payout ratio is lower for firms with higher expected cash flow volatility, controlling for leverage, size and property level diversification. Their findings were in line with information based explanation of dividend policy but not with agency cost explanation.

A comparative study of dividend policy in Australia and Japan was conducted by Ho (2002) in which he examined the panel data of stocks from ASX 200 and Nikkei 225 index using fixed effect regression model and found that dividend policy is positively affected by size in Australia and by liquidity in Japan and negatively by risk, in Japan only. Industry effect is found to be significant in both the countries.

Gugler (2003) examined the relationship between dividend and ownership control structure for a panel of 214 non financial Australian firms from 1991 to 1999 using OLS technique and reported that state owned firms were engaged in dividend smoothing while family controlled firms were not. In addition, the state owned firms were most reluctant and family owned firms were least reluctant to cut dividends and also observed that firms with low growth opportunities optimally disgorge cash irrespective of who controls the firm.

Myers and Frank (2004) empirically examined the data for a sample of 483 firms from Multex Investor Database using OLS regression techniques to assess the impact of selected financial variables on the dividend decision and found that the higher Price to Earning is related with higher payout because of lower risk, and greater Institutional and insider's ownership lead to lower payout ratio which can be due to the reason that managers have an incentive to reduce dividends in order to increase the expected value of their stock options received as executive compensation. Surprisingly, Debt to equity ratio was found to be positively related with dividend payout, for which they argue that firms are willing to increase debt to finance increasing dividends in order to send a strong positive signal to institutional owners to enhance reputation and maintain access to capital.

Dhanani (2005) adopted survey methodology along with secondary financial and non-financial company data. The data of survey methodology consisted of top 800 firms listed at London Stock Exchange (LSE). The survey opted to examine empirically the importance and relevance of various theories of dividend in UK companies and to measure the extent to which these theories are influenced by corporate characteristics of size and industry sectors. The results indicated that UK managers support the general dividend relevance hypothesis, Companies generally refute the residual dividend policy for investment decisions, and also believe that dividend decisions allow limited flexibility with which to influence capital structure decisions which is in line with signaling hypothesis.

From emerging economy of Pakistan, Ayub (2005) studied the impact of firm specific factors on corporate dividend payments. He analyzed 180 companies listed at KSE during 1981 to 2002 and reported that only 23% of incremental profits are transformed in to dividend and remaining profits are utilized for additional investments and companies start paying dividend after a certain level of growth. Moreover, large number of shares held by directors lead to high dividend and low reserve funds. He also found liquidity as negatively whereas profitability, insiders' ownership and retained earnings as positively related with payment of cash dividend.

Khan (2006), analyzed the ownership structure of 330 large listed UK firms, her results indicated negative relationship between dividends and ownership concentration. She further analyzed ownership compositions and reported that ownership by insurance companies is positively but individual ownership is negatively related with dividend policy.

Kumar (2006) investigated the relationship between corporate governance and dividend payout for a panel of Indian firms from 1994 to 2000 and explained the difference in dividend behavior with the help of firm's financial structure, investment opportunities, dividend history, earning trends, and the ownership structure. He found positive relationship of dividend with earning trends and investment opportunities and negative relationship with debt-equity ratio and also the ownership by corporations and directors was positively related with dividend decision, but squared corporate ownership was negatively related with dividend but he found no evidence of relationship of foreign ownership and dividend payout.

Naceur et. al. (2006) analyzed dividend policy of 48 firms listed at Tunisian Stock Exchange during 1996 to 2004 and found that Tunisian firms rely both on current earnings and past dividends to fix their dividend payments but the former seems to be more influencing. Using dynamic panel regression they argued that

profitable firms with more stable earnings can afford large free cash flows and thus pay large dividends and they distribute large dividends when they are growing fast but the liquidity of the stock market and size were negatively related, and ownership concentration and financial leverage had no significant impact on dividend policy.

Pappadopoulos and Dimitrios (2007) investigated the impact of firm's specific characteristics on dividend payout of 72 companies listed at Athens Stock Exchange from 1995 to 2002. They split the sample into retail and industrial firms but found no statistically significant difference in dividend payout of retail and industrial firms and suggested that cash flow is the most important dividend payout determinants and is positively related with dividend payments.

From emerging economy of Jordan Al-Malkawi (2007) examined the determinants of dividend policy using the panel data of publically traded firms on Amman Stock Exchange between 1989 and 2000. Results from Tobit specification suggested that proportion of stock held by insiders and state ownership significantly affect payout while size, age and profitability were found to be the determining factors of dividend policy in Jordan. The results strongly supported the Agency Hypothesis and were broadly consistent with Pecking Order Hypothesis but inconsistent with Signaling Hypothesis.

Recently, Anil and Sujata (2008) examined the determinants of dividend payout in Indian Information Technology Sector from 2000 to 2006 and found liquidity and Beta (year to year variability in earnings) the only significant determinants of dividend payout.

Jakob and Johannes (2008) in their study on dividend policy in Denmark identified 3948 firm-year observations from 356 firms during 1988-2004 and found that the dividend payers in Denmark are characterized by positive earnings, high ROE, low volatility in ROE, high retained earnings, large size, and payment of dividend in last year but no relationship is found between market to book ratio, leverage ownership structures and dividend decision in Denmark

More recently in Pakistani context, Ahmed and Attiya (2009) analyzed determining factors of dividend policy in emerging economy of Pakistan on a sample of 320 firms listed at KSE from 2001 to 2006. Firstly, they analyzed Lintner, Fama and Babiak Proposed models, which were the extension of partial adjustment model using Panel Regression and found that Pakistani companies rely more on current earnings and past dividend to fix their dividend payment. Secondly, they analyzed the determinants of dividend payout and found that firms with stable positive net earnings pay larger dividends. Furthermore, the ownership concentration and market liquidity are positively related with dividend payout ratio but Growth opportunities had no impact on dividend payment and size of the firms found to be negatively and significantly related with payouts.

The studies of Ayub (2005) and Ahmed and Attiya (2009) have provided the baseline to our study. Ayub (2005) focused on the role of corporate governance related factors in designing dividend policy, whereas, Ahmed and Attiya (2009) investigated the impact of general corporate characters on dividend payouts. However, cash flow which is relatively more important than mere profitability was not considered by both studies. Cash flows are more useful than accruals in predicting dividend changes since cash flows are a more direct liquidity measure (Charitou and Nikos, 1998). Regarding ownership structure, Ayub (2005) argued that increased ownership by managers increases the corporate dividend payouts, however, in Pakistan where majority of companies have concentrated family ownership structures and management practices are not strongly monitored, managerial ownership is expected to have negative relationship with dividend payouts. Therefore, the present study attempts to explore the impact of ownership structure, cash flow sensitivity and operating cash flows on dividend payout behavior of companies in emerging economy of Pakistan.

3. Data and Methodology

The data of 100 companies representing all major sectors of KSE has been collected from 2005 to 2007, using the following criteria:

- 1). Firms were listed at KSE during years 2005 to 2007.
- 2). Ownership data was available for all years under study.
- 3). Should not be in loss during the whole study period.
- 4). Should not have missed dividend payment in more than 1 year from 2005-2007.
- 5). Should not be a State Owned Enterprise.

OLS regression is among the widely used technique to investigate the impact of firm specific characteristics on dividend behavior (See for example; Ayub, 2005; Kumar, 2006; Al-Malkawi, 2007; Anil and Sujata, 2008; Ahmed and Attiya, 2009). We have used the same estimation technique to analyze the impact of ownership

structures and cash flow characters on dividend behavior of companies listed in KSE Pakistan.

3.1. Variables of the study

The variables used in the study are summarized in the table 3.1:

[Insert Table 3.1 here]

Dividend payout and dividend intensity are taken as the dependent variables. Since dividend payout is the widely used proxy for dividend policy, almost every financial researcher has used payout as a proxy for corporate dividend policy (See for example Gugler, 2003; Reddy and Rath, 2005; Papadopoulos, 2007; Al-Malkawi, 2007; Ahmed & Attiya, 2009). In order to calculate dividend payout, total cash dividend per share by the company is divided by earnings after tax per share. For this purpose the reported earning per share is not considered because the denominator, number of outstanding shares, is calculated on the basis of weighted average, so to avoid the measurement bias earning per share is calculated by dividing earning after tax to number of outstanding shares. To check for robustness of results following Kumar (2006) we have used dividend intensity not only to counter the problem due to censoring of dividend payouts but also to check the robustness of results obtained from dividend payout.

In order to analyze Managerial ownership, we have used proportion of shares held by Board of Directors (BOD) and Executive Officers (see, for example, Rozeff, 1982, Jensen et al., 1992, and Holder et al., 1998). It has been argued that agency costs may be reduced if insiders (managers, directors, and other executive officers) increase their ownership in the firm, because this can help to align the interests of both managers and shareholders (Jensen and Meckling, 1976), the higher the proportion of managerial ownership in firm, the less would be the need for using dividends as a tool of reducing agency cost (Al-Malkawi, 2007). Therefore we expect a negative relationship of ownership structure and dividend payments. For individual ownership, proportion of shares held by individual investors is considered (see Khan, 2006), while calculating individual's proportion of shares, manager's proportionate share is excluded where it is reported under the heading 'individual's shareholdings'. Based on Pakistan's taxation policy, capital gain is exempted from tax but dividend is taxed at source, therefore individual investors are expected to prefer capital gain instead of cash dividends, based on which we expect negative relationship of Individual ownership with Dividend Payments.

Operating Cash Flow (OCF) represents the level of cash flow from operating activities; a strong positive relationship of operating cash flow and dividend payments is expected. According to Jensen's (1986) Free Cash Flow Hypothesis, companies prefer to use their cash resources to invest in profitable projects first; dividend is paid out of residual. From a company's point of view, cash generated from operations plays an important role in deciding the level of payout, among all three sources of cash flows i.e. operating; investing and financing, cash generated from operations is considered as most desirable source of funds for the company for distribution of dividends. Anil and Sujata (2008) also found cash flow from operations as the most significant determinant of dividend policy in Indian IT industry, they considered log to the base "e" of operating cash flow as a proxy of liquidity. Based on existing literature we expect a positive relationship between operating cash flow and proxies of dividend behavior. For measuring a firm's level of firms' Cash Flow Sensitivity (CFS), following Khurana et. al. (2006) we used annual change in cash holdings to total assets as a proxy. Based on the intuition that financially constrained firms try to accumulate cash to invest in future profitable projects, cash flow sensitivity is expected to have negative relationship with a firm's potential to pay dividend.

We have used three control variables, size, leverage and profitability in this study. Existing literature suggests that size may be inversely related to the probability of bankruptcy (Ferri and Jones 1979; Titman and Wessels 1988; Rajan and Zingales 1995). In particular, larger firms should have easier access to external capital markets and can borrow on better terms, because of limited resources the conflicts between creditors and shareholders are more severe for smaller than larger firms. Moreover, large firms tend to be more diversified and their cash flows are more regular and less volatile. Therefore, large firms should be more willing to pay out higher dividends. To measure firm size Log of Assets is considered and is expected to have positive relationship with dividend behavior. Secondly, Leverage is considered as a control variable, besides the fact that debt has the tendency to leaver up shareholders return but it also entails risk, that is , when a firm acquires debts, it commits itself to a fixed financial charge, interest, and repayment of principal, failure to which can lead a firm into liquidation. To avoid liquidation a firm, therefore, must maintain good liquidity position and cash flows which ultimately effects dividend payout negatively (Gugler and Yurtoglu, 2003; Aivazian et al., 2004). Total liabilities to total assets are considered a measure of a firm's financial leverage and expected to have negative relationship with payout. Finally, profitability represents firm's primary source of fund generation, firms suffering from losses are unlikely to pay dividends due to deficiency of funds or risk of bankruptcy. Therefore a firm's profitability is expected to have a positive relationship with dividend payouts. A firm's earning per share (EPS) is considered as a proxy of

its profitability.

3.2. Models

In order to analyze the impact of firm specific factors on dividend behavior of companies three models have been designed, each consists of two regression equations. Model 1 analyzes the impact of ownership structure using two proxy variables in which MNG represents the proportion of Managerial Ownership and IND represents the proportion of individual ownership (excluding management's proportion). Furthermore, control variables of size, leverage and profitability are also included in the model. For robustness of results we have used dividend intensity as dependent variable. The regression equations 3.1 and 3.2 have been used to estimate the impact of ownership structure on dividend behavior.

$$(DPO)_{it} = \alpha_0 + \beta_1(MNG)_{it} + \beta_2(IND)_{it} + \beta_3(SZ)_{it} + \beta_4(LVRG)_{it} + \beta_5(PRFT)_{it} + \varepsilon_{it} \quad (3.1)$$

$$(DIVINT)_{it} = \alpha_0 + \beta_1(MNG)_{it} + \beta_2(IND)_{it} + \beta_3(SZ)_{it} + \beta_4(LVRG)_{it} + \beta_5(PRFT)_{it} + \varepsilon_{it} \quad (3.2)$$

Model 2 investigates the impact of cash flow characteristics using two variables in which OCF represents the operating cash flow of the company and CFS represents cash flow sensitivity along with three control variables i.e. size, leverage and profitability whereas dividend intensity is used for robustness check. The regression equations 3.3 and 3.4 estimate the impact of cash flow characteristics on dividend payouts and dividend intensity respectively.

$$(DPO)_{it} = \alpha_0 + \beta_1(OCF)_{it} + \beta_2(CFS)_{it} + \beta_3(SZ)_{it} + \beta_4(LVRG)_{it} + \beta_5(PRFT)_{it} + \varepsilon_{it} \quad (3.3)$$

$$(DIVINT)_{it} = \alpha_0 + \beta_1(OCF)_{it} + \beta_2(CFS)_{it} + \beta_3(SZ)_{it} + \beta_4(LVRG)_{it} + \beta_5(PRFT)_{it} + \varepsilon_{it} \quad (3.4)$$

Model 3 is a joint model which analyzes the combined effect of ownership structure and cash flow characteristics on dividend behavior. The regression equations 3.5 and 3.6 estimates the combined impact of all variables previously used on proxies of dividend behavior.

$$(DPO)_{it} = \alpha_0 + \beta_1(MNG)_{it} + \beta_2(IND)_{it} + \beta_3(OCF)_{it} + \beta_4(CFS)_{it} + \beta_5(SZ)_{it} + \beta_6(LVRG)_{it} + \beta_7(PRFT)_{it} + \varepsilon_{it} \quad (3.5)$$

$$(DIVINT)_{it} = \alpha_0 + \beta_1(MNG)_{it} + \beta_2(IND)_{it} + \beta_3(OCF)_{it} + \beta_4(CFS)_{it} + \beta_5(SZ)_{it} + \beta_6(LVRG)_{it} + \beta_7(PRFT)_{it} + \varepsilon_{it} \quad (3.6)$$

(All variables have been explained in table 3.1)

4. Results Discussion

Given below are the results of regression equations on a sample of 256 firm-year observations (Note 1)

[Insert Table 4.1 here]

The results of Table 4.1 reveal that managerial ownership has significant and negative relationship with dividend payout and dividend Intensity in Model 1 which is in agreement with Meyers and Frank (2004). In Pakistan management practices are not strongly monitored by corporate law authorities, that is why corporate managers seem to have greater tendency to increase funds under their control at the expense of low dividend payouts. Jensen (1986) also provided evidence that the managers, who are reluctant to pay dividend, are reluctant to give up control over earnings" (cited in Belden et. al., 2005). Individual's ownership coefficient is also significantly negative which shows that individual investors do not prefer dividends over capital gain, which could be due to double taxation on dividend and no tax on capital gain, supporting tax preference hypothesis. In addition, majority of individual investors seems to be interested in speculative profit rather than long term investments in equity shares and the dividend is not considered as an instant source of funds which reduces individual's inclination towards dividend. As a result companies also seem reluctant to pay a high dividend, which is inline with the "Catering Theory". According to which, management gives incentives to shareholders as per their expectations and pay dividend only when investors put premium on shares of dividend paying companies. The reducing importance of dividends adversely affects the corporate payouts and is partly the reason of disappearing dividends form Pakistani Stock Market. Similar results have been observed by Wei (2003) and Khan (2006) who reported negative relationship between individual ownership and dividends in Chinese and UK firms respectively. Overall explanatory power of the model is 14% with dividend payout and 23.70% with dividend intensity.

Model 2 captures the impact of cash flow from operations and cash flow sensitivity on dividend payout and dividend intensity. The results show significant positive relationship between operating cash flow with both proxies of dividend behavior. This relationship shows that operating cash flows are of significant importance in determining the level of cash dividends in Pakistan. It also shows that cash flow sensitivity is insignificant but negatively related with dividend payout and has a significantly negative relationship with dividend intensity. Similar results were reported by Alemeida et. al., (2004) who argued that firms facing financial constraints in future respond to those potential constraints by accumulating cash today which makes firm more cash sensitive, this accumulation of cash negatively affect cash dividends of companies. Intuitively, firms which are sensitive to

cash flow would be reluctant to pay high dividends. Operating cash flow and cash flow sensitivity along with control variables of size, leverage and profitability explain 8% and 35.5% of total variation in dividend payout and dividend intensity respectively.

Finally, Model 3 analyses the combined impact of all variables on dividend behavior. The results of joint model (Model 3) show managerial ownership, individual ownership and operating cash flow as the most significant determinants of dividend behavior. The coefficient of cash flow sensitivity is insignificant with dividend payout but significantly and negatively related with dividend intensity. The overall explanatory power of Model 3 is 15% for dividend payout and 40.6% for dividend intensity.

All models include three control variables in which size is used as first control variable having significantly negative relationship with dividend behavior. Existing literature shows mixed results on the relationship of size and dividend payouts where majority of researchers have reported the positive relationship of size with dividend payouts (See for example, Stacescu, 2006; Al-Malkawi, 2007) while others have reported negative relationship (See for example, Naceur, 2006; Avazian et. al., 2006; Ahmed and Attiya, 2009). In the context of Pakistan, Ahmed and Attiya (2009) have found similar results and reported negative relationship of firms' size with dividend payouts which can be due to large firms' preference to retain dividends in order to avoid costly financing. Another explanation of negative co-efficient of size could be the period of study i.e. 2005 to 2007, which is considered as the period of economic boom in which GDP growth rate reached up to 6.9% (in 2007) and was recorded as the highest in Asia (Economic Survey of Pakistan, 2007-08). But this rate declined again to 5.8% in 2008 and Pakistan's economy was hit by the worst crises of its history driven by energy shortage, disappointing harvest in key cash crops and policy uncertainty during the transition of the government. It seems that large size firms might be expecting this dramatic deterioration, therefore, they started building up their reserves instead of dividend payments while small firms, being myopic, tried to attract investors through high dividend as they don't have easy access to external capital markets.

Leverage is negatively but insignificantly related with dividend payout showing lesser importance of Debt Ratio in determining dividend payout which is inline with the results reported by Baker et. al. (2007) and Ahmed and Attiya (2009) but contradicts the results of Mayers and Frank (2004) who reported positive relationship of leverage and dividend payouts. The insignificant relationship of leverage seems to be in line with Ayub (2005) who argued that the public debt market is not well established in Pakistan and majority of loan are sanctioned on socio-political basis and such loans are sanctioned only for a particular project and are not contributed in capital employed by the company. Therefore, debt cannot be considered as having a direct bearing on the corporate dividend policy in Pakistan.

Profitability is also positively but insignificantly related with dividend payout but significantly related with dividend Intensity which is inline with the results of Mayers and Frank (2004) in general and Avazian et. al. (2003) specifically in Pakistani context, who reported insignificant positive relationship of profitability with dividend payouts.

5. Conclusion and Policy Implications

Although, timely payment of dividend has a positive impact on reputation of company in equity market, but unfortunately, corporate dividend payouts in Pakistan are very low as compared to other emerging economies. During last three years, the number of dividend paying companies has been reduced to 40% in 2007 as compared to 46% in 2005 (Annual Report KSE, 2008). The objective of the current study is to investigate the reasons behind declining dividends, in general, and to explore the impact of ownership structure and cash flows on corporate dividend payouts, in particular. In context of Pakistan, recently Ayub (2005) and Ahmed and Attiya (2009) have studied determinants of dividend policy but both studies did not consider the cash flow aspect, which is argued by many researchers as a potential determinant of dividend policy (See for example, Lawson, 1996; DeAngelo and DeAngelo, 2006;). Furthermore, the evidence on impact of ownership structures on payout of Pakistani companies is also very limited. Therefore, present study attempts to extend this literature by examining the impact of cash flows and ownership structure on corporate payouts. The data of 100 companies representing all major sectors of KSE has been collected from 2005 to 2007 and analyzed using OLS regression. The estimated results show that the companies in which high proportion of shares are held by managers and individual are more reluctant of pay high dividends as compared with the companies in which managerial and individual ownership is low. However, high operating cash flows increase companies' potential to pay high dividends. Although, cash flow sensitivity reduces the companies' payouts but still it is not among the potential determinants of corporate payouts in Pakistan. Large and highly leveraged firms are more reluctant to pay high dividend as compared to small and low leveraged firms, while profitability increases the companies' dividend

payouts.

The above findings reveal the fact that corporate managers try to accumulate funds under their control at the expense of low payouts because managerial practices are not strictly monitored and investors' rights are not strongly protected in Pakistan, which seems to be the main reason of disappearing dividends from Pakistani stock market. Furthermore, individual investors consisting of stock brokers, agents, dealers, retired civil servants, businessmen, professionals and small jobholders, are more interested in capital gain from short selling and long buying based rather than dividends. A possible reason for the preference of capital gain over dividends could be the exemption of capital gain from tax as compared with dividends which are subject to double taxation. Although operating cash flow is the most desirable source of cash dividends but our data shows that during last seven years the corporate operating cash flow to total assets ratio has declined from 0.167 to 0.117 which has also contributed towards declining corporate dividends. Surprisingly, large companies have been found more reluctant to pay high dividends which might be because large companies try to save more cash for reinvesting in assets, whereas, small companies, having little access to external debt market try to improve the demand of their shares by paying dividends to accumulate required sum of money from issuance of equity shares at better price.

Based on the results, it is suggested that corporate law authorities should discourage concentrated family ownerships in companies and due protection should be given to minority shareholders against expropriation of minority rights. This could be done by formulating policy and procedures through which minority shareholders can approach SECP in case they any mismanagement in company's affairs. SECP should also discourage increasing speculative activities in the stock markets by reducing withholding tax on dividend income to encourage long term investment in shares. Furthermore, in order to encourage companies to pay dividends, corporate tax authorities should announce tax incentives to such companies who pay regular dividends. Corporate managers, on the other side, should focus on increasing companies' operating cash flows in order to make their companies able to pay high and regular dividends which will ultimately raise the market price of their equity shares.

The scope of this study is limited to 3 years data of 100 companies listed at KSE Pakistan, and therefore, represents the nature and trends of dividend payouts of listed companies during the window period from 2005 to 2007 only. Results from this study can be refined further by increasing the sample size and study period. Furthermore, due to non-availability of ownership data of most of the companies, only managerial and individual ownerships have been studied, future researchers may study the impact of Institutional ownership on dividend payouts. The sample may further be classified in to financial and non-financial companies, regular dividend paying and irregular dividend paying companies.

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Notes

Note 1. For refinement in results another sample with more strict criteria has been analyzed in which only those companies have been included in the sample that paid dividend in all three years (i.e. 2005-2007) which has reduced our sample size to 180 firm-year observations but increased the explanatory power (Adjusted R-Square) of all regression models. The results of regression equations from new sample have shown slight increase in coefficient values but no change has been observed in signs of coefficients and level of significance in any of the models.

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Table 3.1 Variables of the study

Symbol	Variable description	Proxy	Expected relationship
Dependent Variable			
DPO	Dividend paid per share / Net Earning per share	Dividend Behavior	
DIVINT	Total Dividend Paid/ Total Assets	Dividend Behavior	
Independent Variables			
MNG	Proportion of shares held by Directors and Executives	Managerial Ownership	Negative (-)
IND	Proportion of shares held by Individuals	Individual Ownership	Negative (-)
OCF	Operating Cash Flow / Total Assets	Operating Cash	Positive (+)
CFS	Δ Cash Balance / Total Assets	Cash Flow Sensitivity	Negative (-)
SZ	Log of Assets	Size	Positive (+)
LVRG	Total Liabilities / Total Assets	Capital Structure	Negative (-)
PROFT	Earning Per Share	Profitability	Positive (+)

Table 4.1.

VARIABLES	MODEL 1		MODEL 2		MODEL 3	
	DPO (EQ 3.1)	DIVINT (EQ 3.2)	DPO (EQ 3.3)	DIVINT (EQ 3.4)	DPO (EQ 3.5)	DIVINT (EQ 3.6)
CONSTANT	1.794*** (4.727)	0.272*** (4.144)	0.961*** (2.807)	0.047 (0.915)	1.573*** (3.980)	0.178*** (2.909)
MNG	-0.405*** (-4.406)	-0.069*** (-4.303)	---	---	-0.359*** (-3.800)	-0.047*** (-3.188)
IND	-0.401*** (-3.270)	-0.101*** (-4.743)	---	---	-0.331** (-2.548)	-0.069*** (-3.432)
OCF	---	---	0.674*** (3.040)	0.242*** (7.312)	0.459** (2.017)	0.216*** (6.163)
CFS	---	---	-0.389 (-0.997)	-0.170*** (-2.921)	-0.429 (-1.061)	-0.203*** (-3.248)
SZ	-0.056*** (-3.312)	-0.008*** (-2.903)	-0.028* (-1.814)	-0.001 (-0.442)	-0.049*** (-2.859)	-0.006** (-2.194)
LVG	-0.135 (-1.350)	-0.030* (-1.762)	-0.161 (-1.619)	-0.033** (-2.223)	-0.119 (-1.176)	-0.021 (-1.371)
PRFT	0.000 (0.051)	0.000*** (3.289)	0.001 (1.581)	0.001*** (6.342)	0.001 (0.922)	0.001*** (5.442)
N	212	212	230	230	208	208
R2%	16.00	25.50	10.00	36.90	18.00	42.60
ADJ-R2%	14.00	23.70	08.00	35.50	15.20	40.60
D/W	1.530	1.043	1.607	1.311	1.622	1.369

Parenthesis contain (t-Statistics); *** significant at level of 1%; ** significant at level of 5%; * Significant at level of 10%

Gaming of Strategy--Strategic Realignment of Chinese Dairy Industry

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Abstract

Over the past ten-odd years, the dizzying prosperity and rapid development achieved in Chinese Dairy Industrial t actually covered up a fundamental defect concerning the strategy, which eventually led to the "Melamine Event". Today, the troubled waters have been poured oil on, but it still needs time to be recovered. China's Dairy Industry, which suffered heavy losses and casualties, is about to seek for a transformation and will have to help himself out of the crisis. This paper will apply the game theory of "Prisoner's Dilemma" case to reflect the strategic defects appeared in the early dairy industrial development, with the combination of the new changes in the dairy industrial development environment after "Melamine Event", it also points out that the key to revitalize the domestic dairy enterprises is to put the emphasis on the nature of the dairy industry itself, to return to consumers standard, to try to establish the undifferentiated marketing strategy and differentiated marketing strategy system.

Keywords: Melamine, Prisoner's Dilemma, Strategic Realignment, Dairy Industry

After rapid growth for a decade, Chinese dairy industry has taken a hit in melamine storm. The wheels of history will never stop, the disgrace has passed away. It's necessary to learn from the mistakes for re-emergence in the murky market environment. Research on the sound development pattern is important for the Chinese dairy industry and is of strategic importance.

1. Melamine incident-Chinese dairy industry has encountered prisoner's dilemma

Study on the melamine incident is essential for the strategic development of Chinese dairy industry. Superficially, a collective moral hazard, its essence is the result of a long-term contradiction accumulation during the rapid development stage.

The Chinese dairy industry has developed with annual growth rate of 30% before with the continuous raise of market demand and capital input. The dairy industry has superiority over promoting the peasant income, employment, local public finance, and lower barrier to entry. Its development is influenced by the general market discipline and especially local government. The Chinese dairy industry developed too quickly for its unique industry characteristic, and landed in deep trouble of over competition. Currently, the number of Chinese mainland massive dairy industries is more than 700. And their product technology is highly homogenization. So they are independent and encounter predicament of price war. The notorious melamine incident is the inevitable outcome of vicious competition and effective supervision shortage.

It's useful to build a gaming model to reveal the depths of melamine event.

Gamers: dairy enterprise A and B, homogeneity of their products, price elasticity of demand is more than 1; price is the critical factor of the purchase.

Payoff function: same price, then same profit. If A cuts its price and B maintain its original price, then A would gain more profit. If A and B cuts its price at same extent, they would gain the same profit but lower.

Excessive competition of China dairy results in prisoners' dilemma of price, promotion and advertisement. If the supervision of product quality is ineffective, the competition based on rational individual would erode the cost, and "Melamine Event" would be inevitable.

2. The change of China Dairy's competition environment

After "Melamine Event", dairy's environment of competition has changed. First, standardization of China dairy's competition environment achieved remarkable results. Government and relevant enterprises took an active action to eliminate the harmful effects. The authorities have introduced a range of plans to rectify the milk stations and dairy processing enterprises to promote the level of quality and supervise, such as quality and safety of dairy products Regulatory Ordinance, dairy industry rectifying and revitalization program planning, food safety law and so on.

Secondly, consumer buying behavior is more mature and rational. Quality and safety have become the chiefly factor affecting the buying of dairy products. The milk source, quality and quality guarantee period have already exceeded brand and advertisement.

Finally, the competition between well-known brand and second, third line brand became fierce. After “Melamine Event”, Sanlu Group go bankrupt, and some well-known dairy brand suffer great losses. The market share they lost causes more competition. Some dairy enterprises with good reputation increase the marketing investment to expend nationwide and enter the leading echelon, for example: Wanda Shan, Feihe and so on. The sales volume of some dairy enterprises whose product didn't contained melamine grows by 30%-50%. Some regional brands gain greater development opportunity.

3. Gaming of strategy ——strategic realignment of Chinese dairy industry

The internal per-capita consumption of milk is only 7.2kg, and less than 8% of global average. Agree inside course of study think, domestic dairy market will be the largest in the following 10 years. After Melamine Event, we realize industry essence was ignored, the defect of product convergence, and the opportunity of industry rectification.

According to Peter Drucker, the social problem could be transformed into enterprises developing opportunity by the solving social problem rather than new technology, new product and new service. Dairy enterprises must learn from mistakes and adjust competition strategy to get a long-term positive development.

3.1 Industry essence and construction of stable and normative milk base

Designing and executing strategy based on industry essence is the key for enterprises' success. Milk and powdered milk have become daily necessities and fast-moving consumer goods of many families. As nutritious foods Dairy products' quality safety is industry essence and base of consumer confidence resumption. According to information of dairy association, the cow population is 6,000,000. According to the objective laws, the annual growth rate is 10%. But the annual growth rate of dairy industry is 30%. So it is certain that milk scarcity would be the bottleneck of the industry development.

Form industry chain competition perspective, melamine event has exposed the defect of raw milk supply chain. A mismatch between milk source and processing industry leads to no guarantee of raw milk's quality. The key to improving the quality of raw milk is developing large-scale dairy farms. Most of enterprises run under their capacity as a result of milk resource restrict. So, dairy industry competition has turned into the upstream resource competition. Steady and standard milk base become the key of competition.

To the tightness of combination of supply chain and enterprise, milk source organization pattern contains enterprise + farmer and enterprise + large-scale pasture. Currently the former is numerous. The lax pattern ship couldn't ensure the quality of raw milk, and its ability of resisting risk is worse. The latter takes active measures to promote collective, large-scale and scientific raising. The enterprises could have the whole productive process under control and could guarantee the quality of product. The milk source is the critical factor of competitiveness. So, the dairy enterprises build more and more standard pastures even the investment is huge and the investment cycle is long.

Currently, the quantity of large-scale pastures is limited and couldn't meet the demand of raw milk supply. So, the dairy enterprises should seek advanced management pattern of mild source, for example: “cow cooperative society” of Yili Group, organizes dairy farmers, government department and milk station to resist risk. Enterprises connect directly with the scattered dairy farmers to unify the milk collection, quality inspection. The administration cost is down, and the raw milk supply is steady and high-quality. This pattern proves the milk farmers' ability of risk-resisting, and accords with realistic condition of China.

3.2 No differentiation competitive strategy

Because of actual dairy industry demand and freely diffusible industry technology, the difference between enterprises' products is small. Concentration, mouth fell, taste and supplement could be adjusted easily. Enterprises couldn't stay competitive by unique product characters for long term. The no differentiation competition is mainly in product homogeneity market, especially liquid milk market. Usually, the competitive strategy in no differentiation market is brand competition. But, after melamine event, the brand loyalty is not tall and couldn't effectively influence the consumer buying decision. In this case, the traditional competition factors become the main competition model.

3.2.1. Concept competition

Dairy industry concept competition is divided into high-end and low-end. Low-end concept is expressed in some product stunt, for example, reconstituted milk, pure and fresh milk, thick milk, calcium milk and so on. High-end concept is reflected in product positioning appeal point, for example, “nature pasture” always is the appeal point every brand battles for, because the milk source could server as a foil to quality.

3.2.2. Talent competition

At present, many young men with few working experience rise to important positions. Dairy enterprises are faced with lack of talent. Superior talent resource is important for the comprehensive competitive power. Menniu is the model in talent resource. It has only a 3 years history, but most of its senior management has a working experience above 10 years. The talent resource is more important than capital.

3.2.3. Price competition

Price is a common competition method. In liquid milk market, many brands with lower price derived from size effect have competitive advantage. On Guangdong market, Yili group and Menniu group drive down price of extraordinary high temperature milk, Guangmin group grabs market share of fresh milk with low price.

3.3 Differentiation competition strategy

Chinese dairy market is still in the demand-driven stage. Rural-urban difference, regional disparity and demand disparity provide the dairy enterprises' differentiation competition strategy with abundant scope. The differentiation competition strategy is the medium-sized and small enterprises' best choice.

3.3.1 Product differentiation

The key to product differentiation is market segment. The enterprises must find the unsatisfied demand and fill the market space. The dairy products have gradually become daily necessities rather than luxury. Take liquid milk as example. According to a survey, the infant demand accounts for 19% of the whole consumption, and old man over 60 years accounts for 28%. People of all professionals are part of liquid milk consumption group. Difference of milk demand is very notable, and the dairy enterprises could get differentiation advantage. As a temporary competition strategy, the product differentiation could help enterprises enter an emerging market, and get advantage. Sanyuan group cooperates with Jiaoda LP to compete against Guangmin Group with its temporary leading product.

3.3.2 Channels expanding

Channels expanding include three aspects. Expanding mail body is expanding into restaurants and taverns based on the existing channels. The second is operational pattern expanding. Based on traditional wholesale and tail, the enterprises build the direct selling model to delivery the milk to door and order online. The third is channels expanding in depth and breadth. The dairy consumption and supply have been focused on urban market and the rural market has been neglected. The rural market's potential consumption is huge. During developing in rural market, the product form is important for product image of high quality and lower price, for example, high-capacity package, lower price, and longer quality guarantee period. In addition, it is useful to use the local selling resources to form an overlay area selling network.

3.3.3 Promotion support

Dairy consumption is always impulse buying. The package, advertisement, price, display and shopping guide could effect the buying decision. But, the consumer wouldn't buy the same brand without combination of these elements. The consumer loyalty is related with the brand and product value. So the consumption transition would occur when the consumers realize some brand is material benefit. The dairy enterprises must choose proper promotion pattern and pay attention to communication with consumers, because of consumer environment change and prudent buying.

When setting promotion pattern, enterprises should give consideration to consumer mental remedy after melamine event. They should pay attention to the consumers' experience and realize it is more important to make consumer experience the healthy and fashionable lifestyle advocated by the product than the taste, function and service. Then, the enterprises could enter the consumers' inner space, and affect the buying behavior.

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Efficacy of Drivers' Fatigue on Road Accident in Selected Southwestern States of Nigeria

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Abstract

The study examines the causes and effects of driver's fatigue on road crashes in south-western Nigeria. The study was carried out in the administrative seats of Oyo and Ogun states of Nigeria with the aid of structured questionnaires which were administered on 325 respondents in the study area using simple random sampling approach. The collected data were analysed using multiple regression model.

The study revealed that, duration of driving, stress, sleep deficit, alcohol contributed significantly to the causes of driver's fatigue both at 5% and 10% significant levels.

It was concluded that, the safest option is for driver to avoid driving when sleepy on when they are ill or taking medication. And that it is pertinent on them to plan their journeys in such a way that it will include regular rest, break of at least 15 minutes at every two hours.

Keywords: Accident, Driver, Efficacy, Fatigue, Road

1. Introduction

The role of fatigue must not be underestimated when studying the causes of crashes. Driver fatigue crashes are not only a matter of having spent too long behind the wheel; fatigue can also be caused by too little sleep, stress, or time of the day. According to a conservative estimate based on studies abroad, driver fatigue is involved in 10-15% of all severe crashes (Nordbakke et al, 2007). Although technical aids that prevent fatigue crashes are being developed, they are not yet ready for use. In the road haulage industry, the only means that are presently available to combat fatigue crashes are consistently applying (and enforcing) the driving and resting hours and a safety culture. Information campaigns should make non-professional car drivers aware of the risks of fatigue.

The impact of driver fatigue on driving safety is a complex one. Within commercial road transport, the core issue is one of working time and the opportunity this offers for rest and recuperation from work, together with the possibility of presenting for work unimpaired by fatigue and loss of sleep. However, powerful economic and social forces influence and control the normative pattern of work of commercial drivers. Working time is, after all, one of the basic economic inputs to production and transport. Consequently, the safety argument too often has been brushed aside in the face of a commercial logic that requires flexible and on time transportation of goods and passengers, in many cases spanning the 24-hour cycle (Vanlaar et al, 2007). The customer, the consumer and new modes of production require this – and in some respects, the working conditions of many

drivers have become harsher and more demanding over the last 30 years. For these reasons, it is of particular importance to restate the safety case for controlling more effectively the factors that give rise to fatigue.

2. Concept of fatigue

There is no clear definition of fatigue. The term is attributed with various meanings: physical (e.g. as a result of heavy and protracted physical labour) and neurobiological (biologically determined sleep-awake rhythms) (Nordbakke et al, 2007). In addition, it also has a mental/psychological meaning: not having the energy to do something, and a subjectively experienced reluctance to continue with a task. Fatigue, or tiredness, concerns the inability or disinclination to continue an activity, generally because the activity has been going on for "too long". There are different kinds, such as local physical fatigue (e.g. in a skeletal or ocular muscle), general physical fatigue (following heavy manual labour) or "central nervous" fatigue (sleepiness). The last of these is mental fatigue – not "having the energy" to do anything. Sleepiness is a particularly important form of fatigue related to the level of brain stimulation and the structures that regulate it (Åkerstedt and Kecklund, 2000).

In behavioural terms, there are four levels of sleep:

(a) Completely awake

(b) Moderate sleepiness when the central nervous system maintains an adequate pattern but functions more slowly than normal (Angus and Heslegrave, 1985);

(c) Severe sleepiness, where the individual is repeatedly overcome by fatigue and Interruptions occur interactively with the surroundings and performance becomes irregular and fitful. This characterises such disorders as narcolepsy (Valley and Broughton, 1983), as well as totally healthy, but exhausted, individuals (Torsvall and Åkerstedt, 1987); and

(d) Sleep, where there is no longer any interaction with the surrounding environment.

The level of fatigue or sleepiness is a function of the amount of activity (for example, number of hours awake) in relation to the brain's physiological waking capacity. Several factors can influence this physiological waking capacity and hence lower the fatigue threshold. For example, disturbed sleep, the low point in the circadian rhythm (time of day), and alcohol and drugs. These factors are independent of the activity being undertaken, but result in the fatigue effect of that activity appearing more quickly. Thus fatigue cannot be seen simply as a function of the duration of time engaged in work (or any other activity). Furthermore, where there is a lack of sufficient restorative sleep, the fatigue threshold may be affected over a period of days or weeks.

Human beings need to sleep. Sleep is not a matter of choice; it is essential and inevitable. The longer someone remains awake, the greater the need to sleep and the more difficult it is to resist falling asleep. Sleep will eventually overpower the strongest intentions and efforts to stay awake. The need for sleep varies between individuals, but sleeping for 8 out of 24 hours is common, and 7 to 9 hours sleep is required to optimise performance. Sleep patterns are governed by the circadian rhythm (the body clock) that completes a full cycle approximately once every 24 hours.

Humans are usually awake during daylight and asleep during darkness. There are two peaks of sleepiness: the early hours of the morning and the middle of the afternoon. The loss or disruption of sleep results in sleepiness during periods when the person would usually be fully awake. The loss of even one night's sleep can lead to extreme short term sleepiness, and continual disrupted sleep can lead to chronic sleepiness. The only effective way to reduce sleepiness is to sleep. Sleeping less than four hours per night impairs performance. The effects of sleep loss are cumulative and regularly losing one or two hours of sleep a night can lead to chronic sleepiness over time.

The most comprehensive research undertaken into the effects of driver fatigue has been carried out in the USA. A series of studies by the National Transportation Safety Board (NTSB) have pointed to the significance of sleepiness as a factor in accidents involving heavy vehicles (NTSB, 1990 and 1995; Wang and Knippling, 1994). The NTSB came to the conclusion that 52 per cent of 107 one - vehicle accidents involving heavy trucks were fatigue related; in nearly 18 per cent of the cases, the driver admitted to falling asleep. In a report published by NTSB (NTSB, 1999), summarising the US Department of Transport's investigations into fatigue in the 1990s, the extent of fatigue -related fatal accidents is estimated to be around 30 %. Fatigue is considered the most important road safety factor for large trucks (FHWA, 1995).

In Europe, the evidence is less comprehensive, and often involves retrospective accounts of fatigue involvement which are likely to underestimate its impact. A Dutch survey found that 7% of HGV drivers attributed their accident involvement to having fallen asleep at the wheel (Van Ouwerkerk, 1987). A more recent French study

showed that 10.5% of HGV drivers stated that fatigue had contributed to their road crash involvement (Monfrin et al, 1996). Langwieder and Spörner (1994) found that for commercial vehicles, the rate varied according to the weight of the vehicle identified as being mainly responsible for the accident: 26% for HGVs of more than 7.5 tonnes GVW and 35.7% for light vehicles under 7.5 tonnes GVW, both figures being more in line with the US results.

Posing the question in another way – what proportion of drivers report having fallen asleep at the wheel? As the results of different surveys carried out at different times show, over 50% of long-haul drivers have at some time fallen asleep at the wheel (Hamelin, 2000). While, internationally, there has been a lot of research on fatigue and safety, in Europe and Africa there have not been concerted effort to provide a strong and coherent research basis for the development of policy. Thus while quite a lot is known about the physiology of sleep and waking (particularly over cycles of no more than 24 hours) and a certain amount about the risks associated with the various parameters of working time, knowledge of the actual working hours (and how they are distributed) is limited to certain countries (Van Ouwerkerk, 1987)

3. Causes of fatigue

Fatigue has many causes. It used to be directly and almost exclusively associated with the amount of time that one has been carrying out a particular task (time-on-task). It is still seen as one of the most important causes. However, research has shown other factors that are equally important (Vanlaar, et al 2007). In the first place, fatigue is a lack of sleep. This can be *chronic* or *acute*.

A *chronic lack of sleep* is the result of not having enough sleep during a long period. The average person needs 8 hours of sleep in every 24-hour cycle. The quality of the sleep is also of great importance, besides the quantity. If sleep is regularly interrupted, this leads a chronic lack of sleep, just as too little sleep does. The quality of sleep is influenced by, among other things, sleep disorders like sleep apnoea (temporary breathing stoppage while sleeping) or narcolepsy (the tendency to suddenly fall asleep). But it can also be a side effect of chronic diseases and/or medication or the result of external factors such as a noisy or unpleasant sleeping environment (Valley and Broughton, 1983).

An *acute lack of sleep* is also the result of too little sleep, but is less structural than chronic lack of sleep. An acute lack of sleep can occur after just *one* bad or short night. If there has been too little sleep during a 24-hour period, we refer to it as a partial, acute lack of sleep. There is a complete, acute lack of sleep if there has been no sleep at all in a period of 24 hours.

Fatigue or sleepiness can also occur without lack of sleep. This type of fatigue is usually linked to the daily sleep cycle or the biorhythm. This means that at certain times in the 24-hour cycle the human body has a greater need for sleep than at other times. This happens most and lasts longest early in the morning (approximately between midnight and 4 a.m.) and, to a lesser extent, about 12 hours later (approximately between 2 p.m. and 4 p.m.). At these moments, there is a natural tendency to sleep and, if this cannot be given in to, a sleepy feeling occurs.

The duration and quality of sleep have a direct effect on the level of alertness and the ability to drive a vehicle safely. Setting off in the vehicle in the early hours of the morning means, for instance, that a person is combining driving at the low point in the circadian rhythm with a greatly shortened period of sleep. Fragmented sleep, characteristic of a sleep disorder called sleep apnoea, can in serious cases have no recuperative value whatsoever with an accompanying high risk of falling asleep at the wheel. Any cumulative sleep debt, which has built up over several days, will also adversely affect performance. Such a sleep debt needs to be dissipated over successive nights of good sleep that include the time window of the circadian low point. Some evidence suggests that following severe sleep restriction, recovery of performance may not be complete even after three nights of recovery sleep (Balkin et al, 2000).

The NTSB's in-depth study of single-vehicle accidents involving large trucks (NTSB, 1995), concluded that the most important factors behind the 58 per cent of fatigue-related accidents were the duration of the driver's last period of sleep, the total number of hours of sleep during the past 24-hour period, and fragmented sleeping patterns (several short periods of sleep). The period of sleep starts to be negatively affected if this daily rest falls below 12 to 14 hours (Kurumatani et al, 1994; Kecklund and Åkerstedt, 1995; Wylie et al, 1996; Mitler et al, 1997; Hantula, 2000).

The following factors have indirect influence: age, physical condition, the use of alcohol, drugs and/or medicine, external factors such as temperature, noise, vibrations, and also the routine of a task. For example, driving alone on a boring road for a long time may not itself cause fatigue or sleepiness, but it can cause the consequences to manifest sooner.

4. General effect of fatigue

Fatigue leads to a reduction in alertness, longer reaction times, memory problems, poorer psychometric coordination, and less efficient information processing. Fatigue also has an effect on the frame of mind. The motivation to carry out a task diminishes, the communication and interaction with the surroundings deteriorates, and one gets irritated quicker and reacts more aggressively towards people and things. In other words, fatigue leads to diminished action capability and action preparedness (Langois et al, 1985; Lavie et al, 1987; Horne and Reyner, 1995; Pack et al, 1995; Hantula, 2000).

All the above-mentioned functions are important for carrying out the driving task accurately and safely. It can, therefore, be expected that fatigue also leads to a worsening of carrying out the driving task. Various studies have indeed shown this to be the case. Such research generally involves a driving simulator in which subjects either drive a long distance or are not allowed to sleep for a long time. The results of this type of study are reasonably uniform. In the first place it was found that tired people have more problems in keeping their lane, more often cross or nearly cross the side marking, and make greater steering adjustments and do so more abruptly. The drivers also react less accurately to deceleration by the driver in front (Wang, 1995).

In spite of this, the car driver appears to be capable of adjusting to the circumstances. For example, it has been found that the task performance deteriorates less when the task gets more difficult or more dangerous, for example in road bends, when an oncoming vehicle approaches, or when a vehicle in front suddenly brakes. In addition, there are also indications that a driver compensates fatigue. Initially, this is done by increasing the task demands by, for example, driving faster. Next, as fatigue increases, the task demands are decreased by driving slower and keeping a longer distance to the vehicle ahead. It must however be observed that people in a hurry use compensation in the form of lower task demands much less frequently.

5. Fatigue and road crashes

Fatigue is not normally referred to on road accident report forms. This means that, in general, no reliable official statistics exist for the frequency of fatigue-related road accidents. The data that do exist mostly originate from studies that estimate the extent of fatigue from other variables (for example, characteristics of accidents), or from specially constructed studies collecting new material on the incidence of tiredness in relation to accidents. Thus, while the typical representation of fatigue in official road accident statistics may be around 3% or less (slightly more for fatal accidents), the actual contribution of fatigue is hidden by systematic under-reporting. This is demonstrated in a wide range of reliable studies, a few of which are mentioned below.

In a UK survey, "tiredness" was reported by the drivers questioned as being a factor in 7.3 % of the accidents they had been involved in during the three years preceding the study (Maycock, 1995). This figure is similar to a German study (7%) although this work focused on lorry and bus drivers (Garo et al, 1997). A Bavarian study found that 24% of the fatal accidents (irrespective of road users categories) that had occurred on motorways in 1991 (204 in total) were the result of sleepiness at the wheel (Langwieder and Spörner, 1994).

A later UK study found that sleep-related accidents accounted for 16% of all vehicle accidents occurring in Devon and Cornwall counties between 1987 and 1992 and 23% of all accidents to which the Midlands counties police forces were called (Horne and Reyner 1995). In Australia, VicRoads, an Australian road safety organisation, estimates that 25% - 35%

(And possibly up to 50%) of road crashes are sleep related. Fell (1994), estimated that driver sleepiness accounts for 6% of road accidents, 15% of fatal accidents and 30% of fatal crashes on rural roads. Also in Germany, a study of motorway accidents in Bavaria estimated that 35% of fatal motorway crashes were due to reduce vigilance (driver inattention and fatigue) (Hell et al, 1997). In New Zealand between 1996 and 1998, 114 fatal road crashes (8% of all fatal crashes) and injury road crashes (5% of injury accidents) were thought to be fatigue related (Land Transport Safety Authority, 1998). A study of 370 heavy motor vehicle crashes in 1997, found that driver fatigue was listed as a contributing factor in 7% of accidents (Gander, et al 1998).

A questionnaire survey of 9,200 accident-involved drivers in Norway found that 3.9% of the accidents were sleep related, but almost 20% of night-time accidents involved driver drowsiness (Sagberg, 1999). An assessment of road accidents between 1984 and 1989 in Israel found that up to 1% were recorded as sleep related, but the real figure was likely to be much higher as many accidents recorded as other types of driver error were likely to have been related to driver fatigue. In Ghana, the questionnaire survey of 250 drivers in some selected motor park in Accra revealed that 10-20% of all single accidents are caused by fatigue (NRSC, 2008).

6. Methodology

The research was carried out in the administrative seats of selected states of Southwestern Nigeria (Ibadan and Abeokuta), with the aid of structured questionnaire and interview techniques.

The states are known to have existed over the centuries as economic and administrative centres of the former kingdoms in this part of the country. The activities of the colonial administration in the mid 20th century reinforce their growth and development (Aworemi, 2008). The states are well connected to the major cities by express roads and their locations in the country make them accessible to the more economically developed regions in the country.

The data on which the study is based were collected from a total of 325 out of 400 respondents' drivers in the study area, representing 81.25% respondent rate using simple random sampling technique. The collected data were analysed using multiple regression model. The model was chosen because it allows for dummy variables to be included. A number of fatigue related variables could not be measured or calibrated at interval, ratio or continuous scales, but in binary or dichotomous forms, therefore the inclusion of dummy will make sure that the estimates do not lose any of their properties.

The identified variables include; duration of driving, sleep deficit, experience, alcohol, stress, family responsibilities, time of the day.

The model is specified as $Y_i = a_0 + b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_nX_n + Ue$ (1)

Where,

a_0 = Constant

Y = Dependent variable (fatigue)

X_1 = Duration of driving

X_2 = Sleep deficit

X_3 = Stress

X_4 = Time of the day

X_5 = Age and experience

X_6 = Family responsibilities

X_7 = Alcohol

And $b_i = b_1, b_2, b_3, \dots$ represent the coefficient of the identified predictors

Ue = Error term

7. Results and Discussion

In attempt to analyse the efficacy of fatigue in road traffic accident, three functional forms were employed in the regression analysis. The result for each functional form is as shown in Table 1. The functional forms that were considered before choosing the lead equation were linear, semi-log and double log functions. The importance of Multiple Regression in this study is to determine how the exploratory variables (X_1 - X_7) affect the dependent variable (Y). From the three functional forms used for the data, the linear function was chosen as the lead equation. This was based on the appropriateness of the signs on the regression coefficient as specified by a *priori* expectation, the value of the coefficient of multiple determination R^2 , the number of statistically significant variables that is 't' and F-values and tests.

The equation obtained from linear function regression result is as follows:

$$Y = -14.238 + 1.11X_1 + 0.556X_2 + 1.499X_3 + 1.545X_4 - 0.248X_5 - 0.228X_6 + 0.923X_7 \quad (2)$$

The coefficient of Multiple Determination R^2 of 0.78 implies that 78% of the total variation in the causes of fatigue among the drivers was explained by the independent variable. The remaining 22% not explained could be attributed to the stochastic variation.

The t-value of the coefficients X_1, X_2, X_3 , and X_7 were all statistically significant at both 5% and 10% levels. This implies that duration of driving (X_1), Sleep deficit (X_2), Stress (X_3), and Alcohol (X_7) contributed significantly to the variation in the causes of drivers' fatigue.

The positive regression coefficient of X_1, X_2, X_3, X_4 , and X_7 indicate that increasing in duration of driving, sleep deficit, time of the day, stress, and alcohol in-take, will have an increasing effect on fatigue which eventually can lead to accident. While the negative regression of X_5 , and X_6 , indicate that any increase in family responsibilities and experience will lead to decrease in level of fatigue.

The duration of driving (X_1) had a coefficient of 1.11, which implies that any one-unit increase in the driving duration would increase the fatigue level of driver by 1.11. This shows that long driving duration on

monotonous roads, such as motorways, are more likely to result in a driver falling asleep at the wheel. Journeys that are for work purposes, especially ones involving truck drivers or company car drivers, are also a high risk type of journey because they involve long period of driving. This corroborates the earlier studies by Horne et al (1995) which confirmed that all of the sleep related accidents occurred within seven hours of the start of the journey.

The age and experience of driver (X_5) has a coefficient of -0.648, which means that the older or more experience a driver is, the less fatigue he would experience. The belief is that driver with more than 10 years driving experience or over forty years of age have a consistently lower accident risk than their younger or less experienced counterparts. This result is in contrary to the findings of Harris et al (1972) and Hamelin (2000) that older drivers appear to be more susceptible to fatigue than their younger counterpart.

Furthermore, Stress (X_3) is an important contributory factor to fatigue in driving and it is expected to contribute positively and significantly to the drivers' fatigue. It has coefficient of 1.499, which translates to the fact that for every one unit measure of increase in Stress, there is an increase of 1.499 in the level of fatigue experience by the driver. Also it is significant at 5% which shows that Stress contributed positively and significantly to the level of fatigue in driving.

Family responsibilities (X_6) have a coefficient of -0.640. Thus the level of fatigue decreases by 0.640 with one unit increase in family responsibilities. The implication of this is that the more responsible a driver is, the less fatigue he would be experiencing. Because he would be taking his time in making driving decisions so as not to fall victim of accident due to the responsibilities and part he is playing in the family. This corroborates the earlier finding of Aworemi (2007) that family responsibilities and social status had significant effects on accident reduction in south-western Nigeria.

Lack of sleep or sleep deficit (X_2) on the part of drivers is an important variables and it is expected to contribute positively and significantly to the level of fatigue in driving. This variable has coefficient of 1.545, which means that one-unit increase in sleep deficit or lack of sleep by driver would result into 1.545 increases in the level of fatigue. This is in line with the study of United State National Transport Safety Board (NTSB, 1999) which ascertained that 17% (about 1 million) of road accidents are caused by drivers' fatigue.

Meanwhile, time of the day (X_4) had coefficient of 0.732 which shows that increase in time of the day by one unit would increase the level of fatigue by 0.732. However, this value is insignificant at both 10% and 5% confidence level.

Finally, alcohol intake (X_7) had a coefficient of 2.21 which indicate that for every single alcohol taken by the driver, there is possibility of fatigue level been increased by 2.21, which is very significant and positively related. This is in consonance with earlier study in New York (Hamelin, 2000). Some 593 truck drivers were interviewed at rest areas on New York's interstate highways. Nearly two-thirds reported episodes of drowsy driving after taking alcohol, and almost 5% said that they drove when drowsy on most, if not all, days after taking alcohol. Nearly half had fallen asleep at the wheel at some point in their driving career, and about one-quarter reported doing so at least once during the previous year.

8. Conclusion and Recommendation

Driver fatigue is a serious problem resulting in many thousands of road accidents each year. It is not currently possible to calculate the exact number of sleep related accidents because of the difficulty in detecting whether fatigue was a factor and in assessing the level of fatigue. However, research suggests that up to 20% of accidents on monotonous roads in Great Britain are fatigue related (Johnson, 1998). Research in other countries also indicates that driver fatigue is a serious problem.

The safest option is for drivers to avoid driving when sleepy, when they would normally be sleeping or when they are ill or taking medication which contradicts driving or using machinery. It is crucial that drivers plan journeys, especially long ones involving driving on motorways or other monotonous roads. Drivers should:

- 1) Try to ensure they are well rested, and feeling fit and healthy (and not taking alcohol), before starting long journeys.
- 2) Plan the journey to include regular rest breaks (a break of at least 15 minutes at least every two hours). If necessary, plan an overnight stop.
- 3) Avoid setting out on a long drive after having worked a full day.
- 4) Avoid driving into the period when they would normally be falling asleep.
- 5) Avoid driving in the small hours (between 2am and 6am).

6) Be extra careful when driving after eaten a meal.

7) If feeling sleepy during a journey, stop somewhere safe, take drinks containing caffeine and take a short nap.

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Table 1. Result of regression analysis of causes of fatigue

Forms of Equation	Constant	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	R ²	F-value
Linear Function	-14.328	1.11 (2.61)*	0.556 (4.24)*	1.499 (3.34)	1.545 (0.73)	-0.248 (-0.64)	-0.228 (-0.64)	0.923 (2.21)*	0.78	2.11
Semi-Log Function	52.146	0.147 (2.41)	0.308 (5.13)*	- (-2.37)	-0.1388 (-2.37)	- (-2.37)	- (-2.37)	- (-2.37)	0.48	3.39
Double Log function	2.692	0.089 (1.34)	0.241 (3.74)*	0.122 (2.46)	-0.107 (-1.93)	-0.171 (-3.16)	0.104 (-2.582)	0.032 (0.64)	0.62	2.18

Source: Data Analysis, 2009

t-value in parenthesis

*Significant at 10%

**Significant at 5%

A Brief Review on Developing Creative Thinking in Young Children by Mind Mapping

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Abstract

Mind mapping is a presentation form of radiant thinking, utilizing lines, colors, characters, numbers, symbols, image, pictures or keywords, etc. to associate, integrate and visualize the learned concept and evoke brain potential. Through mind maps, one's attention, coordination ability, logic, reasoning, thinking, analyzing, creativity, imagination, memory, ability of planning and integration, speed reading, character, number, visuality, hearing, kinesthetic sense, sensation, etc. are significantly enhanced. "Picture" is not limited by nationality and language and is the best tool for young children to explore new things and learning. Because pictorial representation is one of the most primal human traits and drawing ability is better than writing ability in young children, learning and expressing through mind mapping prevents difficulties of writing, grammar and long description in children. Thus, this study reviews related researches to figure out whether mind mapping can be applied by young children to develop their creative thinking.

Keywords: Mind Mapping, Mind Maps, Young Children, Creativity, Radiant Thinking

1. Background and Motivation

Generally, words are used as tool of thinking by human. However, the ability of expressing in young children is not mature. It is better for children to express what they exactly feel via non-verbal pictures, charts, concept map and semantic network. "Picture" is not limited by nationality and language and is the best tool for young children to explore new things and learning. Here another point made by Arnheim seems provocative: Every picture is a statement. The picture does not present the object itself but a set of propositions about the object; or, if you prefer, it presents the object as a set of propositions (Arnheim, 1969). Through browsing concrete picture, young children are able to describe its content or even draw the content. "Mind map" can be seen as a product of memory. Mind mapping, Morning Pages, and Brainstorming are a few such tools that help one to collect and organize their creative output (Gino et al, 2004). Left brain manages the regular, ordered and linear logics, such as process of drawing, while right brain manages observation and sensation on features of objects, thinking on creativity, such as image, space, affection, etc. According to Filippakopoulou and Nakos (2009), children are exposed to maps from an early age. Map understanding progresses slowly and gradually from easy to difficult concepts. Theories of children's spatial development, mainly deriving from psychological studies, have provided the theoretical basis for approaching the way children use maps. The results of three decades of theoretical and experimental studies offer insight into children's thinking as to how they handle information while using maps and also provide evidence regarding the development of concepts associated with the basic characteristics of

maps. There is still a lot more to be said. Specialists on children and mapping persistently ask for map literacy, facing children as map users in the information technology era.

Previous studies have suggested that children's learning of the relation between number words and approximate numerosities depends on their verbal counting ability, and that children exhibit no knowledge of mappings between number words and approximate numerical magnitudes for number words outside their productive verbal counting range (Barth, Starra & Sullivan, 2009). Tony Buzan (1997) considers that radiant thinking is the most natural way for brain to function, while mind mapping is the best visualization tool to reflect radiant thinking of brain and maximize brain potential. As a graphic knowledge representation tool, a mind map 500 diagrams key ideas in a topic area and demonstrates the relationships among them (Novak, 1998; Hill, 2004). Thus, this study explores whether mind mapping can be applied by young children.

2. Theory and Practice of Mind Mapping

Mind map is a presentation form of radiant thinking, utilizing lines, colors, characters, numbers, symbols, images, pictures or keywords, etc. to associate and integrate, visualize the learned concept and maximize brain potential. (Buzan & Buzan, 1996) (Fig.1). Mind mapping developed by Tony Buzan (1960) is a learning tool that can maximize brain potential in radiant thinking. In fact, some stakeholders have stated that this form of evaluation has helped them more clearly present and explain the impact and sustainability of their programs (Mary & Skye, 2009). Through the process of mind mapping, capability of analyzing, comprehending and memorizing information is enhanced. Through mind maps, one's attention, coordination ability, logic, reasoning, thinking, analyzing, creativity, imagination, memory, ability of planning and integration, speed reading, character, number, visuality, hearing, kinesthetic sense, sensation, etc. are significantly enhanced because mind map organizes large amount of information systematically.

Mind map is a useful key adopting association skill and utilizing pictures to express the thoughts to maximize brain potential. It is a skill to develop the whole brain, applying characters, images, numbers, logics, rhythm, colors and unique observation method, providing a limitedless and free imaginary space to the brain. Briefly, mind map is a map for the brain (Buzan & Buzan, 1996). Application of mind map is to construct "Divergent Thinking" in the brain. While applying mind mapping, ability of logical analyzing and reasoning of left brain and creative thinking and memory of right brain can be maximized.

Functions of mind map:

- Build a concept or viewpoint in a broader scope or topic.
- It provides a direction while planning or making decisions, helping users to collect and organize large amount information.
- It encourages users to solve problems by a new and creative way and thus enhances the effectiveness.
- It attracts and controls one's attention and thinking
- It makes observation, reading, thinking or memorizing interesting.

Steps of mind mapping:

- I. Put the topic in the center. To start from the center conforms to the way of thinking of mind and also follows the natural rule.
- II. It is better to use good-quality and blank A3 or A4 paper and put it horizontally.
- III. Good-quality paper make one feel comfortable, while blank paper provides a limitedless and free thinking space.
- IV. Application of image- It is better to be colorful and three-dimensional because it triggers thinking and strengthens memory more easily when it more close to the real-life context
- V. Application of color-Different colors has different meanings for everyone
- VI. Application of words-Words on each line represents a keyword, written tidy in the blank space and put only one vocabulary.
- VII. The length of the line should equal to size of figure or length of sentence.
- VIII. The line should be smooth and structured and are linked to each other
- IX. The thickness of lines depends on the distance from the center. The nearer the line to the center, the thicker the line is. But the application can be adjusted according to different situations.

- X. The structure and levels of mind map is radiant guided by association.
- XI. The structure must be clear and ordered (clockwise or counter clockwise, depending on individual habit or topic).
- XII. It is important that the style of mind maps should highlight the points and demonstrate self-style.

3. Difference Between of Mind Map and Concept Map

According to Novak & Cañas (2008), concept maps are graphical tools for organizing and representing knowledge. Concept maps include concepts, usually enclosed in circles or boxes of some type, and relationships between concepts indicated by a connecting line linking two concepts. Words on the line referred to as linking words or linking phrases, specify the relationship between the two concepts. Figure 2 shows an example of a concept map that describes the structure of concept maps.

The primary feature of concept map is its level structure expressing relationship between concepts. The most general and inclusive are placed on the top of map, while the secondary ones are placed under the primary ones. Thus when seeking to understand an answer, situation or event, it is suggested to use specific questions to construct concept map and understand specific knowledge by structure of concept map. Another feature of concept map is its cross linkages. It is to express the relations of concepts in concept map. Cross linkage explicates how knowledge of specific domain linked to the other. Thus, a good concept map must contain good level structure and easy to search for the required information. It is better to include some events or examples for explicating the concept.

The followings are advantages of concept map application:

- It visually presents complicated knowledge structure and linkages between two knowledge points by simple graph
- It demonstrates one's knowledge of specific domain thoroughly and transparently.
- It is a tool organizing messages surrounding primary concepts.
- It increases comprehension toward concepts through defining causal relations, distinguishing level of concepts, organizing relationship of concepts and demonstrating other meaningful concept patterns.
- It allows learners to reflect the learning process over and over, predict possible behavior outcome and enhance learning effectiveness.

Steps of concept mapping:

- I. Determine the center topic: Determine the center question, knowledge or concept to be explored via concept map and figure out concepts related to center topic via guiding of this topic and list out.
- II. Sort the listed concepts: Place general, the most abstract and the most inclusive concepts on the top of map. There might be some difficulties while selecting the concept on the top of map. Reflecting on direction of center topic might be helpful for sorting concepts.
- III. List out the rest of concepts according to the levels.
- IV. Make a concept map: Place general, the most abstract and the most inclusive concepts on the top of map. There are only two or three inclusive concepts on the top of map.
- V. Link these concepts with lines and put a conjunction on the line. These conjunctions must be able to clearly present the relationship between two concepts to make it a simple and valid thesis. When these concepts are linked and levels form, a corresponding meaning construction of knowledge, thesis and center topic can be found.
- VI. Reorganize concept map: Increase or decrease concepts or alter relationship of upper level and lower level in the concept map.
- VII. Figure out meaningful cross linkages in various branches of concepts and put conjunctions on the lines to present the relations, helping find a new relationship on knowledge of specific domain.
- VIII. Detailed and concrete examples can be attached to these concepts by graphical symbols.
- IX. For similar concepts, it can be presented by various structures of concept maps.
- X. Difference between mind map and concept map is that concept map emphasizes that linkage of network is changeable. Mind map combines color and picture. Its line is wavy and the concept is written on the line; while mind map emphasizes that secondary concepts surround primary concepts. Mind map is a kind of semantic

mapping.

4. Related works on application of mind mapping in developing creativity of young children

Generally, words are used as tool of thinking by human and thus neglect to combine non-verbal pictures, chart, concept map and semantic network. “**Mind mapping**” is helpful for problem-solving process and deduction. Under visuality and brainstorming provided by pictures and characters, one is able to use both hands and brain. Thoughts are evoked while drawing. Messages obtained from the process can be attached to the concepts and trigger learning motivation. If students are taught to use these non-verbal symbols to think (so-called “Abstract Thinking”) and being equipped with this ability, creativity, comprehension and problem-solving ability will be enhanced. The followings are analysis on results of related works:

Aydin and Balim (2009) study aims at enabling the students learn the concepts within the unit “Systems in Our Body”, in the 6th grade Science and Technology lesson, based on the constructivist approach. Additionally, the mental constructions of the students were tried to be interpreted by making them prepare mind and concept maps by hand and in the computer environment during the lesson, regarding the subjects in the unit. The principles of preparing mind and concept maps were explained and examples of these maps prepared by the students were also included in this study. According to Dalke (1998), young 3-year-olds showed some ability to make and use maps but performed poorly on the false belief tests. Children were more likely to use an incorrect map to predict behavior if the represented object was missing instead of in a wrong location. Many children were also able to predict that someone who used an incorrect map would not “**Find**” the object. In particular, it would be useful for at least two individuals to go through the mind map independently to help ensure objectivity when reporting the number and strength of the relationships and connections listed (Cresswell, 1998). These results contradict Perner’s hypothesis and suggest that representational skills develop gradually rather than appearing in a radical conceptual shift at age 4. Mundy and Gilmore (2009) used a novel task to assess children’s mapping ability, they showed that children can map in both directions between symbolic and nonsymbolic numerical representations and that this ability develops between 6 and 8 years of age. Moreover, we reveal that children’s mapping ability is related to their achievement on tests of school mathematics over and above the variance accounted for by standard symbolic and nonsymbolic numerical tasks. Chen (2007) examined the role of experience on 2.5- to 5-year-old children’s discovery of spatial mapping strategies. With experience, 3- to 4-year-olds discovered a strategy for mapping corresponding locations that shared both featural and spatial similarities. When featural and spatial correspondences were placed in conflict, requiring children to negotiate both object-centered and location-centered mapping possibilities, 4- to 5-year-olds proved capable of discovering a novel mapping strategy, abandoning an ineffective strategy, and generalizing the acquired strategy across analogous tasks. It has been successfully used in community serving programs and could be similarly applied in youth serving agencies (Wells & Arthur-Banning, 2007). Upon examining the mechanisms underlying developmental differences in strategy discovery and strategy change, the author observed that 3 key components contributed to the children’s spatial mapping skills: encoding locations within each space, noticing a potential analogy between spaces, and detecting precise mapping correspondences. According to Atance and Meltzoff (2005), two experiments examine preschool-aged children’s ability to anticipate physiological states of the self. One hundred and eight 3-, 4-, and 5-year-olds were presented with stories and pictorial scenes designed to evoke thought about future states such as thirst, cold, and hunger. They were asked to imagine themselves in these scenarios and to choose one item from a set of three that they would need. Only one of the items could be used to address the future state. In both experiments, developmental differences were obtained for correct item choices and types of verbal explanations. In Experiment 2, the performance of the 3- and 4-year-olds was negatively affected by introducing items that were semantically associated with the scenarios but did not address the future state, whereas the 5-year-olds’ performance was not. According to the above exploration, it is known that mind mapping increases creativity of young children and allows cognition of children can be easily understood. With abundant colors, images, keywords or short sentences, such map integrates functions of right brain and left brain and facilitates thinking, memorizing, analyzing and triggering inspiration and allowing young children to learn via picture.

5. Conclusions

Mind mapping is a thinking method which stimulates thinking and helps integrate thoughts and information, and it is also a strategy of thinking visualizing concepts (Buzan & Buzan, 1996). This mind mapping utilizes lines, colors, characters, numbers, symbols and pictures to quickly record information and thoughts, it clearly and easily record large amount of information or ideas which originally require magnitude of words to record on a mind map. The structure becomes open and organized, allowing one to organize a variety of information and evoke more new ideas. Finally, we propose some guidelines for later researches to improve course design of

information education for young children. This allows one to find that picture is helpful for young children on learning and interaction. However, there are still some unanswered questions, such as: how to implement mind mapping in teaching, how to train the teachers to master this method, etc., need further investigation.

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Notes

Note 1. Mind Mapping

Note 2. Concept mapping

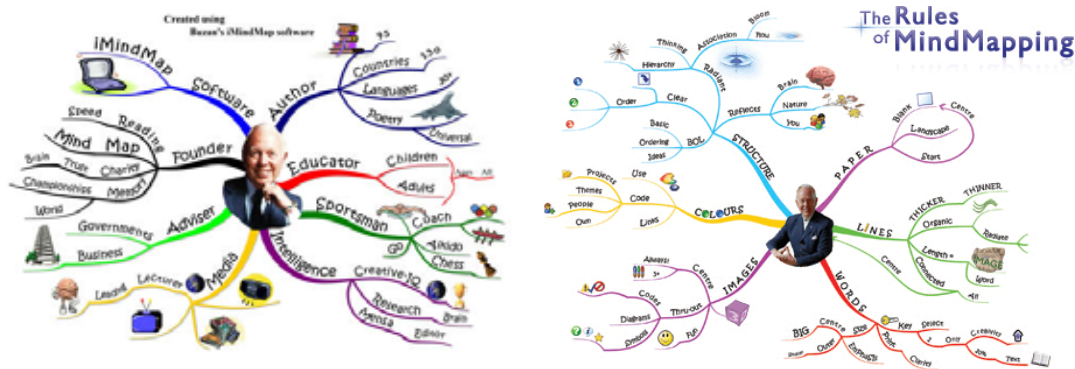


Figure 1. Mind Mapping

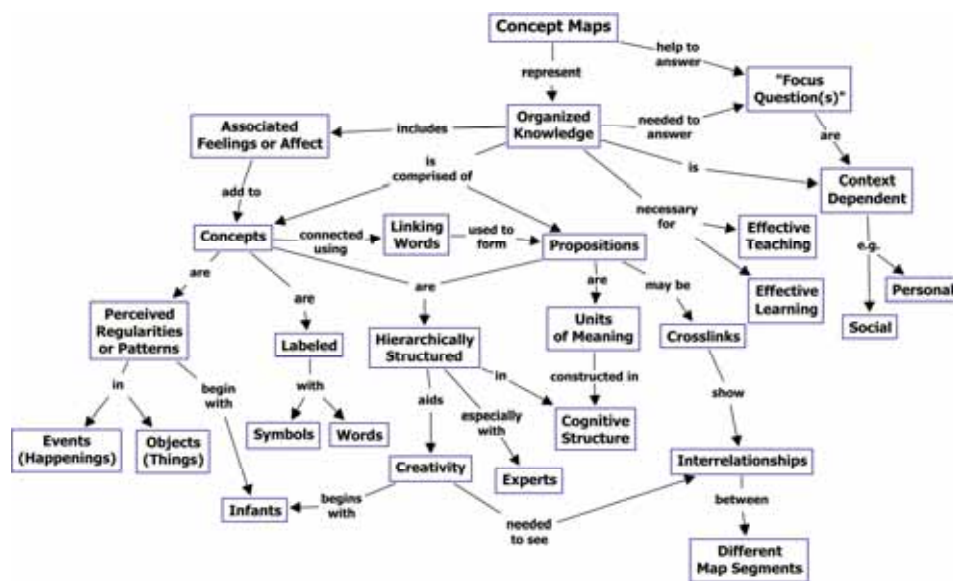


Figure 2. Concept mapping

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