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# Cross Country Evidence on the Linkages between

# Financial Development and Poverty

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**Abstract**

This paper presents empirical evidence of a direct relationship between financial development and poverty. The empirical modeling employs an efficient panel data estimation technique called fixed effect vector decomposition (FEVD) which is applied to a poverty determination model designed to explain poverty in term of financial development and financial instability. This technique can efficiently estimate time-invariant and rarely changing variable which traditional panel data models cannot. Using panel data the study finds that on average financial development is conducive for poverty reduction but the instability accompanying financial development is detrimental to the poor. This result holds for both measures of financial development namely the ratio of money to GDP (M3-GDP) and the ratio credit to GDP.

**Keywords:** Finance-poverty nexus, Fixed effect vector decomposition, Financial development, Poverty determination

## 1. Current Research on the Linkages between Financial Development and Poverty

In this study we employ a fixed effect (FE) model to predict the impacts of both the level and the instability of financial development on poverty (Note 1). We chose FE model to allow for the fact that unobserved country specific factors not only affect the poverty rate but also are correlated with our explanatory variables namely level of financial development and financial instability. Pure time series or cross-sectional models provides inconsistent and biased parameter estimates in presence of such correlation. FE models consider the unobserved factors affecting the dependent variable as consisting of two types: those that do not change over time but vary across units, and those that vary both over time and units. FE models remove the time invariant effects by applying some simple transformation (e.g. differencing or demeaning) to the data, and then apply OLS to the transformed data in order to minimize the effect of time varying omitted variables. Briefly this is how FE models handle the potentially large number of unobserved explanatory variables (Note 2).

However, this apparent superiority of FE models over pure time-series or cross-sectional ones in handling unobserved heterogeneity does not come free of cost. A widely recognized limitation of FE models is their inability in estimating time-invariant variables (see for instance Baltagi 2001, Wooldridge 2002, and Hsiao 2003). Since the FE models use only the within variance for the estimation and disregards the between variance, they do not allow the estimation of time-invariant variables. A second and by far the less recognized drawback of the FE models results from their

inefficiency in estimating the effect of variables that have very little within variance. An inefficient estimation is not only a nuisance leading to somewhat higher standard errors (SEs) but also leads to highly unreliable point estimates and may thus cause wrong inferences in the same way a biased estimator could. Therefore, the inefficiency of the FE models in estimating variables with low within variance needs to be taken seriously.

Recently, Plümper and Troeger (2007) propose a remedy to the problems of estimating time-invariant and rarely changing variables in FE models with unit effects. They suggest an alternative estimator that allows estimating time-invariant variables and that is more efficient than the FE model in estimating variables that have very little longitudinal variance. They label this alternative as ''fixed effects vector decomposition'' (FEVD) model. As the name suggests, the FEVD estimator decomposes the unobserved unit fixed effect into two segments: an unexplained part and a part explained by the time invariant or the rarely changing variables. The FEVD technique involves the following three steps: in the first step, the procedure estimates the unit FE by running a FE estimate of the baseline model. In the second step, the procedure splits the unit effects into an explained and an unexplained part by regressing the unit effects on the time-invariant and/or rarely changing explanatory variables of the original model. Finally, the third stage performs a pooled-OLS estimation of the baseline model by including all explanatory time-variant variables, the time-invariant variables, the rarely changing variables, and the unexplained part of the FE vector. This third stage allows computing correct SEs for the coefficients of the (almost) invariant variables. In addition, one can conveniently use this stage to adjust for serial correlation of errors.

This paper uses the FEVD model to investigate empirically the direct impact of financial development and instability on poverty. The primary reason for choosing FEVD model is to control for the influences of such variables as corruption, legal standards, regional identity, government type, and some slowly changing macroeconomic variable like trade in the finance-poverty nexus. We believe that not only our dependent variable, the poverty rate, but also our explanatory variables are correlated with country specific factors such as corruption, legal system, and trade. In traditional panel data models, either we drop them in the so-called unobserved variable category, or discard them from analysis because they have little or no within variance. In pure cross-sectional analysis or even in case of panel data analysis using the fixed effect dummy variable method (see Gujarati 2003), it may be possible to use dummies in model for time invariant variables if their number is not very large. But what if a variable changes very rarely and has only a little within variance as some of our explanatory variables do (see table A2 in appendix)? As we have already mentioned, popular panel data estimators e.g. FE, RE or DPD models cannot identify these variables because they involve transformation of data e.g. differencing, demeaning or quasi demeaning (as in the case of RE model), all of which require adequate within variance. But FEVD model can estimate such variables rather efficiently. The primary objective of this paper is to provide empirical support for this efficient alternative of estimating time invariant and rarely changing variables from panel data.

More specifically, we consider a panel data model where poverty is explained by a set of time-varying, time-invariant, and rarely changing variables. Parameters of the models are estimated by the technique of fixed effect vector decomposition using panel data on 54 developing countries. The FEVD technique helps us extracting the impacts of such time-invariant and rarely changing factors as corruption, political stability, and legal system from the finance-poverty linkage. Even after controlling for the impact these variables, we cannot reject the null hypothesis that on average financial development is conducive for poverty reduction but the instability accompanying financial development is detrimental to the poor. Our results also point to the conventional wisdom that while corruption is a constraint, political stability is a catalyst in fighting against poverty by means of financial development.

We proceed as follows: section 2 describes the research issue and briefly reviews related literature. Section 3 presents the model and estimation technique. Results and their interpretations are provided in section 4, and section 5 concludes the paper.

## 2. The Research Issue

There is little doubt in the literature that financial development boosts economic growth (e.g. Levine *et al* 2000, Levine 1997, Easterly 1993), and sustainable growth is a necessary condition for poverty alleviation (Beck *et. al* 2004, Julilian and Kirkpatrick 2002, and Dollar and Kraay 2002). These studies allude to an indirect linkage between financial development and poverty alleviation. In other words, these studies suggest that economic growth is the channel through which financial development helps the poor. A more fundamental question, however, is: can financial development exert a direct impact on poverty? This paper investigates this question empirically. We are not interested in the indirect link between finance and poverty because it has already gained unanimous theoretical and empirical support. But there are still doubts about the direct role of financial development in reducing poverty and income inequality. The hypothesis of a direct link between finance and poverty seems to have found no support, particularly from academia, which sees financial services as simply costly for the poor who cannot afford to pay for them. This argument appears to be true in context of the fact that financial services for the poor people in the developing countries have mostly been expensive or absent. Why are the poor people in developing countries so badly served compared to the rich in

developed countries? An easy answer is that the poor people have too little money to be suitable clients for sophisticated financial services. The idea is more formally presented by Greenwood and Jovanovic (1990) who argue that getting involved in the financial sector or subscribing to such financial services as screening and risk pooling requires an initial set-up cost. Poor people are not in a position to incur this cost. Moreover, the low to medium income groups may not find financial intermediaries a beneficial place to park their savings.

However, empirical support to Greenwood and Jovanovic (1990) proposition has been mixed so far. For instance, Li *et al* (1997), Rajan and Zingales (2003), Honohan (2004) and Beck *et al* (2004) are renowned among those that strongly reject the Greenwood and Jovanovic (1990) hypothesis. Li *et al* (1997) find that financial depth enters strongly and significantly as a contributor of lowering income inequality (Gini index) and raising the average income of the lower 80% of the population. They conclude that financial development removes credit constraints for poor households and thereby feeds their desire to spend money on activities such schooling and healthcare for children. Rajan and Zingales (2003) observe that as the financial system becomes healthier, powerful and more competitive, financial strength of firms and households enhances; as a result, they can bear with even higher cost of capital. Moreover, the development of informal credit, which is often the only source of borrowing for poor people, is made easier by the growth of a formal financial system which offers opportunities for profitable investments.

The Greenwood and Jovanovic proposition (1990) is shortsighted in the sense that it fails to apprehend the 'hidden wealth' of the poor. The hidden wealth of the poor is their creativity which financial service providers should consider as the collateral that they look for before providing finance to their clients. Rajan and Zingales (2004) present strong theoretical arguments why the poor are deprived of institutional finance. They believe that it is the deficiency of financial institutions to explore the creative potentials of the poor that is to be blamed, not the inability of the poor to provide so-called collateral. They observe that the reason why the poor people in developing countries cannot get finance at a reasonable rate is that these countries are deficient in institutions; ownership rights are neither well demarcated nor well enforced; there are no agencies collecting, storing, and disseminating information on the creditworthiness of potential borrowers; there is little competition between moneylenders; the laws governing credit are outdated; contracts are not enforced because the judiciary is all too often either asleep or corrupt. Thus the idea that people who have little money do not make suitable clients for financial services is at most a half-truth. A more reasonable explanation is that the poor have been hurt by massive market and regulatory failure. Fortunately that failure can be, and increasingly is being, remedied. There are instances that finance can be redirected from the vicinity of the rich to the unexplored wealth of the poor, and in consequence, the disparity in the distribution of income between the rich and the poor can be minimized.

Honohan (2004) considers the relationship between financial development and absolute poverty. Using a cross country sample, he shows that financial development reduces the share of the population with income below one dollar a day while controlling for GDP per capita. Beck *et al* (2004) use a sample of 52 developing and developed countries with data averaged over the period 1960 to 1990 and examine whether there is a direct relationship between financial intermediary development and changes in income distribution. They consider the ratio of credit by bank and non-bank financial institutions to GDP as the measure of financial development and investigate its impact on the income growth of the poor. They conclude that financial intermediary development is pro-poor as it boosts the income growth of the poor at a faster rate than that of the rich. But Jeanneney and Kpodar (2005) produce opposing results in regard to the direct relationship between financial intermediary development and poverty alleviation. This difference is due to the difference in econometric techniques that they have applied. Studies such as Beck *et al* (2004) and Honohan (2004) apply cross sectional analysis which fails to capture a wider set of information and therefore, cannot provide much insight into the dynamics of changes in a given phenomenon. Moreover, they consider only financial development but ignore the instability that follows development. Jeanneney and Kpodar (2005) overcome these limitations. They integrate both the level and instability of financial development in a poverty determination model and estimate parameter coefficients from panel data. They employ two different measures of financial development (ratio of M3 to GDP and the ratio of credit to GDP) and estimate their impact on absolute poverty measured as the percentage of population under a dollar daily income. They find that financial depth, represented by the ratio of M3 to GDP, is beneficial to poverty reduction but the ratio of credit to GDP fails to explain poverty. They interpret their results as an evidence of the relevance to McKinnon's (1973) *conduit effect* which implies that financial intermediaries do not exert a direct impact on poverty but stimulate growth by enhancing economic activities. Poor people participate in these activities, and hence, eventually benefit from financial development. They conclude however, that the benefit of financial development is constrained by instability that follows financial development as the poor has to suffer disproportionately from the consequences of such instability. An identical conclusion has been drawn in our previous attempt (Daly and Akhter 2007) where we consider a similar specification as proposed by Jeanneney and Kpodar (2005) and estimate parameters using fixed unit effect model. Since the FE model can consider only time-varying variables, our previous study suffers from the problem of omitting time-invariant variables. More specifically, we consider poverty to be determined exclusively by some variables which have sufficient within variance. However, there are

many factors which change at a very slow rate or even not at all over time in a given country but are believed to have substantial impacts on the living condition of the people in the country. The present study considers some of these variables. There are two types of time-invariant variables. Plümper and Troeger (2007) present description of these types which are briefly reproduced below before we decide which ones are to be considered for the present study.

The first category includes those that are time invariant by nature. For example, regional identity, geographic location, and inheritance belong to this category. Indonesia is located in a geographically vulnerable zone so it has to encounter devastating earth-quake more frequently than other countries on the globe. Bangladesh is a low-lying delta, hence, subject to flood more frequently than the landlocked countries like Hungary or Switzerland. It is almost unlikely that the geographic characteristics of these countries are going to change in a foreseeable future. For the same reason, colonial heritage, cultural background, and climatic features are some of those variables which are time-invariant by nature. In fixed effect models, effects of these variables are assumed to be captured by the so-called fixed effect which is removed from the model by differencing or demeaning. As a result, there coefficients cannot be estimated. Whereas in cross-sectional analysis, researchers use dummies for these variables in order to estimate their impacts on a given relationship. For instance, Laporta et al (1997) have applied dummies for legal origin and estimated their impacts on the growth of financial system. Beck et al (2004) have used legal origin in their cross-sectional analysis of the relationship between finance and income inequality. But these time-invariant variables are never considered in panel context because of the technical difficulty of panel data models in estimating coefficients for these variables. However, this study incorporates some strictly time-invariant variables such as legal origin, regional identity and government type with a view to controlling for their impacts on the finance and poverty relationship.

The second category of time-invariant variables covers those that are time invariant for the period under analysis or because of researchers' selection of cases. By increasing the number of periods and/or the number of cases it would be possible to render these variables time-variant. These variables may more accurately be referred to as rarely-changing variables. Political variables such as level of democracy, the status of the president, electoral rules, central bank autonomy, or federalism are some exquisite examples of variables belong to this category. They do change over time; but the within variance, the variance over time, typically falls short of the between variance, the variance across units. This is equally true for many macroeconomic variables such as government spending, social welfare, tax rates, pollution levels, or per capita income; they do change from year to year, but in context of panel data, their within variances are found to be less than their between variance unless the time period is sufficiently large. This has been the case with most of the variables in this study. In our previous study we used panel data for the period over 1980 to 2004 and found the within variance of each variable higher than the between variance (see table A1 in appendix). As a result we could identify a fixed effect model. But in the present study, we consider a shorter time period from 1993 to 2004 because the poverty indices (percentage of population under a dollar income per day) before 1993 appear to be suspicious for some countries. Moreover, for some countries, poverty data before 1993 appear not to be comparable with data after 1993. The reason is that the poverty index is constructed on the basis of an internationally comparable concept of income, that is, income measured in terms of a currency unit which is comparable across countries. This is done by converting a local currency unit to a currency unit of international purchasing power parity (PPP). But consistent information about PPP before 1993 is not available for many countries, especially the developing ones. This makes poverty index before 1993 and after 1993 inconsistent for many countries. We therefore, decide to use data for the period 1993 to 2004 in this study. But as the time period is contrasted, we find the within variance to become less than the between variance for most variables (see table A2 in appendix). Thus, most variables including the variables of interest in this study, namely level of financial development and financial instability belong to the second category of time-invariant variables. We will extract the impacts of some other variables e.g. corruption, political stability, and per capita arable land from the relationship between financial development and poverty.

As the results in table A3 in the appendix reveal, when we use data for period 1993 - 2004 to estimate the same panel data models that we estimated in our previous study, no significant relationship is found between financial development and poverty. Should we accept these results? According to Beck (2001), accepting these results means a compromise with the underlying inefficiency of FE models in estimating rarely changing variables. Nathaniel Beck has rightly observed:

''Although we can estimate [a model] with slowly changing independent variables, the fixed effect will soak up most of the explanatory power of these slowly changing variables. Thus, if a variable . . .changes over time, but slowly, the fixed effects will make it hard for such variables to appear either substantively or statistically significant'' (Beck 2001, 285).

Perhaps even more importantly as Plümper and Troeger (2007) emphasize, inefficiency does not just imply low levels of significance; point estimates are also unreliable since the influence of the error on the estimated coefficients becomes larger as the inefficiency of the estimator increases. We should therefore, look for an efficient technique for estimating rarely changing variables rather than relying on results in table A3. An available technique is the random effect (RE)

model. But the RE model yields inconsistent and biased estimates when regressors are correlated with the unit effects. This makes RE models unviable for the present study because we assume correlation between regressors and the unobserved country specific effects. Another alternative which econometric textbooks (e.g. Wooldridge 2002, 325–8; Hsiao 2003, 53) typically recommend is the Hausman and Taylor (1991) procedure. This estimator overcomes the bias of the RE model in the presence of correlated unit effects by means of appropriate instruments for endogenous variables. From an econometric perspective, the procedure provides a consistent solution to the potentially severe problem of correlation between unit effects and time-invariant variables. Unfortunately, the procedure can only work well if the instruments are uncorrelated with the errors and the unit effects and highly correlated with the endogenous regressors. Identifying those instruments is a formidable task especially since the unit effects are unobserved (and often unobservable).

Plümper and Troeger (2007) suggest a three-stage procedure for the estimation of time-invariant and rarely changing variables in panel data models with unit effects. They refer to the procedure as Fixed Effect Vector Decomposition (FEVD). They use Monte Carlo simulations to compare the finite sample properties of FEVD estimator to those of some competing estimators and find FEVD to provide the most reliable estimates under a wide variety of specifications common to real world data. This motivates us to apply FEVD in order to examine a poverty determination model where most of the explanatory and controlling variables are either time-invariant by nature or change over time only at a snail's pace.

## 3. Model, Estimation Technique, and Data

Financial development enhances growth and growth is good for the poor. We are not interested in this indirect effect of financial development on poverty because it is already well documented in literature. We are interested in a more fundamental issue: can financial development exert a direct impact on poverty? Accordingly, we hypothesize that financial development directly helps reduce poverty. But there are barriers that may limit the impact of financial development on poverty alleviation. The most likely limit is the instability that accompanies financial development. Among the other barriers (Note 3), we consider inflation, corruption, and political instability

The reason for integrating these factors in the finance-poverty nexus is pretty clear. In most developing countries, inflation tends to be high and volatile; government is often incompetent; and the necessary legal framework is missing. Incomplete and erratic regulation of financial institutions has also undermined the confidence of the poor in the financial services that are available. Corruption is also commonplace in many developing countries. It raises the cost of every financial transaction, allows undesirable transactions to take place and undermines consumer confidence in financial system. The lack of confidence causes a great majority of the population to be excluded from financial services and consequently retards economic growth and increase poverty and inequality. Theoretical models have shown that financial market frictions that prevent broad access can be the critical mechanism for generating persistent income inequality or poverty traps (Banerjee and Newman, 1993; Galor and Zeira, 1993). With this view in mind, we incorporate variables such as inflation, corruption, and political instability our model in order to extract their impacts from the finance-poverty relationship. The finance-poverty nexus is also controlled for trade and some other indicators such as legal origin, regional identity, and government type. As mentioned earlier, because these variables are either rarely changing or time-invariant by nature, we consider a fixed effect vector decomposition (FEVD) model which is describe in the following section.

*3.1 Fixed Effects Vector Decomposition (FEVD)* (Note 4)

A panel data model with time-invariant variables can be defined as:

$$y_{it} = \alpha + \sum_{k=1}^{K} \beta_k x_{kit} + \sum_{m=1}^{M} \gamma_m z_{mi} + u_i + \varepsilon_{it} \tag{1}$$

where the *x* variables are time-varying and the *z* variables are time invariant (and/or rarely changing), $u_i$ denotes the ($N - 1$) unit-specific fixed effects (FE) of the data generating process (DGP), $\varepsilon_{it}$ is the independent and identically distributed error term, $\alpha$ is the intercept of the base unit, and $\beta$ and $\gamma$ are the parameters to be estimated.

In the first stage, the FEVD procedure estimates a standard FE model. The FE transformation can be obtained by first averaging equation (1) over the time period *T*:

$$\bar{y}_i = \alpha + \sum_{k=1}^{K} \beta_k \bar{x}_{ki} + \sum_{m=1}^{M} \gamma_m z_{mi} + u_i + \bar{e}_i \tag{2}$$

where $\bar{y}_i = \frac{1}{T}\sum_{t=1}^{T} y_{it}$, $\bar{x}_i = \frac{1}{T}\sum_{t=1}^{T} x_{it}$, $\bar{e}_i = \frac{1}{T}\sum_{t=1}^{T} e_{it}$ and $e$ stands for the residual of the estimated model. Then

equation (2) is subtracted from equation (1). This transformation removes the individual effects $u_i$ and the time invariant variables $z$. We get

$$y_{it} - \bar{y}_i = \beta_k \sum_{k=1}^{K} (x_{kit} - \bar{x}_{ki}) + \gamma_m \sum_{m=1}^{M} (z_{mi} - z_{mi}) + (e_{it} - \bar{e}_i) + (u_i - u_i)$$

$$\equiv \tilde{y} = \beta_k \sum_{k=1}^{K} \tilde{x}_{kit} + \tilde{e}_{it}; \text{ with } \tilde{y}_{it} = y_{it} - \bar{y}_i, \ \tilde{x}_{it} = x_{it} - \bar{x}_i, \text{ and } \tilde{e}_{it} = e_{it} - \bar{e}_i$$

(3)

We run this FE model with the sole intention to obtain estimates of the unit effects $\hat{u}_i$. It is important to note here that the ''estimated unit effects'' $\hat{u}_i$ do not equal the unit effects $u_i$ in the DGP (Note 5). Rather, these estimated unit effects include all time-invariant variables, the overall constant term, and the mean effects of the time varying variables x—or, in other words,

$$\hat{u}_i = \bar{y}_i - \sum_{K=1}^{K} \beta_k^{FE} \bar{x}_{ki} - \bar{e}_i$$

(4)

Where $\beta_k^{FE}$ is the pooled-OLS estimate of the demeaned model in equation (3). This $\hat{u}_i$ includes the unobserved unit-specific effects as well as the observed unit specific effects $z$, the unit means of the residuals $\bar{e}_i$ and the time-varying variables $\bar{x}_{ki}$, whereas $u_i$ in equation (1) only accounts for unobservable unit-specific effects.

In stage 2, we regress the unit effects $\hat{u}_i$ from stage 1 on the observed time-invariant and rarely changing variables—the z variables (see equation 5) to obtain the unexplained part $h_i$ (the residual from regressing the unit-specific effect on the z variables). In other words, we decompose the estimated unit effects into two parts, an explained and an unexplained part that we label $h_i$:

$$\hat{u}_i = \sum_{m=1}^{M} \gamma_m z_{mi} + h_i$$

(5)

The unexplained part hi is obtained by computing the residuals from equation (5):

$$h_i = \hat{u}_i - \sum_{m=1}^{M} \gamma_m z_{mi}$$

(6)

As we said above, this crucial stage decomposes the unit effects into an unexplained part and a part explained by the time-invariant variables. We are solely interested in the unexplained part $h_i$.

In stage 3, we rerun the full model without the unit effects but include the unexplained part $h_i$ of the decomposed unit FE vector obtained in stage 2. This stage is estimated by pooled OLS.

$$y_{it} = \alpha + \sum_{k=1}^{K} \beta_k x_{kit} + \sum_{m=1}^{M} \gamma_m z_{mi} + \delta h_i + \varepsilon_{it}$$

(7)

By design, hi is no longer correlated with the vector of the z variables. If the time invariant variables are assumed to be orthogonal to the unobserved unit effects, the estimator is consistent. If this assumption is violated, the estimated coefficients for the time-invariant variables are biased (Note 6), but this bias is of course just the normal omitted variable bias. Yet, given that the estimated unit effects $\hat{u}_i$ consist of much more than the real unit effect ui and since we cannot disentangle the true elements of ui from the between variation of the observed and included variables, researchers necessarily face a choice between using as much information as possible and using an unbiased estimator. The FEVD procedure thus gives as much power as possible to the available variables unless the within variation is sufficiently large to guarantee efficient estimation.

The estimation of stage 3 proves necessary for various reasons. First of all, only the third stage allows obtaining the correct standard errors (SEs). Not correcting the degrees of freedom leads to a potentially serious underestimation of SEs and overconfidence in the results. Second, the third stage also allows us to explicitly deal with the dynamics of the

time-invariant variables. This is important since estimating the model requires that heteroscedasticity and serial correlation must be eliminated. Keeping this in mind we present estimates which are robust to heteroscedasticity. We also include lagged dependent variable and present results (table 2) from Prais-Winsten (Note 7) version of feasible generalized least square (FGLS) estimation.

*3.2 Data*

For empirical investigation we specify our baseline panel data model as:

$$hci_{i,t} = \beta_i + \beta_1 \log(pci_{i,t}) + \beta_2 FD_{i,t} + \beta_3 FI_{i,t} + \beta_4 \log(1+Inf)_{i,t} + \beta_5 corrupt_{i,t} + \beta_6 polstab_{i,t}$$
$$+ \beta_7 trade_{i,t} + \gamma_1 legalorg_i + \gamma_2 region_i + \gamma_3 govtype_i + u_i + e_{i,t} \tag{8}$$

where the response variable—poverty, is represented by the head count index (*hci*) and is defined as the percentage of population under a dollar daily income. On the explanatory side we include per capita income (*pci*) with a view to capturing a reasonably wider set of conditioning information. Per capita income is one of the principal determinants of poverty. Hence a poverty model is inadequately specified if a principal determinant like *pci* is discarded from the model. Data on *hci* and *pci* are obtained from the World Bank poverty database called *PovcalNet* (Note 8).

We use two measures of financial development (*FD*) namely the Credit-GDP ratio and the M3-GDP ratio. Credits include those extended to the private sector by the bank and non-bank financial institutions while M3 includes currencies and deposits. One cannot expect financial development to have immediate impact on poverty. It may take couple of years to exert an influence on peoples' living condition. Moreover, poverty index is observed at irregular intervals. For these reasons, we take an average of five years. Thus, each observation of *FD* at time *t* is an average taken over the year of poverty index and preceding four years.

Financial instability (*FI*) is measured by the average (again over the year of poverty index and preceding four years) of the absolute value of the residual of the equation: $FD_t = a + bFD_{t-1} + ct + \varepsilon_t$ (where *t* is the trend indicator). Thus

$$FI_{i,t} = \frac{1}{n} \sum_{t=1}^{n} |\varepsilon_t| \text{ where n = 5} \tag{9}$$

Inflation (*Inf*) represents annual rate of change in consumer price index. Data on the two measures of FD, and inflation are obtained from the online version of the World Development Indicator (WDI) 2006.

In regard to corruption and political stability, we use data from two popular sources. For corruption, we use the corruption perception index (CPI) prepared by the Berlin based Transparency International (TI) (Note 9). CPI Score relates to perceptions of the degree of corruption as seen by business people and country analysts, and ranges between 10 and 0. The high CPI indicates less corruption, while a low CPI score represents more corruption. For political stability (*polstab*), we use the World Bank's index of political stability constructed by Daniel Kaufmann and associates (Note 10).The index represents the perceptions of the likelihood that a government will be destabilized or overthrown by unconstitutional or violent means, including political violence and terrorism. Its value ranges between -2.5 to 2.5; with a high value indicates more stability while a low score represents less stability of the government. Hence we expect negative coefficients for both corruption and political stability.

For data time-invariant or indicator variables such as legal origin, regional identity and government-type, we use the CIA World Factbook (Note 11). A summary of the data we employ can be found in the appendix.We consider time period from 1993 to 2004 with at least three observations for each country. This gives us a panel of 54 developing countries. As mentioned earlier, the reason for using a shorter time period is that the poverty indices (percentage of population under a dollar income per day) before 1993 appear to be suspicious for some countries. Moreover, for some countries, poverty indices before 1993 are not comparable with the indices after 1993. The reason is that the poverty index is constructed on the basis of an internationally comparable concept of income, that is, income measured in terms of a currency unit which is comparable across countries. This is done by converting a local currency unit to a currency unit of international purchasing power parity (PPP). But consistent information about PPP before 1993 is not available for many countries, especially the developing ones. This makes poverty index before 1993 and after 1993 inconsistent for many countries. We therefore, decide to use data for the period 1993 to 2004 in this study.

## 4. Results and Interpretations

This section interprets results that we obtained at the third stage of the FEVD procedure discussed in section 3.2. In other words, results presented in this section are actually the empirical estimates of equation 7 (estimates of *hi* are not reported). As table 1 exhibits, in all FEVD models, both measures of the level of financial development (the ratio of M3 to GDP and the ratio of credit to GDP) appear as a significant explanatory variable with minus sign. The minus sign of both M3-GDP and C-GDP implies that poverty falls as the level of financial development enhances. For instance, as our

first specification (model 1) in table 1 reveals, if other variables remain unchanged, the current period poverty reduces by an average of four percent in response to a 10 percent average increase in the ratio of M3-GDP over the preceding five years (Note 12). The impact of financial development on poverty alleviation turns out to be stronger when the level of financial development is measured by the ratio of credit to GDP. As model 3 suggests, a 10 percent average increase in the ratio of Credit-GDP over last five years alleviates poverty by seven percent in the current period. Table 1 also exhibits the fact that poverty is less responsive to the level of financial development as financial instability is dropped from the model. The coefficient of M3-GDP falls from 0.04868 to 0.0371 in absolute terms when financial instability is discarded from the model.

The strength of the linear relationship between poverty and financial instability is exhibited in the added variable plot (Note 13) (figure 1) below. It shows that the slope coefficient of financial instability is significantly different from zero, meaning that the variable plays an important role in the model. Moreover, as tables A5 and A6 in the appendix reveal, t-values (in absolute terms) and R-squared increase while the standard error of the estimate decreases when both the level of financial development and financial instability are integrated in a model. This implies a strong correlation between the level of financial development and financial instability, suggesting financial development helps the poor to a larger extent in countries with stable financial system. The Wald test results (shown in the appendix under table A5) with regard to model that considers both financial development and instability suggest that we can reject the null hypothesis that population coefficients for these variables are zero, implying joint significance of these variables.

We introduce a measure of economic instability namely the standard deviation of per capita GDP growth in all specification with a view to investigating whether the detrimental impact of financial instability is channelled through the instability of economic growth as the cost of economic crises might be borne disproportionately by the poor. As we can see in table 1, this variable appear with moderate statistical significance and minus sign in all specifications. The chain of the relationship is clear: the more the financial service, the more the economic activity, hence the less the poverty but the more the overall economic volatility.

Among the other variables, as we can see in the table 1, inflation appears with a positive sign and statistical significance. Whereas corruption and political stability appear with negative sign. Economists view inflation as general rises in commonly accepted price indices. It is held that the rate of growth in economic activity is a key factor in determining the rate of increases in price indices. Thus strengthening in activity leads to higher prices and hence higher inflation while weaker activity causes lower inflation. By this point of view, inflation is desirable to the extent it is inevitable for growth. But if it exceeds that threshold, the sustainability of growth becomes uncertain. In context of finance poverty relationship, inflation may not be a threat if the return on investment can sufficiently offset the rate of inflation. But in many countries, inflation just escalates uncertainty and threatens sustainability of the success of financial development in the fight against poverty. Consider the case of poor people in developing countries who base their tiny business on fund borrowed at a higher rate. Return from their businesses is relatively stable compared to the rate of inflation. As a result, if inflation goes up and up, their business becomes vulnerable; it becomes difficult for them to come back to the same level of business as they start with. Furthermore, because their access to insurance is very limited, and they do not have sufficient trade independent security (the ability to survive loss with own funds), their business could not survive unexpected economic hazards. The only way they can survive is to borrow again and again and of course, with a promise to pay a more exorbitant rate for each subsequent borrowing. The burden of loans never ends.

Our analysis identifies corruption as an impediment to poverty alleviation through financial services. This reminds us of an instance cited in the Economist: in two poor states in India where the financial system is largely controlled by the government, borrowers paid bribes to officials amounting to between 8% and 42% of the value of their loans (Easton 2005). Our results provide empirical support for the fact that corruption raises the cost of every financial transaction, allows undesirable transactions to take place, undermines consumer confidence in institutional finance, and eventually impedes economic growth. Our findings also support the idea that corruption causes a social segmentation which is detrimental to private investment. By means of bribes, some people get more connected to the bureaucrats or the administrators, while the poor stay afar. Thus corruption causes the poor and unconnected members of society to feel insecure in investing in resources such as human or physical capital. Unlike the well connected, the poorer members of society are discouraged from investing in their resources. Therefore, even if private investment coexists with high rates of corruption, the poor and unconnected members of society will unlikely engage transactions that allow them to reap the benefits of the funds that flow from large scale private investments. Moreover, when corruption is high, substantial amount of funds that are generated from private investments do not necessarily flow down to the other members of society. These funds that would otherwise be directed to productive use in society are usurped by corrupt government officials for private gain.

The index of political stability appears with expected negative sign in all specification though it loses statistical significance in the lagged models and FGLS estimates (see table 2). Briefly, our results in regard to the relationship

between poverty and political stability support the conventional wisdom that good governance is a necessary condition in order for the financial development to help poverty alleviation.

Among the indicator variables considered, regional identity and legal origin appear with statistical significance in almost all specifications. Statistical significance of these variables indicates their degree of influence in explaining heterogeneity in the finance-poverty relationship across countries. The fifty four developing countries we considered here are grouped under four broad regional identities namely Asia (the base region), America (region-1), Europe (region-3) and Africa (region-4). Coefficients of these regions are positive even when a lagged dependent variable is introduced in the model and the Prais-Winsten AR (1) version of FGLS is implemented. The highest positive coefficient of region-4 (Africa) indicates that the poverty reduction in response to a given change in financial development would be the least in an African country compared to countries belong to the other region.

With respect to legal origin, counties are divided into four categories: the English legal origin (the base), French legal origin (legalorg-2), German legal origin (legalorg 3), and the Russian legal origin (legalorg-4). All these regions come up with negative coefficient, meaning more poverty reduction for a given increase in financial development in countries with French, German, and Russian legal origin compared to the English legal origin.

With respect to government type, countries under considerations are classified into five groups namely republic (the base), democracy (govt-2), dictatorship (govt-3), communist (govt-3), and constitutional monarchy (govt-5). In both original FEVD and FGLS estimates democracy appears with a negative sign, though statistically insignificant, meaning that financial development is more beneficial for poverty alleviation in this form of government. For the other forms of government the results are not clear enough to make a precise conclusion. For instance, dictatorship appears with a negative sign in the original models but fails to fit in FGLS. Furthermore, results are different for different government types under the original FEVD and FGLS. Reasons for these differences are autocorrelation and the fact that we consider a small sample with number of countries under groups such as dictatorship, communist and monarchy is very few. Hence we cannot make an exhaustive conclusion about the influence of government type on the finance-poverty nexus. We leave the issue for future research.

## 5. Conclusion

This paper considers a panel data model where poverty is explained by a set of time-varying, time-invariant, and rarely changing variables. Parameters of the models are estimated by a technique, called fixed effect vector decomposition (FEVD), using panel data on 54 developing countries. The FEVD technique helps us extracting the impacts of such time-invariant and rarely changing factors as corruption, political stability, and legal system from the finance-poverty linkage. Even after controlling for the impact these variables, we cannot reject the null hypothesis that on average financial development is conducive for poverty reduction but the instability accompanying financial development is detrimental to the poor. Our results also point to the conventional wisdom that while corruption is a constraint, political stability is a catalyst in fighting against poverty by means of financial development.

Our results indicate a strong correlation between the level of financial development and financial instability, suggesting financial development helps the poor to a larger extent in countries with stable financial system. Our results also show barriers that may limit the impact of financial development on poverty alleviation. The most likely limit is the instability that accompanies financial development. Incomplete and erratic regulation of financial institutions has also undermined the confidence of the poor in the financial services that are available. The lack of confidence causes a great majority of the population to be excluded from financial services and consequently retards economic growth and increase poverty and inequality.

These results have important relevance for policy makers involved in the alleviation of poverty. We hope our research will invite relevant agencies into the finance-poverty nexus and encourage responsible institutions to direct their energies toward recognising the importance of financial development in the alleviation of poverty.

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**Notes**

Note 1. We found financial development to help, while financial instability to hurt the poor. These findings are identical to those of other studies e.g. Beck *et al* 2004, and Jeanneney and Kpodar 2005.

Note 2. See chapter 13, Wooldridge (2006) for an introduction of panel data models.

Note 3. See Beck et al (2006) for a description of various barriers.

Note 4. This section largely draws on Plümper and Troeger (2007).

Note 5. We follow standard practice by this notation. However, from equation (4) it follows that the FE estimate of the unit effects propels much more to the estimated unit effects. To avoid confusion and maintain consistence with standard textbooks, we stick to this notation-needless to say that it does not make much sense.

Note 6. Note that the estimated coefficients of the time-varying variables remain unbiased even in the presence of correlated unit effects. However, the assumptions underlying a FE model must be satisfied (no correlated time-varying variables may exist).

Note 7. See Baum (2006, 159-160) for description.

Note 8. *PovcalNet* is an interactive computational tool that allows researchers to replicate the calculations made by the World Bank's researchers in estimating the extent of absolute poverty in the world, including the $1 a day poverty measures. [Online] Available: http://iresearch.worldbank.org/PovcalNet/jsp/index.jsp

Note 9. CPI scores. [Online] Aavailable: http://www.transparency.org/policy_research/surveys_indices/cpi

Note 10. See and Kaufmann et al (2005) for methodology, [Online] Available: http://info.worldbank.org/governance/wgi2007/resources.htm downloadable data.

Note 11. [Online] Available: https://www.cia.gov/library/publications/the-world-factbook/geos/af.html

Note 12. Table A5 in the appendix presents the beta coefficients of the regressors in the model which are defined as $\partial y^* / \partial x_j^*$ where $x$ and $y$ are the explanatory and the response variables respectively. The starred quantities are z-transformed or standardized values of these variables. For instance, $y^* = (y_i - \bar{y})/s_y$, where $\bar{y}$ is the sample mean and $s_y$ is the sample standard deviation of the response variable (Baum 2006). Thus the beta coefficient for M3-GDP tells us that the poverty index would decrease by approximately 0 .062 standard deviations for a 1-standard deviation increase in M3-GDP.

Note 13. See Baum (2006, p 119) for description.

Table 1. Fixed Effect Vector Decomposition (FEVD) Models

```
Dependent variable: Percentage of population under $1 income a day
------------------------------------------------------------------
     Variable |    Model1      Model2      Model3      Model4
------------+-----------------------------------------------------
       logpci |  -.3126***    -.3081***   -.3066***    -.311***
        m3gdp |  -.04868***   -.0371**
  instabm3gdp |   .3815***
    stdvgdpgrow | -.2459**     -.1973*     -.2361**     -.2113**
    inflation |   .01315***    .00999**    .01015**     .00944**
      corrupt |  -.00857***   -.00645**   -.00873***   -.00639**
       polstab |  -.01419***  -.01491***  -.01234**    -.01408***
        trade |   .01224       .00972      .00228       .00289
     region_1 |   .1418***     .1425***    .1424***     .1456***
     region_3 |   .03837***    .0427***    .03784***    .04413***
     region_4 |   .2734***     .2757***    .273***      .2758***
   legalorg_2 |  -.05773***   -.05406***  -.05376***   -.0497***
   legalorg_3 |  -.02635**    -.0344***   -.02251*     -.02949**
   legalorg_4 |  -.04604***   -.04433***  -.0393***    -.03865***
       govt_2 |  -.00961      -.00903     -.00574      -.00707
       govt_3 |  -.07361***   -.07355***  -.08011***   -.07956***
       govt_4 |   .03077*      .03057*     .03211**     .02693**
       govt_5 |   .00416       .01362      .04214**     .03404*
         cgdp |                           -.07006***   -.04188***
   instabcgdp |                            .2035***
        _cons |   1.101***     1.086***    1.096***     1.098***
------------+-----------------------------------------------------
         r2_a |   .9687        .9686       .9684        .9685
         rmse |   .03007       .03013      .03022       .03016
------------------------------------------------------------------
          legend: * p<0.05; ** p<0.01; *** p<0.001
```

Table 2. Lagged and FGLS Models

```
Dependent variable: Percentage of population under $1 income a day
------------------------------------------------------------------
   Variable |    L_Model1       L_Model2        FGLS1        FGLS2
------------+-----------------------------------------------------
      L.hci |     .00627        -.01567         .02661       .01357
     logpci |    -.3262***      -.3199***      -.3158***    -.3067***
      m3gdp |    -.06662                        -.0682*
 instabm3gdp|     .2114                          .2079
 stdvgdpgrow |   -.2487         -.2666          -.2954*      -.315*
  inflation |     .01372**       .00755         .01347       .00851
    corrupt |    -.00807*       -.01029**       -.00834     -.01018*
     polstab |   -.00792        -.00544         -.00757     -.0053
      trade |    -.00106        -.01148         -.0004      -.01091
   region_1 |     .1513***       .1555***       .1452***     .1481***
   region_3 |     .04778**       .0465**        .04635***    .04507***
   region_4 |     .27***         .2782***       .2627***     .2668***
 legalorg_2 |    -.05544***     -.05275***     -.05265***   -.04932**
 legalorg_3 |    -.03414*       -.02434*       -.03414      -.02393
 legalorg_4 |    -.0468***      -.03895**       -.04637**   -.03774*
     govt_2 |    -.00427        -.00413         -.00407     -.0038
     govt_3 |                   dropped
     govt_4 |     .047           .0454**        .04773       .04326
     govt_5 |     .03048         .06925*        .03295       .06969
       cgdp |                   -.0951***                    -.09156***
 instabcgdp |                    .2298***                     .2089**
      _cons |     1.158***       1.162***       1.126***     1.117***
------------+-----------------------------------------------------
       r2_a |     .8887          .8863          .8632        .8588
       rmse |     .02562         .02591         .02521       .0255
        rho |                                   .2253        .2334
dw (original)                                   .9916        .9657
dw (transformed)                                1.249        1.186
------------------------------------------------------------------
                     legend: * p<0.05; ** p<0.01; *** p<0.001
```

Table A1. Summary of Panel Data Descriptive Statistics 1980 - 2004

```
 Variable      |     Mean      Std. Dev.     Min        Max  |     Observations
---------------+---------------------------------------------+-----------------
hci    overall |  12.39958     16.41162        0       79.35 |    N =     430
       between |               17.1687       .102      70.584 |    n =      68
       within  |               6.931503   -12.84042   80.07958 | T-bar = 6.32353
               |                                              |
logpci overall|  3.234381      .2830776   2.487421   3.811028 |    N =     430
       between|                .2782029   2.572309    3.6547  |    n =      68
       within |                .1092266   2.655425   3.735311 | T-bar = 6.32353
               |                                              |
cgdp   overall |  40.65244     28.60905   2.728468   146.1481 |    N =     433
       between |               24.64284   4.174426   115.6307 |    n =      68
       within  |               13.04356  -24.34943   91.19223 |  T-bar = 6.36765
               |                                              |
Instab- verall |  5.318948     7.912336   .4422445   111.4181 |    N =     439
cgdp    between |               6.194112   1.247873   45.44027 |    n =      68
        within  |              5.595512  -29.10763   71.29676 | T-bar = 6.45588
               |                                              |
m3gdp   overall |  37.33651    21.57917   7.118877   131.2097 |    N =     435
        between |              19.76472   7.977093   107.8741 |    n =      68
        within  |              9.778911   -10.1296   93.18751 | T-bar = 6.39706
               |                                              |
Instab- overall |  2.771136     2.749052        0    20.07871 |    N =     440
m3gdp   between |              2.018951   .3576512   13.35264 |    n =      68
        within  |              1.856562  -7.374862   11.2186  | T-bar = 6.47059
               |                                              |
Infla-  overall |  .1446322     .2257527  -.0003332   1.498168 |    N =     449
tion    between |               .13672     .0043073   .5794414 |    n =      68
        within  |              .1692261  -.3730157   1.115143 | T-bar = 6.60294
               |                                              |
Stdvgdp- overall |  3.673535    2.888598   .3176078   23.38795 |    N =     449
grow    between |              1.787006   1.052037   8.401389 |    n =      68
        within  |              2.286595  -3.226379   18.6601  | T-bar = 6.60294
               |                                              |
```

Description of the Variables and Sources of Data:

hci          :       Head count index: Percentage of population under $ 1 daily

                     income. Source: PovcalNet (A World Bank Poverty Database):

                     Available: http://iresearch.worldbank.org/PovcalNet/jsp/index.jsp

logpci               : Log of per capita yearly income. Source: Ibid

cgdp         :       The ratio of credit by the banks (to the private sector) to GDP

                     Source: World Development Indicator (WDI) 2006.

instbcgdp :          Financial instability measured in term of the credit-GDP ratio.

                     Estimated from the time series of CGDP as described in section 3.3.

m3gdp:               The Ratio of M3 to GDP. Source: WDI 2006.

instbm3gdp           : Financial instability measured in terms of M3-GDP ratio.

                     Calculated from the time series of M3GDP as described in section 3.3.

inflation   :        Log (1+ rate of inflation expressed in decimal).

                     Source: (rate of inflation measured from CPI) WDI 2006

stdvgdpgrow          : Standard deviation annual growth of GDP per capita.

                     Source: (GDP Per Capita growth): WDI 2006

Table A2. Summary of the Panel Datatime Period: 1993-2004

```
 Variable        |      Mean   Std. Dev.       Min        Max |   Observations
-----------------+--------------------------------------------+----------------
 hci      overall | .1180752   .1699273      .0002      .8794 |   N =     258
         between |            .1918411    .001175  .8504667 |   n =      54
          within |            .0344009  -.0117915  .2893419 | T-bar = 4.77778

 logpci   overall | 3.239738   .2637668     2.5115     3.7079 |   N =     258
         between |            .2722678     2.5708   3.63875 |   n =      54
          within |            .0552702   3.060821  3.395313 | T-bar = 4.77778

 m3gdp    overall | .3679626   .2155051    .071189   1.312097 |   N =     258
         between |            .2052909      .0804  1.066641 |   n =      54
          within |            .0641836   .0992389  .6134186 | T-bar = 4.77778

 ins~3gdp overall | .0278861   .0256013          0    .189264 |   N =     258
         between |            .0182677   .0076776   .101566 |   n =      54
          within |            .0181598  -.0416139  .1155841 | T-bar = 4.77778

 cgdp     overall | .3843031   .2828017    .042794   1.461481 |   N =     258
         between |            .2640287   .0521757  1.237154 |   n =      54
          within |            .1053993  -.2046244  .8498868 | T-bar = 4.77778
                 |                                           |
 ins~cgdp overall | .0536576   .0904549    .004422   1.114181 |   N =     258
         between |            .0693959   .0068447  .4544027 |   n =      54
          within |            .0632097  -.2906081   .713436 | T-bar = 4.77778
                 |                                           |
 stdvgd~w overall | .0361196   .0281816    .003176    .212261 |   N =     258
         between |            .0186262   .0064483  .0754892 |   n =      54
          within |            .0213299  -.0174117  .1808318 | T-bar = 4.77778
                 |                                           |
 inflat~n overall |   1.2173   .5984864        .01     3.3217 |   N =     258
         between |            .4149335   .3177667   2.05425 |   n =      54
          within |            .4270793   .0792503   3.06396 |T-bar = 4.77778
                 |                                           |
 trade    overall | .7219253   .3568841    .167698   1.938305 |   N =     258
         between |            .3373858   .2034208  1.691308 |   n =      54
          within |            .0929717   .2772555  1.012098 |T-bar = 4.77778
                 |                                           |
 polstab  overall | -.2904884  .7321932     -2.123      1.105 |   N =     258
         between |            .6891094  -1.752667     .9178 |   n =      54
          within |            .2731016  -1.674988  .4251783 |T-bar = 4.77778
                 |                                           |
 corrupt  overall | 3.222209   1.069459        1.4        7.5 |   N =     258
         between |            1.004319   1.633333  5.633333 |   n =      54
          within |             .344704   2.105543  5.305543 |T-bar = 4.77778
```

Description of the Variables and Sources of Data (continued from table A1):

trade :   Export plus import as a percentage of GDP

Source: WDI 2006

polstab:   Political stability: The perceptions of the likelihood that a government will be destabilized or overthrown by unconstitutional or violent means, including

political violence and terrorism.

Source: http://info.worldbank.org/governance/wgi2007/resources.htm for data &

Kaufmann et al (2004) for how the index is constructed.

corrupt:   Corruption perception Index (CPI): Perceptions of the degree of corruption as seen by business people and country analysts.

Source: Transparency International (TI).

Available at: http://www.transparency.org/policy_research/surveys_indices/cpi.

Table A3. Fixed Effets (Within) Regression: 1993-2004

```
Dependent variable: Percentage of population under $1 income a day
                                          Number of obs     =       258
                                          Number of groups  =        54
R-sq:  within  = 0.2750                   Obs per group: min =        3
       between = 0.5562                                  avg =      4.8
       overall = 0.5040                                  max =       10
                                                 F(5,199)     =     15.09
corr(u_i, Xb)  = 0.2981                    Prob > F      =    0.0000
------------------------------------------------------------------------------
         hci |     Coef.  Std. Err.      t    P>|t|    [95% Conf. Interval]
-------------+----------------------------------------------------------------
      logpci | -.3155478  .0393602    -8.02   0.000    -.3931643   -.2379312
       m3gdp | -.0074706  .0344565    -0.22   0.829    -.0754173    .0604762
  instabm3gdp | -.1444913  .1305554   -1.11   0.270     -.401941    .1129583
   stdvgdpgrow | -.0254113  .1069852   -0.24   0.812    -.2363814    .1855589
    inflation |  .0101588  .0058528    1.74   0.084    -.0013828    .0217003
        _cons |  1.135697  .1261334    9.00   0.000     .8869674    1.384426
-------------+----------------------------------------------------------------
     sigma_u |  .13945748
     sigma_e |  .03328829
         rho |  .94609439   (fraction of variance due to u_i)
```

Table A4. Fixed Effets (Within) Regression: 1980-2004

Dependent variable: Percentage of population under $1 income a day

| Variable | model 1 | model 2 | model 3 | model 4 | model 5 | model 6 |
|---|---|---|---|---|---|---|
| lnpi | -.3812*** | -.384*** | -.3837*** | -.4187*** | -.4194*** | -.4198*** |
| m3gdp | -.08537** | -.07884* | -.07852* | | | |
| inflation | .00418 | .01202 | .01444 | .00298 | .00331 | .00968 |
| instabm3gdp | | -.1745 | -.1754 | | | |
| stdgdpp | | | -.05885 | | | -.1197 |
| cgdp | | | | .00646 | .00675 | .00844 |
| instabcgdp | | | | | -.00195 | -.01111 |
| _cons | 1.388*** | 1.398*** | 1.4*** | 1.475*** | 1.477*** | 1.482*** |
| sigma_u | .09482 | .09523 | .09494 | .0946 | .09461 | .09427 |
| sigma_e | .05711 | .0571 | .05708 | .05753 | .05766 | .05761 |
| rho | .7338 | .7355 | .7345 | .73 | .7291 | .7281 |

legend: * p<0.05; ** p<0.01; *** p<0.001

Table A5. Ols Estimates of Fevd Model 1

```
            Dependent variable: Percentage of population under $1 income a day
                                   Number of obs =     258
                                   F( 19,   238) = 345.54
                                   Prob > F      =  0.0000
                                   R-squared     =  0.9710
                                   Root MSE      =  .03007
            ------------------------------------------------------------------
                             |                 Robust
               hci |     Coef.  Std. Err.      t    P>|t|              Beta
            -------------+----------------------------------------------------
            logpci | -.3126199   .013607   -22.97   0.000           -.485259
             m3gdp | -.0486838  .0123797    -3.93   0.000          -.0617418
        instabm3gdp |   .38154  .0751772     5.08   0.000           .057483
        stdvgdpgrow | -.2459097  .0773618    -3.18   0.002          -.0407829
          inflation |   .013149  .0037694     3.49   0.001           .0463111
            corrupt | -.0085691  .0024492    -3.50   0.001          -.0539305
            polstab | -.0141887  .0041961    -3.38   0.001           -.061137
              trade |  .0122366  .0070643     1.73   0.085           .0256996
            ------------------------------------------------------------------
                              WALD TEST
                          ( 1)  m3gdp = 0
                         ( 2)  instabm3gdp = 0
                         F( 2,   238) =   19.84
                          Prob > F =    0.0000
```

Table A6. Ols Estimates Of Fevd Model 2 (Variable Financial Instability Is Dropped)

```
             Dependent variable: Percentage of population under $1 income a day
                                            Number of obs =      258
                                            F( 18,  239) =   332.38
                                 Prob > F    =  0.0000
                                            R-squared    =  0.9708
                                            Root MSE     =  .03013

        --------------------------------------------------------------------------
                    |                  Robust
             hci |      Coef.     Std. Err.      t      P>|t|         Beta
        -------------+------------------------------------------------------------
          logpci |   -.3080907    .0135651    -22.71     0.000      -.4782287
           m3gdp |   -.0370996    .0126778     -2.93     0.004      -.0470504
       stdvgdpgrow |   -.1973129    .0785959     -2.51     0.013      -.0327233
        inflation |    .0099864    .0032258      3.10     0.002       .0351721
          corrupt |   -.0064476    .0023696     -2.72     0.007      -.0405789
          polstab |   -.0149111    .0041452     -3.60    0.000       -.0642498
```



coef = .38154001, (robust) se = .07517716, t = 5.08
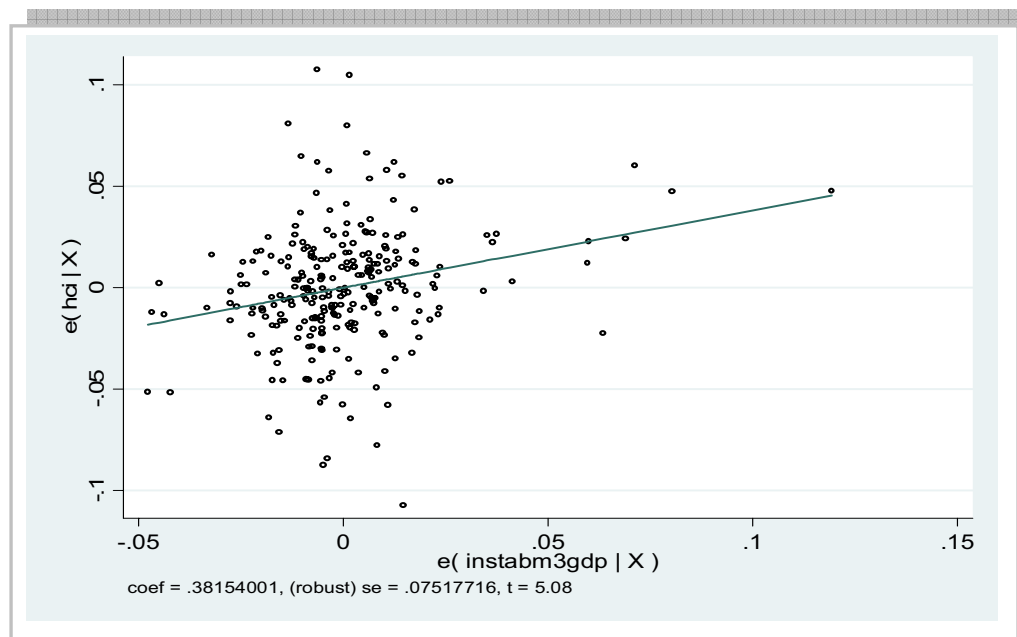
Figure 1. Relative Contribution of Financial Instability in the Model 1
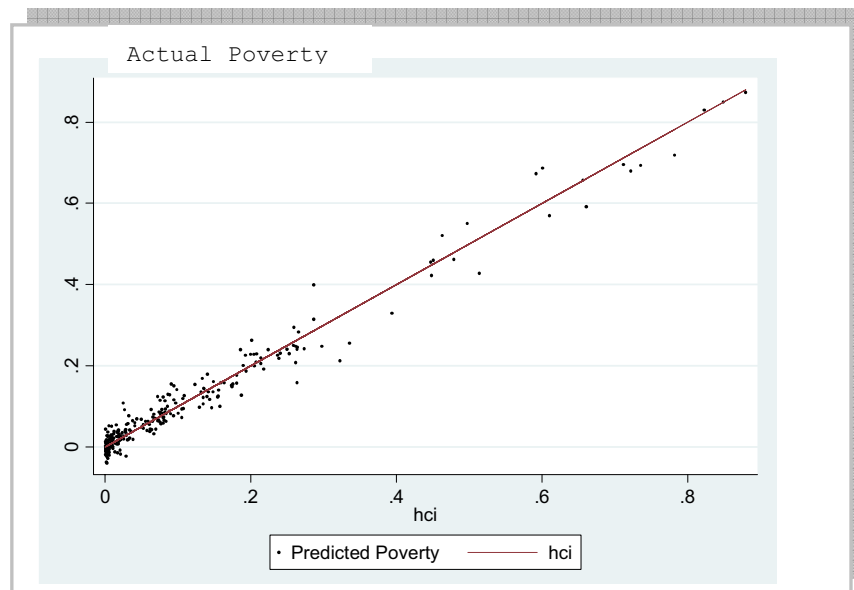
Figure A1. Actual versus Predicted: FEVD Model 1
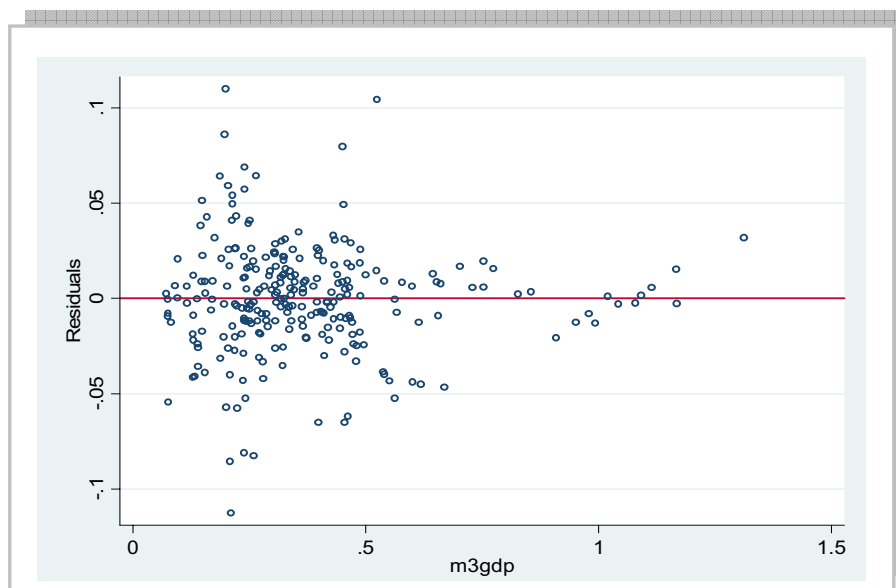


Figure A2. Residual Plot: FEVD Model 1

# International Market Expansion Strategies for High-Tech Firms: Partnership Selection Criteria for Forming Strategic Alliances

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**Abstract**

Newly established, technology-based firms entering international markets often have limited resources in terms of capabilities, time, and capital. As a consequence, these firms often use entry modes characterised by low resource commitment, including partnership agreements (strategic alliances). This paper, investigates which partner selection criteria that are important for this group of firms when they are selecting partners. Based on case studies of three Norwegian firms targeting the UK market, five selection criteria have been identified as important (trust, relatedness of business, access to networks, access to market knowledge, reputation), one has been identified as partly important (sharing of financial risk), and ten have been identified as having limited importance. Further, the paper discusses the implications of these results for managers of small firms entering international markets and presents recommendations for further research.

**Keywords:** International marketing, Partner selection, Strategic alliances, Competitiveness

## 1. Introduction

Although many new, technology-based firms remain relatively small over time, and only a small fraction of them grow into larger firms, several researchers have presented empirical evidence suggesting that this minority of fast growing companies generates a significant proportion of economic growth and new jobs (Rickne and Jacobsson, 1996; Jones-Evans and Westhead, 1996). For many of these firms, international expansion is necessary to realise growth ambitions, while others are pushed into international markets due to significant R&D start-up costs and limited home market potential.

Managers of internationally oriented new, technology-based firms need to navigate complex international environments, and their challenges are different from the challenges facing domestic and established firms. Most importantly, these firms will have limited resources as well as limited time, capital, and capabilities; qualities that are all needed for entry into international markets (Doutriaux, 1992). As a consequence, these firms will tend to use entry modes characterised by low resource commitment. Burgel and Murray (2000, p. 35) state that "findings from quantitative surveys agree that the preferred entry modes of technology based start-ups are characterized by relatively low resource commitments and

are directed toward commercialization rather than foreign production". Similar results were obtained by Lindquist (1991) and Bell (1995).

The next sections are organized as follows: First, the reasons and risks related to entering a partnership agreement is emphasised in order to understand firm behaviour and priorities. Second, criteria for partner selection are addressed. Third, the process of partner selection is commented upon. On the basis of these sections, a case study of three Norwegian firms entering the UK market is presented in order to gain insight into partner selection criteria and the partner selection process.

## 2. Literature Review

### 2.1 The use of alliances

The use of contractual agreements represents a possible entry form, and Nielsen (2003a) states that firms often form alliances due to the many potential benefits for the firms involved, or as a way to compensate for a lack of resources or knowledge There has been a sharp increase in the number of alliances formed since the 1980s, particularly among high-tech firms (Krubasik and Lautenschlager, 1993). Ohmae (1989, p. 143) states: "Globalization mandates alliances, makes them absolutely essential to strategy." Firms have a number of internal resources that may give the firm a competitive advantage, but a range of well chosen and well developed relationships may also strengthen the competitive edge, as described by Glaister (1996). Most of the available literature and research on strategic alliances as an entry stragegy focuses on joint ventures from the perspective of large, multinational companies. As expressed by Varis et al. (2005), there is limited knowledge about how newly established firms may use partnership agreements as an entry strategy in international markets in general, and: "In particular, partner selection and the reasons why a firm allies with a certain partner have received limited attention" (p. 20).

Obviously, a firm is not able to pick and choose whichever partner it wants; there will be a process of interaction and negotiation in order to reach an agreement and be accepted by a potential partner. This process is not the focus of this study, whose main focus is an investigation of the criteria used for partner selection when small, technology-based firms are entering international markets.

The terms strategic alliance and partnership agreement are used, and these terms denote several forms of cooperative working modes. Both these terms are, based on Mahoney et al. (2001), defined as: "[B]usiness arrangements where two or more firms choose to cooperate for their mutual benefit" (p. 501). Such alliances may differ between spot market transactions and complete mergers, and may also differ in terms of inter-organisational dependence and strategic impact (Root, 1987; Contractor and Lorange, 1988). As most new export and technology-based firms may be characterized as "born global" firms, the term born global firm will also be used in this paper.

### 2.2 Motives and Risks

As long as the variety of different types of alliances is great, so is the variety of motives for forming them (Nielsen, 2003a). Mahoney et al. (2001), as well as Lei and Slocum (1991), present categories of motives for alliance formation including ease of market entry, shared risk as well as synergies and competitive advantages. Even though the advantages of and motives for partnership agreements are well documented (Mowery et al, 1996; Glaister, 1996; Ohmae, 1989), there will still be a certain element of risk. If a firm shares its competitive knowledge it runs the risk of increased competition instead of cooperation, as described by Mahoney et al. *(*2001). This might happen if the partner acts opportunistically, monitoring the skills that migrate between firms. All firms should develop safeguards against unintended informal transfers of information in order to limit the transparency of their operations (Hamel et al., 1989). Engaging in a strategic alliance, the firm develops a degree of dependency on its partner, especially if the partner's function is not easily replaced by another firm, in which case this dependency might be extensive. Being too dependent on a partner may be challenging during periods of sudden and substantial change in technology or market segmentation. Mitchell and Singh (1996, p.191) found that "[b]usinesses that are able to work closely with current partners while at the same time identifying capabilities that need to be integrated are likely to be the most successful in an industry marked by ongoing technological change."

From a managerial perspective this illustrates the duality between potential advantages and risk when entering partnership agreements. As a consequence, the process of selecting suitable partners for the firm's strategic alliances is of utmost importance, as described by Cavusgil and Evirgen (1997). Making poor choices when selecting a partner will negatively impact several different areas of operation. Possible outcomes of choosing an unsuitable partner might be problems with distribution, promotion, sales, after-sales, and pricing strategies (Nijssen et al., 1999). Not surprisingly, the choice of partner has significant impact on the firm's performance in international markets, as identified both by Nijssen et al. (1999) and Glaister and Buckley (1997).

*2.3 Partner Selection Criteria*

Geringer (1991) has summarised the available literature, identifying 15 different partner selection criteria. Furthermore, he presented a typology that has been widely adopted, splitting the partner selection criteria into two categories: task-related selection criteria and partner-related selection criteria. The task-related criteria focus on operational skills; the variables that are important to the firm's operations and for its competitive success. The partner-related criteria, on the other hand, are variables influencing the partner's ability to cooperate effectively and efficiently in a partnership with the firm.

Glaister (1996), Glaister and Buckley (1997), and Nielsen (2003a) have all conducted empirical tests of partner selection criteria. The results are similar, with the task-related criterion "knowledge of local market" ranked as the most important. This criterion has a mean value that is significantly higher than the other task-related criteria. The next three task-related criteria that are also deemed important are "distribution channels", "links to major buyers" and "knowledge of local culture". These are all criteria related to ease of market entry.

An examination of these empirical studies reveals that partner-related criteria were generally higher ranked than task-related criteria. To the degree that the results of joint ventures and other strategic alliances have been presented separately, the two corresponds in that the top three criteria are the same, only with a different internal ranking. The top partner-related criteria are "trust between the top management teams", "relatedness of partner business and reputation", "financial resources" and "complementarity of the partner's resource contributions". Based on these empirical studies, partner selection criteria are classified as either important or less important (Table 1).

When examining the criteria above from the perspective of Born Global firms, trust between top management teams should be as important for Born Globals as for other firms. The Born Global is most likely a small firm of which the potential partner often has limited or no knowledge. The Born Global is dependent on gaining the trust of a partner in order to obtain a productive partnership. Furthermore, the Born Global needs to know that it can trust its partner so that it does not need to have concerns about the partner behaving opportunistically.

By being associated with a partner with a good reputation, the Born Global enhances its legitimacy, which may ease the process of establishing a network. Furthermore, a positive reputation may act as a substitute for first-hand experience with a partner. Hence, partner reputation should be expected to be important for a Born Global firm.

Reducing financial risk may be suggested to be an essential motive for finding a partner for Born Globals, as limited financial resources are often presented as a typical characteristic of a Born Global firm. Since market entry is uncertain and costly, sharing the financial risk through strategic alliances have been known to help firms decrease the financial loss experienced by a less successful entry (Mahoney et al., 2001).

The complementarities of a partner's resource contribution are also expected to be important. Born Global firm have resource gaps, which could be one of the strongest motives for entering a strategic alliance. The chosen partner is thus expected to cover one or more of these resource gaps. If the partner only possesses the same resources as the Born Global, these resource gaps will not be covered.

In order to penetrate a new market, firms need local market knowledge. In order to secure sales, knowledge is needed about potential customers, competitors, and the level of technology in the market. Several researchers have suggested that gaining a strong foothold in foreign markets can be more easily achieved through an alliance where the partner has market knowledge and experience (Bleeke and Ernst, 1991; Lei and Slocum, 1991; Mowery et al., 1996).

Upon examining the criteria classified as less important, it is expected that the size of the partner firm is not an issue in itself. As long as the trust, reputation, and financial status are at adequate levels, the size is of less importance to the Born Global. As a young firm, a Born Global will have few past experiences with potential partners. Due to the limited history of such experiences, past experience is not an important criterion for the Born Global.

The potential for new technology development is probably also less important for a Born Global than for many other companies. Born Globals are likely not very willing to commit their scarce resources to obtain a high degree of technology transfer. For this reason, access to technology/knowledge is also expected to be of limited importance.

In total, six different partner selection criteria is expected to be of importantce for a Born Global firm entering international markets, whereas a number of other criteria is expected to be of less importance. However, limited empirical evidence exists about these issues, and the case studies will examine how the firm managers assess the importance of different criteria.

<Insert table 1 here>

## 3. Methodology

Due to the limited knowledge of the partner selection process and partner selection criteria for newly established firms, a case study approach was selected for this study. Norwegian firms classified as Born Globals within the field of

information and communication technology in the process of entering the UK market was selected for analysis. A limited list of possible firms was obtained based on information from the export promotion part of the public "Innovation Norway" organisation, and from this list, three firms that seemed to best match the defined criteria were selected for further evaluation.

The firms were IKT Interactive, Pronto TV, and Netlife. These three firms were in different phases of UK market entry; IKT Interactive had one employee working half-time from Surrey and had several established partnerships in the UK; Pronto TV had one employee working in London, and they were in the process of establishing their first partnership in the UK; whereas Netlife had one employee working in London, but the firm had no customers or partners in the UK.

The interviews were prepared by drafting an interview guide covering the central topics of the study. Under each main topic, several issues that should be covered during the interview were listed. The interview guide was thoroughly reviewed several times in order to prepare for an unbiased interview, asking open-ended questions. Finally, the interview guide was adjusted for each firm, so that it would match the firm's internationalisation experiences, partner situation, and experiences from the negotiation process.

Four personal interviews were conducted, including the UK manager of IKT Interactive, both the Head of Sales and Marketing and the UK Manager of Netlife, and the UK Director of Pronto. Each interview lasted two to three hours.

The interviews were conducted as semi-structured interviews. This type of interview is "characterised by predefined themes, but without specifying in detail the wording and ordering of questions" (Ryen, 2002, p.99).

Eisenhardt (1989) proposes two key steps in case study analysis. First, a within-case analysis should be conducted, involving a detailed case study write-up for each case. The overall idea is to become intimately familiar with each case as a stand-alone entity, thereby contributing to the generation of insight. The second step is to search for cross-case patterns, using selected categories or dimensions (Eisenhardt, 1989).

The data in this research were categorised as described by Strauss and Corbin (1990), and sorted into the categories A, B, and C. First, the transcribed interview material was reviewed, and firms were separated looking for statements relevant to this study's specific research problem. These statements were then placed in the A category. Structuring the information in this way reduces the material in that it eliminates information deemed not important in relation to research problem. However, quotes listed belonging to category A do not offer any logical arrangement of the data. Bringing the information to a higher level of abstraction in the search for cross-case phenomena, statements were placed in the B category. Findings in the B category were discussed and evaluated against the theory. Based on these discussions category C was conceptualised, representing the highest level of abstraction.

## 4. Case Firms Presentations

This section presents the three case firms in the study, IKT Interactive, Pronto TV, and Netlife.

**IKT Interactive** was established in 1996, and the firm's business idea was to create an ERP (Note 1) system that could be distributed to SMEs via the internet at a much lower cost than existing systems. IKT Interactive has 15 employees, and is pursuing market opportunities in Germany, Belgium, Spain, Australia, Singapore, and Brazil.

In the autumn of 2002, IKT Interactive made plans to enter the British market. The plans were made after the firm participated on a business trip to Guilford, where a Norwegian export promotion agency presented the possibilities of joining Springboard UK. This programme targets Norwegian SMEs; easing market entry in the UK by providing office space, advisory services, and technology networks in regional research parks across the UK. Through the programme, IKT Interactive established an office in Surrey Technology Park and a sales office in London. At that point the system was not yet translated into English, so product development and market activities proceeded simultaneously. In January of 2004 all modules except accounting were fully developed and partners were in place. At the same time the firm had experienced that market entry took much longer than expected, due to prolonged processes in both product adaptation and partnership establishment. IKT Interactive has entered formal agreements with two partners and signed a letter of intent with a third.

The **Pronto Group** started product development in 1996, and the firm was formally established in 1999. The Pronto idea was a response to the growing interest in interactive television during the early 1990s. Broadband technology started being used more widely, and this helped make interactive television possible. The Pronto Group offers a tailored in-room entertainment and information system for hotels, cruise ships, and apartment complexes.

Pronto Group currently employs 25 people. The main office is located in Norway, but Pronto also has offices in the UK, the Netherlands, Dubai, and Abu Dhabi. At start-up, Pronto won a contract for the cruise ship "The World". This was thus the first installation of Pronto. Their first hotel installation was in Leeds, England. The target market today is primarily hotels, while Pronto also sees opportunities in spas and private hospitals.

Pronto TV has recently started the process of forming a strategic alliance with a UK company selling and leasing TVs and other electronic equipment. This is a well-established and well-known company in the UK, and it has a support department, service cars, and employees who can make electronic installations.

For this strategic alliance, the UK company made the initial contact, wanting to investigate the potential for collaboration. The alliance is still in an early phase, and the formal contract has not yet been signed. In this alliance the UK partner would supply all the hardware (TVs, servers, set-up boxes, cables). Once the alliance is established, Pronto will supply the software and be responsible for keeping the software stable and updated, and providing content and software support. This strategic alliance is ideal for Pronto, as the UK partner complements Pronto well; they have service cars and personnel close to the installations; they have knowledge about the British business culture; and they are well-known in the market. In taking on the financial costs of installation they also reduce Pronto's risk.

Established in 2000, **Netlife** has become one of the market leaders in software for the digital photofinishing industry in the Nordic region. Their system offers a complete solution for managing digital images on the internet, including features such as viewing, organising, editing, storing, sharing, and printing. The firm has 12 employees and has recently opened a UK subsidiary. Netlife is pursuing market opportunities in the Baltic states and Switzerland as well.

In December 2003 Netlife established the UK subsidiary Netlife Internet Solutions Ltd. and hired a person to permanently represent Netlife in the UK. The firm is currently searching for the proper partner(s) to represent Netlife in the British market. The British market was selected because of its size, and because a large client here will be a valuable reference in the future internationalisation process.

## 5. Findings and Discussion

Six criteria related to partner selection were expected to be of importance. Each of these possible major factors, expected to be important for partner selection, is discussed below:

### 5.1 The most Important Partner Selection Criteria

#### 5.1.1 Trust between management teams (personal chemistry)

When analysing the interviews, it became evident that trust was strongly interrelated with two different aspects: personal chemistry and perceived similarities in firm cultures and ambitions. Personal chemistry is important, because usually only one or a few persons are responsible for handling the partnership. These people will meet every now and then, and they need to agree on the details of the operation; they need to be able to cooperate. Both IKT Interactive and Pronto emphasize the importance of personal relations/chemistry with representatives of the partner firm, and IKT Interactive even says that personal chemistry helps them choose partner firms.

Furthermore, a sense of having something in common may be beneficial. IKT Interactive sees itself as a young and funky company and prefers to cooperate with other companies with a fairly young staff and a trendy image. Having these characteristics in common may increase the likelihood that the partners are able to share the visions of the Born Global. Both IKT Interactive and Pronto believe it is important that the partner understands their product, the potential of the product, and the vision of the firm. This will be reflected in a willingness to work hard and a belief in success.

Based on the interviews, personal chemistry, as well as a sense of having something in common and sharing the vision, will create a fairly strong relationship, and seems to have a strong influence on trust between the firms. As such, trust is a very important criterion for the Born Global entering international partnership agreements.

#### 5.1.2 Relatedness of partner business, complementary resources

The three case firms have all seen the possible benefits of finding partners with complementary resources. In the UK, IKT Interactive has partners functioning both as subcontractors and co-developers. IKT Interactive believes that these partnerships are very beneficial, and they will look for similar companies to expand, both in the UK and in other markets.

Pronto is considering finding a partner that is offering a low-end product as a complementary product to their own, so that they can continue developing Pronto TV as a high-end product. They are also partners with Forbes, which offers TVs, installation, and service. This is complementary to what Pronto may provide, namely the technology and technical support.

Theory on selection criteria and Born Globals indicates that this complementarity is especially important for Born Globals because of their resource gaps. Both Pronto and IKT Interactive seem to have, more or less consciously, recognised this in their choice of partners in the UK. Thus, the findings give support to the assumption that complementarity is important.

More specific, the partner's capacity for sales and marketing has been emphasised by all three case firms. Interactive's strategy in the UK is to let partners handle all sales. Also, Pronto has a partner that is responsible for all marketing and

sales. Netlife has seen the benefits of this in other markets, and one of the criteria the firm sets for new partners is that they should have the resources necessary for successful marketing and an existing customer base.

5.1.3 Access to links to major buyers, networks and distribution channels

The Born Global is likely to have a limited professional network in the new market. Since building a network requires considerable time and resources, finding a local partner with an already established network can potentially cut the Born Global's time to access the market considerably (Glaister, 1996).

All three case firms stress that building a network in the UK market is of utmost importance to succeed. Both Interactive and Netlife stress that as an unknown firm it is difficult to find customers and partners and to build relations without a network. All three case firms also emphasise that building a reputation and securing clients to a large extent happens through word-of-mouth. Meeting the right people is more likely to happen when the firm has a partner with an established network. Both Interactive and Netlife stress that this would improve their chances of finding clients and partners.

McDougall et al. (1994) stated that one of the main challenges faced by Born Globals was their lack of networks. Born Globals were found to lack access to proper networks where they could acquire information and support and get in touch with key people when entering new foreign markets. Meeting the right people, and getting to know them and establishing trust and a relationship takes substantial effort over a period of time, but it is essential for success. All the case firms seem to agree on the importance of building a network in order to be able to build a reputation and to get partners and customers. However, building a network without having a network is difficult. The firms therefore all emphasised that finding a partner with a local business network is important for success. The case firms' success of locating partners largely depended on their UK representatives being able to utilise all arenas for building networks.

Interactive has established partnerships with firms that already have an established customer base that is in the target segment of Interactive. If Interactive were to approach customers on its own, it would need to pass many gatekeepers before reaching the right person. And even then they would have a hard time getting the person's interest. On the other hand, when using the partner's network, they expect to have easier access to customers and increased sales opportunities. Netlife is also looking for partners who have a relevant, established customer base. Finding local partners with an established network and customer base thus seems to increase the probability of obtaining quick sales, in turn facilitating for a rapid market entry. Pronto stresses that having a partner who is located close to their customers is important in order to quickly assist them and provide after-sale services.

Mohr and Spekman (1994) suggest that a partnership with a local firm will enable a firm to better disseminate their products and services and better serve their customers than can the firm alone. The distance between Norway and England is large enough that customers are better served through using local partners in some instances. A product like that of Pronto would need to be serviced on site if a problem should occur. It is not surprising that Pronto deems finding a partner close to the customer as important in order to give service quickly. Pronto has also mentioned that they have spent a considerable amount of money travelling back and forth between Norway and England. Hence, reduced travelling expenses are also a key argument for using local partners.

5.1.4 Access to local market knowledge

None of the firms have any significant market knowledge regarding the UK market. The firms have therefore been looking for potential partners with local market knowledge. Interactive has found two partners who already have established customer bases within the SME segment, which is Interactive's target segment. Having served this segment for a while, it can be assumed that both partners have knowledge about customers, as well as about both the level of technology and technology acceptance among many of its customers. Furthermore, they have found a distributor who has specialized in technology sales, and a certain amount of knowledge about competitors, potential customers, and level of technology can thus be expected. Pronto has also stressed the importance of collaborating with a local partner who is close to the customers. They found a partner who has a long history in the marketplace. Netlife is looking for established partners who have market knowledge.

The knowledge barriers a firm has to consider in a foreign market entry are often more easily handled when forming a strategic alliance with a local firm (Oliver, 1990). All three case firms stressed that they did not have such knowledge. Furthermore, they do not have a sales division, nor do they intend to establish one. Thus, they do not have much experience in obtaining market information either, and they would be expected to use both significant time and resources to engage in sufficient pre-entry activities, such as market research, if they were to do this alone. Finding a local partner who has operated in the market for a period of time therefore seems to be both time and cost saving. This also facilitates for a rapid market entry and the possibility of reaching their market goals, since it would be reasonable to assume that partnering firms already possessing such competences would be able to find customers for the case firms more easily.

Based on the case studies, the expected importance of access to local market knowledge through partnership agreements was supported.

### 5.1.5 Reputation

All three firms stated that engaging in strategic alliances with firms that have a well-known name and reputation in the market would lead to increased legitimacy. Interactive does not focus on building a strong brand; instead they focus on the benefit of selling through their partners' brand name. Netlife emphasises that, being a new and unknown firm, they will have a hard time trying to gain customers by themselves. Therefore, they have been looking to form an alliance with a large firm with a large marketing budget. Netlife has experienced benefits in relation to having a large chain as their partner in Norway, Sweden, and Finland, in that these partners have strong brand names, extensive networks, and marketing power. Furthermore, these firms have involved Netlife in large projects generating profits for Netlife. Pronto states that their partner has been in the market for many years, and is regarded a serious and trustworthy actor in the marketplace. Thus, Pronto has experienced that being associated with another firm through a partnership increases their reputation in the marketplace and serves as a great reference for them.

In order to improve their reputations and images firms have been found to cooperate with organisations whose legitimacy is perceived to be considerably higher than that of the focal firm (Oliver, 1990; Baum and Oliver, 1991). Wiewel and Hunter (1985) found this to be especially important for new firms. All three case firms were found to emphasise that the reputation and image of their partner was important in order for them to enhance their legitimacy. When Interactive let its partners use their own brand name this was because their partners had a better-known name, and using the brand of a better known firm would ease sales. Furthermore, both Pronto and Netlife gained legitimacy through their partners. Both firms are cooperating with well-established firms with a good reputation. Since larger and more profiled firms are more likely to attract customers, outsourcing sales and marketing to such firms benefits both Pronto and Netlife. Moreover, using their larger and better known partners as a reference increases the legitimacy of both Pronto and Netlife.

It can therefore be argued that for these case firms, combining their core competencies and their technology with the reputation and sales and marketing organisation of their partners created synergy effects. Their partners did not have the technology to sell, and the case firms had neither the reputation nor the sales organisation. These complementarities of resources in the alliance are creating synergies for both partners. This supports Ohmae's (1989) findings that strategic alliances allow partners to achieve results they could not have achieved as single entities.

### 5.1.6 Financial status and the sharing of financial risk

Sharing costs related to entering the new foreign market was found to be a motive for finding a partner for Pronto. Pronto stated they were looking for partners that could assume most of the financial costs and risks related to their projects. They emphasised their partner's financial resources as being very important. By freeing up this capital they would have more money to spend on hiring new staff and investing in more equipment. Pronto emphasised minimising financial risk as an important motive for forming strategic alliances, together with the motives of achieving sales and focusing on product development. Furthermore, Pronto mentioned that sharing the risk with a partner serves as an incentive to create more sales. Another motive given by Pronto was that by engaging in strategic alliances, financial expenses decrease and the risk of diluting investors' shares in a re-financing process was decreased.

Neither Interactive nor Netlife emphasised sharing financial risk as a significant motivation the same way Pronto did, and there may be several explanations for this. First, the motivation for sharing financial risk may be product related. Pronto has considerable up-front costs associated with sales in relation to the hardware used for providing the video-on-demand system. Interactive and Netlife both provide software systems. The cost of adding an additional customer to the system is minimal after the system has been adjusted for the new market. Therefore, financial risk for the latter two firms more or less involves merely employment costs of using personnel to plan and carry out the market entry activities. Hence, sharing financial risks would not be as important for Interactive and Netlife.

Another reason may be that Pronto is the only company of the three with external investors. Investors want low risk and high return on their investments. Reducing financial expenditures in an already pressed economy may therefore keep investors from getting increasingly nervous. Through outsourcing marketing and sales, Pronto keep costs associated with market entry to a minimum. If Pronto were to undertake the entire process of market entry by themselves, including marketing and sales, further rounds of equity investment would be necessary. Hence, by using strategic alliances Pronto decreases the risk of its investors' shares being diluted in a comprehensive equity reinvestment.

In total, the case studies illustrate that both product characteristics (influencing market operation cost) and investor relations/preferences may have an impact on the importance of financial status/sharing of financial risk.

*5.2 The less Important Partner Selection Criteria*

Partner selection criteria related to firm size, access to technological knowledge, international experience, and the ability to negotiate with local government was not expected to be of importance for Born Global firms.

Providing for transfer of knowledge and skills is strongly recommended in the available literature (Prahalad and Hamel, 1990; Hamel, 1991). Hamel et al., (1989, p.134) even stated that "Successful companies view each alliance as a window on their partners' broad capabilities. They use the alliance to build skills in areas outside the formal agreement and systematically diffuse new knowledge throughout their organisations." However, none of the case firms focused on internalising their partners' knowledge and skills. It is possible that when the case firms acquire sufficient resources to support learning and knowledge transfer, these activities will be carried out. It seems just as likely, however, that the firms remain extremely focused on resource constraints, and do not want to allocate any of their limited resources to learning processes.

It was assumed that the size of the partner firm was not an issue in itself, as long as trust, reputation, and financial status were acceptable. Pronto has benefited from having a small partner in the UK; team spirit is strong, and it is possible to remain flexible and change plans whenever necessary. Netlife, on the other hand, has benefited from having large partners. Interactive did not comment on firm size as being an issue.

The criteria concerning favourable past experiences with the partner and the potential for new technology development were not mentioned by any of the case firms. Being a young firm that has not been in business for decades, the Born Global will have had limited experience with cooperating with other firms, and this was found to be the true for the case firms as well.

Furthermore, none of the firms mentioned the potential for new technology development as a motivation. Technology is the core competence of these companies, and is what the entrepreneurs want to continue developing and commercialise. At an early stage in the life of the Born Global it is thus reasonable to assume that there firm does not have enough resources available to both develop its own technology and to develop new technology in collaboration with a partner.

## 6. Implications and Further Research

In total, the case studies support the expectation that criteria 7-16 in Table 1 was of limited importance for Born Global firms. For the six criteria expected to be more important, the expectation was supported, with the exception of financial status/sharing of financial risk. Both product characteristics (influencing market operations cost) and investor relations/preferences may influence the importance of this factor. For managers, these results have important implications.

Managers of small exporting firms have to be extremely aware that the technology of the firms is often their core competency and the most critical resource they have to contribute in a partnership. In order to survive in the marketplace, managers must ensure that the firm stays competitive and that it is not outdistanced by its competitors. Managers must therefore make sure that sufficient resources are committed to product development. However, a foreign market entry is an expensive process, and a short product life cycle and threat of imitation calls for a rapid market entry. In order to rapidly enter a new foreign market while at the same time engaging in product development, managers should thus consider using partners for marketing and sales activities instead of the firm developing these skills itself. Born Globals usually lack local market knowledge and have limited resources to spend on market research, as well as little experience in obtaining market information. Thus, finding a local partner that has operated in the market for a period of time can be beneficial, and may help the firm obtain the necessary local market knowledge more rapidly. Furthermore, travelling back and forth between Norway and the new market can cause the firm to incur extensive costs in the long run. Hence, if on-site support for customers is necessary, managers should evaluate whether a partner can perform such support in order to save time and money. This implies that by using partners for marketing and sales activities, resources become available for product and technology development, which may also provide for a more rapid market entry. Another finding from the case studies was that adapting the product to suit the new market was time consuming. This implies that when firms emerge with an international perspective from the beginning, managers should request that the product's functionality, if possible, be designed in a way that provides for easier adaptation.

Based on the case studies, the recommendation is for firms to handle the process of searching for and selecting partners themselves, instead of applying external consultants. Searching for partners is a process that may be misconceived as being more complex and time consuming than it really is. The most demanding part of the search process is to gain initial contact with potential partner firms, while the rest of it is a fairly standard procedure (Tonning, 2004a). The firms in this case study have been found to partly conduct partner searches themselves, ad partly using Innovation Norway. There are several reasons for managers to conduct partner searches themselves. First of all, as previously mentioned, it is not a particularly demanding process, and managers can thus save the costs of hiring consultants. Second, managers know their products better than any hired consultants, who only spend a day or two learning this and the firm's needs. Third, even when using a consultant, managers need to spend time on preparing the search; the only difference is that

they are guided by the consultants. Fourth, managers will gain additional information about potential partners and their competitors and customers by conducting the search themselves. This information may play a part when selecting a partner. Fifth, performing the search gives valuable learning for later partner searches and reflects a long-term perspective. It is thus recommended that managers perform the entire search process of finding a partner themselves.

In order to find a suitable partner, it is necessary to be aware of the firm's resource gaps. These resource gaps will, to a large extent, represent the qualities to look for in a potential partner. Formalising a set of partner selection criteria will increase the chances of finding a suitable partner (Nijssen et al., 1999). Several other benefits can also be seen from this; it will make firms more aware of which criteria are most important; it will facilitate for the evaluation of potential partners; it will offer some clues as to where to search for partners; and it will increase what a firm takes away from the process, seeing that it is documented. Managers are encouraged to formalise the process of searching for partners. This may be achieved by creating a fairly straightforward strategy, including points such as where to search for information, how much information to obtain about each firm, and how many firms to investigate. Creating such a process has also been shown to be beneficial in other empirical studies (Nijssen et al., 1999).

Obtaining information about potential partners is demanding, and it is important for managers to utilise accessible, low cost sources. The case firms conducted internet searches, interacted with people at trade shows, and accessed information through their network. In addition to being a source of information, the network may act as a door opener. This is one of the reasons why building a network is so important for Born Globals. As unknown, small, foreign firms, their network can provide credibility and act as an introduction to potential partners or customers.

The criteria related to trust, relatedness, and reputation were ranked the highest by the case firms and have also been found to be important in previous research. If the parties engaging in a strategic alliance trust each other, they will be more willing to provide the joint venture with their core competencies and strategic knowledge, without being afraid of the partner acting opportunistically. When people feel they can trust each other, share knowledge, experiences, and talk freely, chances are motivation increases, and they are better able to utilise each other's skills, thus increasing the flexibility and efficiency of the alliance. Trust is as important for Born Globals engaging in alliances as it is for any other firm. Born Globals have limited resources and their strategic knowledge and core competencies are critical assets. The more the partners share, the more successful the strategic alliance will be, as long as none of the partners act opportunistically. Born Globals should thus emphasise trust above all other partner related factors.

The high ranking of the criterion of relatedness is also understandable. Different firms have different ways of operating and conducting business. Also, business sectors vary in terms of conducting business; the value chain and distribution chain may differ, as well as who the customers are and how one best can serve them. When firms have a certain degree of relatedness they are better able to understand each other. They can better relate to each other's problems that need to be addressed and each other's operations. Hence, they will have a platform of communication and understanding.

Reputation is important and Born Globals should be aware of the importance of this criterion. Many firms go through a time-consuming and costly process when trying to gain reputation in the market. Industrial customers, through which firms can secure large and valuable contracts, have strong demands related to such things as: Just-in-Time delivery, ethics, and fulfilment of international standards, in addition to product quality. Many small firms experience that even though they have competitive products or services they do not get introductory sales. Hence, partnering up with a firm that has a good reputation in the market could decrease the magnitude of this problem. Furthermore, a potential partner'a reputation when it comes to former partnerships is important to consider. If a firm has reputation of being a trustworthy partner and has previously participated in successful partnerships, this might be a sign of a partner that knows how to utilise the advantages of cooperation and to create a good and fertile climate for an alliance.

A major finding of this case study is that the most important partner selection criteria for Born Global firms are similar to observed important partner selection criteria in empirical studies focusing on large, multinational firms engaging in joint ventures. Large-scale empirical studies are needed to verify these case-based results. A related and significant area for further research is the partner selection process. In accordance with Nijssen (1999), this paper suggests that formal and thorough procedures for partner selection has a clear impact on the success of finding a suitable partner. Additional research is recommended to establish the degree to which a formal partner selection process correlates with successful partner choices.

In order to understand the process from partner search to selection and the formation of strategic alliances, additional research is needed on Born Global firms and partner negotiations. Even though numerous studies on international business negotiations exist, evidence to how Born Globals approach negotiations for potential alliances is limited. One argument is that thorough preparations before negotiation will lead to a higher probability of alliance success, and investigations into whether this argument holds should be conducted. According to findings in this paper, key research issues will be to investigate how trust, bargaining power, cultural differences, and the use of different information sources influence the negotiation process and alliance performance.

All the managers interviewed in this study, emphasise the importance of partner agreements in order to succeed in international markets. This is regarded a key issue, due to the firms' resource gaps and need for rapid international entry. It should be noted that all managers state that it is impossible to succeed without establishing some form of partnership agreement with firms operating in the export market. For researchers, this indicates the need for both in-depth case studies and broad empirical studies in order to increase our understanding of these important and complex processes.

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**Note**

Note 1. An ERP (Enterprise Resource Planning) system is designed to integrate the firm's software for economy and accounting, CRM (Customer Resource Management), e-Commerce, content management, project management, e-mail, file sharing and calendar, etc.

Table 1. Classification of Partner Selection Criteria

| | | **Partner selection criteria** |
|---|---|---|
| **Important** | 1) | Trust between top management teams (personal chemistry) |
| | 2) | Relatedness of partner business, complementary resources |
| | 3) | Access to links with major buyers, networks, and distribution channels |
| | 4) | Access to local market knowledge |
| | 5) | Reputation |
| | 6) | Financial status, sharing of financial risk |
| **Some importance** | 7) | Firm size |
| | 8) | Past experience with partner |
| | 9) | Access to local cultural knowledge |
| | 10) | Access to product-specific knowledge |
| | 11) | Access to local regulatory knowledge |
| | 12) | Access to technology |
| | 13) | Access to materials/natural resources |
| | 14) | Access to labour |
| | 15) | International experience |
| | 16) | Government negotiation ability |

# Interest Rate Pass-through in the Central African Economic and Monetary Community (CAEMC) Area: Evidence from an ADRL Analysis

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**Abstract**

This paper examines the monetary transmission mechanism in the countries of the Central African Economic and Monetary Community (CAEMC). Specifically, we focus on the very first step of this mechanism namely the interest rate pass-through from short-term interest rates towards long-term rates. Using an autoregressive distributed lag (ADRL) model, we show that there is evidence of a very low and incomplete long-run pass-through from the policy rate to the deposit rate. It appears also that the lending rate exhibits a huge overshooting effect in reaction to the changes in the policy rate. When splitting our time span in two interest rate cycles, we show that there is evidence of an interest rate cycle asymmetry.

**Keywords:** Monetary transmission mechanism, Pass-Through, Interest rates overshooting effect, ADRL model

## 1. Introduction

Since the mid-1970s, the evolution of monetary policy in most countries has been a steady increase in market orientation. In practice, this has meant the removal of direct controls, reductions in reserve requirements, an increasing emphasis on interest rates as an operating target, and a shortening of the maturity of rates directly involved (see BIS, 1997, for a survey of monetary policy "tactics"; and Borio, 1997, for a survey of central bank operating procedures).

Meanwhile, monetary policy has been a Mecca of economic research as many economists has put pen to paper in an attempt to scrutinize its effects on the real economy. The monetary transmission mechanism describes the ways in which monetary policy impacts aggregate demand and prices by influencing the investment and consumption decisions of firms, households, and financial intermediaries. Although the neoclassical view of the long-run neutrality of money appears to be widely accepted, monetary policy is thought to influence economic activity in the short to medium term through changes in interest rates or money supply, either because of the presence of nominal price rigidities (Keynes view) and/or owing to a number of wealth, income, and liquidity effects, and by its impact on inflationary expectations (Dabla-Norris and Floerkemeier, 2006). Christiano et al. (1996), based on their study of the US economy, argue that monetary actions impact on the real sector with an average delay of 4 months and their effect can last up to 2 years. This finding is also borne out in Romer and Romer(1989). Another salient feature of monetary policy put forth in a number of studies (Bernanke, Gertler and Gilchrist, 1994; Hubbard, 1994; Bernanke and Gertler, 1995), is that small changes in short-term interest rates could result in large changes in output (amplification effect, or the financial accelerator effect). Although the specific classification varies at times, the following six channels of monetary policy transmission are generally distinguished: (1) interest rate channel; (2) bank lending channel; (3) balance sheet channel; (4) asset price channel; (5) exchange rate channel; and (6) expectation channel (Note 1). Of all these channels, the interest rate channel seems to be the most important. As noted by Isakova((2008), the role of interest rate pass-through is crucial, since it represents a potentially important transmission channel, and because other channels of the monetary transmission mechanism are related to its performance . The monetary authority sets policy rates; these affect short-term money markets rates, which in turn influence medium to long-term market rates, bank retail rates, etc. Borio and Fritz (1995) argue that "bank lending rates are a key, if not the best 'indicator of the marginal cost of short-term external funding in an economy". Households and firms take out bank loans in order to finance consumption and investment expenditures. Therefore, the price of bank loans is crucial in the determination of final demand and consequently inflation in an economy. However, not only bank lending rates but also bank deposit rates are important, as they influence the saving versus consumption(and the saving vs. investment) decisions of economic agents. To shed more light on this issue, Biefang and Howells (2002) argue that the first link in the chain, in all monetary regimes, is the link between official rates and market rates. For these authors, it is not the rate at which the central bank supplies liquidity to the domestic banking system that changes demand pressure. It is how agents react to changes in the rates on loans charged by banks, to changes in asset values that flow from a different rate of discount, to changes in the rate that they

earn on their savings, and so on. According to them, all monetary regimes that use interest rates as the operating target must naturally assume a fairly ready link between official and market rates. Clearly, without satisfactory knowledge of how changes in official rates connect with market rates it is impossible to know what change in official rates is necessary to achieve a given result.

After a long period of financial repression spanning from 1973 to 1990, the monetary authority in the Central African Economic and Monetary Community (CAEMC) came to recognize the necessity to move to a more liberalized financial system. Thus as from 1990, direct instruments were abandoned in favor of indirect instruments and the implementation of a monetary programming. The new deal of monetary policy was also accompanied by a vast banking reform and the launching in 1994 of the monetary market in which the central bank plays an important role. The central bank has been assigned the objective of monetary stability. The central bank actions are based on a bank liquidity control through a refinancing policy and the imposition of reserve requirements. Since then, the central bank has been manipulating among other instruments, the policy interest rate (the rate at which commercial banks are allowed to borrow at the discount window) in order to stabilize the economy in the region.

The focus of this paper is therefore on the first step of the monetary transmission mechanism: the interest rate pass-through from short-term interest rates towards long-term rates. Using monthly data from 1990 to 2007 in an autoregressive distributed lag framework, we show that there is evidence of incomplete pass-through from the policy rate to the deposit banking rate and the loan rate in the countries of the CAEMC. Moreover, our results indicate a huge overshooting effect of the loan rate to changes in the policy rate.

The rest of the paper is structured as follows: in section 2, we reassess the concept of interest rate pass-through through its two stages and explore some reasons why it might be incomplete. Section 3 is devoted to an overview of the empirical literature. In section 4 we describe our empirical methodology and our data. Empirical results are provided in section 5 while section 6 concludes.

## 2. Interest Rate Pass-through.

### 2.1 The two stages

The literature on the pass-through to retail rates distinguishes between the "cost of funds approach" and the "monetary policy approach" (Sander and Kleimeier, 2004).

The cost of funds approach (De Bondt, 2005) focuses on the "price-setting decision" of banks. As describe by Kapwil and Scharler (2006), the cost of funds mainly reflects the opportunity costs that arise for a bank that issues loans and the financing costs for a bank that takes in deposits. The cost of funds is the best way to describe how changes in the market rates influence bank deposit and lending rates. In general, several factors make sure that market rates are passed onto retail rates. For loan rates, the link to market rates is secured by the fact that banks rely on the money market to fund (short-term) lending. This is in the same vein that deposit rates, which represent the cost of loans, should be reflected in loan rates. At the same time, yields on government securities can be viewed as opportunity costs for banks. This helps maintain the link between, for instance, government bond yields and loan rates of longer maturity.

The connection between market rates and deposit rates is warranted by the possibility that households and the non-financial corporate sector can hold their financial assets not only in bank deposits, but also in government securities of comparable maturity (kapwil and Scharler, 2006). In addition, banks can rely on the money market instead of deposits for funding loans, which can also lead to an equalization of deposit and money market rates.

In contrast to the cost of funds, the monetary policy approach is interested in the effect monetary policy has on retail rates and includes no other explanatory variables. It focuses solely on the question of how closely retail rates follow policy rates. For Egert, Crespo-Cuaresma, and Reininger (2007), the assumption of a stable yield curve makes it possible to take a shortcut looking directly at the relationship between policy rates and retail (deposit and loan) rates.

### 2.2 Reasons for incomplete interest rate pass-through

A vast literature on the pass-through to retail interest rates (Cottarelli and Kourelis, 1994; Mojon, 2000; Angeloni and Ehrmann, 2003; De Bondt et al., 2005) documents that bank interest rates are characterized by a lower variance than money market rates. This means that banks typically do not fully adjust retail rates when market rates change. Therefore, banks are no neutral conveyors of monetary policy. A number of explanations are given to justify why retail rates do not track money market rates closely. One potential explanation is that the limited pass-through may be interpreted as an implicit contract between the bank and its customers, which arises as a consequence of long-term relationships (Berger and Udell, 1992; Allen and Gale, 2004). That is, banks with close ties to their customers offer relatively stable retail interest rates in order to insulate the customers from volatile market rates. Moreover, a limited interest rate pass-through may also be the consequence of adjustment costs (e.g. Hannan and Berger, 1991; Hofmann and Mizen, 2004), like labor costs, computing costs and notification costs. This is contained in a set of hypotheses developed by Hannan and Berger (1991) which deal with asymmetric rigidity. Hannan and Berger (1991) examine whether interest rate rigidity is

different when rates are increasing or decreasing. In their model of deposit rates they propose two competing hypotheses. On the one hand, they argue that greater rigidity in deposit increases could arise from the collusive pricing behavior of banks. Such arrangements may break down if prices are changed, thus banks consider the cost of breakdown before adjusting prices. The expected costs are higher for deposit rate increases relative to decreases, because of increasing payments to depositors. Thus, deposit rates will be relatively more rigid when they are increasing. On the other hand, Hannan and Berger (1991) also propose an alternative argument for greater rigidity in deposit rate decreases. As they argue, if banks perceive that an important cost to them of changing the deposit rate comes from the negative reaction of customers, they will be reluctant to decrease deposit rates- hence greater downward rigidity. Scholnick (1996) names these two competing arguments the "collusive" and the "customer reaction" hypotheses. He thinks that those arguments can be extended by relating the discussion to lending rates. In this case, the collusive hypothesis would be supported by evidence of greater rigidity in lending rate decreases as banks would expect higher costs from the breakdown of collusive arrangements if lending rates were lowered. Alternatively, evidence of rigidity in lending rate increases would support the adverse customer reaction hypothesis.

A number of authors also argue that the financial structure of the economy might influence the monetary transmission mechanism (Mojon, 2000; Dabla-Norris and Floerkemeier, 2006). Related to this view is the Hannan and Berger (1991) symmetric hypothesis which concerns differences between banking firms in different markets areas. This is stated as follows: "…to the extent that firms(banks) in more concentrated markets exhibit price conjectures as a result of greater recognized interdependence, operation in a more concentrated market implies … greater price rigidity. To the extent that a larger customer base results in more customers changing deposit quantities in response to a price change, a larger customer base is likely to be associated with less price rigidity". Their argument is that the greater the degree of interdependence between banks, because of the high market concentration, the greater the reluctance to adjust deposit rates after exogenous changes to the wholesale rate. This is because of the perception that deposit rate changes may lead to adverse reactions from the other banks which may affect their own supply of deposit. Such a feature is likely to happen in Central Africa where the banking sector is still very concentrated. On the other hand, banks in highly competitive markets will be less concerned about the perceived behavior of other banks, which implies lower interest rate rigidity in response to exogenous shocks.

Another explanation for a limited pass-through to retail rates is related to asymmetric information and moral hazard. Kapwil and Scharler (2006) argue that banks have an incentive not to raise interest rates by too much, because borrowers who accept a higher rate are likely to be of poor quality. If borrowers take up a loan at a high rate, they are more likely to choose riskier projects, decreasing the expected value of the amount paid back. It is also observed that macroeconomic conditions, like rapid economic growth and higher inflation rates can enable bank to easily pass on changes in the interest rate to their lending and deposit rates faster(Egert, Crespo-Cuerasmaan Reininger, 2007). By contrast, higher interest rate volatility weakens the interest rate pass-through, given that banks wait longer before changing their rates.

Lastly, Kapwil and Scharler(2006) think that in a varying interest rate environment, banks can also change other components of a loan or deposit contract, such as collateral requirements, fees, etc.

## 3. An Overview of the Empirical Literature on Interest Rate Pass-Through

Before going into further detail regarding the empirical study of the interest rate pass-through in the CAEMC, it seems useful to overview the available empirical results obtained so far. Those results mainly concern studies in the Euro area and the United Stated, while there is also an increasing interest of the issue in emerging and developing countries.

Mizen and Hofmann (2002) seek to uncover how the official base rate affects deposit and mortgage rates of commercial banks and building societies in the UK. Using monthly data for 1986-1999, the estimations indicate that there is complete pass-through from base rates to deposit rates. By contrast, changes in the base rate feeds into mortgage rates only in an incomplete manner. Results also reveal the existence of asymmetries in the adjustment process towards the estimated long-term relationship, which connects the base rate and the retail rates.

A number of papers suggest that financial spreads are useful indicators of real activity (Stock and Watson, 1989; Davis, 1992; Davis and Henry, 1993). Relying on this argument, Biefang and Howells (2002) state that the price of bank loans would be better represented as a spread term showing the difference between the costs of bank finance versus nonbank alternatives. Based on the empirical case of the United Kingdom, they note that individuals are affected by monetary policy because a change in official rate means "they face new rates of interest on their savings and debts...Furthermore, higher interest rates (current and expected) tend to reduce asset values, and lower wealth leads to lower spending. Therefore, in their study, they focus directly on the behavior of three spreads in response to changes in the official rate. As they admit themselves, this is less likely to be done, for interest rates are generally integrated of order one and also tend to cointegrate pair-wise. Thus, they estimate pair-wise cointegrating relationships between the interest rates that are part of the spread and the Treasury Bill Rate (TBR), considered as the proxy for the official rate, then discuss after the effects of changes in TBR on the spread terms. The study shows evidence of a complete pass-through from the TBR to

three key market rates since 1986 (Short Bond Rate, Deposit Rate and a Lending Rate proxied by the three-month LIBOR). The authors then conclude that this makes it difficult for the Bank of England to induce lasting changes in relative rates, in pursuit of its monetary objectives, by any change in its official rate.

Other early studies on the transmission mechanism of monetary policy assumed immediate and complete pass-through of changes in official rates to retail bank rates (for example, Bernanke and Gertler, 1995; Kashyap and Stein, 2000; Altunbas et al., 2002). However, the full pass-through found by these authors is in contrast with other studies, which usually give evidence concerning the incompleteness of the pass-through with which base rates are transmitted to bank deposit or lending rates.

Mojon(2000) considers 6 Euro zone countries, namely Belgium, France, Germany, Italy, the Netherlands and Spain. The transmission from the money market to retail rates is analyzed by means of a VAR model. A score of different rates are used for the retail deposit and lending rates during the period 1979 to 1998. The pass-through turns out to be incomplete and seems rather sluggish, especially for rates of higher maturity. When splitting the time span into two interest rate cycles, Mojon (2000) shows that with the exception of Belgium, there is evidence of an interest rate cycle asymmetry. Furthermore, and more importantly, there is evidence of strong heterogeneity among countries. It is shown that the pass-through is the strongest in the Netherlands followed by Germany, France and Italy, whilst in Spain and Belgium, Changes in the money market rates are transmitted only partly into deposit and lending rates.

Similarly to Mojon (2000), Donnay and Degryse (2001) also make use of the VAR technique and set out to estimate the pass-through between the money market rate on the one hand, and several bank lending rates for households and firms and government bonds rates, on the other, for a set of 12 EU countries from 1980 to 2000. The estimation carried out using monthly data indicates an incomplete pass-through except for short-term bank lending rates. Government bonds and long-term rates for households react fairly smoothly. On average, the pass-through seems the most important for Spain, Italy, Greece and the Netherlands, while one half of the changes in money market rates are reflected in deposit and lending rates in Ireland, Belgium, Portugal, Austria and the UK. Results for France, Germany and Finland are somehow in between these extremes.

An overview of the empirical research on the pass-through from policy rates to retail rates is found in Kapwil and Scharler(2006). In their paper, the two authors summarize the empirical findings of the literature on the immediate and long-term pass-through, distinguishing between the euro area and the U.S.A (Note 2). In the euro area, the authors find that the adjustment of retail rates to changes in money market rates does need some time and does not occur instantaneously, as the immediate pass-through is smaller than the long-term pass-through. Both deposit rates and lending rates follow this feature. Another common finding in the euro area is that the immediate pass-through seems to be below 0.55 in all cases. This means that only half of the change in money market rates is immediately passed through to retail interest rates. For the long-term pass-through the range of estimates is bigger. However, the results seem to suggest that with only few exceptions, the long-term pass-through is below 1 and, thus, not complete. This indicates that banks in the euro area insulate their customers from volatile money market rates by absorbing part of changes. Therefore, it appears plausible that the euro area (a bank-based) economy experiences smoother business cycles than a more market-based system, as for instance the U.S.A. In fact, in contrast to the euro area, estimates for the pass-through in the U.S.A. seem to be higher than in the euro area, and most of the studies suggest that the pass-through to U.S. retail rates is nearly complete in the long-run.

If the literature about the interest rate pass-through focuses more on industrialized economies, there are some authors who are interested in emerging countries. In their study related to the interest rate pass-through in New EU Member States, Crespo-Cuaresma, Egert and Reininger(2004) show that the null hypothesis of complete pass-through cannot be rejected for any interest rate in Poland. On the contrary, there is evidence of incomplete pass-through in Hungary for the deposit rates (both the short and long-term) and the yield on the 5-year government bond. There is also some evidence of an overshooting effect observed in the interbank money market rate, but this effect is quantitatively tiny and only marginally significant. The results for the Czech Republic give evidence of incomplete pass-through for all rates except for the interbank money rate.

Isakova (2008) focuses on three CIS economies in Central Asia namely Kazakhstan, the Kyrgyz Republic and Tajikistan. In the case of Kyrgyzstan, he demonstrates that there is nearly a complete pass-through to interbank money rates and also the average household deposit rates, while lending rates and Lombard rates overshoot the policy rate. He explains this phenomenon by the overreaction of creditors to rising interest rates in the economy in order to hedge their credit risks in the face of uncertainty and underdeveloped financial markets. For Kazakhstan, Isakova(2008) shows that all interest rates exhibit an overshooting effect in reaction to the changes in the policy rate. Moreover, the 1998 financial crisis in Russia might have had a significant effect on the economy of Kazakhstan. This is illustrated by the presence of cointegration relationships between different interest rates and the policy rate. Finally, results for Tajikistan are contradictory, as no cointegration is established between the central bank's refinancing rate and the deposit and lending rates.

Having overviewed this vast existing literature, it is now time to turn on more empirical issues.

**4. Data Description and Empirical Methodology**

As the previous section has shown, the research aiming at assessing the monetary transmission mechanism in general and the interest rate pass-through in particular remains scarce, if nonexistent in Central Africa (Note 3). The aim of this study, which sounds as a premise, is then to go inside the "black box" of the monetary policy of the "Banque des Etats de l'Afrique Centrale" (B.E.A.C), the central bank of the six countries forming the CAEM.C, namely Cameroon, the Central African Republic, Chad, the Republic of Congo, Gabon and Equatorial Guinea. We are interested in this study, in the relationship between the policy rate on one hand, and the deposit and lending rates on the other hand. The empirical issues concerning the interest rate pass-through in those countries are the following:

\-      Is there evidence of complete pass-through from the official rate to markets rates, like the deposit and loan rates to non-banks? That is, do retail rates react one-to-one to changes in the key policy rate in the long-run? If so, does this long run relationship act as an attractor to the dynamics of retail interest rates?

\-      Is there evidence of asymmetric adjustments to the equilibrium depending upon the direction of change in the policy rate? Stated otherwise, is there evidence of any change in the elasticity between the deposit and lending rates, and the official rate over the whole period?

*4.1 Data description*

The data used are monthly times series per annum interest rates in percentage points from 1990.1 to 2007.12. The source of the data is the International Financial Statistics CD-ROM published by the International Monetary Funds. We set the starting time on January 1990, the year which marks substantial changes in the conduct of monetary policy in the CAEMC area. Although the inter-bank money market was launched in 1994, interest rates on this market are still to be disclosed. As noted by kapwil and Scharler (2006), monetary policy rates and short-term money markets rates usually move together. Therefore, money market rates are often used as proxies for policy rates. However, policy rates are constant for long time periods and change only when policy decisions are taken, which makes them less suitable for econometric purposes. Unfortunately In our case, we were unable to apply such a feature, due to the fact that money market rates are unavailable. Moreover, interest rates are harmonized in the six countries of our study, that is, the same lending and deposit rates are applied in the six countries by the banking system. In fact, the lending rate, as it appears in the IFS database, is the maximum debtor rate, while the deposit rate is the minimum creditor rate, all fixed by the Governor of the central bank. Consequently, we chose not to apply a country-by-country study, relying only on the global data from the monetary authority which in fact are identical in all the member states. Actually, those rates are only indicators of what commercial banks can apply as rates in their operations, not the real cost of credit or the actual deposit rate applied by various commercial banks in the sub-region. Nevertheless, as those are the only data available, we use them in our study. Specifically, we consider as the policy rate variable, the rate offered by the central bank to second-tier banks for their refinancing process. That is, the so-called TIAO (taux d'interet d'appel d'offre).

The deposit rate is as we said, the minimum creditor rate, TCM (taux crediteur minimum).

The lending rate is the maximum debtor rate, TDM (taux debiteur maximum).

Descriptive statistics of those data are displayed in Table.1.

A rapid glance at this table tells us that there is evidence of lower variation of our data, as standard deviations are very low. Table 1 also indicates that the average spread between the lending rate and the deposit rate is quite high (13%) in the CAEMC. Moreover, if there is evidence of a high pair-wise correlation between the policy rate and the deposit rate (94%), on the contrary, there is no apparent correlation between the policy rate and the lending rate. Our empirical results might tell us more on these issues. Finally, the evolution of the policy rate reveals two main periods: one period of increasing rates from 1990.1 to 1994.5, and one period of decreasing rates from 1994.6 to 2007.12. Fig.1 shows the evolution of the three interest rates for the whole sample period.

*4.2 Methodological Approach: Econometric Framework*

In this study, we use the methodology proposed by Crespo-Cuaresma et al. (2004). This methodology consists in representing the relationship between the policy rate and a given market rate as an autoregressive distributed lag (ARDL) model such as

$$i_t^m = \alpha_0 + \sum_{j=1}^{p} \alpha_j i_{t-j}^m + \sum_{k=n}^{q} \beta_k i_{t-k}^p + \varepsilon_t \tag{1}$$

Where $i_t^m$ is the market interest rate, $i_t^p$ is the policy rate and $\varepsilon_t$ is a white noise disturbance with a constant variance $\sigma_\varepsilon$. Equation (1) can be rewritten using the lag operator as

$$A(L)i_t^m = \alpha_o + B(L)i_t^p + \varepsilon_t \tag{2}$$

Where

$$A(L) = 1 - \sum_{j=1}^{p} \alpha_j L^j \quad and \quad B(L) = \beta_0 + \sum_{k=1}^{q} \beta_k L^k$$

The long-run relationship implied by this parameterization is given by

$$i^m = \frac{\alpha_0}{A(1)} + \frac{B(1)}{A(1)} i^p \tag{3}$$

The error correlation (EC) representation of (1) can be written as

$$\Delta i_t^m = \delta_0 + \sum_{j=1}^{p-1} \mu_j \Delta i_{t-j}^m + \sum_{k=0}^{q} K_k \Delta i_{t-k}^p + \gamma\left(i_{t-1}^m - \lambda i_{t-1}^p\right) + \varepsilon_t \tag{4}$$

Where there is a one-to-one mapping between the parameters in (4) and in (1). The term in brackets acts as an attractor, and represents the long run equilibrium (i.e. $\lambda = B(1)/A(1)$). In fact, $\lambda$ shows by how much the retail rate changes in reaction to a change in the policy rate by 100 basis points after all adjustments have taken place. Meanwhile, when estimating equation (4), one might also be interested in the immediate pass-through, which is given by $K_0$. It gives the reaction of retail rates to a change in the policy rate within the same time period. Kapwil and Scharler (2006) argue that a high long-run pass-through might be due to high direct effects passed through from the policy rate to retail rates or a high persistence in the retail rates. If $\lambda$ is equal to 1, the pass-through is said to be complete in the long run and changes in the policy rate are to the full extent transmitted to retail rates.

All the data series were subject to the unit root test through the Augmented Dickey-Fuller and Phillips-Perron procedures. Results of this test are reported in Table 2. Due to the existence of a unit root in the autoregressive representation of all the series included in the analysis, $\gamma$ can be interpreted as the speed of adjustment to the cointegration relationship given by equation (3). Several methods have been proposed in the literature to estimate the parameters in (4), starting with the seminal contributions by Engel and Granger (1987) and Johansen (1988, 1995). Another approach, suggested by Wickens and Breusch(1988), implies obtaining estimates for the parameters in (4) directly from the OLS estimates of (1). This is the approach we use in this study. Crespo-Cuaresma et al. (2004) indicate that similar results are obtained if the Bewley(1979) transformation of (1) is used to retrieve the long run responses of the market interest rates to the policy rate.

## 5. Empirical Results: The Interest Rate Pass-through in the Central African Economic and Monetary Community (CAEMC)

Table 3 presents the estimates of $\lambda$ and $\gamma$ (the long run multiplier and the speed of adjustment, respectively) for the deposit and lending rates, using the "TIAO" as the policy rate. The lag length of the ADRL models was chosen as the pair that jointly minimizes the Schwartz Bayesian criterion (SBC) and the Akaike information Criterion (AIC), setting a maximum of twelve lags for each variable. Isakova(2008) indicates that the more an identified model fits the data, the lower the AIC and the SBC will be. As the fit of model improves, the AIC and SBC will approach $-\infty$. Results are based on models including one of the market rate (the deposit rate or the lending rate) and the policy rate. We also include in Table 3, the value $K_0$ which gives the reaction of retail rates to a change in the policy rate within the same time period. For each specification, full interest rate pass-through, corresponding to the restriction $\lambda=1$ in (4), was tested (Note 4).

The first finding is that the adjustment of the deposit rate to changes in the policy rate seems to occur instantaneously, as the estimate of the immediate pass-through is not too different from that of the long-term pass-through for this retail rate. On the contrary, the adjustment of the lending rate to changes in the policy rate does need some time, for the immediate pass-through is largely smaller than the long-run pass-through. Secondly, one can already predict the magnitude of the long-run pass-through estimates of the two rates, based on their immediate pass-through coefficients. As argued by Kapwil and Scharler(2006), immediate pass-through estimates are in some extent, indicators of the magnitude of the long-term pass-through estimates. Therefore, it can be presumed that the long-run pass through from the policy rate to the deposit rate might be weak and incomplete, while the long-run pass-through from the policy rate to

the lending rate might be high, due to their respective immediate pass-through. Another finding from Table 3 is the difference of the immediate pass-through of the deposit and lending rates. For the deposit rate, less than one half of the change in the policy rate is passed through the deposit rate within one month. On the other side, about 70% of the change in the policy rate can already be passed immediately to the lending rate.

As for the long-term pass-through, our results show that the estimate for the deposit rate is quite small and statistically different from 1. Thus, one can argue that banks in the CAEMC insulate depositors from volatile policy rates by absorbing part of the change. This low and incomplete pass-through from the policy rate to the deposit rate can be explained by the excess reserves of commercial banks in the CAEMC, which makes it more difficult for the deposit rate to follow increasing movements in the policy rate. Moreover, the absence of competition and the very high concentration of commercial banks also explain this feature. However, the 0.3398 level of the pass-through indicates that banks in some extent still need deposits to finance their loans.

A more interesting feature appears when considering the pass-through to the lending rate. Our results show that the lending rate exhibits an overshooting effect in reaction to the change in the policy rate. This effect is rather significant. That is, the lending rate changes by more than 600 basis points after a change of 100 basis points in the policy rate. This phenomenon could be explained by the overreaction of creditors to rising interest rates in the economy in order to hedge their credit risks in the face of uncertainty and under-developed financial markets. In the particular case of the CAEMC, it should be recalled that the Douala Stock Exchange (DSX) and the Central African stock Exchange in Libreville (Bourse des Valeurs Mobilieres de l'Afrique Centrale) both launched in 2003, are still only at their starting point with no real activity. In such a context, an increase of the monetary policy interest rate, which affects the cost of money, is unlikely to induce a switch from money to nonmoney assets. Investors can only rely on bank loan; otherwise, they turn to the shadow economy to raise money. Finally, as stated by Hannan and Berger (1991), the high concentration of the banking system in the region can also explain the reason why the lending rate overshoots the policy rate.

Our results also show that the estimate of the speed of adjustment for the specification including the lending rate and the policy rate although negative, is insignificant. On the contrary, this estimate is negative and significant at 10% in the specification including the deposit rate and the policy rate. This means that the equilibrium relationship acts as an attractor in the dynamics of the deposit rate.

Finally, in order to stress the potential asymmetry of the interest rate pass-through in the CAEMC, we divided our time span into two sub-periods corresponding to two interest rate cycles. The first sub-period runs from 1990.1 to 1994.5 and is characterized by increasing policy rate while the second sub-period spans from 1994.6 to 2007.12 and is a decreasing policy rate period. In each of these two sub-periods, we reapplied the empirical methodology presented in section 4.2. Our results (not reported) show that there is evidence of asymmetry in the adjustment of the lending rate (Note 5). The pass-through is lower ($\lambda=0.353$) during the first cycle of increasing policy rate while the lending rate overshoots the policy rate ($\lambda=4.51$) in the second sub-period of decreasing policy rate. The greater rigidity in lending rate increases in the first interest rate cycle could be explained by the "adverse customer reaction" hypothesis of Scholnick (1996). On the contrary, the greater rigidity in lending rate decreases during the second period could come from the "collusive" hypothesis of Scholnick(1996) because banks expect higher costs from the breakdown of collusive arrangements if the lending rates were lowered. The "collusive" and "customer reaction hypothesis" also apply in the case of the deposit rate. The fact that the deposit rate is rigid when increasing ($\lambda=0.298$) implies that banks avoid expected higher costs following a potential increase in the deposit rate. During the second sub-period, the pass-through becomes very low ($\lambda=0.08$) leading to a "customer reaction hypothesis".

## 6. Conclusion

This paper studies the monetary transmission mechanism in the CAEMC countries, focusing more on the very first step of this process: the interest rate pass-through from the policy rate to retail rates. Making use of the autoregressive distributed lag (ADRL) model we notice some interesting outcomes of this pass-through in the area of concern.

The first outcome is that the immediate pass-through to the lending rate is quite two times the one in the deposit rate. With this result, one can already predict the magnitude of the long-term pass-through, which might be higher for the lending rate and lower for the deposit rate.

A more interesting feature of our study is the outcomes in the long-term. Our results indicates that while the long run pass-through to the deposit rate is low and statistically different from 1, thus incomplete, the lending rate rather exhibit an overshooting effect in reaction to changes in the policy rate. The absence of competition in the banking sector, combined with the well established excess reserves situation of commercial banks in the region may help to explain the upward rigidity of the deposit rate. At the same time, the poor financial structure, characterized by the inefficiency of the two stock markets of the region may contribute to reinforce the preeminence of bank loans as the only debt instrument available to economic agents. In such a context, creditors may also overreact to rising interest rates in the economy in order to hedge their credit risks in the face of uncertainty and under-developed financial markets.

As for a possible asymmetry of the pass-through of policy rate changes, we do confirm that there is evidence of asymmetry in the pass-through from the policy rate to both the lending and the deposit rates. In our case where the time span was split into two sub-periods, this phenomenon is better known as "the interest rate cycle asymmetry" as termed by Mojon (2000). As we argue, this phenomenon might result from the collusive behavior of commercial banks, because retail rates adjustments induce supporting additional costs. But, "sanction" by customers can also prevent such adjustments by commercial banks.

Due to those shortcomings on the monetary transmission mechanism in the CAEMC area, some policy measures shall be useful. First, a more commitment must be taken to render effective, the two stock markets of the region, which existence is still on papers. This would enable the diversification of assets in the CAEMC and maybe slowdown the highest lending rate of the region. Second, although the control and supervision of the banking system are necessary, measures aiming at easing the settlement of more commercial banks in the CAEMC are also of importance. This may trigger competition between banks for retail deposits and maybe increase more the pass-through from policy rate to the deposit rate. Finally, as it has been demonstrated by Saxegaard(2006), excess liquidity weakens the whole monetary policy transmission mechanism in the CAEMC region. Therefore some policy measures aiming at reducing this excess liquidity must be implemented.

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**Notes**

Note 1. A complete expose of the monetary transmission mechanism can be found in Mishkin(1996).

Note 2. Studies include   Mojon(2000), Anjeloni and Ehrmann(2003), Sander and Kleimeier(2004) de Bondt(2005), Kapwil and Scharler(2006), Kleimeier and Sander(2006) Sorensen and Werner(2006) for the Eura Area; Cottarelli and Kourelis(1994), Borio and Fritz(1995), Moazzami(1999), Sellon(2002), Angeloni and Ehrmann(2003), Kapwil and Scharler(2006), Kaufmann and Scharler(2006) for the U.S.A.

Note 3. An exception is the study of Saxegaard(2006) which analyzes the consequences of the excess liquidity on the effectiveness of monetary policy in Sub-Saharan Africa.

Note 4. As the null hypothesis of complete pass-through was rejected in the two specifications, results for the test are not reported in Table 2.

Note 5. We also used the generalization of the Error Correlation specification in equation (4), allowing for an asymmetric behavior of the speed of adjustment, as proposed by Crespo-Cuaresma et al. (2004). This generalization can be given by the expression,

$$\Delta i_t^m = \delta_0 + \sum_{j=1}^{p-1} \mu_j \Delta i_{t-j}^m + \sum_{k=0}^{q} K_R \Delta i_{t-k}^p +$$

$$I\left(\Delta i_{t-1}^p < 0\right) \gamma_1 \left(i_{t-1}^m - \lambda i_{t-1}^p\right) + \left[1 - I\left(\Delta i_{t-1}^p < 0\right] \gamma_2 \left(i_{t-1}^m - \lambda i_{t-1}^p\right)$$

Where I (•) is a Heavyside function taking value one if the argument is true and zero otherwise. This specification allows for two speeds of adjustment to the long-run relationship (corresponding to $\gamma_1$ and $\gamma_2$) depending on whether the adjustment follows a negative or positive change in the key policy rate. A simple test for symmetry is then given by the F-test for equality of $\gamma_1$ and $\gamma_2$. A rejection of the null would indicate that the speed of adjustment to the long-run equilibrium is significantly different for increases and decreases of the policy rate. When adopting this specification, we were unable to reject the null hypothesis of symmetry adjustment for the two retail rates (deposit rate and lending rate). Those results are available on request.

Table 1. Descriptive Statistics

|  | Mean | Median | maximum | minimum | Std. Dev. |
|---|---|---|---|---|---|
| Policy rate | 0.079438 | 0.075 | 0.14 | 0.0525 | 0.02236 |
| Deposit rate | 0.057338 | 0.05 | 0.09 | 0.0425 | 0.013055 |
| Lending rate | 0.186551 | 0.18 | 0.22 | 0.15 | 0.024947 |

**Correlation Matrix**

|  | DEP_RATE | POLICY_R | LENDING_R |
|---|---|---|---|
| DEP_RATE | 1.000000 | 0.944693 | -0.188091 |
| POLICY_R | 0.944693 | 1.000000 | -0.002680 |
| LENDING_R | -0.188091 | -0.002680 | 1.000000 |

Source:   International Financial Statistics CD-ROM

Time Span: 1990: 1- 2007: 12

Table 2. Augmented Dickey-Fuller and Phillips-Perron Unit Root Tests

| Variables | ADF statistics | Order | PP Statistic | Order | Lag |
|-----------|----------------|-------|--------------|-------|-----|
| Policy Rate | -11.23*** | 1 | -11.31*** | 1 | 14 |
| Deposit Rate | -16.18*** | 1 | -16.11*** | 1 | 14 |
| Lending Rate | -14.45*** | 1 | -14.45*** | 1 | 14 |

Note: All the test regressions were performed without a trend and a constant term. The ADF statistic is based on 14 lags. The critical value for the ADF and Phillips-Perron are from MacKinnon (1996). (***) indicates that the relevant null hypothesis is rejected at the 1% level.

Table 3. Long-run Responses and Adjustment Coefficients in the CAEMC area

$$Spcification\ Estimated: \Delta i_t^m = \delta_0 + \sum_{j=1}^{p-1} \mu_j \Delta i_{t-j}^m + \sum_{k=0}^{q} K_k \Delta i_{t-k}^p + \gamma\left(i_{t-1}^m - \lambda i_{t-1}^p\right) + \varepsilon_t$$

| | $\lambda$ | $\sigma_\lambda$ | $K_0$ | $\gamma$ | $\sigma_\gamma$ | (p,q) |
|---|-----------|------------------|-------|----------|-----------------|-------|
| Deposit rate | 0.3398*** | 0.103 | 0.368*** | -0.036* | 0.020211 | (7,12) |
| Lending rate | 6.21*** | 0.357 | 0.673*** | -0.00216 | 0.00279 | (1,10) |

Notes: ***, **, and * stand for statistical significance at 1, 5 and 10 percent critical level respectively. No cointegration has been found between the policy rate and the lending rate.
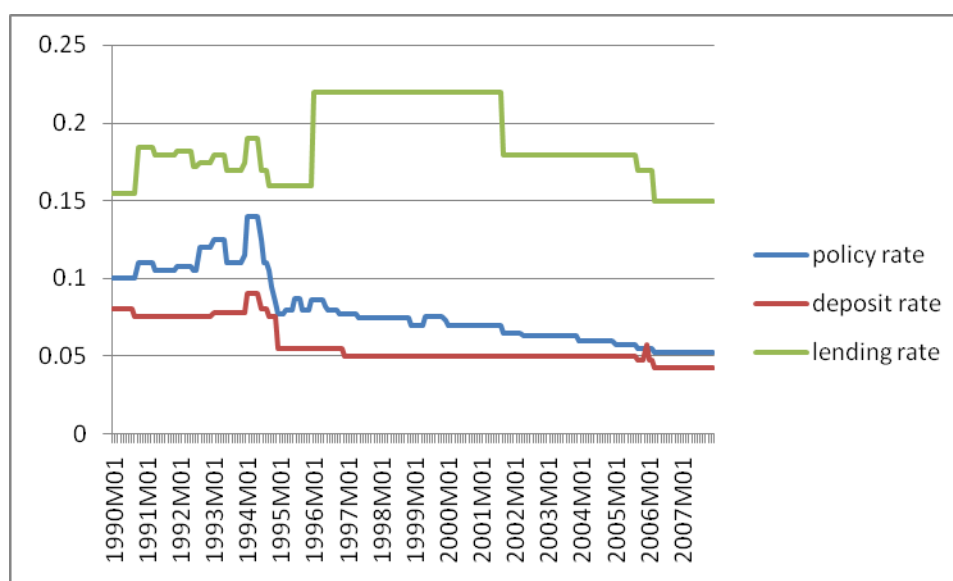


Figure 1. Interest rates in Central Africa

Time Period: 1990.1- 2007.12. Source: IFS CD-ROM

# A Rocket Left Launcher — Modern Industrial Civilization

## (No. 2 of the series of *Reflections on Economics Law and Ethic Culture Caused by World Financial Crisis*)

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**Abstract**

Focused on the macro level of economics law and ethic culture, this paper aims at finding out the fundamental obstacles for sound development of world economy and providing scientific theory for the establishment of a healthy global financial, economic, legal and social system as well as ethic cultural basis.

Through macrolevel analysis on modern economic theories, this series 2 exposits the essence of the modern economic theories and industrial civilization of the world from historical perspective.

**Keywords:** Science and technology, Modern economic theories, Global economic crisis integration, Space for development of industrial civilization

## 1. The Modern Economic Theories Stand on the Same Base Point of Science and Technology

Looking at the various schools of western economists, the theories, whatever live in the orthodox position in post-war west economic circles of the post-Keynes mainstream economists, or the Neo-classical liberalism Economists who take Hayek as the representative compete with the Keynesian, although there are too much difference in their theories, the purpose is same: seeking the causes of various social ills under the capitalist system, finding the way of curing the ills, making an ideal, happy, stable, sustainable capitalism. One word, much better social order and life for mankind.

All kinds of theories have some effects for helping governments or enterprises to regulate economic activities, However, their effects are just in short-term and unsustainable, it has been full proved by the global financial crisis, soever advocating "market regulation", or stressing "government's intervention", or combining the both.

Marxism and some left-wing economists are opposed to the capitalist system, but their purpose is not contradictory with the others mainstream economists of Western capitalism, The reason why leftists are critical of capitalist system and oppositional to such a system because they believe that there are too many serious drawbacks which are insuperable obstacles by capitalism. Human beings have to establish a new ideal social system will be able to avoid economic polarization and recurrent crisis to enjoy an equal, happy, well-ordered social life. The theories of Marx and all his followers including all left-wing economist do not guide them to build a successful example of socialism institution finally during they practice the socialism, their practice on socialism in global field is frustrated, and up to now can not supply a perfect hypothesis which is not only able to solve the new economic crisis caused by overproduction and waste of resources under capitalism, but the economic crisis of shortage for material products caused by underproduction also, and bureaucratic privileges with corruptions because of the extreme centralization. (Ding, Sheng-Zhen et al, 2009. etc)(Note 1)

How incompatible and different the economists are in schools, but they are totally same with keeping industrial civilization up on the premise of developing science and technology. All the bifurcations or differences are that people should put what kind of institution, organization and policy in practicing the how of gaining, occupying and sharing wealth is the best way, which is maximum, stable and sustainable. It is indubitable that modern economic theories stand on the same base point of science and technology, are not contradictory.

All the socialism countries, including the former socialism countries, invest manpower and material resources in developing science and technology, especially in heavy industry and military not less than developed countries. Taking former Soviet Union and North Korea as an example, millions of hungry people have not enough food to eat, in such a case that the rulers make the countries gone in so powerful states of nuclear deterrent actually that the whole world have to pay big attention to them.

Modern science and technology develop rapidly every day, which is the sufficient evidence that all the world is making every effort to pursue and promote its developing speed. The reason is a rigid rule, that is, who is prevailed in this area,

which is mean in possession of priority and dominant position, the others have to obey this position in economic and even political, make too much sacrifice to the owner of the position. The status of the first powerful country, United States, is generated by this case.

In industrial civilization, human beings tie own to science and technology too tight to separable as one as flesh and blood, in order that they have controlled the mode of production and life, even law, institution, culture, moral consciousness and way of thinking, every aspect. Standing on this same base point was precisely why the world economy was able to complete the economy integration rapidly in several torrents of technology developing swept after the war. (2009)(Note 2)

## 2. Global Economic Crisis Integration

The completion of world economic integration can not help but make economic crisis go into integration, either. Its routing showed when economic crisis appeared, trade protectionism is against world economic integration to be gaining some ground. Nevertheless the case is on the contrary every time, crises in a new round that accelerate the process, and make it deeper and wider in the world over but do not stop.

We observed only from the 1970s. to start: In 1975, the United States, Britain, France, West Germany, Japan and Italy, the six main industrial countries combine into one Group of Six (G6), since then, the group's expansion process had never been stopped. In 1991, the world patterns undergone great changes, former Soviet Union entered actively into western world, and formed the G8 soon. The financial turmoil in 1977 appeared newly-emerging nations in Asia and influenced over the western economies, therefore the western nations established an informal dialogue mechanism with the emerging nations so as to prevent the recurrence of the financial turmoil from affecting severely on the world economy, G20 was put forth by the financial turmoil really.

We are able to see that taking more than ten years from G6 to G8, however, only a few years from G8 to G20. According to a United Nations estimate, in terms of the size of its economy of all the members of G20 has taken up 85% in the world. All leaders including the United States put forward unanimously to reconstruct a new world economic order, at the G20 meeting in Pittsburgh. It is sure to say, the new order will reflect a fresh global architecture which is much more co-operation and integration in the future world economy. As President Barack Obama said, the summit laid the ground for an era of co-operation, and he linked the co-operation of summit with the prosperity of ordinary Americans. In the statements the White House said, because of "Dramatic changes in the world economy" the leaders had "reached a historic agreement to put the G20 at the centre of their efforts to work together to build a durable recovery while avoiding the financial fragilities that led to the crisis". Gordon Brown, the UK prime minister, went even further, describing the new body as offering "more chance of delivering results than anything since the Second World War." All these symbolize that the move is very important since it brings the system of economic co-operation up to date with changes to the global economy that have been apparent for more than a decade - notably the rapid shift of economic, the crisis accelerates the global economic integration even further.

From this history we see clearly, world economic integration has led to the integration of the crisis, in turn, the crisis integration strengthen further the speed and degree of economic integration. In the end, the world economy just like what a Chinese proverb says, all nations are that "the grasshoppers tied to one rope", no one is out of the rope.

## 3. The Confined Space of Human Industrial Civilization

Human industrial civilization has developed over 200 years since Industrial Revolution, during the period material wealth produced exceed much more than the sum of the previous history over five thousand; simultaneously non-renewable resources consumed are also further more than the sum of the history. The society of industrial civilization is developed greatly by human using means of science and technology, however, is the developing space of industrial civilization infinite? In addition to financial, economic, political, cultural, moral and the other sociality crises, between the mankind society and nature wherein even serious crisis lurk at present, which means that human industrial civilization development of space is limited, not unlimited. Someday this space will be no longer existed for the life mode of human beings.

In 1972, Meadows and other 17 leading scholars from developed and developing countries, pointed out, in their report caused a big stir in the world, "Limits to Growth", that the main resource of supporting the industry, oil, coal and the other sorts of indispensable essential mineral resources are drastically reducing, most of them will be exhausted within a hundred years. "World Resources 1988-1989", edited by WRI and IIED, indicate that oil reserves can maintain the world only 32.5 years, natural gas can last only 58.7 years, coal keep only 226 years, by the drain rate on resources meanwhile. The famous "Daly Statistics" shows: put all the world's essential non-renewable resources together, only enough for 18 percent of the world's population to live with modern American life style. Some one put such a question to Mahatma Gandhi over half a century ago, "Like after getting independence whether India can reach the living standard of the suzerain. Gandhi asked back: Britain achieved such a rich level that it had consumed a half of the resources on earth, how many earth does a country like India need? " Gandhi answered this question from in terms of

entire mankind and the global ecology. He clearly realized that it is beyond the bound of nature that the industrialized consumption for resource and the desire human beings for enjoy material wealth.

The data from Guangzhou of China Environmental Sanitation Bureau show that in 2008, domestic garbage in Guangzhou reached 9776 tons daily, the output is expected up to 2010, will be over million tons per day. It has been at an annual increase of 5% since 2004, because of increasing so speedy that the largest urban garbage treatment site is ended in advance of 8 years. It lasts to 2012 only. Another emerging industrial city, Dongguan, the garbage output is thousands tons daily, only 30% in a harmless treatment. Beijing, Shanghai, Jiangsu and other places have had to face the predicament of waste disposal. (Note 3) These problems are only a tip of the iceberg around the world. (2009)

The ocean, which covers 71 percent of the earth's surface, is threatened with certain destruction, the problem, ocean pollution and ocean trash, is increasingly severe. "The New York Times" published a group of photos recently on the Pacific Garbage Patch on its website, to remind people that the ocean has been becoming a garbage dump of humanity. And most of them are high-tech trash.

In fact high-tech trash has polluted in the outer space, which also become a serious environment problem. Since the first artificial satellite was fired off in 1957, various space vehicles has launched into space by human beings during the 52 years, a part of them is flying in orbit as space trash. Space scraps recorded can be observed from the earth about 4000, which have been space trash about 3,000 tons, and the amount more and more every year, even caused some satellite accidents.

So many data prove that industry civilization not only consume earth resources out too fast, but pollute and destroy the living environment, which brought by science and technology to human. In addition to all above, even it is advanced the evil consequence that the expansion of world population encroaches on land resources. All these tell us that the confined space for developing industrial civilization will is approaching to the end.

## 4. A Rocket off Launcher — Modern Industrial Civilization

Many people who are filled by the confidence for the future of human believe, all the crises faced by human will be resolved one by one in the process of developing science and technology. It is indubitable that all the crises will be able to solve with some wises, however, may the modern science and technology make various crises done for humanity?

Based on the conclusion in the analyzing the characteristics of science and technology in No. 1 of this series articles, the answer is: no. use the means of science and technology to regain a perfect earth which would no longer be spoiled, make them obey to be dictated by human and become human's servant, which is never the nature of them. Everything in the universe is never out of the "law" in counterpart each other, exists side by side and plays a part together, only advantages no disadvantages in any thing that is never exist. Enjoying the lap of luxury under industrial civilization that means inevitable facing the evil consequence the environment is destroyed. Being stuck on enchanted "Pandora" that means accepting her gift. It is nothing more than mankind's unilateral nice willingness that making science and technology return the earth as beautiful as ever to human. Modern industrial civilization just like a rocket left the launcher which is blazing out into space until it vanish in thin air. Maybe we can make out this subject clearly by the following facts.

First, a well-known fact is that with regard to Convention come to a binding treaty cuts in carbon emissions. From the last century, 38 developed countries signed the "Kyoto Protocol" to the February 16, 2005 which became effective, US and developing countries are still in the " blame game", make the treaty which only maintain a low cuts standards can not be executed. The attitude the American government is opposite to "Kyoto Protocol" come from the view of majority public, especially from these states such as Virginia, Nebraska and Michigan, which have either strong coal-based manufacturing or agricultural lobbies. The excuses by the three: first, that some people offer: the science underlying climate change is highly uncertain, and costs exceed benefits; second, that it would delay the democratic process of industry in the world, or transfer wealth into developing countries; third, that it will increase unemployment, it is absolutely not allowed.

China and India, the two most populous emerging countries have relatively lower, but very high in absolute emissions per year because of the huge population, so as to growth rapidly, China has even surpassed US. These emerging countries claim that high-carbon emissions should be traceable to the primary developed countries in world history, especially US. So they should bear the chief responsibility, and take effective measures firstly, then developing countries would follow. It means that the developed countries had enjoyed the benefits of high-tech meanwhile the world environment was destroyed by them, the new emerging countries under developed, why should charge with the duties at the same time with the developed countries, it is absolutely not fair, and allowed either.

Under these circumstances, United Nations climate change conference in Copenhagen focused by the attention of all world will be reached some agreement and specific promise which is almost impossible. All these fully reflect that the value orientation of human beings who face environmental protection and vested interest. (Nancy Birdsal, Arvind Subramanian et al, 2009.). (Note 4)

Next, the difficult problem that no politicians and business leaders would take an initiative action to be responsible for cutting emissions has not been resolved yet, the scientific circles fell into another conflict. One side is the more aggressive green groups, the other side is the increasingly bold ranks of the skeptics, who insist on no tangible proofs some certain relationship between climate changing and carbon emissions. It seems the conflict in this turn the sceptics have gotten some ace in the hole, which is the opposing side overstate the scientific case for global warming and suppress contrary findings. I was supposed that scientists should keep their heads best, but they do incandesce such a pure science case, the matter seems a puzzle, but not yet. (Note 5) Because science and technology can make mankind quickly prize some benefits and privileges from material wealth, the "magic" existed in its framework of industrial civilization has made most people in the world become fetichists of money and powers unconsciously. (Fiona Harvey. et al, 2009.)

Since science and technology-led the values of economy, politics, legality, ethics and culture which framed by human industrial civilization are not able to ravel out the problem of climate and environment effectively. The industrial civilization is a rocket lauched from a launcher, its one and only fate is blazing out into space until it vanish in air, however, it does not mean that human beings would fall in a decline to death with it together. In the history of earthman has never some everlasting civilization since hundreds of millions years, but human society always stand and prosper on the earth again and again by some another way of civilization.

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# FDI in BRICs: A Sector Level Analysis

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**Abstract**

This paper attempts to compare the overall trends and industrial patterns of inward foreign direct investment in the BRICs and explain their determinants. The overall trend of the inward FDI in the BRICs is increasing. Nevertheless, the industrial patterns of inward FDI are different from each other. In addition, there are three main factors that determinant the industrial patterns of inward foreign direct investment in the BRICs: develop courses, resources and the business environment.

**Keywords:** Inward FDI, BRICs, Industrial pattern

## 1. Introduction

"The combined economies of Brazil, Russia, India and China (BRICs) appear likely to become the largest global economic group by the middle of this century." (Cheng, Gutierrez, Mahajan, Shachmurove, and Shahrokhi, 2007). With this trend, the BRICs have attracted more and more FDI inflow and developed rapidly, which is out of imagination. FDI flows to Brazil declined from $22.5 billion in 2001 to $16.6 billion in 2002, a decline of more than 26%. Despite this Brazil remained the largest recipient of FDI in Latin America. FDI flows remained relatively strong despite the crisis in Argentina, and the uncertain outcome of the presidential election in 2002 (World Investment Directory online). Following substantial increases during 1995-1997, FDI flows to the Russian Federation is at about US$ 2.8 billion on average during the following four years. Compared the size of the Russian economy with the volume of flows to other countries in Central and Eastern Europe, the level of FDI in Russia is relatively low, suggesting that FDI in the country is still at an early stage (World Investment Directory online). Inward FDI stock in India in 2002 nearly doubled over the past four years. Inward FDI stock in India soared from less than US$ 2 billion in 1991, when the country undertook major reforms to open up the economy to world markets, to about US$ 45 billion in 2005 (UNCTAD, online database). Since 1980, China has grown at an average rate of around 10% per year and China became the world's fourth largest exporter in 2002. The flow of FDI in 1993 reached a remarkable 26 billion US dollars (China State Statistics Bureau, 1994). "Many other developing countries have expressed the concern that the FDI into China represents a diversion of global direct investment away from them" (Wei, 1995). Due to the BRICs have attracted much of the world's FDI and become more important in the global market, it is reasonable to know the overall trends and industrial patterns of inward foreign direct investment in the BRICs.

This paper attempts to compare the overall trends and industrial patterns of inward foreign direct investment in the BRICs and explain their determinants.

The paper is organized in the following way. In Section 2, I provide a literature review of foreign direct investment in the BRICs. In Section 3, I attempt to compare the overall trends and industrial patterns of inward foreign direct investment in the BRICs. In Section 4, I try to explain their determinants and make the conclusion in Section 5.

## 2. Literature Review

With the rapid development of the BRICs, many scholars have done researches on them and try to find out their determinants.

Cheng, Gutierrez, Mahajan, Shachmurove, and Shahrokhi (2007) consider that while the BRICs are not sure to become economic hegemony in the world economy, the interplay between BRICs economies and other developing countries is viewed as a critical aspect of globalization and interdependence. Mcdonaldm, Robinson, and Thierfelder (2008) use a global general equilibrium trade model to analyze the impact of the dramatic expansion of trade by India, China, and an integrated East and Southeast Asia trade bloc and productivity growth in the region on developing countries. China is an integral member of the E&SE Asia bloc, with strong links through value chains and trade in intermediate inputs, while India is not a part of any trade bloc. Chakraborty and Nunnenkamp (2008) assess the proposition that FDI in India will promote economic growth by subjecting industry-specific FDI and output data to Granger causality tests within a panel cointegration framework. It turns out that the growth effects of FDI vary widely across sectors. Felipe, Lavin and Fan

(2008) document the diverging patterns of capital accumulation, profit rates, investment rates, capital productivity, and technological progress of China and India between 1980 and 2003. And find out the two Asian economies have followed very different growth patterns and now face different challenges. Lo and Liu (2009) extend other scholar' model to demonstrate why China has been so successful in disproportionately attracting foreign offshore manufacturing activities, while India has been engaged mainly in offshore service activities. They argue that the host country's industry-specific technology capabilities make the difference in FDI composition between China and India. They also find that, after excluding overseas Chinese investment, India is almost on par with China in terms of the market size it offers to marketing-seeking FDI. Fabry and Zeghni (2002) develop their understanding of FDI in Russia by asking a main question: Why is Russia an exception in the context of FDI globalization? Is Russia willing to stay outside the general trend of fierce competition for FDI and able to developed endogenously sustainable growth? Giner J and Giner G (2004) elaborate an interpretative model of foreign direct investment in China based on an integrated view of economic policy. The principal conclusions are both macroeconomic determinants and sociopolitical factors that bear upon the flow of direct foreign investment towards China should be taken into account. Wei (1995) explore the determinants of inward FDI in China and India and the causes for their huge difference. It was found that China's much higher FDI from OECD countries was mainly due to its larger domestic market and higher international trade ties with OECD countries. India, however, had advantage in its cheaper labor cost, lower country risk, geographic closeness to OECD countries, and cultural similarity.

From the researches before, we can see that many researches are focus on comparing economic development between India and China, but there are less researches on Brazil and Russia. Moreover, the determinants of their industrial patterns of inward foreign direct investment in the BRICs should be pay more attention.

## 3. Comparison

### 3.1 Overall Trends

Although the BRICs have attracted more and more FDI in recent years, their growth rates and paths are not the same. From figure 1, we can see that China is growing the fastest among the BRICs from 1994-2007, and reaches about 140 billion US dollars in 2007. Brazil has a rapid decline from 2001 to 2003 and then increases slowly. Russia and India both develop smoothly and increase a lot from 2005. According to the UNCTAD, Brazil, China and Russian Federation are belong to high FDI potential and low FDI performance. However, India is both low FDI potential and low FDI performance (Matrix of inward FDI performance and potential, 2006).

<Insert Figure 1 here>

### 3.2 Industrial Pattern

From figure 2 we can see that FDI stock in Brazil in the primary sector is at a lower level and declined largely in 2002, while FDI in the secondary sector increased slightly. FDI in the service sector declined from $1.6 billion in 2001 to $1.0 billion in 2002.

<Insert Figure 2 here>

<Insert Figure 3 here>

Figure 3 shows us that the FDI inflows in Russia fluctuated substantially. The tertiary sector registered substantial increases in FDI flows during 1998-2000. By 2001, the tertiary sector received about 50% of total FDI inflows. The secondary sector lost its share compared to 1998, but still receives about 30% of total FDI. Finally, the ups and downs of the primary sector reflect the FDI flows in the petroleum sector which fell by 70% in 2000 to US$400 million.

In India, the inward FDI stocks for specific sectors and industries reveal a tremendous shift from FDI in the secondary and the manufacturing sectors to FDI in the tertiary and service sectors since 1995 (Figure 4, Chakraborty and Nunnenkamp, Economic Reforms, FDI, and Economic Growth in India: A Sector Level Analysis, World Development Vol. 36, No. 7, pp. 1192–1212, 2008). From the study of Chakraborty and Nunnenkamp, in the manufacturing sector, all previous priority areas accounted for steeply decreasing shares in overall FDI stocks. The data of FDI in services is increasing rapidly. This is mainly because the definition of services sector is largely confined to the unspecified category of "other services", and this category is heavily concentrated in information and communication services.

<Insert Figure 4 here>

<Insert Figure 5 here>

<Insert Table 1 here>

In China, the situation is also different. The secondary sector is the main receiving station of inward FDI and the volume of the FDI is increasing rapidly and consistently. The FDI flows to secondary sector in China reaches about 2000 billion dollar in 2007, which is the highest in the BRICs. However, the primary and tertiary sectors are at a lower level of FDI inflow, and only have a slightly increase in the past decade.

As is mentioned above, the overall trend of the inward FDI in the BRICs is increasing. Nevertheless, the industrial patterns of inward FDI are different from each other. In Brazil, Russia and India, the tertiary sector receives the most inward FDI on average over the past decade, while the primary sector receives the least and the secondary sector is in the middle. But China has a special industrial patterns of inward FDI, that is, the secondary sector dominant the majority of the inward FDI and the primary and tertiary sectors receive only a bit. We also can see this from table 1. The table gives the three most important industries in terms of FDI stock in the BRICs. In Brazil, business activities accounts for 31% of its total inward FDI in 1998, finance accounts for 12%, and electricity, gas and water accounts for 8%. While in Russia, the transport accounts for 21%, food accounts for 20%, and trade accounts for 12% in the same year. From 1987 to 2002, the annual average of other services accounts for 51% of the total inward FDI in India, chemicals accounts for10%, and machinery accounts for 10%. In China, the manufacturing accounts for 58% of its total inward FDI on average from 1987 to 2007, and all the three most important industries in China belong to the secondary sector.

## 4. Determinants

As we all know, the industrial patterns of inward foreign direct investment in the BRICs vary from each other, so we should find out the determinants. In my opinion, there are three main factors that determinant the industrial patterns of inward foreign direct investment in the BRICs.

### 4.1 Develop Course

Brazil's position in international market is better than India and China before the democratic independence. It can control over its fate, and has a comparative advantage in all aspects. Brazil becomes independent at an early time. So it has been long to form an elite political group which represents the northern and southern manufacturers, and by the Great Depression and World War I, Brazilian government began to confiscate the assets of the United Kingdom and the United States and gradually implemented import substitution-oriented economic policies to promote economic expansion. Since the 30th to early 50th, the Brazilian economy continues to have around 6% growth. At that time, Brazil has obtained a more favorable position in the international division than China and India. World War Ⅱ brought great order to Brazil, as a result, the Brazilian economy boomed.

At the beginning of Indian foundation, India has not encountered large-scale war for 200 years. It has good industrial system, prevailing legal system, accounting system and statistical system. Before the arrival of the first oil crisis, India is not only near the world's two major crude oil production, but has good internal and external factors than China. As early as 1928, the League of Nations had regard India as the world's 8 major industrial nations.

China in the three countries, neither is not the first colonized, nor the deepest, half of the 20th century, China suffered the deepest domestic crisis and the biggest blow of aggression. Finally in 1949 the Chinese people stood up to go its own way. From 1979, China used gradualist economic reform, with FDI regulation and moderately low country risk. Then, China opened more and had a high level of inward FDI. In the short run, China will have high levels of investment, exporting and job-creation but low commitment and innovation in the long run (Buck, Filatotchev, Nolan and Wright, 2000).

Russia used shock therapy, which is totally different from China, with insider privatization and extremely high country risk. So it has low levels of inward FDI, investment and exporting, but job preservation in the short run. However, incumbents may change their attitudes towards foreign investors and there will be an increasing inward FDI (Buck, Filatotchev, Nolan and Wright, 2000).

### 4.2 Resources

Compared with China, the most prominent advantage of Brazil is that it has a very rich natural resources. Brazil has more than 300 million hectares plowland that is 3 times of China, and the population of Brazil is only 1/9 of China's. The unused land in Brazil is more than 100 million hectares which is the same as China's total plowlandland. Brazil has the world's largest tropical rain forest, and the area is more than 500 million square kilometers. Brazil is extremely rich in mineral resources, and reserves iron ore of about 48 billion tons. Brazil has a good prospect on   agricultural good export market, and the Brazilian beef export is showing rapid growth trend. Another characteristic of Brazil is that the energy technology development has started early in the 70th last century.

Russia's natural resources are also very rich. It has more than 90% of forest area, 70% of the coal, 80% of natural gas, and the majority of iron ore of the former Soviet Union. Russia is a region riched in natural resources around the world. There are a large number of various metal minerals such as iron, copper, nickel, zinc, tin, gold, silver and so on. The natural conditions of the Russian Federation have a significant impact on its economic development. Broad forest belt and abundant land resources of Russia help the development of agriculture and agricultural products. The diversity of natural conditions offers a wide range of possibilities for Russia's economic development.

Compared with China, India has advantages in some aspects. First, the software industry, India's software industry is

one of the best in the world. India currently has a large number of professionals. According to McKinsey's report, by 2008, India's IT services and logistics will have four million employees, and the annual exports will reach 57 billion U.S. dollars, accounted for 7% of total India's GDP. In contrast, China's software industry develops late, and has a large gap with India's. Second, financial institutions, India has a relatively sound financial system, with lower proportion of non-performing loans and non-performing loan rate of commercial banks was only 10.8%. India's more mature stock markets, become an important place for raising funds for Indian companies. However, the social infrastructure in India is several decades behind China, which is the main bottleneck constraining economic development in India.

It is known to all that China is riched in labour force with low cost. In addition that, China also have rich nature resources and big domestic market, which makes it is valuable to invest in China.

*4.3 Business Environment*

For starting a business, Russia is ranked 33rd out of 175 economies in 2006, which indicates that barriers to start a business are not high (Aidis and Adachi, 2007). While Brazil has the longest duration and India has the highest cost. For dealing with licenses, Russia has the longest time and India still has the highest cost. The difficulty of hiring workers is the biggest in Brazil, while the difficulty of firing workers is the biggest in India. But the firing costs are not the highest in India but in China. Moreover, it is more difficult to get credit in Russia and India than Brazil and China. The investor protection in the BRICs is near the OECD average level. But the total tax rates in the BRICs are higher than the OECD average level. The cost to import in China is quite low compared with the BRICs but the cost of closing a business in China is the highest (doing business data, 2006).

From the different develop courses, resources and business environment, we can see that the BRICs have different advantages and disadvantages that make them have different industrial patterns of inward foreign direct investment now.

**5. Conclusions**

This paper compares the overall trends and industrial patterns of inward foreign direct investment in the BRICs and explains their determinants. The overall trend of the inward FDI in the BRICs is increasing. Nevertheless, the industrial patterns of inward FDI are different from each other. In Brazil, Russia and India, the tertiary sector receives the most inward FDI on average over the past decade, while the primary sector receives the least and the secondary sector is in the middle. But China has a special industrial patterns of inward FDI, that is, the secondary sector dominant the majority of the inward FDI and the primary and tertiary sectors receive only a bit. In addition, there are three main factors that determinant the industrial patterns of inward foreign direct investment in the BRICs: develop courses, resources and the business environment.

This paper fills the gap of study on the industrial patterns of inward foreign direct investment in the BRICs, which can give help to the further study. However, the study of the determinants of the industrial patterns of inward foreign direct investment in the BRICs still belongs to theoretical analysis. I did not find the data to do the empirical analysis, so the results need to be proved further more.

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Table 1. The three most important industries in terms of FDI stock in the BRICs

| Year | Brazil | Russian Federation |
|---|---|---|
| 1990 | Other services (17%), chemicals (14%), motor vehicles (10%) | |
| 1995 | Business activities (31%), chemicals (11%), metal and metal products (7%) | |
| 1998 | Business activities (31%), finance (12%), electricity, gas and water (8%) | Transport (21%), food (20%), trade (12%) |
| 2002 | | Transport (25%), mining (16%), food (15%) |
| | India | China |
| 1987-2002 (average) | Other services (51%), chemicals (10%), machinery(10%) | |
| 1987-2007 (average) | | Manufacturing (58%), real estate (15%), electricity, gas and water (7%) |

Source: World Investment Directory online and China Economics Information Online Database
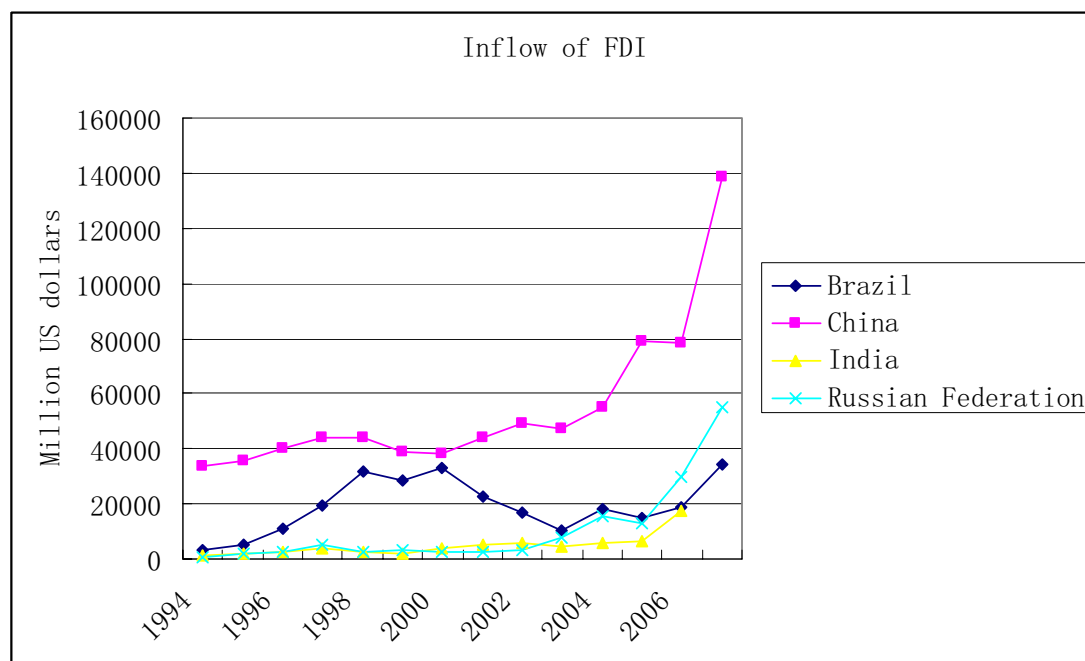


Figure 1. Inflow of FDI in the BRICs (1994-2007)

Source: OECD Factbook 2009: Economic, Environmental and Social Statistics
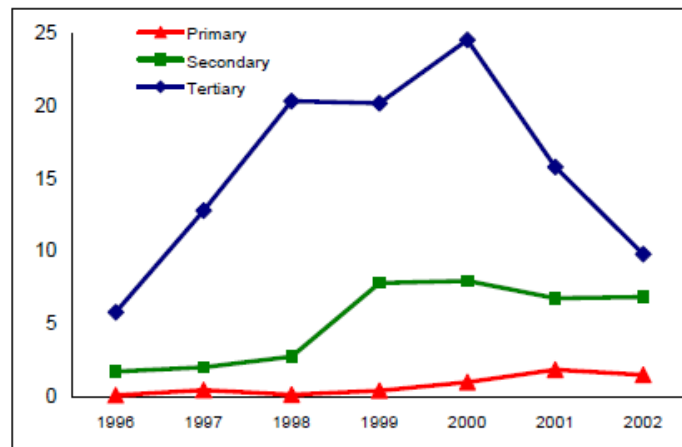
Figure 2. FDI inflows by industry, Brazil, 1996-2002 (Billions of dollars)
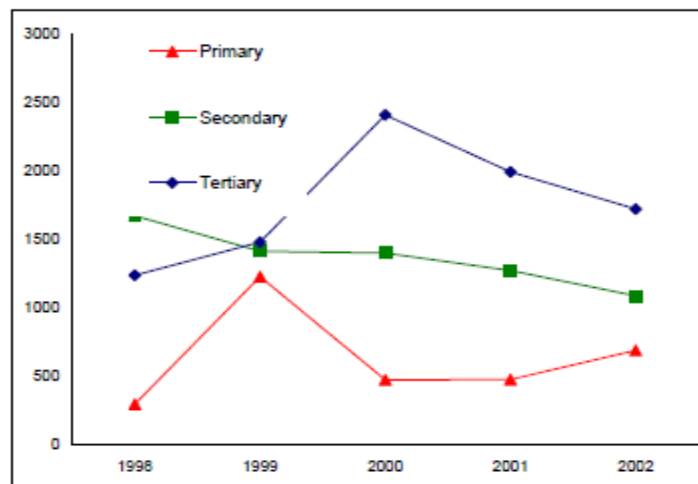


Figure 3. FDI inflows by industry, Russian Federation, 1998-2002(Billions of dollars)
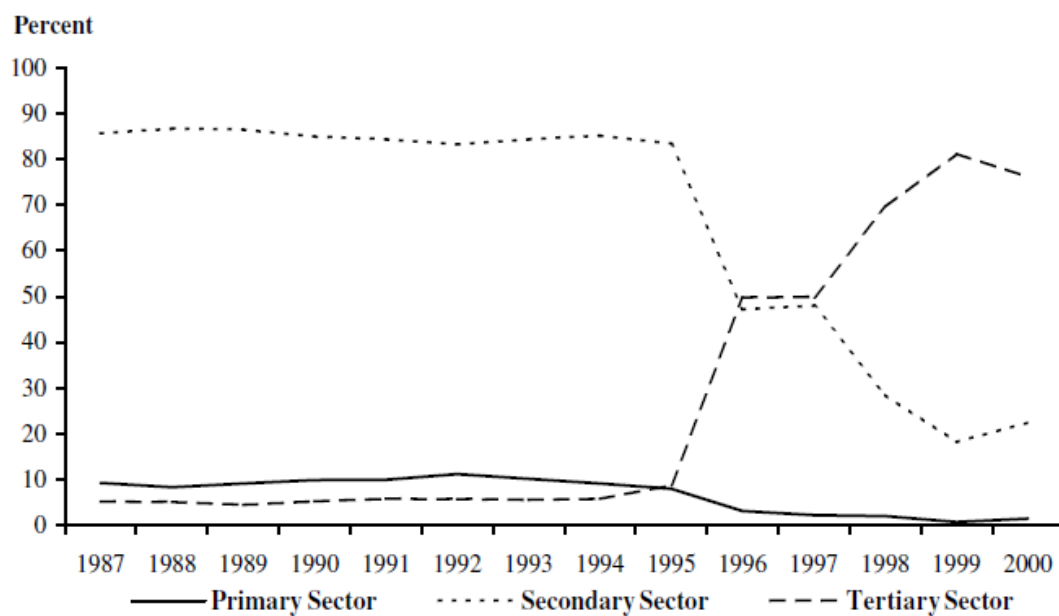


Figure 4. Sector-wise composition of FDI Stocks, India, 1987–2000

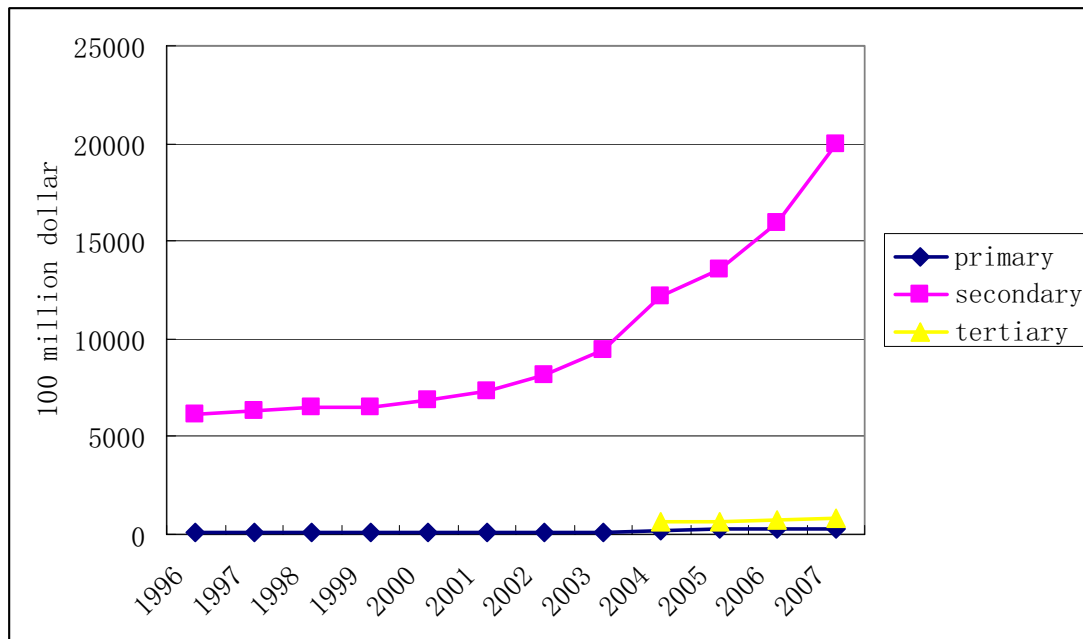Source: UNCTAD (2000) and Central Statistical Organisation (various issues).

Figure 5. FDI inflows by industry, China, 1996-2007

Source: China Economics Information Online Database

# Intellectual and Social Capitals Development

## A Case in Malaysian's ICT Companies

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**Abstract**

Intellectual capital is said to be a source of competitive advantage and there is evidence that business success can be partly explained by its intellectual capital. It is argued that the main dimensions of social capital of relevance to intellectual capital are structural, cognitive, and relational capitals because these, among other things, foster the exchange of knowledge and resources among the organization members. The objective of this paper is to investigate the importance of social capital in fostering the development of intellectual capital among the engineers. This study used case study method and data were collected through interviews. Data were analysed using within-case and cross-case analysis. The analysis shows that the most important dimension for intellectual capital development is structural capital. The findings also suggest that structural capital is a prerequisite of relational capital among engineers in an organizational project. The findings also demonstrate that frequent meetings and interactions, relationship, hierarchy or status, and shared language are among the factors that foster the sharing of knowledge among engineers. This study also elucidated that structural and relational capitals play important role in knowledge sharing and hence intellectual capital development.

**Keywords:** Intellectual capital, Social capital, Relational capital, Cognitive capital, Structural capital, Organisational capital, Knowledge sharing, Engineers

## 1. Introduction

In a knowledge-based economy, the generation and exploitation of intellectual capital plays the predominant part in the creation of wealth. The effective management of intellectual capital has been proposed as a critical element of organizational flexibility and innovation (Rockart, 1988). Therefore, organizations should learn to improve continuously and this could be carried out through innovation.

It is believed that the most flexible and innovative organizations are those which have effective learning system and those which could maximize both their abilities to acquire information about their customers, competitors and technology, and their abilities to digest that information. Tushman & Nadler (1986) suggest three critical factors in managing innovation: informal organization, organizational arrangement and individual. These three critical factors are similar to the three dimensions of intellectual capital (people, external, and internal) introduced by Bontis (1998); Sveiby (1997); Roos *et al.,* (1997) and Stewart (1997).

The people dimension incorporates competencies, knowledge, know-how and experience of the individuals in an organization. The internal dimension includes organization structures, routines, processes, and management systems. This also includes the norms and culture of an organization, and the systems and work processes; including information technology (IT), communication technologies, images, concepts, and models of how the business operate, databases, documents, patents, copyrights and other codified knowledge (Allee, 1998). Meanwhile, the external dimension is referred to the external constituencies and structures such as links to customers, suppliers, and other stakeholders and networks (O'Regan, O'Donnell & Heffernan, 2001).

Organizational flexibility and innovation require the management of an organization to hire, develop, and train a set of individuals with diverse skills and abilities, and has the capacity to innovate. Social capital is an important mechanism to give individuals access to crucial resources available in other people (Coleman, 1988). As a key enabler for

knowledge sharing (Brachos, Kostopoulos, Soderquist, & Prastacos, 2007; Chaminade & Roberts, 2002) and hence intellectual capital development, it encourages organisational members to form relationships, communicate with each other, and act together more effectively in achieving organisational goals (Adler & Kwon, 2002; Burt, 1997; Cohen & Prusak, 2001; Nahapiet & Ghoshal, 1998; Putnam, 1995; Tsai & Ghoshal, 1998). Thus, we argue that strong partnership among engineers are a key piece of achieving competitive advantage Therefore, it is a challenge for organizations to develop effective social capital throughout the organization (Nelson & Cooprider, 1996; Rockart, 1988; Reick & Benbasat, 2000).

The objective of this study is to investigate the importance of social capital dimensions in intellectual capital development. It will also identify the most influential dimension of social capital in fostering intellectual capital. Apart from that it examines and distinguishes the differences among three dimensions of social capital: structural, cognitive, and relational (Nahapiet & Ghoshal, 1998) for intellectual capital development. It also tends to investigate factors that foster or hinder the development of intellectual capital among the engineers. ICT companies were chosen because this type of organization must continuously innovate in order to maintain its competitive position.

## 2. Literature Reviews

In today economy, the essential apprehension of organizations is how to manage their intellectual capital (Teece, 2000; Nahapiet & Ghoshal, 1998). There is a significant and growing body of research suggesting that intellectual capital is associated with important outcomes and processes in the organizations (Nahapiet & Ghoshal, 1998; Meyer, 1994; Nohria & Eccles, 1992). Organizations must be positioned to anticipate in developing the needs of the customers and in responding to these needs through additional innovative products and services. Organizations do not have brains but they have cognitive systems and memories (O'Keefe, 2002). Furthermore, consumers nowadays are becoming more sophisticated in their selection of products and services, and they have wider choices in the market and expect new and improved products, superior services, and lower prices.

There is no universally accepted definition of intellectual capital in the literature. However, most of the definitions and frameworks of intellectual capital include human, customers, suppliers, and organizations as factors (e.g. Roos & Roos, 1997; St Onge, 1996; Van Krogh & Roos, 1996). For the purpose of this study, three classifications of intellectual capital are used: relational capital, human capital, and organizational capital. The term relational capital refers to external capital of organization and it includes relation with the suppliers, customers, and other members of its external community. Human capital refers to the know-how, skills, capabilities, experiences and expertise of an organization's members. Human capital present in an organization but the organization has imperfect ownership of it. Human capital is used to accomplish tasks at hand and ultimately achieve organizational goals and missions (Youndt, Subramaniam & Snell, 1996). But this human capital can leave the organization. Organizational capital refers to the internal configurations and system of an organization. It consists of two components: innovation that includes intellectual property and intangible assets, and process capital that includes organizational structure and operating procedures (Roslender & Ficham, 2001). The organization has perfect ownership of its organizational capital (Roslender & Ficham, 2001; Sveiby, 2001).

Although intellectual capital has been characterized as an attitude of the individual (Simon, 1991), the dominant view is that it is an organization level construct (Brown & Duguid, 1991; Nelson & Winter, 1982). Nahapiet & Ghoshal's (1998) theory argue that the presence of social capital will facilitate the creation of intellectual capital and leading to organizational advantage. However, to extract values from social and intellectual capital, they must be managed properly through knowledge management activities (Lee & Yang, 2000).

Thus, this study argues that the intellectual capital development among the engineers is highly influenced by their social capital. Social capital can be defined as *the sum of the actual and potential resources embedded within, available through and derived from the network of relationships possessed by an individual or social unit* (Nahapiet & Ghoshal, 1998). We applied the three dimensions of social capital that create the value of the intellectual capital introduced by Nahapiet & Ghoshal (1998): structural, cognitive, and relational.

Structural capital refers to the network structure or connection between the actors. It consists of the number of people in the network, their willingness to lend support and their willingness to do so. This relationship is very important as it can enhance both the firm and individual performance in two ways; first by facilitating access to information and resources, second by helping co-ordinate task interdependencies (Gargiulo & Benassi, 2000). Relational capital refers to the nature of the personal relationship such as trust, toleration, & cooperation that develops between specific people (Nahapiet & Ghoshal, 1998). Trust and relationship will lead to positive attitudes and behaviour among the workers (Sparrow & Cooper, 2003; Gambetta, 1988). According to this theory, workers have to be able to trust others to discharge their obligations. It is not only enabler to increase cooperation but also as catalyst to improve flexibility, lower cost or coordinating activities and increase level of knowledge transfer (Mat Isa & Ameer, 2007; Inkpen, 1997). Without trust and sense of reciprocal obligation, workers will be less committed and less loyal, which will lead to high turnover

intention. Cognitive capital is defined as a degree to which actors of the network share a common understanding to the achievement of common goals and outcomes (Inkpen & Tsang, 2005).

## 3. Malaysian ICT Industry

The Malaysian Government recognizes that in the knowledge-based economy, educated and skilled human resources, or human capital, is the most valuable asset. The Government of Malaysia is emphasizing on the development of human capital as being in the forefront towards the continuous development of the country. The development of human capital is of paramount importance in competing in this era of globalization. Qualified, knowledgeable and highly skilled work force is essential to ensure that Malaysia can be competitive and succeed in the knowledge-based economy. The development of human capital has been placed as one of the principal agenda in the implementation of the Ninth Malaysia Plan (RMK9), as well as given specific emphasis in the second Malaysia National Mission, which is to enhance the country's knowledge and innovative capacity and to inculcate first class mentality.

In a knowledge-based economy, a high proportion of its Growth Domestic Product (GDP) derives from knowledge-based and knowledge-enabling industries such as high technology and medium high-technology industries, financial and other business services, and the teaching profession. The Information Communication Technology (ICT) industry is one of the knowledge-services which are vital to compete in the global economy, increasing productivity and efficiency, and enabling the enhancement of quality of life. The Malaysian ICT industry is demonstrating high growth rates and emerging as a strong contributor to the country's employment and economic growth. Malaysia is moving with rapid speed in establishing itself as a technology leader and is ranked 26 out of 127 countries in the Networked Readiness Index in the Global Information Technology Report 2007-2008. The Malaysian Government invested substantial funds in creating the Multimedia Super Corridor (MSC) in 1996 to attract domestic and foreign investors to its ICT industry. The MSC is the backbone of ICT infrastructure in Malaysia.

## 4. Research Methodology

The objective of this study is not to search for a conclusion based on statistical generalizations, but rather the findings from this study are meant to enhance the understanding of the development of intellectual and social capitals. Intellectual and social capitals are still new and not much study have been conducted particularly in Malaysia. According to Benbasat, Goldstein & Meeds (1987), and Eisenhardt (1991), case study method is especially appropriate when the research is at the formative stage. Therefore, case study use case study in order to explain and understand the intellectual and social capitals development in Malaysian ICT companies. According to Benbasat, Goldstein & Meeds (1987), the advantages of employing case study research are: (i) the researcher can study the topic in a natural setting, and generate theories from practices, (ii) the case study method allows the researcher to answer 'how' and 'why' questions, that is to understand the nature and complexity of the process taking, and (iii) a case study approach is an appropriate way to research an area in which few previous studies have been conducted.

Furthermore, case study method is used in order to understand the phenomenon under research and interpret the respondents' experiences and beliefs in their own terms (Gilmore & Carsen, (1996). Yin (1994, page 23) pointed, "a case study is an empirical inquiry that investigates a contemporary phenomenon within its real context, when the boundaries between phenomenon and context are not clearly evident and which multiple sources of evidences are used". This triangulation process will increase the meaningfulness of study and make the evidence more convincing (Cresswell, 1998).

This study employed multiple-cases approach because the evidence from multiple-cases is often regarded as more convincing and strong than a single case study approach. According to Benbasat, Goldstein & Meeds (1987), "multiple-case approaches are desirable when the intent of the research is description, theory building or theory testing. Multiple-case approaches allow for cross-case approaches and this allows for more generalization and transferability from the single-case approach". The single case analysis involved identifying and extracting key issues for each company in this study. Within case analysis involved detailed case study write-up for each case.

In this study, 35 engineers from 3 ICT companies were chosen based on their involvement in organizational projects. Interviewing was used as the principle method of investigation. Nahapiet and Ghoshal's model (1998) informed the research, rather than asking direct questions about all the three dimensions under social capital, the respondents were asked questions that encourage them to speak openly about their opinions, views, and experience. For instance, they were asked about their relationships with other team members, and the medium and frequency of interactions. Interviews were open and flexible and all were tape recorded, transcribed, and coded against the dimensions suggested by Nahapiet and Ghoshal (1998). To aid consistency, interview data was initially coded, based on the coding of social capital developed by us.

## 5. Findings and Discussion

This study helps us understand the complex process in which outcomes expectation of social capital influence intellectual capital development among engineers. The results indicate that all social capital dimensions have a significant impact on the development of intellectual capital.

*5.1 Structural Social Capital*

The structural dimension of social capital refers to network structure or connection between actors (Nahapiet & Ghoshal, 1998). It consists of the number of people in the network and the way they gain knowledge to develop or gain access to intellectual capital. The data provide evidence that there were cross functional networks among the engineers as they were chosen from different departments and have diverse skills and knowledge. Formal activities carried out when working in a project (for example; meetings, presentations, briefings, and workshops) cultivate the opportunity for knowledge sharing among the team members. Hence, formal activities are perceived as a focal point connecting the team members.

Based on the interviews, meeting is seen as important because it creates the opportunity for the team members to share knowledge and hence developed their intellectual capital. One of the interviewees mentioned that:

*This project involved many people from other departments; sometimes I don't know some of them. I discovered that this meeting is useful for me as I know who is responsible for what, it makes it easier for me to ask the person concerned if problems occur.*

In line with the argument that network closure would be more likely to promote the sharing of resources (Nahapiet & Ghoshal, 1998; Coleman, 1990; Bourdieu, 1986), our findings suggest that in a project context, close network which is a result of organisation as institutional setting is important for the sharing of knowledge (Moran & Ghoshal, 1996). It can be posited that closure or density of the group is necessary realistic in a project context for example through formal interaction such as periodic meeting in which the leader seeks the input of employees, hence knowledge can be shared (Bartol & Srivastava, 2002).

Findings also suggest that previous interaction helps the engineers to have connection or relationship which can be transferred to another setting. It was also apparent that engineers had favoured to return to the team members who had behaved flexibly in the past. Their perceptions were that it was of obvious benefit to be in a position where they had previous experience of working together. The quotes below indicate their concerns.

*I would say that it is much easier to work with somebody that you know or have been working together before rather than a total stranger…because you don't know what to expect.*

*I find it easier to interact with the team members if we had worked together in the previous project. Furthermore, I will know better about their expertise.*

*We went for a two weeks training together. I guess I know her much better than before. I am quite 'OK' with her compared to others.*

Consistent with the previous studies (Newell *et al.,* 2004; Koskinen *et al.*, 2003), project members can use existing social capital that has been built up over time through previous involvement in other projects, job rotation or other relations such as training and workshop. These socialization activities lead to the conversion of new tacit knowledge into the existing tacit knowledge. In addition, individual tacit knowledge will communicate through this interaction process. This is in line Lee & Yang (2000) who suggest that interaction process will lead to knowledge innovation in the organisation. Knowledge innovation is one of the most important activities in knowledge management.

Findings from the interviews also suggest that most of the knowledge sharing entailed a significant amount of face-to-face or at least telephone interaction. Researchers have confirmed that face-to-face meetings are the key driver for knowledge transfer and crystallisation of new ideas, and are the best method for the manifestation of alternative opinion (Swan *et al.*, 1999; Bennett & Gabriel, 1999). The finding from this study confirms that complex information is transmitted face-to-face in an office. In line with the media richness theory, preference for face-to-face interaction is due to a need for clarity, understandability, facial expression and feedback. Media richness theory also argues that people use less Computer Mediated Communication (CMC) compared to face-to-face communication especially if the required knowledge is complex.

However, the findings from this study also suggest that apart from face-to-face interaction, the younger members aged 35 and less prefer to use CMC. Although most of the participants were provided with fixed telephones, the younger generation, preferred to use mobile phones, and it was assumed that this preference was associated with the text message facility. The following quotes indicate their views:

*Sometimes, when I was with my clients and they asked me about things that I was not sure of, I just called or sent a text to my colleagues*

*I prefer to use text messages ... I don't know… everybody use text messages … I find it convenient.*

*I prefer to use text messages, I don't know…everybody use text messages…I find it convenient.*

In terms of position or hierarchy, findings from the interviews indicated that the interviewees internalised a feeling of vulnerability from the status they held in the project. Consistent with suggestion by De Long & Fahey (2000) that status differentiation can lead to 'silo mentality' which encourage employees to spend time defending their unit's perspective and an overall unwillingness to express ideas. Consequently, engineers accepted the prevailing norms of behaviour which emphasised status differences such as senior and junior. Status different among the engineers can also hamper their willingness to contribute their knowledge for the project. For example, they were suspicious of others looking at them as not competent or blaming them for failure that they had no chance of avoiding. Indeed, the interviews revealed that status differences, and the team members' actual roles in the project or in the workplace generally, did affect their interaction, as indicated by the following quotes:

*Sometimes, I feel afraid to talk because if I give suggestions, and it turns out to be unconstructive, people will put the blame on me.*

*The team members never asked me, so, I would just keep quiet. I don't know when the management would change and want to listen to us.*

The findings are similar to Wasko & Faraj (2000) that individuals are less likely to contribute when they feel their expertise to be inadequate. On the other hand, by asking for help, an individual may fear looking incompetent and thus suffering a blow to his or her image (Edmondson, 1999). Brown (1990) contends that asking for help, admitting errors, and seeking feedback illustrate the kinds of behaviour that could pose a threat to face. In addition, the unwillingness to express one's ideas and knowledge for fear of being criticised also characterises an environment in which diversity of opinions and perspective is devalued or altogether not valued. Unfortunately, network structure properties such as hierarchy and status may hamper the development of intellectual capital (Nahapiet & Ghoshal, 1998)

*5.2 Cognitive Social Capital*

Cognitive capital refers to the shared representation and systems of meaning among parties. It enables the network actors to share a common understanding to the achievement of common goals and outcomes (Inkpen & Tsang, 2005). However, it requires the ongoing dialogue of shared meanings among parties. Cognitive effect of social capital on intellectual capital was fostered by the existence of a shared engineering culture and language (Koruna, 2004). Interestingly, when asked whether they expect other members to reciprocate in the knowledge sharing activity, most of the team members from the three companies responded by saying:

*Some of the team members do not understand me, probably because of the jargon that I used. Only engineers will do.*

Similar to Koruna (2004), the findings of this study indicate that engineers developed and institutionalized their owned 'language' obstructing and complicating conversation with other team members. In line with our expectation, shared language has a significant impact on the intellectual capital development.

Furthermore, findings from the interviews also suggest that area of expertise inhibits the ability of the engineers to communicate beyond their boundaries and discipline. They are also reluctant to accept others' opinions and suggestions. Koruna (2004) mentioned that this is the engineers' syndrome who always rejected ideas from outside.

*5.3 Relational Social Capital*

Engineers could generate relational capital based on the resources and capabilities housed within the organisation. This finding seems to provide support to the argument that relationship may not be developed in organisational project context due to short term relationship, lack of shared history, infrequent interactions, lack of co location, and lack of co presence (Cohen & Prusak, 2001; Nahapiet & Ghoshal, 1998; Nohria & Eccles, 1992). However, despite the lack of relational capital, engineers still share and disseminate knowledge when they are structurally embedded in a network. Surprisingly, engineers do not expect others to contribute, nor do they expect help in return. This is because among the engineers, reciprocity norms were not important in governing relationship with other team members. Engineers were willing to do extra work because they believe it is their duties and responsibilities. It is evident in the statements below:

*I will share what ever I know with the senior staff. After all, this is my responsibility to make sure the project is successful.*

*We always discussed together. I want my staff to come and see me often. They can ask whatever they want regarding the systems.*

*Sometimes you cannot do the task on your own without collaborating with other partners. We can get things done quickly if we work together.*

This is in line with the suggestion by Putnam (2000) that some people will help other "without expecting anything immediately in return and perhaps without even knowing you, confident that down the road you or someone else will

return the favour." The interviews revealed that engineers help others in the team not because they expect something in return from the same person. Some of them mentioned that they help because they don't want to disappoint others and feel bad if they rejected their requests. It could be postulated that their action is due to not wanting to damage the relationship among the team members and on the other hand would just keep to them for all the consequences. However, this reciprocity may be abused when there is influence from the hierarchy (Edelman *et al*, 2004). Interviews indicate that the junior engineers were willing to share their knowledge with senior members although they do not get credit from it because of power distance or seniority.

Contrary to our expectation, trust did not have a significant impact on intellectual capital. One possible explanation may be that individuals are willing to share their knowledge due to responsibility towards the achieving goals of the project. However, this study shows that for a longer term, social interactions such as social ties, reciprocity, trust may increase individual knowledge sharing and hence intellectual capital.

Ultimately, relational capital is a property of the dyad or network that is jointly generated and owned by the engineers. Although they have the opportunity to develop the interpersonal relationship, it is still up to their initiative to establish and preserve it (Inkpen & Tsang, 2005). Moreover, these relationships are rewarded by repeated transactions due to commitment, obligation, and reciprocity. However, the culture of engineers may hamper the development of relational capital.

In summary, this study has explored the structural dimension of social capital showing how the configuration of team members as shaped by formal structure as well as informal structure assist the engineers to access to knowledge and developed their intellectual capital. This study shows that structural capital provides an opportunity for the engineers to develop a network or access to other team members. Engineers are required to be positioned in the structural network so that they can have frequent interaction with others, be more open and can understand other people. For instance, by working together in the project, it serves as an intra-network which can be further prolonged in the future. The formal meeting and informal meetings that they have attended serve as a connection with others and from there they can identify the potential members with relevant knowledge. The findings also suggest that structural capital together with relational capital helps to promote the development of interpersonal relationship among the engineers. Having said that, both prior history of relationships (Krackhardt, 1992), and opportunity for frequent interactions are requirements for the development of relational capital. These in turn encourage the development of intellectual capital. However, cognitive capital plays a role only among engineers but not with other team members as 'language and culture 'of the engineers hamper their ability to communicate with others.

## 6. Implication for Research and Practice

The findings indicate that the roles of organisations are to ensure that the engineers are structured carefully to build further relationship. They can provide place enablers for the engineers to enhance their relational capital. It should also be possible to develop richer theory of institutionalisation, one that explicitly addresses both the regulations and enabling roles for social capital development. The reason is social capital need to be developed among the organisational members and it can be managed (Llewellyn & Armistead, 2000). However, once developed it can die if not maintain.

Dimensions of social capital positively relate to the development of intellectual capital. This research contributes to an overall conceptual understanding of the nature and important of intellectual capital development. Indirectly, this study also contributes to knowledge sharing theory. Our findings suggest that dimensions of social capital are helpful in identifying the determinant of intellectual capital development.

The results indicated that social capital dimensions are significant predictor of individual intellectual capital. Managers interested in managing the intellectual capital development should develop strategies or mechanism to encourage the development of social capital among engineers. For example, the company should encourage frequent face-to-face interaction and encourage knowledge sharing through virtual communities. It is also important to ensure that engineers have an understanding and appreciation for the business in building social capital among them.

Collaboration should be encouraged by restructuring structural capital. For instance engineers should mingle with other staffs, share their expertise and learn to accept other team members' ideas and opinions. Management also can invite experts in different field to give talks to them so that they will be more open and knowledgeable in other field as well. The findings also revealed that younger engineers are more open and willing to accept others' opinions and ideas compare with the senior or older engineers. Thus, to motivate younger engineers, they should be given motivating rewards such as encouragement or praise.

## 7. Limitation and Suggestion for Future Research

This study has limitations. First, the findings could not be generalized to all types of professional and other industries such as manufacturing and service. Therefore, further research is necessary to verify the generalisability of our findings. Second, this study is based on the cross –sectional data collection. While social capital and intellectual capital

development requires time and history of interactions, ideal empirical design would be a longitudinal study in order to capture the dynamic interrelationship of social capital dimensions and its impact on the development of intellectual capital.

**8. Conclusion**

The aim of this paper is to develop further the idea of intellectual capital development among the engineers within the social capital perspective. This study confirms that engineers are required to have social capital in order to develop their own intellectual capital. Our research findings confirm Nahapiet & Ghoshal's framework (1998) that social capital embedded in structural relationship, is the key intellectual capital development among engineers. Our findings allude that social and intellectual capitals are co-evolve. Apparently, the finding found that engineers are more comfortable when dealing with engineers. Their cognitive capital is only developed among engineers and it hinders them from accepting "outsider' opinion. Therefore, in order to enhance their career development, engineers have to strengthen their relational capital with other organizational members.

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# Student User Satisfaction with Web-based

# Information Systems in Korean Universities

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**Abstract**

Despite of the rapid adoption of computer-based information systems in higher education in Korea and their increased importance both in education/research activities and administration, there have been few studies on whether these campus-wide information systems (CWIS) are being effectively used from the student user' point of view. This study tests a modified model developed for this study based on previous literatures to measure student user satisfaction of the information systems. It was found that information and system satisfaction significantly affected the overall user satisfaction with CWIS.

**Keywords:** Campus-wide information systems, User satisfaction, End-user computing satisfaction

## 1. Introduction

Computer-based information systems, at various levels of sophistication, have contributed a great deal to today's higher education, let alone to various research activities. Information systems that process data into information in a meaningful format to the end users have become an inevitable component especially for knowledge-related activities in a rapidly changing techno-societal environment. Not only computer-related studies but other fields have to make use of fast campus LAN and applications through the network.

Universities in general adopt most advanced technologies such as computer systems and keep on upgrading as new technology arise. As a result, universities as such are likely to have technological 'melting-pot', with centralized legacy systems connected somehow with different versions of latest solutions. Legacy systems that used to automate administrative transactions in earlier stage would create problems of interoperability with prevalent web-based systems today. Old systems can hardly solve the diversified information needs in campus today. Lee et al. (2009) pointed out that it is urgent for Korean universities to overhaul the existing computer systems, so that they might compete with the rest of the world in a fast globalizing world, while enhancing the quality of their educational services.

In Korea, Government has taken a strong initiative in educational informatization drive since early 90's, initially to cool off the nation's private education fever. Educational reform over decades also centered around the provision of equal educational opportunities throughout the various income strata. The Internet and advanced IT of the nation contributed largely to this effort. Government funded various levels of educational institutions to develop integrated information systems that were web-based. Divisional systems were integrated to an integrated system through the fast network, and ordinary users could exploit the system for their own good (Etnews, 2006a, b).

Information systems, after all, are to be useful enough to satisfy the end-users through     providing right information, and continual upgrading complying with technological innovations. In other words, there should be routine system evaluations and system audits to see if the system and its outputs are fully satisfied by the users.

The objective of this study is to analyze the student user satisfaction of campus-wide information systems (CWIS) in Korean universities. From the reviews of previous studies, a framework suitable to evaluate various aspects of the information systems will be discussed. Then, a measure based on it will be empirically tested over a sample for its statistical significance. The end-users of the CWIS are limited to the students in this study.

## 2. Literature Review

*2.1 Campus-Wide Information Systems*

CWISs are the computer-based systems that process various data to generate information primarily implemented in universities. From the viewpoint of data being processed, CWISs can be categorized into three groups: those handling primary data such as texts, journals, reports, various digital data, public-domain software and shareware, multimedia materials, those processing secondary resources including catalogs, metadata, journal lists, and those aiding communications including electronic mailing, electronic boards, and integrated information systems.

To be useful, CWISs need to be used effectively accomplishing the system's goal, and managed by an effective growth plan (Semiawan and Middleton, 1999). Users will perceive the value of the CWIS and the information available by the system. Strategic information systems are in need for the successful use of the systems, considering the information needs of the users in the flux of overall educational environment (Strauss, 1992).

In Korea, the first full-fledged CWIS was introduced in 1995 by Ewha Women's University, shortly followed by major universities. Since then, most campuses installed campus LANs, which facilitated the integration of departmental systems throughout the organization. The LANs were connected to the Internet, the nation's fastest growing sector, contributing greatly to the advancement of the higher education of the nation (Etnews, 2006a, b).

New IT applications automate the sequence of academic transactions from recruitment of new students to their graduation. New CWISs expedite communications within and with outside of the campus. At the same time, portal sites provide all kinds of information at a few key strokes. Not for long, electronic learning has provided education opportunities for those who cannot come to classes regularly. EDI expedites document exchanges in a secure way.

*2.2 User satisfaction*

Considering the number of computerized systems increases sharply, information systems should be evaluated somehow in an appropriate manner. Information system evaluation on how well they are effectively used, therefore, has become one of very important research topics (Harrison and Rainer, 1996). Many of previous studies suggested that user satisfaction can be a viable variable measuring the system effectiveness (Baroudi et al., 1988; Conrath and Mignen, 1990; Ginzberg, 1978; Hamilton and Chervany, 1981; Ives and Olson, 1984; Powers and Dickson, 1974). In other words, one can conclude that if the users are well satisfied with the system as they use it, then the system will be working fine. Other behavioral measures often used include system usage as a quantitative measure. In this case, information systems are developed after all to be used; therefore, frequent usages would indicate the information system's success. DeLone and McLean (1992) reported that user satisfaction has been widely employed in practice as a surrogate measure of information systems effectiveness.

Neumann and Segev (1980) found that the users' perceived satisfaction in multiple aspects of the systems was significantly correlated with their responses to the organizational effectiveness. Swanson (1974), on the other hand, identified a high level of correlation between the users' perceived system satisfaction and their applications of the system outputs. Powers and Dickson (1974) concluded user satisfaction was an essential factor for system success. Although not a single standard measure has been proposed yet, user satisfaction is a viable indicator of system effectiveness (Baroudi et al., 1988; Igbaria and Nachman, 1990).

In a pioneer study in this field, Bailey and Pearson (1983) proposed a model that took consideration of both positive and negative responses by the users about the information systems. Here a good information system is a system that the users perceive satisfaction with the key factors comprising the system. In other words, user satisfaction can be an aggregate of positive or negative feeling or attitude that has an effect on certain instance.

Galetta and Lederer (1989) defined user satisfaction in terms of his/her perception or attitude toward the information systems. User's attitude, according to Melone (1990), will be favorable or unfavorable inclination toward such dimensions of the system as computer system, applications, administration, system or application related processes. Later, the end-user satisfaction was regarded as the individual's attitude toward computer uses, or related activities required to perform tasks in an organization (Rainer and Harrison, 1993).

Sometimes, users are asked bluntly to rate their perceived overall satisfaction level on a Likert scale data. Most studies, however, suggest use of multiple variables, each of which measures a certain factor that is presumed to construct the overall satisfaction. Various literatures often quoted variables such as accuracy, content, frequency, timeliness, reliability, assistance, adequacy, accommodation, communication, accessibility, appreciation, and flexibility. It seems that different set of variables were selectively employed, depending on research objectives (Ives et al., 1983).

Doll and Torkzadeh (1988) defined user satisfaction as an emotional attitude that had five dimensions, such as content, accuracy, format, ease of use, and timeliness. They could develop a 12-item instrument, namely, End-User Computing Satisfaction Instrument, with empirically proven validity and reliability tests (Torkzadeh and Doll, 1991; Hendrickson et al., 1994). Tafti (1992) suggested information satisfaction, system satisfaction, and support-group satisfaction be

considered as key factors of the overall user satisfaction.

End-user computing typically includes spreadsheet application, database management, document writing, programming, data analyses, graphics, communications, data search, and memory support (Carr, 1988). University students, as end-users of CWISs, are more or less conducting similar activities.

## 3. Empirical Analysis

### 3.1 Research Model and Hypotheses

A research framework was explored in this study to measure the student user satisfaction with the CWIS. It is based on the previous related studies mostly applied to business firms, e.g., salient studies by Doll and Torkzadeh (1988) and Seddon and Kiew (1994). The former proposed such characteristics as content, accuracy, format, timeliness, and ease of use as the key factors affecting the systems satisfaction. The latter tested two categories to evaluate systems success: information quality and system quality. Seddon and Kiew (1994) adopted all the items developed by Doll and Torkzadeh (1988). This study prepared the 12 items corresponding to five dimensions of end-user computing satisfaction. We also expanded two more items related to system satisfaction to construct user satisfaction measure. The overall student user satisfaction can be the net feeling of pleasure as they interact with the CWIS.

The measure under consideration should be a useful diagnostic tool that will pinpoint ailing or unsatisfactory components of the system in need for further investigation from the user's perspective. Figure 1 illustrates our research model, which has information satisfaction (content, accuracy, format, and timeliness) and system satisfaction (ease of use, and user interface) as independent variables, and overall satisfaction as a dependent variable. Two hypotheses were examined as follows:

•Hypothesis 1: Information satisfaction has a significant effect on the overall user satisfaction.

•Hypothesis 2: System satisfaction has a significant effect on the overall user satisfaction.

### 3.2 Data collection

A survey using a questionnaire was conducted to the sample students of four-year universities in Seoul. We selected a few popular shopping centers where many university students come and go to efficiently obtain the various university students' survey data. A total of 245 usable responses were collected out of 250 distributed. The descriptive statistics of the respondent's demographic characteristics were analyzed and presented in Table 1.

< Insert Table 1. Here>

### 3.3 Reliability and validity assessment

The measurement items for the factors presented in this research model were derived on the basis of research into Doll and Torkzadeh (1988) and Seddon and Kiew (1994). The Cronbach's alpha coefficients ranged from 0.654 to 0.813 were more than the acceptable minimum level of 0.6 in all the items (Nunnally, 1978). The alpha coefficients of measurement items for each construct are presented in Table 2.

All the items measured in the survey were subjected to confirmatory factor analysis. The goodness-of-fit of the measurement model was evaluated using a variety of indices. The result of the confirmatory factor analysis is presented in Table 2. We assessed the overall goodness-of-fit using the chi-square test. The chi-square test assesses the adequacy of hypothesized model in terms of its ability to reflect variance and covariance of the data. Due to its tendency to be sensitive to sample size, other fit indices (e.g., GFI, NFI, TLI, and CFI) were considered in conjunction with the chi-square. For the statistical significance of parameter estimates, t-values were used. The results of confirmatory factor analysis revealed chi-square of 60.17(p<0.01), goodness-of-fit index (GFI) of 0.94, normed fit index (NFI) of 0.92, Turker-Lewis index (TLI) of 0.90, comparative fit index (CFI) of 0.94, and root mean square error of approximation (RMSEA) of 0.10. Generally, fit statistics greater than or equal to 0.9 for GFI, NFI, TLI, and CFI indicate a good model fit (Bagozzi and Yi, 1988; Mulaik et al., 1989). Furthermore, RMSEA values ranging from 0.05 to 0.1 are acceptable (Steiger and Lind, 1980); therefore, the RMSEA suggested that the model fit was acceptable. Reviewing the fit indices in Table 2, we noted that all the fit indices indicated a well-fit.

< Insert Table 2. Here >

< Insert Table 3. Here >

We also conducted the test of convergent and discriminant validity. For assessing the validity, the fit of model, statistical significance for each standardized path coefficient, composite reliability (CR), and average variance extracted (AVE) were utilized. All the standardized path coefficients for the items were significant (t>1.96) and the CR values were higher than 0.7, as shown in Table 2 and Table 3, which suggested that convergent validity of the scale was satisfied (Anderson and Gerbing, 1988).

According to Fornell and Larcker (1981), the AVE should be greater than the square of the correlations between

constructs. As shown in Table 3, the square of the correlations between the construct and any other construct in the model were all smaller than the AVE values, which indicated that discriminant validity was satisfied. The results, therefore, confirmed that the instrument had satisfactory construct validity.

*3.4 Hypothesis testing*

The hypotheses tests to identify factors that affect the overall user satisfaction with CWIS were conducted through a regression analysis. The results of the analysis suggest that 50.4% of the variation in overall user satisfaction can be explained by the students' information and system satisfaction. All the hypotheses were supported at the 0.01 level of significance (See Table 4).

It seems that information satisfaction relatively more affects overall user satisfaction than system satisfaction. In other words, the direct benefits obtained from the outputs of the system in terms of context, accuracy, format, and timeliness are more important than ease of use and user interface related to system satisfaction.

< Insert Table 4. Here>

As such, it was confirmed by this study what needs to be done of CWIS to be effective, or perceived to be satisfactory from the end-user's point of view. First, student user expects CWIS to provide information that is accurate, timely, in a useful format, and of up-to-date content. Also, they want the system to be friendly enough to cause little stress when using the system. This finding suggests that system interface design be given proper attention in development stage.

**4. Discussion and Conclusion**

Today's fast IT progress and its impact on the various aspects of social dynamics naturally demand the rise of creative people, capable of accessing to diverse information sources, then processing, and communicating the information as needed. Higher education, at the same time, needs to shift from the current supply-oriented to demand-oriented services that stress vigorous use of IT and self-teaching available through the Internet. In this venue, web-based information systems will perform a major role in different levels of education.

In general, problems with IS remain unnoticeable until they cause the system to fail. Routine system evaluation along with surveys of the users' information requirements, therefore, is vital for the system to succeed (CSUP, 1992; Darby, 1992; Fleck and McQueen, 1999). System evaluation is one of the main phases of system life cycle.   However, most Korean universities would put more emphasis on technological upgrading of portal sites, data processing, and campus network. Considering that the main objective of CWIS is servicing for the user's information requirements, routine system evaluation on how student users feel about the system should be paid due attention.

This study is to develop a reliable measurement that evaluates the end-user satisfaction, based on some satisfaction factors found in the previous studies. According to the related literature, factors that comprise the user satisfaction include, first of all, the output information in terms of content, accuracy, format, and timeliness. In other words, the users will be satisfied if the system output is appropriate, correct and in a desirable format. Also, the users will be satisfied, depending on the operation of the system itself. The system should be easy to use, equipped with friendly interface. Systems should accommodate the different levels of understanding by the users. User interface needs to be comprehensible, and visibly attractive to the users.

This study reviewed previous studies on the user satisfaction, mostly done for business firms so far, and generated a modified framework that was applied to student users of the CWIS. By relating the five dimensions proposed by Doll and Torkzadeh (1988) with factors of information and system satisfaction (DeLone and McLean, 1992; Seddon and Kiew, 1994), a new conceptual framework was proposed, which then was tested for student users of Korean universities. The 14-item measure corresponding to six dimensions of user satisfaction with campus-wide information systems was examined to be a viable diagnostic instrument for information systems evaluation. In other words, user's overall satisfaction over a period of time measured by the instrument may lead to an in-depth system analysis, or system audit for upgrading. At the same time, the satisfaction scores measured along the different dimensions of the system may provide a clue that relatively unsatisfied areas may be confronted with problems for further inspection. In this way, the measure by this study will contribute to the operation of more satisfying information systems. It is hoped that similar studies will follow for universities in other countries as well.

The major limitation of this study is that the sample size is small. Thus limiting the extent to which the finding of this study may be generalized. In spite of the small sample size, it is likely that the views of the respondents are representative of student users in Korean universities. The study was carried out in Seoul, a major Korean educational hub. Further research may consider comparison of the results of this study against a larger sample.

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Table 1. Demographics of respondents

| Measure | Item | Frequency | Percentage (%) |
|---------|------|-----------|----------------|
| Gender | Male | 142 | 58.0 |
| | Female | 103 | 42.0 |
| Grade | Freshman | 37 | 15.1 |
| | Sophomore | 73 | 29.8 |
| | Junior | 84 | 34.3 |
| | Senior | 51 | 20.8 |
| Major | Human and Art | 51 | 20.8 |
| | Social science | 189 | 77.1 |
| | Natural science and Engineering | 5 | 2.0 |

Table 2. Measurement model assessment

| Construct | Item[a] | Path coefficient | t-value | Fit indices | Cronbach's alpha |
|-----------|---------|------------------|---------|-------------|------------------|
| Information satisfaction | Con | 0.79 | 13.49[***] | $\chi^2$= 60.17 (p-value=0.00) df=17 GFI=0.94 | 0.779 |
| | Acc | 0.69 | 11.37[***] | | |
| | For | 0.68 | 11.14[***] | | |
| | Tim | 0.62 | 9.99[***] | | |
| System satisfaction | Eas | 0.69 | 10.43[***] | NFI=0.92 TLI=0.90 | 0.654 |
| | Int | 0.71 | 10.68[***] | CFI=0.94 | |
| Overall satisfaction | Sat1 | 0.84 | 14.76[***] | RMSEA=0.10 | 0.813 |
| | Sat2 | 0.82 | 14.50[***] | | |

[***]$p<0.01$, a: <u>Con</u>tent, <u>Acc</u>uracy, <u>For</u>mat, <u>Tim</u>eliness, <u>Eas</u>e of Use, User <u>Int</u>erface

Table 3. Construct validity

| Construct | Mean | Standard deviation | Correlation between constructs | | |
| --- | --- | --- | --- | --- | --- |
| | | | Information satisfaction | System satisfaction | Overall satisfaction |
| Information satisfaction | 4.127 | 0.758 | 1.000 | | |
| System satisfaction | 3.952 | 0.966 | 0.508 | 1.000 | |
| Overall satisfaction | 3.937 | 0.984 | 0.642 | 0.588 | 1.000 |
| Construct reliability (CR) | | | 0.790 | 0.658 | 0.816 |
| Average variance extracted (AVE) | | | 0.487 | 0.490 | 0.689 |

Note: All correlations are significant at the 0.01 level.

Table 4. Regression analysis

| Model | Unstandardized coefficients | | Standardized coefficients | t-value | Sig. |
| --- | --- | --- | --- | --- | --- |
| | B | Standard error | Beta | | |
| Intercept | 0.042 | 0.256 | | 0.163 | 0.871 |
| Information satisfaction | 0.600 | 0.068 | 0.462 | 8.793 | 0.000*** |
| System satisfaction | 0.359 | 0.054 | 0.353 | 6.771 | 0.000*** |
| $R^2$=0.504,    F=122.922, Sig. F= 0.000*** | | | | | |

*** $p<0.01$
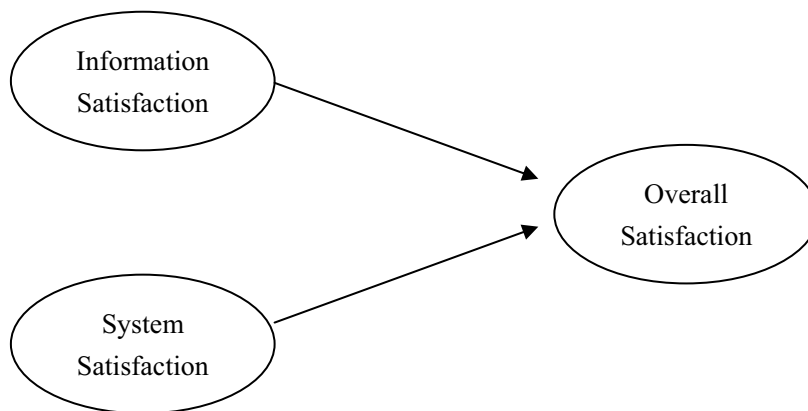


Figure 1. Research model

# Research on the Approaches of the participation of China's SMEs in International Trade under Financial Crisis

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**Abstract**

Over the past 30 years, China's rapid growth of economy has been benefited from the tremendous contribution of SMEs, especially in foreign trade. However, the greatest impact of the financial crisis on China is on exports, and SMEs unavoidably is suffering hardest hit from it. Therefore, it is necessary to examine how SMEs participate in international trade under the new environment thereby contributing better and faster development to our economy. After the analysis of the development of SMEs in international trade, it has been drawn that the current trend of the overall development of SMEs in China is good, but there existing some internal problems, which will cause SMEs facing unprecedented challenges and opportunities in the financial crisis .As a result, SMEs should take the approaches to participate in international trade, such as adhering to independent innovation to enhance the market competitiveness of products; taking the use of operating flexibility to seek for new market space; taking full advantage of new tools to explore international market space; paying attention to avoiding trade barriers, and actively responding to anti-dumping lawsuits; actively investing abroad to conduct transnational business, etc., by which SMEs will soon be out of difficulties and fundamentally improve the depth and level of participation in international trade

**Keywords:** SME, Financial crisis, Participation in international trade

## 1. Development of SMEs in International Trade

SME is the important part of GDP throughout of the world, and China's rapid growth of economy also benefited from the tremendous contribution of SMEs over the past 30 years. Until June 2007, China's total number of SMEs has reached more than 4200 million, accounting for 99.8% of the total number of national enterprises, including more than 430 million small and medium enterprises registered by the business sector, and more than 3800 million self-employed households, which accounted for 76.6% of total employment, 64.5% of industrial output value, especially 68% of total merchandise exporting value. Thus, SMEs has become the main force of China's economic development and exports as well. However, the greatest impact of the financial crisis on China is on exports, and SMEs unavoidably is suffering hardest hit from it. Therefore, it is necessary to examine how SMEs participate in international trade under the new environment thereby contributing better and faster development to our economy. In recent years, more and more SMEs have been "going out" to expand overseas market, which has driven China's economy further to the market-oriented transition to large extent, and caused China's economy integrating with the world economy more and more closely.

*1.1 Growth of Exports of SMEs*

Since the reform and opening up, China has got sustained and rapid development of foreign trade, total value of exports increasing from 20.601 billion U.S. dollars of 1978 to 2.1738 trillion U.S. dollars of 2007 with average annual growth rate of 14.77%, so exports have become one of the most important factors to push national economy, obviously the exports growth rate of SMEs in China also remains high for a long time. Department of SMEs of National Development and Reform Commission chose some small and medium enterprises as samples for analysis and research to form "Research report of export-oriented SMEs" which has been registered in the State General Administration of Customs from 2003 to 2005, with total value of exports from the one million to 20 million U.S. dollars and annual growth rate of over 25%. The report showed that the value of China's exports in 2005 amounted to 761.999 billion U.S. dollars, and SMEs' exports reached 518.159 billion U.S. dollars, accounting for 68% of total exports. Since most of our export enterprises are SMEs, export orders index of PMI index can be selected to reflect the export situation of China's SMEs.( MENG Shan-shan, 2007)If the export orders index is above 50%, it will indicate the export expansion for a period of time, and opposite is true. From January 2005 onwards, the export orders index had maintained at above 50%, while with the gradual expansion of the financial crisis emerged in US. In 2007, the exports of SMEs have declined more and more quickly.

As shown in Table1, in January 2008 the export orders index was 49.0%, which has dropped to below 50% for the first time since January 2005. Especially since from September 2008, PMI index began to decline, driving the export orders index to fall down in November 2008 to the lowest of 29%, which reflected China's external demand being further weakened. Although the index has rebounded gradually since then and rose to nearly 50% in April 2009, export enterprises in China especially SMEs are still being confronted with a severe test.

*1.2 Composition of exporting products of SMEs in international trade*

At present most of exporting goods such as textile and garment, footwear, toys, luggage and other light industrial products, household plastic products and metal hardware, etc. are almost provided by SMEs. In recent years, SMEs are also actively involved in exports of high-tech and higher value-added products such as machinery equipment, electrical and electronic products, and chemical products, etc., and the proportion of SMEs in these three products has respectively amounted to 35%, 14.53% and 12.05%,rapidly growing trend being sustained. However, generally speaking, the structure of exporting goods of SMEs is still irrational, a long way for innovation and research to go. Most exporting products of SMEs are mainly resource-intensive and labor-intensive ones, therefore, the irrational structure of exporting products has brought a lot of obstacles to the survival and rapid development of SMEs. Though the state has strongly advocated "Improving trade with science and technology," but the improvement of exporting high-tech products was not obvious. According to statistics, the proportion for China's SMEs to invest in technology development is less than 40% of the national research funding, far below the level of 70% in developed countries. In particular, most private small and medium enterprises mainly rely on "imitation technology innovation" to develop, which involves small investment, short cycle, and quick pay back, but because of the ambiguity of property rights and low barriers to entry, enterprises do not have obvious advantages, and the additional value of the products produced by them is often low.

*1.3 Regional distribution of exporting SMEs and destination countries of exporting goods*

Exporting SMEs are mainly located along the coastal areas, from Bohai gulf centered by Shandong, and Liaoning, Yangtze River Delta centered by Zhejiang and Jiangsu, to the Pearl River Delta centered by Guangdong and Fujian, which have taken full advantage of the window status to and actively guide SMEs to take the road of export-oriented economy, thereby promoting the continuous development of the regional economy. Exporting destination countries mainly concentrated in the United States, Japan, Europe and other countries, which are the main trading partner of China for a long time, while the worst affected areas by the present financial crisis are Europe and America, which caused tremendous obstacles to the export of SMEs. So SMEs should actively explore new markets in order to avoid the risks of financial crisis. According to statistics of customs, in the first 8 months of 2009, the total value of bilateral trade between China and Brazil has amounted to 25.41 billion U.S. dollars, Brazil ranking as one of China's top 10 trade partners so far. (Fenxi Mining, 2009)

In view of the status above mentioned, the current trend of the overall development of SMEs in China is good, but there existing some internal problems, which concluding low level of technology, irrational export structure, concentration of destination of exporting countries, and weak anti-risk ability. Therefore, SMEs of China are facing unprecedented challenges with the internal problems together with the high degree of harm of the financial crisis, but opportunities also existing side by side.

## 2. Opportunities and Challenges Faced by SMEs in International Trade under the Financial Crisis

*2.1 Challenges*

2.1.1 Reduced demand for exports leading SMEs inadequate production

With proliferation and the severe impact of the U.S. sub-prime crisis, the world economy further slows down. The sluggish consumption growth in the United States and Europe, and the weakened importing demand lead to marked drop in the exporting growth of SMEs especially in processing trade, and varying degrees of reduction in exporting orders. Statistics shows that China's exports to U.S. will decrease by 4% whenever the economic growth of U.S. drops by 1%. According to the statistics from General Administration of customs of China, in 2008, the total value of bilateral Sino-US trade amounted to 333.74 billion U.S. dollars, growing by 10.5% compared with 2007, which reaching the lowest growth rate during the seven years after entry into WTO. And the exporting value of China to the U.S. was 252.3 billion U.S. dollars at an increase rate of 8.4%, which dropping to single digit the first time in seven years. Facing the sharp reduction in orders, the unique countermeasure many companies can apply is to "Produce as orders", i.e. Stopping production without orders, expectant. As the result of limited production, a large number of raw materials companies had purchased have been piled up in warehouses, together with many machinery and equipments, most SMEs have to maintaining a simple production in order to retain workers. In short, considerable number of enterprises is working under capacity. **(**Chen Lijin**, 2009)**

2.1.2 Financing difficulties causing a serious shortage of working capital

Most SMEs are in urgent need of funds in the early stage of development and access to rapid growth period. However, due to financing difficulties, enterprises can not acquire the large amount of fund needed for development. Even with the current turmoil global financial system and the banks non-performing assets increasing substantially, banks will raise credit standards in order to avoid risks, which would cause business loans and consumer credit more difficult, as the result of the deficiency of the SMEs, small scale, poor ability to resist risks, short life and low level of credit Banks would provide more strict loan conditions to SMEs comparing with large enterprises for consideration of reducing credit risks which would cause the community reducing aggregate demand and the macro-economic environment deteriorate, and then SMEs would be lack in orders or even stop production or semi-cut-off.

2.1.3 Economic efficiency decreasing significantly

According to the survey on nearly 2,000 key enterprises by Ministry of Commerce of China, during the first half of 2009, average export profit margin is only 1.5%, decreasing by 6.2%, part of exporting SMEs facing difficulties, which is mainly reflected in the following facts, Firstly, export growth rate of SMEs lowering as result of sharply reducing overseas orders; secondly, SMEs being at the edge of loss because declining cost of export swap rate can not keep up with the appreciation of exchange rate; thirdly, profit margin of exporting SMEs has been severely squeezed with the superposition effect of the changes of tax refund rates, exchange rates, interest rates, raw material prices, labor costs and the monetary policy environment. Since most exporting enterprises of China belong to processing SMEs, already in the end of industry value chain, with the weak ability of price transfer, it is difficult for enterprises to cover operational costs through increasing prices and profit margins of them are further squeezed. in buyer's market.

*2.2 Opportunities*

Despite enormous difficulties faced by SMEs, opportunities of development also come so that SMEs should seize these opportunities to continue development in the new platform.

2.2.1 Opportunities of global industrial transfer

After the outbreak of the financial crisis, the pattern of the world economic development needs to be re-adjusted. From the perspective of the manufacturing sector, the current global manufacturing industry mainly lies in North America, Europe and East Asia, and East Asia represented by Japan and South Korea. At present, China's manufacturing industry occupies an important position in the world, second-largest manufacturing great-power, accounting for 13.2% of that of the global value, but still far below the 20% share of the United States. However, after the hit of financial crisis, the United States, European Union, Japan and other developed economies will fall into recession in 2009 or the edge of a recession, so that the manufacturing industry in developed countries will undoubtedly accelerate the speed of transfer to developing countries to offset the adverse effects on local economy, which will help speed up the formation of China's "world factory" and bring a historic opportunity for the development of manufacturing industry. So far, despite a cyclical downturn of macroeconomic trends faced by China, the degree of the manufacturing sector still remains at a high level. Therefore, after the financial crisis of the industrial structure adjustment, China will strengthen its manufacturing center, and in the near future is likely to replace the U.S. as the world's largest manufacturing base, by which SMEs can get greater share of international trade in the global industrial transfer to drive China's economy out of shadow of the financial crisis.

2.2.2 Opportunities of industrial upgrading

With the development of economic globalization, new industrial revolution and the core technologies is providing an opportunity of "reshuffle" to help backward countries achieve economic development by leaps and bounds through the development of new leading industries. The long-term development of export-oriented SMEs in China and the problems, (such as the low level of technology, mainly engaged in processing trade and low value-added products) focusing in the current financial crisis make China's SMEs in an urgent need to conduct industrial upgrading in process. Thus, we must seize the current favorable opportunity to actively undertake the transfer of global industry and accelerate the optimization and upgrading of industrial structure to achieve sound and fast economic development, which is bound to provide unprecedented opportunities for the development and innovation of China's SMEs and new opportunities for China's industrial and product upgrading.

2.2.3 Opportunities of favorable domestic policies

In order to help SMEs cope with the financial crisis, in 2008,the central and local governments of China have adopted a series of policies and measures to secure steady and rapid development of SMEs, such as improving export tax rebate rate of some labor-intensive products, guiding the SMEs credit guarantee institutions to make greater effort to ease the difficulties of production and management for SMEs activating a package of over 4 trillion yuan construction plans to promote economic development. In addition, the commercial banks have also introduced new measures to support SMEs' development, such as simplifying procedures of small business loans, separately arranging credit scale,

satisfying the liquidity needs of SMEs complying with industrial and environmental policies. With the implementation of the above-mentioned policies, SMEs will get tremendous opportunities for development. (NELSON K. H., 2003)

Therefore, SMEs should actively take advantage of these policy supports and resource to create conditions for the government loan assistance, further expand exports and strengthen their leading role in driving China's exports.

## 3. Approach Choices of SMEs' Participation in International Trade

### 3.1 Adhering to independent innovation to enhance the market competitiveness of products

It is often ineffective for SMEs to survive only by the simple strategy to reduce prices owing to their small-scale, low level of technology and weak market capacity. Only if SMEs implement their own innovative strategies, take the way of ""small but specialized, specialized but tertiary", manage to raise the added value of products, enhance market competitiveness and create differentiated products, would they get rid of difficulties to expand their own market space. Firstly, fully understand the importance of innovation. Many SMEs do not really recognize the importance of innovation and R & D, usually putting production and operation income in the first place while ignoring long-term development of enterprises. Therefore, it is much important to work out relationship between production and R & D. Secondly, orient the innovation of SMEs to market demand. R & D and innovation are aimed at better development of SMEs in the future market competition for them to occupy a dominant position to get more profit. Therefore, all innovation and R & D need to carry out according to the actual needs of the market. Thirdly, obtain innovative technologies outside SMEs through introduction, cooperation and mergers. SMEs can get access to innovative technologies after the correct assessment on the market, its capacity and partners through introduction, cooperation and mergers. (HUANG Bin FANG , 2009)

### 3.2 Taking the use of operating flexibility to seek for new market space

Due to less restriction of traditional economic system, SMEs are strongly interest-driven and market-oriented with flexibility and variability, which request SMEs own a large number of daring entrepreneurs who can take full advantage of their own strengths and market opportunities to develop their business with the absolute control over companies and rich industry knowledge. Additionally, with a strong innovation and pioneering spirit, they can rapidly adjust business decisions to adapt to new economic requirements of the times to come into the market areas usually ignored by large enterprises, as which there existing characteristics as short product life cycle, low but stable profits, inadequate market capacity, and small quantity of production. At present, exporting goods of SMEs are mainly distributed in the United States and Europe, which were badly hit by the financial crisis, so SMEs should actively explore new markets, actively stepping out the shadow from the financial crisis.

### 3.3 Taking full advantage of new tools to explore international market space

During the global economic crisis, facing the situation of shrinking export markets, many SMEs have to tighten expenditure thereby changing the traditional sales methods in order to reduce marketing costs, which concerns that SMEs can acquire complete information quickly through e-commerce, greatly reducing the search costs and improving the efficiency of the search; find suppliers on line to reduce purchasing costs and improve the international market competitiveness of products and expand overseas market through searching purchasers on line. According to "2009 Annual Report on the development of Network enterprises" issued by Alibaba, after 10 years of development, network enterprises of China have gradually realized the integration with the mainstream of socio-economic system. Till the first half of 2009, the amount of China's network enterprises has been expanded to 63 million, with the growing social impact. Thus, SMEs can make use of e-commerce to help enhance mutual exchanges, and to gain more effective means than traditional means of marketing channels to expand the volume of foreign trade.

### 3.4 Paying attention to avoiding trade barriers, and actively responding to anti-dumping lawsuits

Since small differences of exporting goods of the majority of SMEs in China led to the situation of export order in chaos and dramatic price competition, when SMEs were expanding overseas rapidly, they have been exposed to an increasing number of barriers to trade, anti-dumping lawsuits and intellectual property litigation. At present, due to the impact of financial crisis on the global trade, countries are expected to protect their own economy by stimulating domestic demand or taking import substitution measures, while most exporting goods of China's SMEs are labor-intensive, low value-added and easily substitutable, so China's exporting goods ran into hardest hit by trade barriers. (Ruta Aidis, 2005)

As shown in figures of WTO, during the first half of 2008 there launched 85 new anti-dumping investigations, 37 of which were directed against China's export products, accounting for 43% of the overall amount. Therefore, SMEs in China should raise awareness of barriers to trade, and pay attention to the harm caused by trade barriers, on the one hand, avoiding trade barriers through a variety of ways and means to reduce the harm by trade barriers; on the other hand, emphasizing on the anti-dumping lawsuits to actively respond to them. And then, each SME should strengthen its integration to hedge their risks by the full use of the power of community organizations.

*3.5 Actively investing abroad to conduct transnational business*

With the expansion of globalization and the increasingly fierce international competition, China's SMEs expand overseas investment and international co-operation not only to avoid the above-mentioned barriers to trade, but also to get the interests of international competition and to serve as a useful complement to the expansion of exporting goods. At present, the main force of China's foreign investment is large enterprises, foreign investment of SMEs is still in its infancy. SMEs should actively carry out foreign investment, do develop cross-border operations with the use of their own advantages.

**4. Conclusion**

SMEs' participation in international trade is a complicated systematic project, and can not be solved only by themselves. In face of financial crisis, SMEs should continuously improve themselves and seek for the space to survive and develop in the environment for changes. At the same time, the Government has the responsibility and obligation to provide the necessary support to help SMEs survive in difficulties. It is believable that SMEs will soon be out of difficulties and fundamentally improve the depth and level of participation in international trade with the efforts of both the government's policy support and the creating ability of SMEs.

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Table 1. PMI index and Export Orders index since Jan.2008

| Time | PMI index | Export Orders index |
|------|-----------|---------------------|
| Jan.2008 | 53.0% | 49.0% |
| Feb.2008 | 53.4% | 51.3% |
| Mar.2008 | 58.4% | 59.1% |
| Apr.2008 | 59.2% | 58% |
| May.2008 | 53.3% | 54.4% |
| Jun.2008 | 52.0% | 50% |
| Jul.2008 | 48.4% | 46.7% |
| Aug.2008 | 48.4% | 48.4% |
| Oct.2008 | 44.6% | 41% |
| Nov.2008 | 38.8% | 29% |
| Dec.2008 | 41.2% | 30.7% |
| Jan.2009 | 45.3% | |
| Feb.2009 | 49% | |
| Mar.2009 | 52.4% | 47.5% |
| Apr.2009 | 53.5% | 50% |
| Jun.2009 | 53.2% | 51.4% |

Data Resource: http://www.mofcom.gov.cn/

# The Situation and Analysis of

# the Insurance for Old People in China

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**Abstract**

With the advent of the aging time, how to ensure old people to spend remaining years in comfort becomes the hot spot concerned by the society. Old-age insurance for the elderly living, medical expenses and accidental damage protection, with a vast market, the advantages of targeted. And it can make up for lack of social security. Analysis of China's insurance market status and disadvantage, and advices are proposed from three aspects such as tax preference, designing a comprehensive insurance and endowment service.

**Keywords:** Aging, Insurance for old people, Social security, Pension Service

The problem of aging in China becomes more and more seriously, and the "Statistical Communique of the People's Republic of China on the 2000 National Economic and Social Development" showed that up to the late of 2008, the population equal to and above 60 years old was 159.89 million, which occupied 12% of the total population, and the population equal to and above 65 years old occupied 8.3 of the total population. China belongs to the country "getting old before it gets rich", and the social endowment and social security are more obvious, so the commercial insurance companies are more necessary to dig the "silvery-hair market", and actively develop the insurance products relative to old people. Products of insurance for old people launched in the word, and the income rose sharply. According to statistics, Germany has 1.3 million elderly people insured, and occupied of the total number of 2/3. U.S. long-term care insurance with changeable premiums, flexible design, and welcomed by older Americans, which occupied 25% of the U.S. life insurance market share.

The main risk faced by old people is the financial risk induced by the delayed survival time and the medical and nursing charge induced by the diseases, The old insurance aims at the old group above 50 years old, and when the appointed accidents appear in the appointed term for the insurant, the insurer pays the premium to beneficiary according to the contract. It has many characters such as broad market and sufficient guarantee. The good development and utilization of old accident insurance can promote the stability and harmony of the society.

## 1. The Situation of Old Insurance in China

Chinese old insurance started late, and its premium is short. As the world's most populous country, but also aging populous country, until 2002, Shanghai, the country witnessed the emergence of the first old-age insurance - "Yong An-guarantee" accident insurance. "Yong An-guarantee" provisions of the insured at the age of 50 years to 75 years old; this is the first insurance product for senior citizens, mainly to protect the elderly due to accident injuries and medical expenses. In the same year in October, Xinhua Life Insurance Company launched the "wonderful life" insurance, the first time the insured person's age limit relaxed to 80 years old, breaking the old-age insurance of the "forbidden zone." In May 2003, AIG Insurance Company has launched the "peace of mind guarantee" whole life insurance, relaxed the age to 80 years old.

Up to the late of 2007, there were 120 insurance institutions including 59 Chinese-funded companies and 43 Sino-foreign firms, and there were 22 insurance companies which managed the old insurance. Up to the late of 2007, the amount of the old insurance product had achieved 62 in China, and the total proportion of the old insurance in the personal insurance is 11.1% (seen in Table 1).

With the acceleration of the aging process in China, the aging population increases quickly, as at the end of 2007, the aging population in Shanghai which have the most aging population had reached 2.8683 million, accounting for 20.8% of the city's total population(SRCA,2008). The demand for old insurance is huge, but the status quo of China's insurance market, the number of companies operate old insurance is relatively small, the share is still low.

The old insurance products in China have simple structure and construct. Chinese old insurance appear as accident insurance products, mainly in the form of products and by-laws are the main risk insurance, policy design is simple, the insured person age limit, the insurance limit to protect the content in much the same, without their own characteristics, and lack of market competitiveness. The most common old accident insurance only face to fractures, burns, hospitalization subsidies to subsidies.

Faced with enormous potential in the old insurance market, the insurance company why progress so slowly? The following analysis of the national old-age insurance impedes the reason.

## 2. Causes Analysis of Obstacles to the Development of Chinese Old Insurance

### 2.1 Psychological factor

Since China entered the aging very fast, and showing a trend of speed-oriented, the feminization and aging. The people generally haven't understanding of aging very clear, aging would bring what and how to understand, how to resolve, we have not prepared, nor don't have enough experience. This is reflected in many aspects, such as the elderly in their remaining years of life care matters, the community care of the elderly population matters, nuclear families of the contradiction with the traditional old-age pension, as well as follow-up services after the death of old problems, old-age insurance also didn't received enough attention.

### 2.2 Social and cultural factor

Chinese traditional ideas to make raising children for old age, the old people get care and support for granted from the family and the next generation, and people are not accustomed to using insurance to protect the lives of old (Hualing, Wei., Baoqing Lin,1999). Therefore, the old insurance will be a large extent subject to the promotion of the social customs and cultural resistance to the purchase of old insurance for the old people; others may consider that young people's filial piety is not enough, aiming to shirk responsibility. Moreover, from the subject of impact of Chinese traditional culture for several thousand years, people are often reluctant to face up to death, illness, disability and other insurance accident, have resistance to these. Therefore, they are more willing to buy pension annuity which guarantee a happy life, rather than buy accident insurance, such as the old insurance which was pure protection product.

In addition, due to the rapid development of China's insurance industry in the process, some agents have deceived their clients there is the case, individual insurance companies set up there are unfair terms in contracts, resulting in payment difficult situation, which also led to some people in conflict with the insurance.

### 2.3 Risk control factor

The old people have poor physical condition, and their body functions of each part have begun a gradual decline. They are the disease, death and other risk-prone group; the general accident may cause more serious harm to them. Therefore, there is a huge risk for old insurance. Many insurance companies were established not long ago, their actuarial techniques and the accumulation of empirical data are insufficient, so, they not dare to carry out old insurance. Even if carried out, considering their own benefits and risks, insurance companies must improve risk premium rates to prevent a loss; if insurance costs are not high, it must have strict insured conditions and insurance coverage; the other hand, a relatively high premium rates, the majority of the old people is difficult to accept, which will result in the shrinking market demand for old insurance, leading the struggling to the old insurance development.

In addition, Chinese insurance industry has limited investment channels. In 2005, the insurance funds were allowed to invest in the stock market. In 2006, the insurance funds in bonds and stock investments in the proportion of 53.14%and5.22%. and the capital of the investment income is still limited, and without the reinsurance, insurance companies unwilling to take the risk. Figure 2 is the U.S. life insurance companies 1975-2007 the asset holdings of stocks and bonds in the proportion of trend charts. In a word, whether for controlling risks or obtaining a steady growth in investment income, China has a large gap with foreign countries.

## 3. Advices to Develop Chinese Old Insurance

### 3.1 Setting up tax preference, extending investment channels of insurance companies, and increasing the competitiveness of insurance companies

The foreign old insurances are mostly developed relying on policies and tax incentives. Chinese old insurance for the people over the age of 50 also faces high risk of payment problems. In addition to insurance companies to enhance their own experience and technology, the government needs to set the tax preferential policies to encourage and guide insurance companies to actively explore the market. In this way, it can add new impetus to Chinese insurance industry to develop, but also we can ease the pressure on old aging in order to facilitate multi-level old pension system.

In the United States and the United Kingdom, in a number of years, the individual insurance payment rate of home and other property-casualty and W. P. A. is relatively high, up to 120% or more, but the insurance companies do not resolved by raising the premiums, but by a higher return on investment of insurance to make up for operating losses. in our country there are still irrational structure, low efficiency and poor efficiency of the problem in using of funds, we can

refer to the American experience to set the traditional life insurance and investment insurance different accounts, different styles of investment. And we can expand investment channels for insurance funds. We can increase the rate of return with the framework of control, thereby increasing the profit margins of insurance companies and improve the competitiveness of insurance companies.

### 3.2 Combining the specialized insurance and comprehensive insurance

In modern society, population moving and migration has accelerated and job changing frequently changes the family structure for small-scale model. Improving material standard of living, people pursue to spiritual life, young and old generations are required to have a separate space and more and more freedoms, the traditional extended family to live no longer meet the needs of people, small families have been generally accepted. Adult children, the old people tend to live alone(Deming, Li, Tianyong Chen., & Zhenyun Wu, 2006, Hanshi, Xiao,1995). This phenomenon is especially common in cities. Empty-nest families have mortality and accident risk significantly higher than the old people and children living together. When the old people subjected to a number of small, accidental injuries, they often need others to care for some time. Children specialized care for them is unrealistic; employ professionals care is a good choice, but care costs are not a small number. Therefore, we can address this need, to develop of empty-nesters insurance to protect the cost of short-term care. With this insurance, children can significantly reduce the worries about the old people, and the product can promote the development of Chinese aged care industry, expand the aging industries.

High-risk and high rates make insurers operate old-age insurance reluctantly, and the old people are unwilling to insure. Putting old insurance as part of a comprehensive insurance liability can be a good solution to these problems. Comminuting the old people as part of accident and health insurance liabilities with other young family members of the insurance liability insurance or a combination of old insurance with the responsibility of the family property, which may has good effect on reducing the risk of rate policy and increasing the attractiveness. In 2002, the Xinhua Life Insurance, introduced a combination of structural features for the modern family, "portrait Family Protection Program" .which designed for the three generations to solve a family facing health, education, pension and other issues of the insurance portfolio "increase the amount of Gateway," "sunshine", "Jiqing surplus" and the insured ages extended to 80-year-old "happy life" together. This "three-wide has its" new service concept, alleviate the pressure of high-risk of the responsibility of a single old insurance in some extent. The product put service for Chinese families of "family, the whole process, all-round", which is a breakthrough development in Chinese insurance industry.

### 3.3 Using reinsurance to reduce the risk of old insurance

Insurance companies also need to spread and transfer risk, and reinsurance can spread the risk of primary insurers effectively. Catastrophe insurance was used most widely in the international community. the insurance companies can shift more than the amount paid or a standard retention payment rate portion of the risk of old insurance to re-insurance companies, so as to control risk, nake the sound operation and expand the market. General Cologne re-insurance in 2003 started the Chinese version of e-life underwriting manual in Beijing , aimed at the Chinese old-age insurance market which was still a blank. Chinese insurance companies need to corporate to the foreign re-insurance companies which has extensive experience, for the prosperity of Chinese old insurance.

### 3.4 Using a variety of form, and combining the old insurance and pension services,

In rural areas, the old accident insurance can be the powerful compensation of the medial plan of big diseases, and fully guarantee elders' nursing and medical charges because of usual accidents (Shuping, Huang, 2005). Countries can use old insurance to reform the full-scope safeguards. Countries pay for their premiums for those living alone, insurance companies paid when an accident happened. In this way, we can not only reduce the state's financial burden, but also promote Chinese development of the insurance industry. In the city, the old insurance can be combined with community-based services, which can fully exert the charge guarantee function of the insurance and the endowment service function of the community. From this year, Shanghai begins to let all endowment institutions to buy the old accident insurance in the whole city, which not only disperse the risk of endowment institutions, but promote the communication and cooperation of data between insurance companies with endowment service intuitions. Additionally, increasing advocacy have significant effects on the expansion of old insurance awareness and improving old insurance coverage.

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Table1. Companies and product amount of accident insurance in China (Unit: %)

| The amount of insurance company | The amount of the company managing old insurance | Ratio |
|---|---|---|
| 120 | 22 | 18.33 |
| Product of personal insurance | Product of old insurance | Ratio |
| 559 | 62 | 11.11 |

Data from: China Insurance Regulatory Commission, Homeway web, and various insurance companies
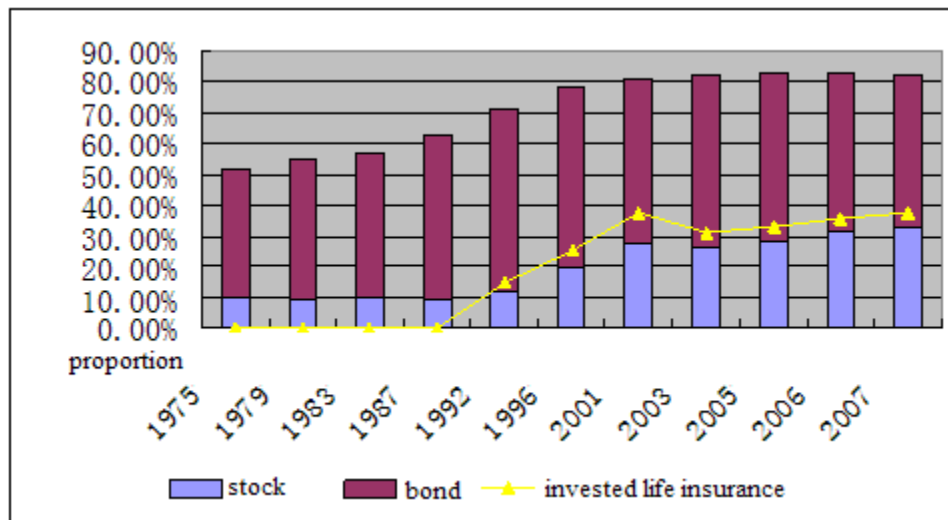


Figure1. Proportional Tendency of Stock and Bond and Invested Life Insurance Proportion in the Assets of US Life Insurance Company from 1975 to 2007 (Data from: ACLI Life Insurers Fact Book 1976- 2008 (US))

# Project Management Plan: Increasing Enrollment Rate

# for the Transworld Institute of Technology

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**Abstract**

Because of the seriously decreasing birthrate in Taiwan (1.2% in 2008), most private colleges in Taiwan as well as the Transworld Institute of Technology (TIT) have a problem recruiting new students every year. From 2002 to 2008, the rate of enrolling new students was decreasing about 5% every year.   The goal of this project is to have 2430 newly enrolled students in the TIT (90% of the 2700 new student enrollment capacity), compared with the fall 2008 baseline of 2025 new students enrolled ( 75% of the 2700 new student enrollment capacity), an increase of in 15% by September 15, 2010. To achieve the goal of this project, the project manager executed this project by adopting Billows' (2002) 19 steps in five phases: initiation, planning, executing, controlling, and closing by Microsoft software of Project Management, and the concepts are consistent with the PMI philosophy.

**Keywords:** Project management, PMI, TIT

## 1. Introduction

The 21st century is the age of the knowledge economy (Rodd, 2002). In order to promote peoples' abilities, and increase their own competitive abilities, the Ministry of Education in Taiwan is not only doing their best to improve educational resources and environment, but also by encouraging people to establish new colleges.

In 1992, the Transworld Junior College of Commerce (TJCC) was established on the hills next to the famous "Ho-Shang Rock" in Yunlin County, Taiwan. All the software and hardware facilities and teaching materials were equipped under the guidelines of the Board of Trustees and the presidents as well as the faculty and staff of the corporation. With a well-developed administration and education environment, Transworld started planning the construction of its Chia-Tong campus in December 1997. In May 1998, Transworld was approved to be upgraded and renamed as the Transworld Institute of Technology (TIT). In 1992, it had seven departments and 780 students enrolled. Now, as of January 2009, it has about 7800 students enrolled, with two campuses and 5 schools, including 18 departments (Transworld Institute of Technology, 2004).

The pillar concepts of the TIT are wisdom: knowledge that produces social values of innovation; innovation: change that creates a new dimension of performance; and nourishment: competition that increases the capabilities of individuals and institutions.   Below is an organization chart of TIT (Transworld Institute of Technology, 2004). Because of the seriously decreasing birthrate in Taiwan (1.2% in 2008), most private colleges in Taiwan as well as the TIT have a problem recruiting new students every year. From 2002 to 2008, the rate of enrolling new students was decreasing about 5% every year. In 2008, it opened with room for 2700 new students, but only 75% (2025) enrolled (Transworld Institute of Technology, 2004).

The objective of the project is to increase in 15% enrolled students in 2010. By September 15, 2010, there will be 2430 newly enrolled students in the TIT (90% of the 2700 new student enrollment capacity), compared with the fall 2008 baseline of 2025 new students enrolled (75% of the 2700 new student enrollment capacity).

## 2. Review of the Literature

In the age of knowledge economy, project management is the necessary management science and technology for organization development (Chang, 2003). PMI (2004) indicated that project management is the application of knowledge, skills, tools and techniques to conduct and meet project requirement, and includes initiating, planning,

executing, monitoring and controlling, and closing processes. Many believe that modern project management was born between the 1940s and 1960s, when massively engineered, complex military and government projects prompted managers to develop management techniques such as the Program Evaluation and Review Technique (PERT) and the Critical Path Method (CPM), and these techniques and others assisted project managers with planning and control aspects of complex projects (Van der Merwe, 1998).

Carton; Adam & Sammon (2008) indicated that the successful rate of project management in enterprise resource planning (ERP) implementations is not high. Effective project management requirements that team of project management understand and conduct knowledge and skills from the five areas as following: 1) the project management body of knowledge; 2) application area knowledge, standards, and regulation; 3) understanding the project environment; 4) general management knowledge and skills; 5) interpersonal skills (PMI, 2004) .

Project management characteristics include temporary, unique products, services or results, and progressive elaboration (PMI, 2004). Billows (2002) indicated that project management includes 19 steps in five phases, and the five phases are initiating, planning, executing, controlling, and closing processes. Projects are different from operations. Projects are temporary and unique, and operations are repetitive and ongoing (PMI, 2004; Zanoni & Audy, 2004), but both of them still share many same characteristics as follows: 1) performed by people; 2) constrained by limited resources; 3) planned, executed and controlled (PMI, 2004).

In 2004, Zanoni & Audys' theoretical literature indicated that the initiation considers the necessary processes to assure that the project will be accomplished. The planning process aims to plan and keep a possible work scheme to reach the objectives of the project, involving scope setting, activities planning, the budget estimates, and the project plans. The execution consists of coordinating people and resources to execute the plan and involves quality guarantee, information distribution, and providers' selection. Monitoring processes aims to assure that project objectives are being reached through monitoring and appraisal of its progress, controlling changes, costs, quality, and risks. Finally, the closing formalizes the project or phase acceptance, ending organized. (P.30)

Increasingly, organizations are adopting and adapting the formalized best practices embodied in the Project Management. A critical task in exploring the firm-level antecedents of organizational scope is the identification of the specific firm-level commitments and capabilities that a firm may exploit through its vertical integration decisions (Leiblein & Miller, 2003). "Force Field Analysis is a useful technique for looking at all the forces for and against a plan. It helps you to weigh the importance of these factors and decide whether a plan is worth implementing. Force field analysis also helps to strengthen facilitators and to minimize the effect of barriers in projects" (Mind, 2004, p. 1).This knowledge structures of project management into five groups of interrelated processes that occur throughout the project lifecycle (Beise & Niederman & Mattord, 2004).

Beise & Niederman & Mattord (2004) indicated that the project managers are also categorized into nine knowledge areas including project integration, scope management, cost management, time management, human resources, communication, quality, risk, and procurement. Each category has formally prescribed inputs, processes, outputs, and tools (Beise & Niederman & Mattord, 2004). Waldron (2005) indicated that "choices companies make for effective change include just in time manufacturing (JIT), flexible manufacturing systems (FMS), total quality management (TQM) and world-class manufacturing (WCM)" (p. 244).

SWOT analysis offers a scan of the internal and external environment of the firm (Wu, 2006). It is an important part of the strategic planning process. Environmental factors internal to the firm can be both a strength and a weakness. Those external to the firm can be opportunities and threats (Quick MBA, 2004). Critical path means the length of a project (Frame, 2002). PERT (program evaluation review technique)/CPM (critical path method) was developed by the U.S Navy and Du Pont Corporation, and both of them were employed in the project management. Frame (2002) indicated that PERT/CPM was the single most famous tool in the project manager's tool box. Billows (2002) indicated that every project team develops a unique culture as the people work together. Sometimes that culture encourages interdepartmental bickering and blaming others for problems and failures. Other times the culture may encourage strict compliance with the rules and discourage creativity and innovation.

## 3. Methodology

The project manager implements this project according to Billows (2002) 19 steps in five phases by Microsoft software of Project Management. The five phases include initiation, planning, executing, controlling, and closing, and are consistent with the PMI (Project Management Institute) philosophy. The 19 steps are as follows: 1) scope initiation and MOS (Measure of Success); 2) scope definition and planning: high-level achievement network (HLA) and communication and collaboration; 3) charter: assumptions, constraints, and risk; 4) charter: authority, resources and change control; 5) broad brush plan approval; 6) summary tasks and sub-tasks; 7) assignments and micro-management avoidance; 8) task sequence; 9) predecessor network: danglers in the network; 10) assigning durations and people; 11) calendars; 12) critical path; 13) final review and approval; 14) team leadership; 15) team culture and conflict; 16)

creating the baseline; 17) status reports; 18) problem-solving and reporting; 19) project closing. Liberatore & Pollack-Johnson (2003) indicated that Microsoft project was conducted by nearly 50% of respondents comparing to other software for project management.

## 4. Analysis of results

*4.1 Phase 1: Initiation*

4.1.1 Step #1: Scope Initiation and MOS (Measure of Success)

Usually, the students in Taiwan may choose what school they are going to enroll in based on reputation (rank of school), organization of school (public or private) and location (city or village) in turn. The reputation of TIT is about average. However, it is a private school in a county, which means higher tuition and fewer things to offer for entertainment, so for most students, TIT is not a very attractive choice. Hence, how to increase its enrollment rate has become a serious problem for the TIT to deal with (Transworld Institute of Technology, 2004).

To increase the enrollment in TIT, the first step of the project is to form a committee whose members are assigned by the president from every school and department to design recruitment tasks. Second, it needs to identify the key stakeholders, including the president, the leader of the committee, the director of the Office of Academic Affairs and the director of the Office of Student Affairs. During the conducting of this project, each procedure of this project has to be approved by the president. Moreover, the director of the Office Academic Affairs and the director of the Office of Student Affairs need to assist the committee to complete all procedures.

Measure of Success (MOS): The committee assigned all tasks for individuals and departments. All individuals and departments will work collaboratively to increase enrolment. By September 15, 2010, there will be 2430 newly enrolled students in the TIT (90% of the 2700 new student enrollment capacity), compared with the fall 2008 baseline of 2025 new students enrolled ( 75% of the 2700 new student enrollment capacity), an increase in 15%.

4.1.2 Step #2: *Scope Definition and Planning: High-Level Achievement Network and Communication*

HLA 1: Form committee to design the recruitment tasks

1.1: Form a staff and teacher recruitment committee for recruitment tasks design

1.2: Design and plan a recruitment plan

HLA 2: Strategies to attract potential student

2.1: Increase the number of scholarships to attract outstanding students

2.2: Design and implement a survey for students of other student who did not choose to attend TIT to determine reasons and provide a report

HLA 3: Increasing school's reputation

3.1: Develop a promotional program to encourage professors and students to publish their papers

3.2: Design an advertising plan to distribute school information on TV, newspapers and magazines

3.3: Build a website which offers information about recruitment
3.4: Assess, design plan, and improve technology and library resources

HLA4: Track and supervise the effectiveness of recruiting tasks

4.1: Provide monthly reports of potential student inquiries

4.2: Track applications and acceptances monthly

For the project, the following key members have been identified: President: Mei Fu Lin; The leader of the committee: You Si Wu; The director of the Office of Academic Affairs: Chi Mei Cheng; The director of the Office of Student Affairs: Lee Mei Liu. In order to enhance the efficiency of the project, the project manager (Sheng Wen Liu) needs to coordinate the key members as a team. The collaboration among the members determines the success of this project.

4.1.3 Step #3 Charter: *Assumptions, Constraints, and Risk*

"There are always risks associated with a project" (Project Management: Fact Sheet, 2002, p. 1). There are several ways to help manage risks.  Following is the force-field analysis and SWOT analysis. The Force-field analysis below illustrates that the driving factors which equal +14 outweigh the restraining barriers, which equal -12, as shown on table 1.

The SWOT analysis for the TIT is completed and listed as follows: Strengths: (1) TIT has two beautiful landscaped campuses with a total of 89 hectare campuses. It is the biggest campus in Taiwan compared to all the private colleges; (2) One of TIT's campuses was just built about two years ago. Everything inside the campus is new and up to date. Weaknesses: (1) TIT is located in a village which is not attractive or convenient compared to cities; (2) The rank of TIT

just average, which is not attractive for potential students to choose. Opportunities: (1) Create a flexible program for people who have jobs, such as holiday courses; (2) Build an online course for potential students who are not able to attend courses because of the distance issue. Threats: (1) Decreasing birthrate in Taiwan every year; (2) More new schools have been established in recent years; (3) Other colleges in Taiwan are threats to TIT, especially public schools in the city.

Every project has its potential risk. Successfully dealing with risk may create a potential opportunity. Having a risk management plan will help project managers to monitor and review risks regularly to lower the possibility of letting those risks run out of hand. There is a risk management plan for increasing the newly enrolled student rate for the project management as follow, shown on table 2.

4.1.4 Step #4 Charter: *Charter - Authority, Resources and Change Control*

Plan for Authority

Because the decreasing birthrate is becoming a very serious issue for every private school in Taiwan, President Lin of TIT has noticed that the decreasing birthrate is becoming the major factor causing a lower enrollment rate in TIT. Hence, President Lin has decided it is necessary to have a project to deal with this issue. He has assigned Sharon Liu to be the project manager to handle and coordinate this project. After Sharon Liu finished the MOS and HLAs of this plan, PM presented and discussed the project with President Lin in the president's office, and has gotten the approval for this project and authority to manage human resources from the president while conducting this project. The president also has arranged the first meeting for the project team to confirm the budget.

Resources

For human resources, all employees (everyone who is working in TIT) and resources are available for this project. The project manager is one member of the committee. The committee not only has responsibility for the recruitment task design, but also has to manage and authorize each team which has different responsibilities for this recruitment task. All teams and assignments are adjustable to meet the plan requirements.

For the financial resources, there is a fund with $ 230,000 for this project. The key budgets for this project are as follows: 1) The budget for human resources; 2) The budget for technology and library source improvement; 3) The budget for advertising, 4) The budget for collecting information.

Change Management

"Managing change is seen as a matter of moving from one state to another, specifically, from the problem state to the solved state" (Nickols, 2004). There is always has an unexpected outcome during the project process because of unexpected external resources and environment. The project manager should always be aware and be prepared to deal with the changes caused by unexpected external factors. In this project, the committee needs to meet at least once a week. They have to reconstruct the steps of this recruitment plan when unexpected issues appear. The committee also needs to review the result of each monthly trace on applications and potential students' inquiries, and to change the project process when needed to achieve project goals. In addition, when changes are to be made, human resources need to be contacted to complete this change.

4.1.5 Step #5: Broadbrush Plan Approval

MOS, HLA, and Charter

The MOS, HLAs and sub-HLAs of this project have been completed by all of the project team and have been approved by the president of TIT. The approval letter and document of this project have passed to every department in TIT. This is also shown on the website of TIT. Everyone in TIT needs to review, and be familiar with every procedure. When this project has made changes, it will also reconstruct the plan and get the approval of President Lin. Every document on the web system will also be updated as necessary.

Quality, Ethics, and Professionalism

The mission of TIT is to produce outstanding students who cherish honesty and practice integrity by offering a learning place with the pillar concept of wisdom (knowledge that produces social values of innovation), innovation (change that creates a new dimension of performance) and nourishment (competition that increases the capabilities of individuals and institutions). In order to meet this mission and successed this project, TIT has set up a stated quality and ethical expectation code for everyone who works in TIT, as follows: 1) To provide an excellent information environment for academic research; 2) To act as the think-tank of the institute and to integrate the school resources for all students; 3) To affiliate with other enterprises for better development and offer professional advice to the small businesses which, as a partner of TIT, can offer a practice place for all students; 4) To fulfill the teaching and research needs of all employees of the school; 5)To provide professional help and guidance to all students on their way to success.

Other Deliverables

Besides the formal deliverables of MOS, HLA networks, charter, risk management, change management and human resource management plan, additional project deliverables are as follows: 1) to provide a training program for people who are working in TIT to get familiar with their recruitment tasks; 2) to improve employees' organizational commitment; 3) to build a good relationship with the community.

*4.2 Phase 2: Planning*

4.2.1 Step #6: Summary Tasks and Sub-tasks

The president of TIT, Mr. Lin, is going to authorize the team leader to carry out its new project, and to formalize a goal for this team at the end of May, 2009 in order to clarify the team position and function. All tasks and sub-tasks entry of HLA1, 2, 3 and 4 could be set at the end of June, 2009.

4.2.2 Step #7: Assignments and Micro-Management Avoidance

Micro-Management needs to be avoided during this project process. The project manager and team members have the responsibility to assist every team with their assignment.   They also have to build up the communication channel not only between teams but also with each leader and with President Lin.

The project manger also needs to arrange meetings with each member and committee periodically to announce the task assignments and get reflection from members.   To be a back-up for each team, project manager and team members need to be able to support and help each team to deal with assignments and problems.

4.2.3 Step #8: Task Sequence

The HLA 1, 2 and 4 include two WBSs, and HLA 3 include four WBSs. Task sequence and predecessor network for WBS of HLA1, 2, 3 and 4 were ranged before the end of June, 2008.

4.2.4 Step #9: Predecessor Network: *Danglers in the Network*

The recurring tasks located in HLA 4 are reports of potential student inquiries, applications and acceptance of newly enrolled students. It will be tracked and reported monthly from date May 1$^{st}$ to September 15, 2010.

According to the task sequence of step #8, the network diagram of PERT chart is also ran by Microsoft software of project management, and it appear two different color boxes. The red boxes indicate a critical success of the project and the figure should not have any dangler which doesn't have a successor.

4.2.5 Step #10: *Assigning Durations and People*

Every task in this project plan has been identified, and assigned, duration time applied to unadjusted assignment of people to tasks as follows: HLA1 is 11 days; HLA2 is 22 days; HLA3 is 112.5 days; and HLA4 is 324 days.

According to the results, the preliminary plan is scheduled to finish on time. The project manager not only needs to adjust the percentage of every team member's daily working hours, but also needs to solve the conflicts in human resources with the intention of making the project more feasible.

The duration of the task in this project plan has been changed because some of team members' daily working hours have changed. This causes some of the tasks in this project plan to have their finish date extended.   However, every task in this project plan is still scheduled to be finished before the date 9/3/2010. According to the change of duration time the each HLA duration time after adjusted assignment of people to tasks as follows: HLA1 is 17.33 days; HLA2 is 71.5 days; HLA3 is 125 days; and HLA4 is 323.5 days.

Two major tasks for this project plan are sub-HLA 1.2 and 3.3. Most tasks can start only sub-HLA 1.2 finished. Therefore, the project manager has assigned an additional human resource, Paul, in order to make this task period shorter.   Sub-HLA 3.3 is a task to help TIT build a communication platform with potential students.   Hence, the project manager has also assigned an additional human resource, Lee Mei Liu, to make this task period shorter, too.

According to the assignment arrangement, two members in this project plan are over-allocating. After communicating with committee members, the project manager has adjusted human resources assigned and the percentage of working time. The way of leveling resource was employed in order to solve the over-allocation problem.

4.2.6 Step #11: Assignment of Costs

The total cost of the project is $ 29,800.00. The most expensive task is HLA3: Increase school's reputation, costing $20,000.00. The HLA 3 needs the longest working duration, which involves the greatest number of human resources. In this project, there are fixed costs for the following sub-tasks: 1) Sub-HLA 3.3: $ 10,000.00 (Build a website which offers information about recruitment); 2) Sub-HLA 3.4: $ 100,000.00 (Assess, design plan, and improve technology and library resources).

After adding the fixed costs, the total cost of this project became $ 139,800.00.   The merging cost and the expense for increasing school's reputation were the main causes of the difference in total costs, $110,000.

The project's total cost went up from $139,800.00 to $ 220,800.00. The material resources increased the projects total cost by $ 81,000.00. The additional cost covers the cost of paper supply and computer with software for task HLA 2.2: Design and advertising plan to distribute school information on TV, newspapers, and magazines in the amount of $ 3000, and HLA 3.4: Assess, design plan, and improve technology and library resources in the amount of $ 78,000.

4.2.7 Step # 12: Critical Path

According to Billows (2002), "the critical path is an important tool for project managers, because we use it to shorten the duration of the project and finish earlier" (p. 54). PERT/CPM is a most valuable scheduling tool for project planning which was rooted in a number of factors: First, a project team needs to engage in a scheduling discipline to create a PERT/CPM net work. Every task in the project needs to be identified, durations estimated, and the relationships of the tasks to each understood. The discipline creates a meaningful PERT/CRM network. Moreover, every member in this project needs to understand every important step. Second, the PERT/CRM network could serve as a mathematical model of the project because computerized PERT/CPM software routines link cost and resource utilization data to the scheduling data once the PERT/CPM network is created. Moreover, by identifying the critical path, a project manager can objectively clarify which tasks need to be monitored strictly in order to avoid project delay and to have a basis for adjusting some important tasks with the intention of accelerating the schedule.  Third, the PERT/CPM is the major approach counter to help the project manager estimate and control the duration of projects (Frame, 2002).

Because this project has enough "slack" between each task, the critical path is associated only with the recurring task sub-HLA 4.1: provide monthly reports of potential student inquiries and sub-HLA 4.2: track applications and acceptance monthly. These two tasks are very important tasks which also involve much more time resources than the other sub-tasks. These two tasks are not only tracked monthly, but also offer information for improvement of this project.

4.2.8 Step #13: Final Review and Approval

The project manager has met with the committee on March 15, 2009, and the committee has decided all assignments and durations of tasks. After posting all assignments on the school website, some comments from different teams suggested changed to the schedule. The committee has made some changes on duration that satisfy every team member. The committee also added some material resources such as paper for surveys on information of potential students for school improvement and computer with software to improve technology and library resources.

After the project plan was revised by the committee, the project manager has set up a meeting with all team leaders for final approval. The final plan has also been approved by Present Lin. The total cost of the plan is $ 220,800.00, and is expected to be completed by September 15, 2010.

*4.3 Phase 3: EXECUTING*

4.3.1 Step #14: Team Leadership

For team assessment, there are 22 statements below including the four parts of roles, activities, relationships and environment, provide a score ranging from 1 to 4 using the scale as follows: 1 = not at all; 2 = limited extent; 3 = some extent, and 4 =considerable extent as shown table 3.

Next, total the scores for each area, then calculate the average by dividing the total score by either 7 or 6, depending upon the number of items in each category as shown table 4.

The highest mean score on the team assessment was the "Roles" score, which averaged to 3.71. The main reason why this item gained highest score was that everyone assigned to this project aware of their responsibility and realizes every task is important for completion of this project. To complete this project successfully, each member must play their role successfully.

The lowest mean score on the team assessment was the "environment" score. The main reason why this item gained the lowest score was that all the procedures of this project were decided by the committee and project manager. Every member in this project was to get the same reward, and there is no particular reward system for outstanding performance. Therefore, most members in this project were not willing to provide ideas.  They just do the job that the committee has assigned to them.

The area that can realistically be improved is the environment. Although everyone in this project plan is clear about goals, the project manager needs to change PM's leadership style. PM needs to open her door for everyone who gets an idea to make this project better, and collect opinions and ideas from every team member before the committee decides each procedure, and to have a reward system for people with excellent performances, who are willing to offer their ideas.

The best leadership activities to further develop the team would be the project manager to involve every team member in the decision making process that impacts them directly. To encourage new ideas, reflections and opinions from every

member, which may be useful for this project, the project manager needs to have a meeting with each team, so the project manager can make sure each team member is clear about their responsibilities and roles.   The project manager also needs to help every team to complete their job and assist them when they have a problem to conduct their job. Moreover, the project manager may build a reward system for excellent performance.

### 4.3.2. Step #15: *Team Culture and Conflict*

While every member of the team influences the culture, the project manager's style is of paramount importance. Specifically, the way in which the project manager makes assignments and what the project manager rewards have important impact's on the overall team culture (Billows, 2002).

For the project, project manager is going to take some approaches in order to achieve a strong orientation and reach the MOS as follows: (a) respecting everyone's ideas and opinions, (b) promoting consistency and fairness in managing people, (c) creating a consonant working environment, and (d) creating a reward system in order to stimulate their creativity as well as efficiency.

### *4.4 Phase 4: CONTROLLING*

### 4.4.1 Step #16: Creating the Baseline

Each project management team should study the starting position and consider alternative courses of action for meeting the required project completion date. While a complete analysis of the network is not essential at this point, the group should at least identify critical and sub-critical paths, and carefully investigate activities that are likely to be completed during the first decision report period. Once a decision has been made, activities completed during that period cannot be changed.

During the simulation, the player is continuously confronted with a number of valuable concepts used in project scheduling, such as the earliest activity start/finish, the latest activity start/finish, the activity slack, and the deadline slack (Vanhoucke; Vereecke & Gemmel, 2008). Every task in this project plan has been assigned, and the time of all HLAs assignment for the project management are as follows: HLA1 is 17.33 days; HLA2 is 71.5 days; HLA3 is 125 days; and HLA4 is 323.5 days.

### 4.4.2 Step #17: Status Reports

At great cost in time, money and the work focus of managers and human resource departments, organizations have measured indicators which are suitable for quantification in order to match indicators in other organizations identified as having 'Best practices' (Swain, 1999). To date the overall project is on schedule, and there are no schedule slippages. This is because every task gets plenty time to work on it. Task HAL 1 has been completed 100% on schedule and no additional hours of work remain. The sub-HAL 3.1 has been completed 33% on schedule and has already used 13.33 hours, and 26.6 additional hours of work remain so far. As a result, the project manager is confident that the project will be completed on schedule.

The slack indicated in this view represents the tasks that have not occurred yet. The majority of the slack occurs in recurring task sub-HAL 4.1 and 4.2. Both tasks take the majority of time which is represented as 323.5 days each. The total cost of the project is $ 220,800.00, with a baseline of $ 220,800.00. Tasks 1.1, 1.2 and 3.1 have already begun and costs have accrued in the "actual" column.

The non-analytical approach is a graphical approach and these graphics are an effective communication tool. Using cumulative cost curves and Gantt charts is an effective way to examine schedule variance. These Gantt charts and cumulative cost curves not only can help the project manager to find out what their project status is in one glance, but also to integrated cost and schedule control portrayed. However, these graphs do not offer important information such as the rate of money being spent or the percentage of work completed (Frame, 2002).

Five steps to produce earned value totals-project and task level: 1) Go to Tool menu, click Option, then click Calculation tab; 2)Click Earned Value; 3) On the Default box, Choose % Complete, use the specific status date, May, 24, 2006, then choose corresponding baseline; 4) Go to View menu, then click More view, then click Task Sheet, then click apply; 5) Go to View menu, click Table, choose More Tables, and click "Earn Value Table". The results of BCWS and ACWP are as follows: 1) BCWS was the budget cost of HAL1 and HAL3, $ 2533.33; ACWP was the actual cost of HAL1 and HAL3, $ 2533.33; and BCWP was $ 2533.33; 2) CV and SV was $ 0.00, which means that no HLA exceeded the planned budget; 3) EAC is $ 220,800.00, and VAC is $ 0.00. This means that the project did not exceed the planned budget.

According to the above result, the project did not exceed the planned budget. It is because the project is just at HAL1 and sub-HAL 3.1 sessions and still has more tasks to run. Therefore, the project manager still needs to observe later results and to have good control on every task to avoid expenses that exceed the planned budget. The project manager needs to have a meeting with each team series for the latest process result, to make sure every task is under control.

Step #18: Problem-Solving and Reporting

Management consultants and turnaround specialists have some things in common, most of which probably are obvious. For example, the diagnostic, problem-solving aspect; the need to understand the parts of a business as well as how they fit together; addressing issues of leadership, finance, organization-and so on (Sargeant, 2005). To conduct a project successfully, the project manager ought to think of three scenarios that may happen as follows: 1) Ahead of schedule-cost variance is fine with respect to resources; 2) Slippage in schedule, extending the completion date significantly and over-budgeted in human resources; 3) On schedule, but over budget in human resources.

Both ahead of schedule and slippage in schedule extending the completion date are not good. It does not matter if the cost variance is fine or over-budgeted in human resources, both issues may induce unexpected conflicts in human resources, especially when there is a slippage in schedule, extending the completion date. On the other hand, if the PM and committee are not accurately calculating human resource needs in each task, it may cause the problem of slippage in schedule. In this case, the PM may need to assign more human resources to make every schedule on time, which may also cause over budgeting in human resources.

To avoid those problems decided above, it is important to prepare reports from each team on a timely basis when a project departs from the orbit. The project manager also needs to work with each team to find out the root causes why the project is not on schedule or over budget in human resources. This is a project which needs each team's collaboration. Therefore, to make this project successful, the PM plays a very important role as a coordinator to help each team when the project is not on schedule or is over budget.

*4.5 Phase 5: CLOSING*

4.5.1 Step #19: Project Closing

The purpose of the end-of-project report is to provide data about how well the project has performed (OGC, 2008). From these end-of-project reports, each member who is working in this project may get a valuable lesson to make the next project more successful.   In this project, the PM has a print out Project Summary Report, Critical Tasks Report, and Budget Report as the final review report. The PM will also file all the reports as a reference for future projects.

## 5. Conclusions

At the beginning of initiating process, the PM analyzes the project environment and provide a project overview statement, which include organizational background, statement of the problem, project goals and objectives, and determining the measure of success for the project. A cut down the scope meets success and then implements the achievement network. Second step was planning stage, the PM conducts software to start the project, and built a WBS, predecessor relationship, PERT, and recurring tasks. In this phase, the PM also builds up communication channels to help each member and team to understand their responsibility. In addition, the PM also analyzes the critical path of this project in order to propose the final plan for approval and to ensure whole project success.

During the executing process, the PM tries to build a successful team by doing team assessment, and tracking issues. The result was that the PM was able to understand more about the strengths and weaknesses of the teams in order to create the best leadership for building an activity-oriented team culture. The style of transformation leadership was used to the team members. In the controlling process, project manager tracked whole schedule including performed tasks, the percentage and usage of work completed, remaining work, and developed earned value reports at every checking point to know whether the expenditure exceeded the budget and whether or not the project was on schedule in order to ensure the project was in control. The earned value management provides a new perception to see how effective is the project running on schedule and on budget. The final stage of the project cycle is to close the project and provides each member who worked on this project a valuable lesson. The most important thing is to learn the lessons from the project in order to avoid similar mistakes for next project. In addition, recognition of outstanding individuals and the team are also important.

Modern organizations face a very dynamic environment for which it is imperative to re-think unique strategies that are more aligned to stable conditions (Bellamy & Becker & Kuwik, 2003). TIT needs to continue to implement outstanding strategies, and attract more students, well-known faculty and educational resources, as well as upgrade its software capabilities and hardware facilities, with the support of outstanding alumni, whose experiences will help create positive images to virtually allow TIT to a greater number of students. This research limited the case study of TIT. For future study, this research work will need to be extended to other case studied, such as ERP in other industries and organizations.

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Table 1. Force Field Analysis

| Facilitators (Driving Forces) | Strength (+1 to +5) | Strategy |
|---|---|---|
| The decrease in newly enrolled student rate | +5 | Supervising the project and seeking other solutions to increase the newly enrolled student rate |
| Need to improve the reputation of TIT | +5 | Develop a promotional program to encourage teachers and students to publish their papers |
| The opportunity to discover potential students | +4 | Use surveys to gather information on potential students |
| Total Score | +14 | |
| Barriers (Restraining Forces) | Strength (-1 to -5) | Strategy |
| Law birthrate in Taiwan | -5 | Having promotional program to attract students |
| The rank of school | -4 | Need to upgrade school's rank |
| School location | -3 | Provide online course to remove the location drawback |
| Total Score | -12 | |

Table 2. A risk management plan for increasing the newly enrolled student rate

| Risk | Sensor (How /Who) | Who Is Responsible | Risk Management Plan |
|---|---|---|---|
| 1. Recruitment Plan (a high risk) | Monthly trace /committee | Committee | Recruitment plan may be flexible and adjustable when it meets a risk |
| 2. Survey for potential students (a medium risk with an immediate attention of resolving it) | Monthly trace/committee | Committee | Information from the survey will be an important source to decide on a recruitment plan. Therefore, there should be more than a survey. When results are conflicting, one more survey needs to be taken to confirm the results |
| 3. Human Resource (a medium risk with an immediate threat) | Monthly working report/every team leader | Every team leader | Need to have appraised and promotion program to improve and monitor numbers performance |

Table 3. Team Assessment

| Team Assessment | Score (1-4) |
|---|---|
| 1. People are clear about goals for the group. | 4 |
| 2. Unnecessary procedures, policies, and formality are minimized. | 3 |
| 3. Team members feel free to develop and experiment with new ideas and approaches. | 3 |
| 4. The allocation of rewards is perceived to be based on excellent performance. | 3 |
| 5. Recognition and praise outweigh threats and criticism. | 3 |
| 6. Calculated risk taking is encouraged. | 3 |
| 7. People are clear about their responsibilities and expectations for performance. | 4 |
| 8. People are clear about how their roles/responsibilities interrelate with those of others. | 4 |
| 9. People perceive others in the work group to be high performers. | 3 |
| 10. People are clear about what personal characteristics/competencies are necessary in their jobs. | 4 |
| 11. The team produces high quality decisions, products, and/or services. | 4 |
| 12. The team is able to conduct effective meetings. | 4 |
| 13. The team achieves its goals. | 4 |
| 14. The team and its individual members are able to interact effectively with others outside the team. | 4 |
| 15. The team makes decisions and produces output in a timely fashion. | 3 |
| 16. The team members truly support each other in carrying out their respective responsibilities. | 3 |
| 17. Team members are open in their communications with each other. | 4 |
| 18. Team members follow through on their commitments. | 4 |
| 19. Team members trust each other. | 4 |
| 20. All team members are equal contributors to the team process. | 4 |
| 21. The group often evaluates how effectively it is functioning. | 3 |
| 22. Individual members feel committed to the team. | 4 |

Table 4. Team Score

| Roles Item | Score | Activities Item | Score | Relationships Item | Score | Environment Item | Score |
|---|---|---|---|---|---|---|---|
| 7. | 4 | 2. | 3 | 5. | 3 | 1. | 4 |
| 8. | 4 | 3. | 3 | 14. | 4 | 2. | 3 |
| 9. | 3 | 11. | 4 | 16. | 3 | 3. | 3 |
| 10. | 4 | 12. | 4 | 17. | 4 | 4. | 3 |
| 18. | 4 | 13. | 4 | 19. | 4 | 5. | 3 |
| 20. | 4 | 15. | 3 | 22. | 4 | 6. | 3 |
| 21. | 3 | | | | | | |
| Total | 26 | Total | 21 | Total | 22 | Total | 19 |
| Average (Total /7) | 3.71 | Average (Total /6) | 3.5 | Average (Total /6) | 3.67 | Average (Total /6) | 3.17 |

# Relationship between National Product and Malaysian Government Development Expenditure: Wagner's Law Validity Application

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**Abstract**

The objective of the study is to see how far Wagner's law validity can be applied in the Malaysian government development expenditure. According to Wagner's law, fundamental economic growth is a determinant to the public sector growth. The public sector is said to be able to grow at a very high rate when compared to the product growth (income). Accordingly, it can be said that government expenditure behaves elastic with the national product and the interpretation of Wagner's law can provide important policy implications. Using a method known as the Autoregressive Distributed Lag model (ARDL) and the border test (bound test) introduced by Pesaran *et al.* (2001), this study found that four out of five version Wagner basic laws show an interrelationship between the national product and government development expenditure. The long-term analysis also showed that national product has a positive relationship and is significant in influencing government development expenditure. Therefore, it can be summarized that this Wagner's law is still relevant to be applied in Malaysia.

**Keywords:** Wagner's law, ARDL, Government development expenditure

## 1. Introduction

Strong economic growth is of paramount importance to a country to increase its people's standard of living and to ensure stability in the country. Economic growth also can be used as a gauge to evaluate the performance of the economic development of a country. The economic growth of a nation has to face a state of increase or decrease. Sometimes economic growth rises rapidly until it causes an increase in prices and at other times it experiences slow growth and causes a decline in prices which and are below the previous level. To determine the economic growth rate achieved by a country, it is necessary to take into account the real national income, namely the Real Gross Domestic Product (RGDP) or the Real Gross National Product (RGNP). In this calculation, the national income and its components are stated at a fixed price which is the basic price of goods in the year.

Economic growth is closely related to the economic situation in the long term and reflects the occurrence of expansion in economy because of government expenditure. Rapid economic growth would be vital to increase income and job opportunities for the people. To enable economic growth to be maintained at a high-level, one of the important factors which need to be enhanced is government expenditure. As such, government expenditure is of paramount importance for the economic growth of a country and becomes an important component to restore the economy.

Government expenditure is one of the important tools which contribute to the economic growth of a nation including Malaysian. Government expenditure includes the allocation provided by the government to carry out various government projects with a desire to enhance the growth of the country's economy.  Most of the government expenditures are funded by the tax revenue collected by then government.

Furthermore, development expenditure is an investment or capital to carry out economic development projects by the government which can enhance the socioeconomic status and promote economic growth. This development expenditure is lower than management expenditure because development expenditure is a long-term investment. This expenditure covers the capital expenditure on economic sectors such as social services, security and public administration.

Malaysia's economy experienced rapid growth until the occurrence of the financial crisis of 1997 and 11 September 2001 which somehow influenced the growth of the country's economy. These show that, any event which occurs in the world can provide a direct impact on the achievement of economic growth of a country. Hence, every country in this world should always be prepared to face various effects, which may arise due to some events, by planning various economic policies to overcome the effects.

Government expenditure is an important component in influencing the growth of the Malaysian economy. It must be handled systematically and wisely so that the expenditure which has been made is effective. However, there is a problem in government expenditure and one of them is the occurrence of haphazard leakage and non-systematic expenditure which could affect the government's financial position. The Malaysian budget is in deficit. If the size of the deficit is large and cannot be closed again in an average period, then it leads to more problems.

The study on government expenditure determination is began the 1880s. One of the famous theories which are related to economic growth and its relationship with government expenditure is Wagner's law (Wagner 1983, 1890). According the basic idea of Wagner's law, economic growth is the fundamental determinant to a growth of public sector. Therefore, the public sector is claimed to grow at a very fast rate when compared to the national product (income). If Wagner's law is applied in a country, the government in that country should increase the fiscal enlargement policy in order to augment of the economy. This law shows that the rate of government expenditure increases more rapidly than the growth of the economy. In connection with that, Wagner's law Version gives important policy implications. For instance, in recession time or in a financial crisis, fiscal enlargement policy should be practised.

This study contains five parts. The second part is the literature review of the explanation of journals which are related to government expenditures and economic expansion. The third part is about research methodology which consists of a theoretical framework, a hypothesis statement, the econometric model usage explanation, the research hypothesis, and the methodology in making decisions. The fourth part is an explanation of the result analysis on the effects of government expenditures towards economic augmentation and the last part is the conclusion of this research.

## 2. Literature Review

This part will discuss the studies that were raised by earlier investigators to prove that there is a connection between economic growth and the country's expenditure. Chang *et al.* (2004) examined Wagner's law in ten countries using the co-integration testing and the error correction model (ECM). They found that Wagner's law gave strong empirical support to advanced industrial countries such as South Korea, Taiwan, Japan, the United Kingdom (UK) and the United States of America (USA). The study also found that there was no co-integration relationship between economic growth and the country's expenditure for countries such as Australia, Canada, New Zealand, South Africa and Thailand.

Bose *et al.* (2003) stated that government expenditure for educational purposes is the essential element for economic prosperity. Limited economic resources are preferred for the purposes of the education sector. Expenditure during aggregate does not affect the growth, but capital aggregate expenditure offers a positive growth. Tax yield gives a negative effect on the growth whereas an increase in the deficit gives the country a significant negative effect. Financial increase will moderate the positive effect of education or outgoing capital.

Glomm (1997) examined the influence of productive government expenditure to the long-term economic growth with a focus on two types of government expenditure, namely the entry as an input into the expenditure function for the output end and the entry as an input in technology investment. He explained that other government expenditure can also give an impression of long-term growth. For example, expenditure on health can improve human life span and has a significant effect on private capital collection and cause growth.

Dawrick (1996) explained that a strong positive relationship between the two growth rates is influenced by the increased demand for public service which causes the validity of economic growth. He states that a negative relationship between cross-country and the actual size of the government and economic growth is more to show proportionate relationship compared to direct cause-effects relationships. It may react to the need of the public sector in the larger economy which is described by a clear market failure in the provision of goods for the general public. Negative relationship across the country between is economic growth and the government size is lost when the government service cost is controlled and the manipulation of the time series data panel to take into account the specific differences of the country which are not observed in the rate of growth.

According to Heitger (2001) if government expenditure is used to provide common goods, such as roads, it will give the impression of positive economic growth to the country and the negative effects of economic growth will exist if the government expenditure is used to provide private goods in the country. Faris (2002) used the dynamic model in explaining the relationship between government expenditure and economic growth. It proved that a positive relationship existed between them.

Dalamagas (2000) described that many economic development experts have been interested in the relationship between economic growth and government expenditure. He said the government expenditure was one of the tools that could

affect the GDP in a country. He explained that government activity will give a positive impression or vice versa on the economic growth of the country. This explains that through use or government expenditure in general public production, it can increase economic growth.

Kweka and Morrissery (2000) stated that government expenditure can be divided into two types which are a production that can lead to economic growth and non-production which can prevent economic growth. They had used time series data to study the effect of government expenditure on economic growth. A small sized government affect the input productivity capital where the situation can improve the economic growth.

## 3. Methodology and Data

Classic estimation method is based on the assumption that the mean and the variables are constant and free. In other words, the standard estimation method assumes that variables are static. Nevertheless previous studies failed to deal with the existence of non-stationary variables in a serial time data which are used in statistical test are not valid. In this study, we will apply co-integration method ARDL in proving existence and prove relevant Wagner's law is applied by the Malaysian government in deciding its development expenditure growth in keeping with growth in economic growth augmentation.

According Engle and Granger (1987), that two serial time data were not stationary, but the linear combination between the two of them was stationary, then the two of the time series are co-integrated. In the context of Wagner law, if co-integration between government development economic growth and expenditure existed, then Wagner's law is more suitable to be tested in error correction context where it will include short-term dynamic coordination which makes a correction on the existence of deviation in a long-run equilibrium and this can be shown by the Error Correction Mechanism (ECM).

Wagner's law states that when incomes increase per capita then part of the government expenditure on gross national product will increase. Generally, we adapted five different basic versions of Wagner's law as follows:

Version 1 - Peacock-Wiseman "traditional"  -  $G = f(Y)$

Version 2 - Goffman  -  $G = f(Y/N)$

Version 3 - Musgrave  -  $G/Y = f(Y_R/N)$

Version 4 - Gupta/Michos  -  $G/N = f(Y/N)$

Version 5 - Peacock-Wiseman "share"  -  $G/Y = f(Y)$

where G is total government expenditure, Y is Gross Domestic Product (GDP), $Y_R$ is Real Gross Domestic Product(RGDP), and N is total population size.

The first version was formed by Peacock and Wiseman (1961) and Goffman and Mahar (1971). The second version was suggested by Goffman (1968) and Mann (1980). The third version was used by Musgrave (1969), Murthy (1993), and Ram (1987). Gupta (1967) and Michos (1975) took into account the fourth version and the fifth version was nominated and tested by Mann (1980). All the above versions were formed to test Wagner's law.

We will use all five of Wagner basic is law versions to test how far Wagner's law can be applied in the Malaysian government's. The versions of Wagner's law are indicated by equation below:

| | | | |
|---|---|---|---|
| 1 | Peacock-Wiseman "traditional" | $\ln Gg_t = \alpha_0 + \alpha_1 \ln Y_t + \varepsilon_t$ | (1) |
| 2 | Goffman | $\ln G_t = \alpha_0 + \alpha_1 \ln Y/N_t + \varepsilon_t$ | (2) |
| 3 | Musgrave | $\ln G/Y_t = \alpha_0 + \alpha_1 \ln Y_{R\,t} + \varepsilon_t$ | (3) |
| 4 | Gupta/Michos | $\ln G/N_t = \alpha_0 + \alpha_1 \ln Y/N_t + \varepsilon_t$ | (4) |
| 5 | Peacock-Wiseman "share" Version | $\ln G/Y_t = \alpha_0 + \alpha_1 \ln Y_t + \varepsilon_t$ | (5) |

For the fives versions above, $G_t$ refers to the government development expenditure, $Y_t$ refers to gross domestic product, $Y_{Rt}$ refers to real gross domestic product, whereas $Y/N_t$ refers to gross domestic product per residential population, $G/Y_t$ refers to the government development expenditure per gross domestic product, and $G/N_t$ refers to government development expenditure per residential population. $\alpha_0$ and $\alpha_1$ refer to coefficient estimates and $\varepsilon_t$ is the random error. Coefficient $\alpha_1$ can be valued positive or negative and depends on the phase of the economic development of the country. If the country is in early development and the government is role would be vital, then coefficient $\alpha_1$ would be worth positive, while if the country achieves a fairly high production-level with the significant role of the private sector in economy, then coefficient $\alpha_1$ would be worth negative.

Equations 1 to 5 as mentioned above clearly show that government development expenditure influences Gross Domestic Product (GDP). This situation demonstrates a closed economy where the external elements are considered as having no effect on the elasticity of government development expenditure.

**ARDL Co-integration version**

The versions in this study will be estimated by using the co-integration border test procedure (Autoregressive Distributed Lag, ARDL) which was introduced by Pesaran and Shin (1995) and Perasan, *et al.* (2001) for analysis purposes by long-term empirical relationship and dynamic interaction between the variable studied. To use the co-integration technique, we need to determine the co-integration rule for each variable. However, as stated in the previous research, different tests will give different outcomes of decision and they depend on pre-test unit cause. This ARDL procedure is applied because of three reasons. First, the border testing procedure is relatively easy. This is different with from various variation co-integration techniques such as Johensen and Juselius (1990) where co-integration relationship estimates the use of ordinary least square (OLS) when rank lapse for model is upheld. Second, the border testing procedure does not require a unit root pre-test for variables in studies such as that of Johensen. This test may be carried out whether regression in the model is I(0), I(1), or it is a jointly co-integrated. We calculated Wald's test (statistic-F) to see the long-term relationship between the variables. Wald's test can be done with restrictions on long-term coefficient expectation. Third, this test is relatively more efficient for miniaturized data sample such as for this case study. Nevertheless, no border testing procedure can be done if the serial is *I*(2).

According to Pesaran *et al*. (2001), this study applies border testing procedure through a long-term model equation (1 - 5) as a general model vector auto regression (VAR) for rank p in z.

$$z_t = c_c + \beta t + \sum_{i=1}^{P} \phi z_{t-i} + \varepsilon_t \qquad t = 1, 2, 3, .....T \qquad (6)$$

Referring to vector (k+I) of intercept and vector (k+I) coefficient trend, Pesaran *et al.* (2001) the issued a mechanism vector error correction model (VECM) based on similarity (6):

$$\Delta z_t = c_c + \beta t + \Pi z_{t-1} \sum_{i=1}^{P} \Gamma z_{t-i} + \varepsilon_t \qquad t = 1, 2, 3, .....T \qquad (7)$$

Where (k+1) x (k+1) is a matrix for $\Pi = I_{k+1} + \sum_{i=1}^{P} \Psi_i$ and $\Gamma = \sum_{j=1}^{P} \Psi_j$, i = 1,2,....*p*-1 which contain long-term coefficient and VECM's coefficient. $z_t$ refers to vector variables $y_t$ and $x_t$ respectively. $y_t$ refers to dependent variable *I*(1), which is $G_t$ (or $G/Y_t$, $G/N_t$) and $x_t = Y_t$ (or $Y/N_t$, $Y_{Rt}$) is a matrix vector of 'power' regression *I*(0) and *I*(1) has identified similar (*identical*) many variation and scatter free (i.i.d) zero mean vector error $\varepsilon_t (\varepsilon_{1t}, \varepsilon'_{2t})$, and homoscedastic process.

With an assumption of long-term unique relationship between variables, VECM's position (7) will become:

$$\Delta y_t = c_{y0} + \beta t + \delta_{yy} y_{t-1} + \delta_{xx} x_{t-1} + \sum_{i=1}^{p-1} \lambda \Delta y_{t-1} + \sum_{i=0}^{P} \xi \Delta x_{t-1} + \varepsilon_{yt} \qquad t = 1,2,3,.....T \qquad (8)$$

By using assumptions made by Pesaran *et al.* (2001) in Case III (unlimited intercept with no trend) and imposing the restriction of $\lambda_{yx} = 0$, $\mu \neq 0$, the interrelationship between dependent variable and independent variables in Equation (1) to Equation (5) are as follows.

$$\ln G_t = \beta_0 + \beta_1 \ln G_{t-1} + \beta_2 \ln Y_{t-1} + \beta_3, i \sum_{i=1}^{p} \Delta \ln G_{t-i} + \beta_{4,i} \sum_{i=1}^{q_1} \Delta \ln Y_{t-i} + \varepsilon_t \qquad (9)$$

$$\ln G_t = \beta_0 + \beta_1 \ln G_{t-1} + \beta_2 \ln Y/N_{t-1} + \beta_3, i \sum_{i=1}^{p} \Delta \ln G_{t-i} + \beta_{4,i} \sum_{i=1}^{q_1} \Delta \ln Y/N_{t-i} + \varepsilon_t \qquad (10)$$

$$\ln G/Y_t = \beta_0 + \beta_1 \ln G/Y_{t-1} + \beta_2 \ln Y_{Rt-1} + \beta_3, i \sum_{i=1}^{p} \Delta \ln G/Y_{t-i} + \beta_{4,i} \sum_{i=1}^{q_1} \Delta \ln Y_{Rt-i} + \varepsilon_t \qquad (11)$$

$$\ln G/N_t = \beta_0 + \beta_1 \ln G/N_{t-1} + \beta_2 \ln Y/N_{t-1} + \beta_3, i \sum_{i=1}^{p} \Delta \ln G/N_{t-i} + \beta_{4,i} \sum_{i=1}^{q_1} \Delta \ln Y/N_{t-i} + \varepsilon_t \qquad (12)$$

$$\ln G/Y_t = \beta_0 + \beta_1 \ln G/Y_{t-1} + \beta_2 \ln Y_{t-1} + \beta_3, i \sum_{i=1}^{p} \Delta \ln G/Y_{t-i} + \beta_{4,i} \sum_{i=1}^{q_1} \Delta \ln Y_{t-i} + \varepsilon_t \qquad (13)$$

where $\Delta$ is the first difference operator; $\varepsilon_t$ is white disturbance error and all variables are expressed in logarithm. Equation (9) to Equation (13) can also be interpreted as an Autoregression Distributed Lag (ARDL) and model ($p_1q_1$). We will use Akaike's Information Criterion (AIC) for lag level selections for ARDL's model. From the unlimited error correction estimate model, long-term elasticity is a lag independent variable (multiplied with negative sign) divided by a lapse dependent variable.

We will estimate Equation (9) to Equation (13) with the use of ordinary least square (OLS) technique and then calculate statistic-F (Wald's Test) for existence of long-term relationships between variables. Null hypothesis and alternatives were built as follows:

$H_0 : \beta_1 = 0$ *dan* $\beta_2 = \beta_3 = \ldots = \beta_6 = 0$ (No long-term level relationship)

$H_A : \beta_1 \neq 0$ *dan* $\beta_2 \neq \beta_3 \neq \ldots \neq \beta_6 \neq 0$ (Long-term level relationship existed)

Third, we will follow border test approach [Table 3 CI(iii)] proposed by Pesaran *et al.* (2001) and when sample statistical tests are below lower critical value it means that we receive the null hypothesis at one level of significance as significant. This null hypothesis is accepted regardless of whether if follows the rule that government expenditure

co-integration of and economic growth showed be either $I(0)$ or $I(1)$. According to Pesaran *et al.* (2001), lower boundary critical values that utilised variables, are integrated at zero, or $I(0)$, while critical values upper boundary assume that they are integrated at one order. Therefore, if statistic-F in our sample is calculated the statistical test exceeds upper boundary value which means we reject the alternative that a long term relationship exists between government expenditure and economic growth. On the other hand, if statistic-F is calculated from the statistical test sample will be smaller from lower boundary value, then we do not reject the null hypothesis and we summarise that economic growth and its determinants are not co-integrated. On the other hand, if statistic-F is calculated from the statistical sample which is between the lower boundary and the upper boundary, its decision is not known.

Finally, error correction model can be defined in ARDL's framework as follows:-

$$\ln G_t = \mu + \sum_{i=1}^{p} \phi_i \Delta \ln G_{t-i} + \sum_{j=1}^{q_1} \varphi_l \Delta \ln Y_{t-j} + vecm_{t-1} + \varepsilon_t \tag{14}$$

$$\ln G_t = \mu + \sum_{i=1}^{p} \phi_i \Delta \ln G_{t-i} + \sum_{j=1}^{q_1} \varphi_l \Delta \ln Y/N_{t-j} + vecm_{t-1} + \varepsilon_t \tag{15}$$

$$\ln G/Y_t = \mu + \sum_{i=1}^{p} \phi_i \Delta \ln G/Y_{t-i} + \sum_{j=1}^{q_1} \varphi_l \Delta \ln Y_{Rt-j} + vecm_{t-1} + \varepsilon_t \tag{16}$$

$$\ln G/N_t = \mu + \sum_{i=1}^{p} \phi_i \Delta \ln G/N_{t-i} + \sum_{j=1}^{q_1} \varphi_l \Delta \ln G/N_{t-j} + vecm_{t-1} + \varepsilon_t \tag{17}$$

$$\ln G/Y_t = \mu + \sum_{i=1}^{p} \phi_i \Delta \ln G/Y_{t-i} + \sum_{j=1}^{q_1} \varphi_l \Delta \ln Y_{t-j} + vecm_{t-1} + \varepsilon_t \tag{18}$$

Here $(\phi$ and $\varphi)$ in Equation (14) to Equation (18) refer to short-term dynamic coefficient and *vecm* shows an adjustment speed.

The data set contains the Malaysian data series for 1970 - 2007. GDP's annual data, real GDP per capita, and government development expenditure can be divided into four sectors; namely social services, economy services, security, and general administration taken from the World Development Indicator, Asia Development Bank, and Government Finance Statistics.

## 4. Empirical Result

To ensure having a long-term relationship between variables in this model, static formal test namely Augmented Dickey-Fuller unit's root test (ADF) was used in econometric analysis in all variables for Malaysia. If variables in Equation (1) to Equation (5) are found to have a similar static level namely $I(1)$, then there is a possibility of long relationship between variables in those equations and this is confirmed by doing the co-integration test. Existing co-integration means that regression results in Equation (1) to Equation (5) are false regressions and form the same resonance in the long run. If all variables are co-integrated, then this shows existence of long-term relationship, or long-run equilibrium between variables in that equation.

Table 1 show empirical results in which GDP's variable (Y) and real GDP ($Y_R$) are stationary in both constant and constant + trend. ADF's test was conducted again in its first differentiation approach and the result showed that the entire serial was stationary at 1% level of significance.

The analysis cause unit in Table 1 shows that most variables are stationary in $I(1)$ although there is a stationary variable in $I(0)$. Ambiguity in this variable integration rule better supports ARDL's approach in using the co-integration alternative test.

Border's tests for Version 1 to Version 5 are indicated in Table 2. Using asymptotic critical value accounting by Pesaran *et al.* (2001), all statistical tests are significant at 1% level of significance. This test result also drove us to reject the null hypothesis that there is no co- integration, regardless of whether variables in were $I(1)$ or $I(0)$ or in both. This test also showed the existence of legal long-term the relationship between independent variables and dependent variables in Version 1 at a significant level of 1% and Version 3 at a significant level of 10%. Exceeding boundary critical values in Version 4 and Version 5 show the existence of long-term relationship in significant statistical test at the significant level of 5% exceeding upper boundary critical value. While Version 2 indicates there is no legal long-term relationship between the dependent variable and the independent variable.

To determine ARDL model's strength Equation (9) to Equation (13) which have are being estimated, have been shown through several diagnostic tests like those indicated in Table 3 and CUSUM and CUSUMSQ stability's test in diagram 1. The diagnostic tests conducted were LM BREUSCH-GODFREY serial correlation test, Jacque-Bera's normality test, Ramsey RESET stability tests and ARCH tests. Structural parameter stability test was undertaken through CUSUM and CUSUMQ. According to Pesaran and Pesaran (1997), stability estimation coefficient models should be empirically investigated. A delegation with CUSUM and CUSUMSQ's statistics is shown in Figure 1. Both CUSUM and CUSUMSQ plots are within the boundaries and as such this statistics confirms long-term stability in government development spending growth coefficient and economic growth in ARDL's model.

Long-term coefficients based on ARDL model's estimate for the period of 1970 to 2007 are listed in Table 4. The results showed that the national product variable in Version 1 and Version 3 to Version 5 with a significant level of 1% does affect the Malaysian government development expenditure.

Version 1 explains that a rise of 1% in the national product leads to an increase of 17.1% in government development expenditure. Version 3 to Version 5 shows that a rise in the national product will increase the government development expenditure by as much as 44.3% (Version 3), 23.4% (Version 4) and 11.9% (Version 5). Referring to the three Versions discussed above, Version 3 shows more effect on the influence of Real Gross Domestic Product per large residential population ($Y_{Rt}/N$) to government development expenditure per residential population ($G/N_t$). Version 2 shows no significant relationship between national products and government development expenditure.

To determine the long-term coefficient for each chosen ARDL's model, we obtained estimation for model error correction. As shown in Table 5, every model which was found to be an estimate error correction parameter is marked 'right' which is a negative sign. Generally, the error correction coefficient of all models is very significant, and shows a speed adjustment which is fairly fast towards equilibrium after a shock. It was found that between 69% - 78% inequilibrium had happened in last year's shock and it was corrected to the long-term equilibrium in the current year.

## 5. Conclusion

Wagner's law is a hot topic which is still being discussed by economists in relation to government expenditure since it was explored by Adolph Wagner in the 1880s. This Wagner's law had been discussed many times as theoretical and empirical studies in past researches. Nevertheless, most of the empirical retrieval study missing validity or quantitative technique introduced in the study is uncertain. Due to this, we tried to test Wagner law's of validity by the exploring new technique in time series data introduced by Pesaran *et al.* (2001). This technique, called border test approach, probably is able to resolve co-integration dependence test on integration rule.

Product growth rate is closely related to the economic situation in the long term and it is a measurement of a country's development performance. By testing its validity based on five (5) of Wagner's law Version, it has been found that four (4) border tests support Wagner's long-term relationship verification in Malaysia. In accordance with that, government activity or economic development can be considered in the long run. Each variable influences the co-integration tests which are suggested by Pesaran *et al.* (2001).

This study shows that long-term relationships exist between national products and government development expenditure. Overall, the estimation analysis of ARDL's model for Wagner's law shows that the national product factor is still relevant in influencing government development expenditure in Malaysia.

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Table 1. Augmented's Test Dickey-Fuller (ADF) for Cause Unit

|  | I(0) | | I(1) | |
|---|---|---|---|---|
|  | Constant | Constant + Trend | Constant | Constant + Trend |
| $\ln G$ | -1.954675 | -1.384145 | -4.051215* | -4.077510* |
| $\ln Y$ | -0.421721 | -2.800540** | -6.105847* | -6.009744* |
| $\ln Y/N$ | -0.926803 | -2.163649 | -5.556977* | -5.541558* |
| $\ln G/Y$ | -0.341275 | -1.896491 | -2.520402** | -3.059059* |
| $\ln Y_R$ | -3.258235* | -3.271125* | -5.070569* | -5.233604* |
| $\ln G/N$ | -1.623778 | -2.225336 | -4.013469* | -4.154940* |

Note: *, **, and *** Significant at 1%, 5%, and 10% significance level.

Table 2. Border's test for long-term relationship existence

|  | Lat AIC | Statistic-F | Probability | Result |
|---|---|---|---|---|
| G   Version 1 | 1,0 | 5.907* | 0.005 | co-integration |
| Version 2 | 1,0 | 2.101 | 0.147 | No co-integration |
| Version 3 | 1,0 | 3.446** | 0.043 | co-integration |
| Version 4 | 1,0 | 4.349** | 0.037 | co-integration |
| Version 5 | 1,0 | 4.346** | 0.037 | co-integration |
| Critical Value | Below | Above |  |  |
| 1% level of significance | 3.15 | 4.43 |  |  |
| 5% level of significance | 2.45 | 3.61 |  |  |
| 10% level of significance | 2.12 | 3.23 |  |  |

Note: Border critical value achieved from Pesaran et al. (2001), Table CI(iii) Case III: unlimited intercept and no trend. *, ** and *** significant at 1%, 5% and 10% significance level.

Table 3. Diagnostic test for ARDL's model

|  | G= $f$(Y) | G = $f$(Y/N) | G/Y = $f$($Y_R$/N) | G/N = $f$(Y/N) | G/Y = $f$(Y) |
|---|---|---|---|---|---|
| LM Test | 0.631(0.434) | 0.605 (0.443) | 0.003 (0.956) | 0.678(0.417) | 0.0016 (0.969) |
| Jarque-Bera | 5.396 (0.125) | 7.920 (0.052) | 5.166 (0.115) | 4.420 (0.110) | 1.172 (0.557) |
| Ramsey's RESET Test | 0.571 (0.456) | 0.392 (0.536) | 1.180 (0.286) | 0.762 (0.390) | 0.054 (0.818) |
| ARCH | 0.392 (0.984) | 0.002 (0.962) | 0.011 (0.916) | 0.103 (0.750) | 0.148 (0.702) |

Note: Ramsey's Test RESET - refer to regression specification error test. ARCH - refer to test heteroschedasticity (Engle 1982); Jarque-Bera - refer to distribution test normal; LM test - refer to Breusch-Godfrey serial correlation's test (BG).

Table 4. Long-term Estimation Coefficient of ARDL's Approach

|  | C | Y | Y/N | $Y_R$/N |
|---|---|---|---|---|
| G= $f$(Y) | 1.320 (2.091)** | 0.171 (3.196)* | - | - |
| G = $f$(Y/N) | 0.928 (1.511) | - | 2.253(0.385) | - |
| G/Y = $f$($Y_R$/N) | 0.317 (2.776)** | - | - | 0.443(3.035)* |
| G/N = $f$(Y/N) | 0.175 (3.897)* | - | 0.234(4.674)* | - |
| G/Y = $f$(Y) | 0.286 (2.035)** | 0.119 (3.227)* | - | - |

*, ** and *** show significant at 1%, 5% and 10% significance level.

Table 5. ECM's model for ARDL's Model

|  | G = $f$(Y) | G = $f$(Y/N) | G/Y = $f$($Y_R$/N) | G/N = $f$(Y/N) | G/Y = $f$(Y) |
|---|---|---|---|---|---|
| C | 0.914 (2.294)* | 0.651 (1.492) | 0.234 (2.132)** | 0.055 (1.978)*** | 0.228 (2.313)** |
| Y | 0.1492 (-2.194)** | - | - | - | 0.095 (3.771)* |
| G(-1) | 0.240 (2.727)* | -0.223 (-2.571)* | - | - | - |
| Y(-1) | 0.146 (2.027)** | - | - | - | -0.005 (-1.464) |
| Y/N | - | -1.582 (-.379) | - | -0.174 (-0.663) | - |
| Y/N (-1) | - | 2.557 (1.712) | - | 0.103 (2.345)** | - |
| $Y_r$/N | - | - | 0.327 (2.089)** | - | - |
| G/Y(-1) | - | - | -0.223 (-2.274)** | - | - |
| $Y_r$/N(-1) | - | - | -0.059 (-.609) | - | - |
| G/N(-1) | - | - | - | 0.197 (2.187)** | 0.179 (2.059)** |
| ecm(-1) | -0.692 (-4.171)* | -0.702 (-4.184)* | -0.738 (-4.304)* | -0.746 (-4.332)* | -0.798 (-5.651)* |
| $R^2$-Adjusted | 0.473 | 0.466 | 0.457 | 0.452 | 0.632 |
| Stat.-DW | 1.808 | 1.806 | 1.945 | 2.055 | 1.896 |
| AIC | 74.784 | 74.568 | 78.086 | 78.411 | 84.89 |

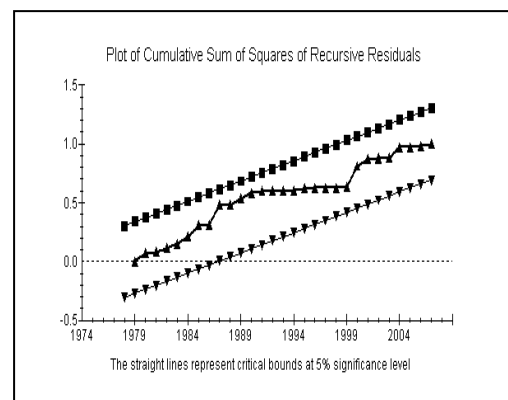Note: (   ) refer to statistic-*t;*     *, ** and *** show significant at 1%, 5% and 10% significance level.
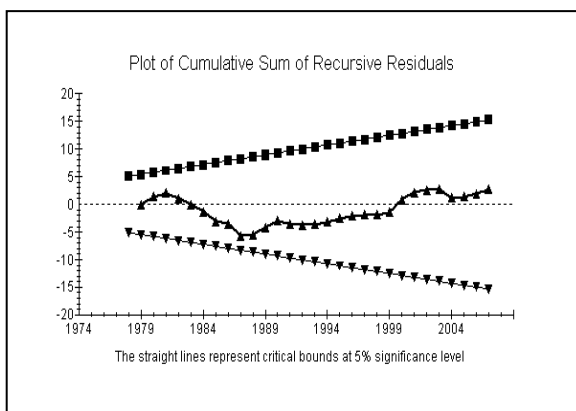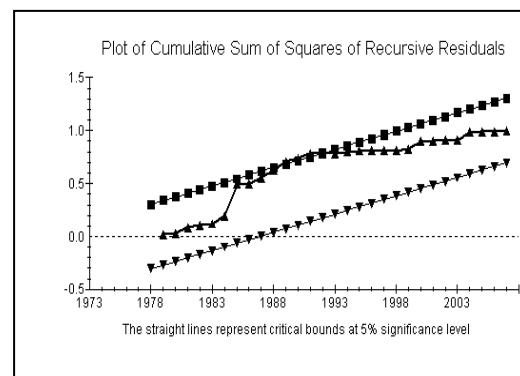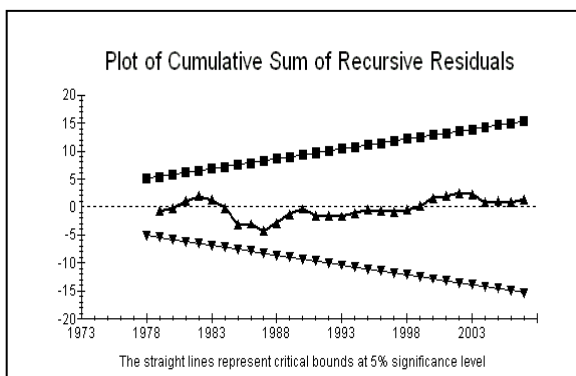
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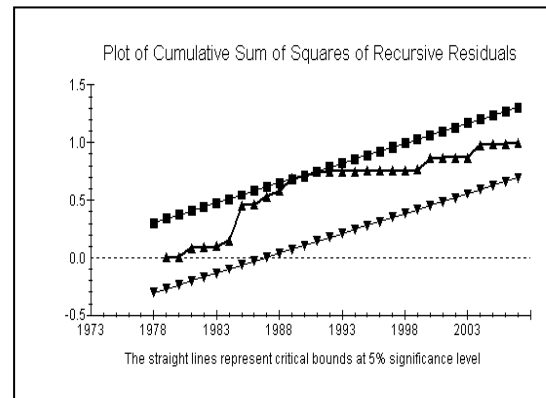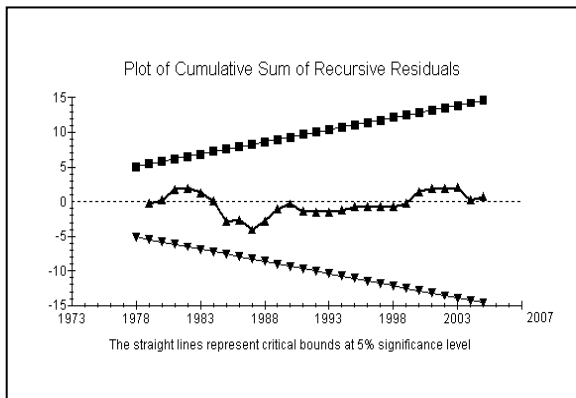


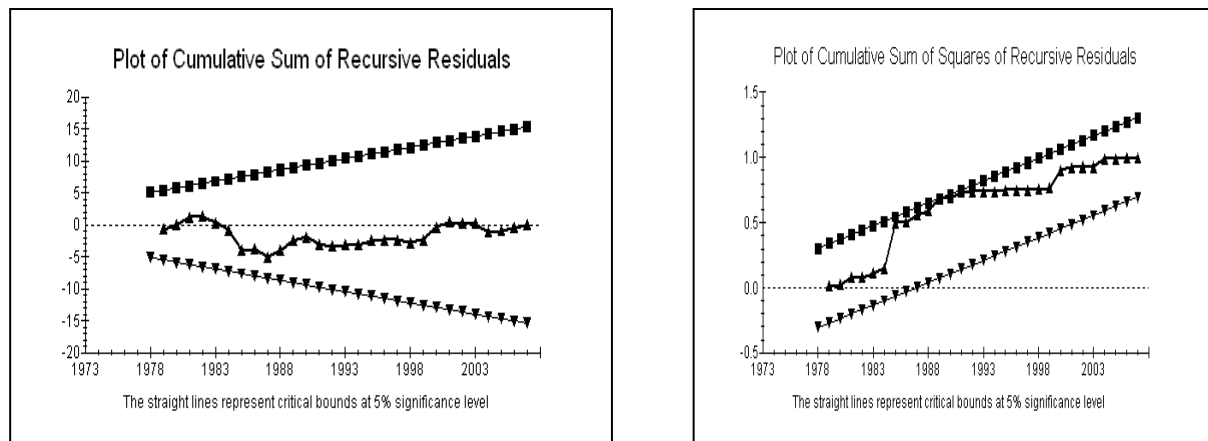Version 2
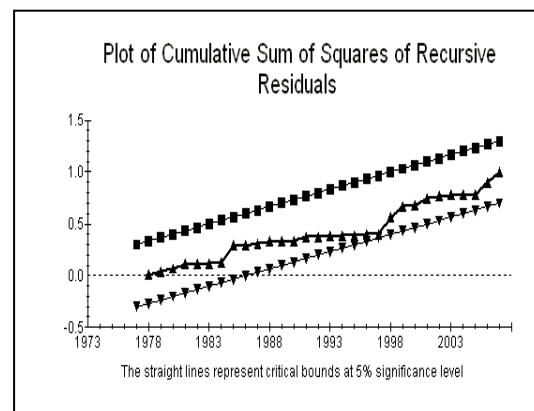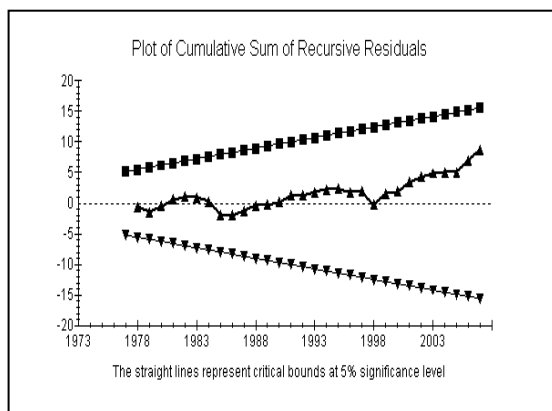


Version 3



Version 4

Version 5



Figure 1. Cumulative Sum of Recursive Residuals (CUSUM) and Cumulative Sum of Squares
of Recursive Residuals (CUSUMSQ)

Note: Straight line is a critical border in level of significance at 5% significance level.

# Challenges Faced by Expatriate Workers in

# Gulf Cooperation Council Countries

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**Abstract**

Over the last six decades, reliance of Gulf Cooperation Council (GCC) countries' economy on expatriate workforce has increased incessantly. Majority of private sector workforce in Gulf Cooperation Council (GCC) countries are expatriates. Recent attempts by governments in GCC countries to localise the workforce, through their workforce nationalisation programmes, have offered limited results. Thus dependence on expatriate workforce will continue in near future and GCC countries, short of professionally and technically qualified local workers will need to employee a large number of expatriates to support their economic and social developments plans. This calls for a systematic approach to understand the specific challenges faced by expatriates of different nationalities in GCC countries, so that these challenges can be addressed to enable GCC countries to become a preferred destination for technically and professionally qualified expatriate workers. This paper presents an overview of GCC countries; reasons for their dependence on expatriate workforce; key current challenges faced by expatriates in GCC countries and suggestions for facilitating adjustment of expatriate workers in GCC countries.

**Keywords:** Expatriate adjustment, Migration, Foreign worker, Gulf Cooperation Council, GCC

## 1. Introduction

Workers working in a foreign location for more than one year are considered to be expatriate workers. (Richardson & McKenna, 2003). Expatriates are temporary workers who work in a foreign location under contracts which are of limited duration (Ward, Bochner & Furnham, 2001 as cited by McGinley, 2008). These work contracts may be renewed multiple times thus prolonging the stay of expatriate worker in a foreign country (Shah, 2009). Increasing numbers of expatriate workers are now accompanied by their spouse and/or children (Haslberger & Brewster, 2008), thus necessitating the need of not only workplace adjustment but also social and cultural adjustment of self and family.

A major section of the work force in GCC is expatriate population derived from different nationalities (Forstenlechner, 2008). This expatriate work force and accompanying family members face specific challenges during their stay in foreign land. Before dwelling into the nature and reasons for such challenges, the following section first presents an over view of GCC countries.

## 2. Common economic FSeatures of Gulf Cooperation Council (GCC) Countries

The Gulf Cooperation Council (GCC) came into existence in 1981, when Bahrain, Qatar, Saudi Arabia, UAE, Oman and Kuwait joined hands for regional collaboration. The GCC countries are a part of the Arab world and share a common cultural, religious and historical background (Kirk & Napier, 2008). Some common economic features amongst GCC countries are: dependence on petroleum products, young and fast paced growth of the local labour population, and high dependence on expatriates in the private sector (Sturm, Strasky & Peschel, 2008). The sparsely populated region of GCC faces acute shortage of technically and professionally qualified nationals (MoEA, 2001).

## 3. Nationalisation of Workforce in GCC

For many years GCC has been attempting to promote higher participation of local population in the national workforce with workforce nationalization programs such as Bahrainization (Bahrain), Emiratization (UAE) and Omanization

(Oman). This has been necessitated by the fact that about 60 per cent of the local population of GCC is between the ages of 14 and 27 (Dollman, 2007) and is speedily adding to the increasing number of employment seeking adults.

In the public sector workforce, higher participation of the local population has been achieved through lower knowledge and experience requirements for recruits (Al-Ali, 2008; Forstenlechner, 2008). Public sector employees are offered better salary, higher job security, lesser work hours, lesser work content and generous holidays (Al-Ali, 2008). This creates a privileged workforce segment of local nationals in public sector with better compensation and less demanding work profile.

## 4. Growth of Expatriate Workforce in GCC Countries

In GCC countries, nationals are a predominant component of government workforce where as expatriates are in majority in the private sector (Forstenlechner, 2008; Keivani, Parsa & Younis, 2003 as cited by Malecki & Ewers, 2007). Number of migrant workers in GCC has increased from just 9 million in 1990 to 13 million in 2005 (Dito, 2008). Popularity of expatriates in the private sector workforce is due to higher productivity and better discipline (Sadi & Henderson, 2005). Poor participation of local population in the private sector has been due to various reasons such as long and irregular work hours and focus on employee performance (Al-Ali, 2008). Private sector organisations depend on expatriates, due to following economic reasons:

-        Expatriates are a major source of technically and professionally qualified and experienced workforce.

-        Lesser training and induction time as expatriates learn and adapt fast to new environment.

-        Expatriates are willing to work longer hours and have lower rates of absenteeism when compared to that of local workforce.

-        In comparison to local workforce, the productivity of expatriate workforce is higher.

-        Majority of Asian expatriates working in GCC countries are available at lower salaries when compared to that of local workforce and expatriates from the advanced western world.

Due to above mentioned reasons government supported programmes for higher nationalisation of workforce in GCC countries have not delivered desired results in the private sector. Private sector organisations continue to depend on expatriate workforce for pure business reasons and will continue to do so in near future as well.

## 5. Gender Differences in Migration in GCC

Though expatriate population in GCC has grown in the last six decades, yet participation of female in migrating workforce to GCC is one of the least in the world with only 29 per cent of the migrants being females (Dito, 2008). A substantial number of Asian female migrants in GCC are engaged in the occupation of domestic servants (Malecki & Ewers, 2007). This highlights the fact that professional expatriate women have limited opportunities in GCC. Orthodox social and cultural factors are responsible for lack of work opportunities for single women in GCC as some of the countries do not easily allow work permits for single expatriate females or married expatriate females not accompanied with spouse. Majority of female expatriate professionals in GCC are those who have accompanied working spouse or parents to GCC on a family visa and have later managed a job opportunity.

## 6. Gender Differences in Salary in GCC

In the Arab world, women in workplace suffer from bias with reference to severe differences in pay as well as social attitude towards women in leadership position (Al-Ali, 2008) and the same applies to GCC. According to Haslberger and Brewster (2008), accompanying spouses of expatriates find it difficult to find a new job in a foreign location. With specific reference to female expatriate workers, as many of them originally accompany their working spouse under spouse sponsored family visa and with no confirmed job, they are more vulnerable to lower paying jobs. In many circumstances for the same job, with similar work content and responsibility, female expatriate workers agree to work for a lower salary in comparison to salary paid to a male colleague, as they prefer to work for lower salary rather than to sit idle at home.

## 7. Social Division of Labour in GCC and Social Interaction between Locals and Expatriates

While adjusting in an environment of a new country, expatriates face multiple social and cultural challenges (ORC, 2007). In the social hierarchy in GCC, local Arabs occupy the highest platform, followed by skilled westerners, Arabs from other countries and the lowest position is occupied by the Asians (Malecki & Ewers, 2007). Within Asians Indians are placed slightly higher than the Bangladeshis and Sri Lankans (Malecki & Ewers, 2007). Expatriates from different foreign locations are extended a different social treatment and Asian expatriates do not enjoy the same social status as their counterparts from western world do. This social division gets further enhanced by the fact that local and expatriate populations have lower social and cultural interaction with each other.

Most expatriates in Middle East live in housing compounds which are located separately from the housing facilities of the locals (Mesmer-Magnus & Viswesvaran, 2007). The social interactions of most of the expatriates in GCC with the

local population are primarily limited to professional reasons. An exception to this may be a Muslim expatriate who may be relatively easily accepted by the local Muslims in GCC countries (Mamman, 1995)

## 8. Work Visa Requirements

The majority of migrants in GCC can not gain citizenship (MoEA, 2001; Shah, 2004; Shah, 2009). Expatriates in GCC work on short term work visa and permanent residency status for the expatriates is discouraged on account of social and cultural reasons. Work visa are generally issued until the age of 60 years (Al-Ali, 2008) and needs to be renewed after every two years. This creates a sense of uncertainty and job insecurity in the minds of expatriates as the present labour laws are skewed in favour of the employer and the work contracts can be terminated any time by the employer (Al-Ali, 2008).

## 9. Weak Labour Laws in GCC and Labour Market Liberalization

Labour laws in GCC are weak, for example in UAE the labour laws are biased in favour of employers and the law enforcements is poor (Keane & McGeehan, 2008). Following facts related to un-skilled and semi-skilled expatriate workers highlight the poor compliance of existing labour laws by a large number of employers in GCC countries (ILO, 2009; Rajan & Prakash, 2009; Saif, 2009).

-        Poor safety condition at workplace

-        Forced daytime outdoor work when temperature is very high

-        Poor housing conditions

-        Delay in payment of salary

-        Forced overtime coupled with non payment for overtime work

-        Forced surrender of passport

For an expatriate to change job from one employer to another, while remaining in the same country in GCC, once required a NOC (no objection certificate) from the current employer. On account of international pressure on GCC to reform its labour laws, such practices are being gradually abolished (Gulf Talent 2008), but still more worker friendly labour laws are the need of hour.

## 10. Economic Problems of Expatriates in GCC Countries

According to Haslberger (2008) adjustment of an expatriate in a foreign location is also influenced by living cost, house rents and other expenses. High inflation in the last few years has become an important feature of GCC economy. Average inflation in GCC increased to above 6% in 2007 (Sturm et al., 2008) and further increased to double digit figures in 2008 (Saif, 2008). This directly influences the capacity of an expatriate to save and remit money to parent country.

### 10.1 Rising house rents

In GCC, residential rents contribute to inflation in a major way. Residential rents rose in different GCC nations in the range of 15 to 42 per cent during 2007-2008 (Gulf Talent, 2008). In UAE in 2008, 35 per cent of income of an employee was being spent on paying residential rent, in Oman it was 28 per cent and in Bahrain 26 per cent (Gulf Talent, 2008). Rise in residential rents in most of the nations in GCC has been attributed to the large inflow of expatriate workers, opening of real estate markets to foreign buyers and upgrading of housing facilities by the nationals (IMF, 2008). Current recession has had some impact on housing rents and the rents have declined in certain cities and regions such as Dubai (UAE) and Doha (Qatar) but still a large section of expatriate population has to pay a significant part of their monthly salary as house rent.

### 10.2 Rising other expenses

Current economic slowdown has not had any impact on cost of living of expatriates in GCC countries. Most of the cities in GCC are witnessing higher costs of housing, transportation, food, clothing, household goods and entertainment. A recent survey conducted in March 2009 by global human resource consulting firm Mercer found Dubai rising from 52nd rank to 20th rank in the global list of most expensive cities (BI-ME, 2009). Other GCC cities also witnessed rise in ranks in the list of global most expensive cities. Abu Dhabi in UAE jumped 39 places, from 65th to 26th, Kuwait city rose from 94th to 77th, Manama in Bahrain rose from 112th to 82nd, Riyadh in Saudi Arabia rose from 119th to 90th rank (BI-ME, 2009).

### 10.3 Increasing gap between salary growth and inflation

According to Bayt (2007) research report, the average increase in salary in GCC was 15 per cent but the average increase in cost of living due to inflation and other related factors was 24 per cent. This rising gap between increase in salary and inflation resulted into reduced disposable income in the hands of expatriates. Similar findings were stated by

Gulf Talent (2008) report, in which many expatriates reported fall in net disposable income. For example in UAE, 40 per cent respondents reported lower savings due to inflation and poor growth in salary (Gulf Talent, 2008).

*10.4 Salary gap within different expatriate communities*

For similar educational qualification, work experience and job responsibilities, expatriates from western advanced nations are paid higher salary in GCC in comparison to expatriates from Asian countries. Arabian Business Salary Survey for the year 2009 highlighted the fact that British expatriates working in GCC countries are paid salaries which amount to more than two times of the salaries paid to their Indian counterparts (Sambidge, 2009). Differences in salary combined with differences in social treatment of expatriates on the basis of different regions/ countries create two categories of expatriates. First is the preferred category of expatriates from the western advanced nations and the second is the general category of Asian expatriates.

## 11. Some Solutions to Challenges Faced by Expatriates in GCC Countries

Expatriates are in general perceived to be temporary worker, but in GCC a large number of expatriates have been living for a longer duration (Coffman, 2003). Further, a large number of expatriates in GCC want to stay back. According to a recent survey 77 per cent of expatriates want to continue working in UAE, further, 54 per cent in Bahrain and 46 per cent in Oman want to continue working (Gulf Talent, 2008). Above mentioned findings suggest that to large extent expatriate workers in GCC countries have been able to overcome the hurdles they face while adjusting in a foreign land. Successful expatriate adjustment in GCC countries is a joint effort in which the GCC governments, employer and expatriate themselves participate and jointly attempt to remove the road blocks for expatriate adjustment.

Expatriates do not get to socialise much with the local community and this brings a bonding amongst the expatriates of similar social status, common regional background, language, religion or profession (MoEA, 2001). Hundreds of expatriate cultural/ recreational associations / clubs are active throughout the GCC (MoEA, 2001) thereby providing a platform for the expatriate community to connect socially. Thus expatriates themselves successfully overcome the challenge of social isolation.

Some GCC countries such as Bahrain and Kuwait are attempting to address the drawbacks of work visa requirements and are trying to simplify the procedures in favour of the expatriate workers. Bahrain is in the process of granting expatriate workers some freedom of movement in the labour market by allowing them to transfer jobs without paying any penalty (Shaikh & Sinclair, 2009). But still more needs to be done by governments in GCC to legally protect the work related interests of expatriates.

Proactive governments of Bahrain, Kuwait and UAE are in the process of establishing a free labour market and in near future stronger laws to protect the interests of expatriate workers are expected. But till then the employers will continue to enjoy the higher bargaining power under the protection of present labour laws skewed in favour of employers. Thus GCC governments are attempting to ensure a more liberal and hassle free work visa system for the expatriates.

Gaps between the salaries of expatriates of advanced western nations and Asian expatriates have narrowed in the recent past with specific reference to Indian expatriate workers. Indian expatriates are the single largest segment of the GCC workforce. Economic boom in the early years of the current century has resulted into growth in salaries in India, and this has put pressure on employers in GCC. They have two choices, either to stop / reduce recruitments from India or to increase salaries of Indian expatriates. According to Gulf Talent (2008) survey, Asian expatriates, majority of who are Indian expatriates, were recipients of highest increase in salary during 2004-2008. This has resulted into narrowing of salary gap between the Asian expatriates and Arab/ Western expatriates. But this reduction in salary gap is limited to highly qualified and technically skilled workers, and majority of Asian expatriates still suffer from the drawback of bias and gap in salary due to their origin.

## 12. Conclusion

Though some of the solutions have been implemented in the recent past to facilitate expatriate adjustment in GCC countries yet a lot more is still required to be done by the governments and private sector organisations in GCC countries.

To become an attractive destination for qualified expatriate workforce, governments in GCC countries need to immediately address following issues:

- Introduction of more stringent labour laws to protect expatriate workers from forced overtime, poor living conditions, working under hazardous conditions.

- Introduction of more stringent laws to protect expatriate workers from arbitrary increase in house rents

- Simplification of work visa rules to enable an expatriate to freely change employer

- Joint initiatives with the private sector to reduce salary bias against Asian expatriates.

To become an attractive destination for qualified expatriate workforce, governments in GCC countries also need to further promote participation of female expatriates in the workforce. To attract larger number of professionally qualified female workers, following initiatives by governments of GCC countries are required

-        Reduction in gender differences in migration by simplifying work visa rules for female expatriates.

-        Better enforcement of labour laws to protect interests of female workers, especially unskilled and semiskilled female workers.

-        Joint initiatives with the private sector to provide a work environment where female expatriate workers do not suffer from any work related bias, especially with reference to salary bias.

While protecting their cultural heritage and sentiments, governments and private sector employers in GCC countries need to implement programmes for enhancing social and cultural interaction between expatriate and local population. GCC governments also have to continue their efforts in improving the work-visa laws as well as labour laws to protect the interests of expatriate workers. Governments in GCC countries in partnership with private sector need to continue the initiatives for a free labour market and to systematically and gradually introduce stronger labour laws to protect expatriate workers from possible exploitation by the employer. Thus, the governments in GCC countries need to play a more effective role in creating a professional and social environment, which can attract better quality expatriate workers who can contribute better in the economic development of the region.

Introduction of any policy,   programme or law to protect the interests of expatiate workers will produce results only when the implementation and monitoring of such policy, programme or law is effective and proper care is taken that such policy, programme or law is adhered to by the employers. Implementation of labour laws and adherence by local employers is one of the major weaknesses in work environment of GCC countries. Out of the three stages of policy making, policy implementation and adherence to the policy, it is the third stage of adherence to the policy that needs to given the top priority by the GCC governments.

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# Quantitative Analysis of the Structured Productivity of Tourism Industry: Taking Sichuan Province as an Example

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**Abstract**

Reasonable structure of the tourism industry is very important for the long-term development of the tourism industry for one country (region). By the quantitative method to analyze the structure of productivity in the development economics, the computation methods of the structure proportion of the tourism industry, the structure change index and the structure productivity coefficient are proposed in the theory, and based on the empirical study taking Sichuan Province as the example, the idea to improve the productivity structure of the tourism industry is proposed in the article.

**Keywords:** Structure of tourism industry, Productivity, Quantitative analysis

The tourism industry is a comprehensive economic industry, and its industry structure not only directly influences the total growth of the tourism industry, but decides the development level and economic benefit of the tourism industry. To study the influence of the tourism industry structure on the economic development of tourism, by referring and applying the theoretical and quantitative method of analyzing the structure productivity in the development economics, the structure productivity of the tourism industry is analyzed and studied in the article.

**1. Analysis Method of Tourism Industry Structure Productivity**

For the structure productivity of the tourism industry, the structure proportion of various industries in the tourism industry, the structure change index and the structure productivity coefficient of the tourism industry can comprehensively reflect the rationalization of the tourism industry structure and its influences and functions to the tourism economic growth.

*1.1 Structure proportion of tourism industry*

The structure proportion of various industries in the tourism industry reflects the contributions and influences of various industries to the gross of tourism economy. Because the tourism industry is a comprehensive economic industry including numerous industries, so to collect and analyze data, the tourism industry is divided into six industries including traffic, hotel, catering, tour, amusement and shopping. Then corresponding index data (such as income, foreign exchange earning, and reception amount) are selected to analyze the structure proportion of these six industries, so the important status and influences of various industries in the tourism industry can be known. The computation formula is

$$R_i = \frac{X_i}{\sum_{i=1}^{n} X_i} \times 100\%$$

Where, Ri is the composing proportion of the industry i in the tourism industry, Xi is the scale of certain index of the industry i in the tourism industry, and n is the industry amount analyzed in the tourism industry.

*1.2 Structure change index of tourism industry*

The structure change index means the change value of the composing proportion of certain index in the tourism industry in neighboring two years or several years, and it reflects the change of the tourism industry structure in different years. Generally speaking, big structure change index means big change of interior structure of the tourism industry, and small structure change index means small or relatively stable change of interior structure of the tourism industry. So by computing and analyzing the industry structure change index of the tourism industry in different development terms, it can be seen that whether the tourism industry structure can accord with the development scale of the tourism industry in corresponding terms, which could offer scientific references for the constitution of proper tourism industry policies. The

computation formula of the tourism industry structure change index is

$$GI_s = \arccos \frac{\sum_{i=1}^{n} X_{i(t)} \cdot X_{i(t-1)}}{\sqrt{\sum_{i=1}^{n} X^2_{i(t)} \cdot X^2_{i(t-1)}}}$$

Where, GIs is the structure change index of tourism industry, Xi(t) is the proportion of certain index of the department i in the tourism industry in the year of t, Xi(t-1) is the proportion of certain index of the department i in the tourism industry in the year of t-1, and n is the department amount of the industry in the tourism industry.

*1.3 Structure productivity coefficient of tourism industry*

The structure productivity coefficient means the elastic coefficient of the tourism industry structure change index to the tourism economy total growth rate, and it reflects the drive function and influence of the tourism industry structure change to the development of the tourism industry. Generally speaking, bigger structure productivity coefficient indicates that the driving force of the tourism industry structure change to the development of the tourism industry is larger. Contrarily, smaller structure productivity coefficient indicates that the driving force of the tourism industry structure change to the development of the tourism industry is smaller. However, when applying the structure productivity coefficient to analyze the tourism industry structure, the rationalization and the height of the tourism industry structure should be combined and analyzed together. By the computation and analysis of the structure productivity coefficient, the actuality and the development tendency of the rationalization and the height of the tourism industry structure can be further discovered. The computation formula of the tourism industry structure productivity coefficient is

$$P_s = \frac{r_i}{GI_{si}}$$

Where, Ps is the structure productivity coefficient of the tourism industry, ri is the total growth rate of certain index of the tourism industry in the term of i, and GIsi is the structure change index of certain index of the tourism industry in the term of i.

**2. Analysis of Structure Productivity of Sichuan Tourism Industry**

Relative statistical materials are seen in Table 1.

*2.1 Computing the structure proportion of Sichuan tourism industry*

According to the data in Table 1, the structure proportion of Sichuan tourism industry from 2005 to 2008 can be computed. The computation result is listed in Table 2.

(1) The proportions of traffic and tour occupy large proportion in the whole tourism income, then the catering and shopping.

(2) The proportions of the incomes of most industries in Sichuan tourism industry from 2005 to 2008 tend to descending, especially the descending extents of traffic and tour are large, and they respectively drop for 3.4% and 3.0%, and the shopping and hotel present the sign of fluctuation, and the proportion of the amusement ascends largely for 6.2%.

(3) Because of the impacts of earthquake in 2008, the total income dropped than 2007, and the proportions of various industries except for shopping were descending.

That indicates the composing changes of various industries in Sichuan tourism industry are large, and they need to be analyzed mainly to find out the cause of change. Of course, the influence of the change on the structure of Sichuan tourism industry needs to be analyzed combining with the industry structure change index.

*2.2 Computing the structure change index of Sichuan tourism industry*

According to relative materials, the structure change index of Sichuan tourism industry can be computed, and the computation result is seen in Table 3.

The data in Table 3 indicate that the fluctuation of change is large, especially from 2005 to 2006, the fluctuation extent can achieve 3.74, but the fluctuations from 2006 to 2007 and 2008 are small. In fact, that shows that the interior structure change of Sichuan tourism industry is large from 2005 to 2006, which reflects not only the drive of the development of Sichuan tourism industry to various departments and the active participation and development of various departments of tourism factor, but also the influences of some unreasonable factors in the structure change, for example, the proportions of traffic, tour, and shopping were respectively ascending for 2.2%, 1.0%, and 2.7%, but the proportions of hotel and amusement respectively ascended for 2.3% and 3.1%, which indicated that the industry structure change of Sichuan tourism industry presented negative correlation with the income growth of the tourism

industry, and the influence of unreasonable factors in the structure change of Sichuan tourism industry from 2005 to 2006 still existed. From 2006 to 2008, the structure change indexes of the tourism industry are close, and the change of the proportions of various industries is small, which shows that the industry structure in these years is relatively stable, so the industry structure basically presents positive correlation with the tourism income growth, and the influence of the unreasonable factor of the industry structure change is very small.

*2.3 Computing the structure productivity of Sichuan tourism industry*

To compare the structure productivity levels of Sichuan tourism industry, the structure productivity coefficients of the tourism industry from 2005 to 2008 are respectively computed, and relative computation result is seen in Table 4.

The computation result shows that the structure productivities computed in three years are very lower than 4, and the structure productivity of 2006 is the highest one, and it is 3.23, and the structure productivity of 2008 is the lowest one, and it is 1.80 (because of earthquake), and the structure productivities present descending, which indicates the driving force of the Sichuan tourism industry structure change to the tourism industry development is small. With the development of the tourism industry, the industry structure also changes, and this change should bring more energy for the development of the tourism industry, but the fact is not so.

## 3. Ideas to Enhance the Structure Productivity of Sichuan Tourism Industry

*3.1 Adjust and optimize the market structure proportion of the tourism industry in various industries*

The structure of six industries in the tourism industry should be harmonized, i.e. the structure should be optimized, because the structure optimization will produce higher productivity. The optimization of the proportion of various industries should achieve maximum profits, and that is a continually developing and perfecting process, and it needs long time to complete it.

*3.2 The key of structure optimization is to strengthen the weak parts*

At present, in various industries of Sichuan tourism industry, the income proportions of the tour and the amusement in the whole tourism industry is low, and in fact, these two industries are weak in the industry structure, that means these two industries still have a large development space, i.e. the proportions of the tour and the amusement in the whole industry structure should be enhanced. In fact, the productivities of these two industries in the tourism industry are high, so after adjusting, the proportions of six industries in the tourism industry structure are relatively balanced.

*3.3 Form a market-oriented operation mechanism*

From above analysis, the industry structure productivities of various industries in Sichuan tourism industry all are low, and the structure of six factors is not harmonious, and some important departments are relatively weak, i.e. there still is large market space. However, it needs the innovation to fill the market space, especially, the market-oriented operation mechanism should be formed to adjust and optimize the industry structure, harmonize and develop the industries, and enhance the structure productivity of the industry.

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Table 1. Domestic tourism income structure of Sichuan from 2005 to 2008

| Composing Year | Traffic (ten thousands Yuan) | Hotel (ten thousands Yuan) | Catering (ten thousands Yuan) | Tour (ten thousands Yuan) | Amusement (ten thousands Yuan) | Shopping (ten thousands Yuan) | Total (ten thousands Yuan) |
|---|---|---|---|---|---|---|---|
| 2005 | 1490016 | 1081440 | 1228877 | 1361433 | 853662 | 941272 | 6956700 |
| 2006 | 1818545 | 1689900 | 1722460 | 1764837 | 1051377 | 1432381 | 9479500 |
| 2007 | 2179513 | 1811236 | 2160685 | 2041049 | 1839352 | 1758165 | 11799000 |
| 2008 | 1936172 | 1601540 | 1939021 | 1787615 | 1644485 | 1864467 | 10773300 |

Note: To be convenient for the structure analysis, part items are combined properly, and the traffic includes post communication, and the amusement includes other items. And the source comes from Sichuan Tourism Statistics.

Table 2. Domestic tourism income structure proportion of Sichuan from 2005 to 2008

| Composing Year | Traffic (%) | Hotel (%) | Catering (%) | Tour (%) | Amusement (%) | Shopping (%) |
|---|---|---|---|---|---|---|
| 2005 | 21.4 | 15.5 | 17.7 | 19.6 | 8.0 | 17.8 |
| 2006 | 19.2 | 17.8 | 18.2 | 18.6 | 11.1 | 15.1 |
| 2007 | 18.5 | 15.4 | 18.3 | 17.3 | 15.6 | 14.9 |
| 2008 | 18.0 | 14.9 | 18.0 | 16.6 | 15.2 | 17.3 |

Table 3. Computation table of Sichuan tourism industry structure change index

| Year / Index | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|
| GIs | 10.27 | 6.53 | 7.08 | 6.92 |

Table 4. Structure productivity of Sichuan tourism industry

| Year | Total growth rate (%) | Structure change index (Gisi) | Structure productivity (Ps) |
|---|---|---|---|
| 2006 | 36.26 | 6.53 | 3.23 |
| 2007 | 24.47 | 7.08 | 2.87 |
| 2008 | -8.69 | 6.92 | 1.80 |

# The Fuzzing Evaluation on Environmental Harmonization

# of the Rural Building Materials

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**Abstract**

The rural dwelling house is not only an important component of housing construction in China, but also significant of promotion of the construction socialism new countryside. With the rapid development of urbanization of rural China, the level of urbanization in China will be close to 60% excepted by 2020, which undoubtedly bring to the rural building industry an unprecedented opportunity for development. The main problem which rural building materials faced is lack of the product performance certification. According to characteristic of customers and tendency of building material industry, the rural building materials should possess the harmonization, except basic quality performance. This paper analyzed the factors which influence on the environmental harmonization and established a fuzzing evaluation model, based on life cycle assessment. Through validation of environmental harmonization of ceramic, fuzzing evaluation method was effective and feasible to assess the rural building material environment harmonization.

**Keywords:** Rrural building material, Eenvironment harmonization, Fuzzing evaluation

**1. Factors of Village Building Materials Life Cycle Assessment**

It is a paramount important issue to evaluate the material environmental harmonization in the research on material. At present, LAC is usually adopted and accepted.

*1.1 The life cycle assessment*

LCA is the method for understanding environmental impacts of a product quantitatively through its life cycle. LAC originated from environmental characteristics of the analysis of resource consumption and release between different beverage containers in Coca-Cola 1969. It was firstly advanced on the international symposium on life cycle assessment held by the international society of environmental toxicology and chemistry. It has been widely used as the analysis and decision-making tool of production environment. Life cycle assessment is a "cradle-to-grave" approach for assessing industrial systems. "Cradle-to-grave" begins with the gathering of raw materials from the earth to create the product and ends at the point when all materials are returned to the earth. LCA enables the estimation of the cumulative environmental impacts resulting from all stages in the product life cycle, often including impacts not considered in more traditional analyses (e.g., raw material extraction, material transportation, ultimate product disposal, etc). By including

the impacts throughout the product life cycle, LCA provides a comprehensive view of the environmental aspects of the product or process and a more accurate picture of the true environmental trade-offs in product and process selection (Wei, 2007). For building materials, LAC is a analyzed and expressed process which the various stages of life cycle environmental load is broken down into the usage of energy resources, the pollution of air, water and soil ,effect of global warming and emission of castoff. It lays heavy emphasis on determination of the environment evaluation factors.

*1.2 Evaluation factors of the Rural Material Environmental Harmonization*

The primary issue of evaluation of rural building material environmental harmonization is to determine the evaluation factor. The evaluation system which is composed by evaluation factors can entirely reflect the characteristic of material in the fully life course and guide or improve on environmental harmonization. According to life cycle theory, the environment harmonization of rural building materials should cover all stages of the life cycle, which include pre-process used non-renewable resources, materials manufacture process released gas, waste and noise and consumption process recycled and reused waste products. Moreover based on characteristic of rural customer, economic factor is brought into the evaluation system. The definition of economic factor is the full cost which happed in the material life cycle (Chen, 2008). According to results of LAC researches, this paper showed that evaluation factors of environmental harmonization include resource consumption factor, energy consumption factor, environmental emission factors and economic factors, base on the , combined with Chinese's rural building materials production and consumption in the course of the specific environmental behavior.

1.2.1 The resource consumption factor

The resource consumption factor is used to evaluate the resource consumption in the whole life cycle. In general speaking, building materials derived from mineral raw materials or biological materials, such as resource consumption factor of glazed tiles can be defined as clay, pyrophyllite, kaolin and water.

1.2.2 The energy consumption factor

The Energy consumption factor is mainly used to evaluate one-time energy consumption of building materials in the whole life cycle. One-time energy consumption is primary coal in the production process, and the consumption in the transport process is gasoline, diesel and so on.

1.2.3 The environmental emission factor

The environmental emission factor is used to evaluate impact of various castoff, which released in the whole life cycle on the ecosystem. The prominent feature of environmental emission factor is throughout the all aspects of the life cycle, began with mining terminated in exhausting (Mary, 1993). According to the discrepancy in impact on environment, the environmental emission factor can be divided into four groups: the first category is air pollution, the second category is water pollution, the third category is solid castoff, and the fourth category is the noise and others. As an example, environmental emission factors of ceramics industry is listed in table

1.2.4 The economic consumption factor

The economic consumption factor is used to measure the cost which consumers must pay for using the materials in life cycle. The economic consumption factor is codetermined by the materials cost and useful life. The cost occurred during consumption process included materials price, maintenance cost and retired cost. For example, the purchase price of ground material is 100 Yuan /m$^2$, maintenance costs is 10yuan/year and useful life is five years, the economic consumption of materials can be defined as 30 Yuan / year. The consumers of rural building material characterized by a significant low level of purchasing power expected cheap production. At present, the higher price is the main obstacle which the material with better environmental harmonization faced in process of extension of rural market. If the building materials cost per unit year can effectively be reduced brought useful life and maintenance cost into economic analysis, the types of materials can be considered in the villages, and vice versa.

## 2. Evaluation Method of Environmental Harmonization of the Rural Building Materials

The evaluation system of environmental harmonization of the rural building materials includes various factors, such as resource consumption, energy consumption and basic characteristic of material. And each factor includes kinds of elements, such as non-renewable resource consumption (Jeroen, 2002 and Kohler 2002). Fuzzying evaluation method is adopted to assess environmental harmonization of the rural building materials. Fuzzing evaluation utilizes membership function to describe and assess the limits of the rating level, and puts different weight to single factor according to the effect on whole influence. The advantage of this method is the determination of the weight more objective and conversion materials life cycle assessment from qualitative to quantitative.

*2.1 Membership function*

The membership function is the basis of fuzzy control applications. It is one of the keys to correct structure the membership function in of fuzzy control. According to the characteristics of building material factors, the relationship

between membership function is followed:

$$u_i = \begin{cases} (x_{i+1} - x)/(x_{i+1} - x_i) & (x_i < x < x_{i+1}) \\ 1 & (x = x_i) \\ 0 & (x < x_i \ or \ x > x_{i+1}) \end{cases}$$

$\mu_i$ – membership

$x$ – Value of factor

$x_i, x_{i+1}$ – Adjacent values of the indicators

## 2.2 Evaluation criteria

According to life cycle theory and characteristics of rural building materials, the evaluation criteria should be reasonable to distinguish resource consumption, energy consumption, waste emission and economic consumption between the different materials. This paper selected five types of indicators to represent environmental coordination. The meanings of various indicators are shown in table 2.

## 2.3 Weight coefficient vector

Due to the discrepant importance of various factors, the evaluated factor should be given a corresponding weight $v_i$. The weight coefficient vector is expressed as followed:

$$N = (w_1, w_2, \ldots, w_m)$$

$$w_i = \frac{(c_i / s_i)}{\sum (c_i / s_i)}$$

$c_i$ – Value of $i$ evaluated factor

$s_i$ – Average value of $i$ evaluated factor

## 2.4 The steps of fuzzing evaluation

1). Establish the evaluation factors set

$$U = \{u_1, u_2, \cdots, u_n\}$$

2). Establish the evaluation set

$$V = \{v_1, v_2, \cdots, v_n\}$$

3). Establish fuzzing relationship matrix

$$R = \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1m} \\ r_{21} & r_{22} & \cdots & r_{2m} \\ \cdots & \cdots & \cdots & \cdots \\ r_{n1} & r_{n2} & \cdots & r_{nm} \end{bmatrix}$$

4). Establish the weight coefficient vector

$$N = (w_1, w_2, \ldots, w_m)$$

5). Calculate fuzzing comprehensive evaluation matrix calculated

$$B = N \cdot R = (b_1, b_2, \cdots, b_m)$$

6). Determine evaluation level

$$b_j = \bigvee_{i=1}^{n} (a_i \wedge r_{ij}), j = (1, 2, \cdots, m)$$

$$b_j = \max\{\min(a_1, r_{1j}), \min(a_2, r_{2j}), \cdots, \min(a_n, r_{nj})\}, j = (1, 2, \cdots, m)$$

In fuzzying evaluation matrix, the grade level is determined by the maximum value.

### 3. The Application of Fuzzing Evaluation in the Rural Building Material Environmental Harmonization

Research targets are two tiles XA and XB which product separately in A and B companies. Type of tile is VWH002NP, and size is 250mm×330mm×8.3mm, functional units is 1m2. The purchase price in March 2009 is separately 48Yuan / m2 and 79Yuan/ m2, without maintenance cost in useful life. The data of environmental harmonization are listed in table 3 and 4. The evaluation criteria of VWH002NP tile is refer to product and emission criteria of enterprise and industry. The detail data are list in table3.

Comprehensive evaluation matrix of $x_A$ is: B= (0, 0.044, 0.455, 0.094, and 0).The largest vector-value is 0.455, the environmental harmonization degree isⅢ. Comprehensive evaluation matrix of $x_B$ is: B= (0, 0.1713, 0.1307, 0, and 0).The largest vector-value is 0.1713, the environmental harmonization degree isⅡ.

### 4. Conclusions

The factors impacted on environment exist in each stage in material cycle life, and is different to quantitative analysis the factor. So fuzzing evaluation is a more scientific and appreciative method to assess the environmental harmonization of rural building material.

In this paper, the design of evaluation system not only considered various types of evaluation of resource consumption and waste emission factors, but also included economic performance based on the characteristics of rural consumer groups. It highlighted the problem which should be faced in promotion process of rural building material and the quantitative result responded the practice preferably. The fuzzing evaluation is valid and practicable that is confirmed by the application of title environmental harmonization assessment. As the result of sample size and time limitations, the evaluation factors designed in this paper is not entirely suit for rural building material, it is necessary to adjust and amend.

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Table 1. The emission factors of ceramics industry in cycle life

| category | emission factors | cycle life | | | | |
|---|---|---|---|---|---|---|
| | | Mining of raw materials | Transport of raw materials | process of production | Transport of production | Use and waste |
| air pollution | $CO_2$ | √ | √ | √ | √ | |
| | $SO_2$ | √ | √ | √ | √ | |
| | $NO_X$ | √ | √ | √ | √ | |
| | CO | √ | | √ | | |
| | Dust | √ | | √ | | |
| | Powder | | | √ | | |
| | Hydrocarbons | √ | | √ | | |
| water pollution | Suspended solids | | | √ | | |
| | Lead | | | √ | | |
| | Cadmium | | | √ | | |
| | $COD_{cr}$ | | | √ | | |
| | Fluorid | | | √ | | |
| solid castoff | Slag | | | √ | | |
| | Industrial castoff | | | √ | | √ |
| Others | Noise | | | √ | | |

Table 2. The meanings of various indicators

| Evaluation criteria | I | II | III | IV | VI |
|---|---|---|---|---|---|
| Resource consumption | Less affected | Small affected | Certain influence | Great affected | Greater affected |
| Energy consumption | Less affected | Small affected | Certain influence | Great affected | Greater affected |
| waste emission | Less affected | Small affected | Certain influence | Great affected | Greater affected |
| economic consumption | Less affected | Small affected | Certain influence | Great affected | Greater affected |

Table 3. Input data of two tiles

| Input(kg) | Clay | Pyrophyllite | Kaolin | Feldspar | Water | Diesel | Coal |
|---|---|---|---|---|---|---|---|
| $X_A$ | 10.15 | 5.40 | 2.79 | 0.99 | 580 | 3.79 | 2.89 |
| $X_B$ | 9.5 | 6.35 | 2.54 | 0.79 | 530 | 3.96 | 2.79 |

Table 4. Output data of two tiles

| Input (kg) | $CO_2$ | $SO_2$ | $NO_X$ | CO | Dust | Powder | Hydrocarbons |
|---|---|---|---|---|---|---|---|
| $X_A$ | 17.98 | 0.89 | 0.225 | 0.026 | 0.83 | 0.88 | 0.007 |
| $X_B$ | 17.23 | 0.69 | 0.19 | 0.019 | 0.69 | 0.76 | 0.055 |
| Output (g) | Lead | Cadmium | $COD_{cr}$ | Fluoride | Slag | Suspended solids | Industry castoff |
| $X_A$ | 0.143 | 0.078 | 88.15 | 6.13 | 5.8 | 908 | 30.99 |
| $X_B$ | 0.129 | 0.059 | 85.13 | 5.73 | 3.5 | 897 | 29.08 |

Table 5. Evaluation criteria

| Evaluation | I | II | III | V | VI |
|---|---|---|---|---|---|
| Clay | 5 | 7.3 | 9.60 | 11.9 | 14.2 |
| Pyrophyllite | 2.5 | 2 | 4.50 | 6.5 | 8.5 |
| Kaolin | 0.88 | 1.76 | 2.64 | 3.53 | 4.4 |
| Feldspar | 0.3 | 0.6 | 0.89 | 1.2 | 1.5 |
| Water | 300 | 400 | 550.00 | 650 | 800 |
| Diesel | 1.3 | 2.6 | 3.57 | 5.2 | 6.5 |
| Coal | 1.5 | 2 | 2.50 | 3 | 3.5 |
| $CO_2$ | 5 | 11 | 16.64 | 21 | 26 |
| $SO_2$ | 0.22 | 0.44 | 0.68 | 0.88 | 1.02 |
| $NO_X$ | 0.04 | 0.08 | 0.13 | 0.2 | 0.28 |
| CO | 0.007 | 0.014 | 0.02 | 0.03 | 0.04 |
| Dust | 0.25 | 0.5 | 0.71 | 0.9 | 1.15 |
| Powder | 0.2 | 0.4 | 0.78 | 0.8 | 1.1 |
| Hydrocarbons | 0.002 | 0.004 | 0.01 | 0.008 | 0.01 |
| Lead | 0.04 | 0.08 | 0.13 | 0.16 | 0.2 |
| Cadmium | 0.022 | 0.044 | 0.07 | 0.088 | 0.11 |
| $COD_{cr}$ | 28 | 56 | 84.15 | 112 | 140 |
| Fluoride | 1.87 | 3.74 | 5.61 | 7.48 | 9.35 |
| Slag | 1.4 | 2.8 | 4.40 | 6.4 | 7.8 |
| Suspended solids | 297 | 594 | 891.00 | 1188 | 1485 |
| Industry castoff | 9.59 | 19.18 | 28.77 | 38.38 | 47.95 |
| Price | 22 | 44 | 66 | 88 | 110 |

# The Race towards a Knowledge Based Economy

# A Comparative Study between Malaysia and Thailand

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**Abstract**

This paper has attempted to study the development and growth of a knowledge based economy in two developing countries, namely Malaysia and Thailand. A summary of different economic theories states that the best theoretical grounding for a knowledge based economy is the endogenous growth theory. The conceptual framework established for statistically measuring the success of knowledge-based economy comprise of the following variables: 1). innovation, 2). information and communication technology, 3). human resource development and 4). business environment. Recommended additions to the framework were proposed in this paper based on integrating the following variables: 1). government incentives, 2). better human capital, and 3). institutional factors. The last section of the paper proposes policy recommendations and conclusions.

**Keywords:** Knowledge-Based Economy, KBE, Malaysia, Thailand

## 1. Introduction

A summary of the different theories of development is important in understanding the theoretical base for development policies of developing countries. However in trying to understand the shift towards a knowledge-based economy (KBE), the theory that offers the best theoretical grounding for that is the endogenous growth theory (EGT) (Abdulai, 2004).

The EGT argues that education and research and development (R&D) are important factors in sustaining a long-run economic growth rate. This is evident from policy reports that show that lack of education is a major cause for the slower growth in OECD countries when compared to the United States (Sapir and Hue, 2004). Much like other theories can help predict and understand phenomena, the EGT can predict the effects and impact of technology and education on economic growth (Kopf, 2006). The importance of knowledge and R&D is realized by firms as evident from the spending of the firms on knowledge and R&D. As much as one third of the firm's investment is geared towards knowledge-intensive goods (Economist, 2005).

The importance of knowledge is also captured in Romer's endogenous growth model which emphasizes that technological change is crucial to the heart of economic growth. Knowledge is broken into two components represented by the variables, H and A. H represents human capital which is the cumulative effect of activities such as education and on-the job training. A represents innovation, more specifically the count of innovation or ideas. Romer proposes the following equation:

$$\mathring{A} = \delta H_A A$$

where 'Å, the number of new ideas at a given time, t, relates directly to the total human capital employed in research, HA, times A, the total stock of ideas or innovations that already exists, and a productivity constant, δ' (Romer, 1990). Thus it can be stated that the theoretical case of a KBE rests on the notion of EGT (Floud and Johnson, 2004). KBE encompasses the attributes stated in the EGT such as human capital, knowledge, innovation and technology. These attributes are believed to be critical success factors in the long-term economic growth rate.

Knowledge and information have increasingly become the basis of modern day economies where knowledge has been recognized as the driver of productivity and economic growth. The term KBE "stems from the fuller recognition of the place of knowledge and technology." Even organizations like the Organization for Economic Co-Operation and Development (OECD) are finding it important to understand the relationship between the endogenous growth theory and the knowledge-based economy. Information societies have emerged as a result of the growth of knowledge through its transmission through communications and computer networks which in turn lead to a learning economy where the need for skilled workers is required (Organization for Economic Co-Operation and Development, 1996).

However KBE is not just a digital economy, it is more complex and is a broader phenomenon. KBE has different dimensions and can be viewed from different aspects:

1) KBE is driven by a very powerful technological force that is caused by the rapid growth of information and communications technology (ICT). The growth of ICT particularly of telecommunications and networks has forced the human activity into a new mode and new spheres (Organization for Economic Co-Operation and Development, 1996).

2). Knowledge today is supported by cultural and spiritual values and has become an important factor in social, economic, technological, and cultural transformation.

3). The integration of the enormous economic resources of economies has become possible because of the emerging KBE's, thereby stimulating the development of countries and in the process allowing them to be equal participants in the global development process (Organization for Economic Co-Operation and Development,1996).

4). Societal activities in various countries, such as institutional and innovation systems, human resource development have been affected with the emerging knowledge-based economies. "KBE has become an engine of progress in every country" (National Information Technology Committee, 2002).

Developed and developing countries are making efforts to establish themselves as knowledge-based economies. Malaysia and Thailand too have realized the importance of a move towards the knowledge-based economy in order to become competitive. The next section of this paper presents the efforts the governments of the two countries have made in fulfilling the dream of achieving a knowledge-based economy. This paper will attempt to study the efforts made by Thailand and compare it with its economic and political neighbor and rival – Malaysia. Section 2 will discuss development processes and strategic actions to enhance KBE in Malaysia and Thailand. Section 3 draws comparisons between the two countries and presents the conceptual framework. Section 4 proposes policy recommendations for knowledge economy in Thailand and concludes.

## 2. Development Processes of Knowledge-Based Economy: Malaysia VS Thailand

In 1991 Malaysia created a long term program called Vision 2020, a name conceived under prime minister Mahathir Mohamad. According to Mahathir "some have wondered why 2020 and not some other year. As a doctor I am attracted to the optometrist measurement of vision; 2020 indicates 100 per cent good vision in both eyes. Our 2020 vision for Malaysia implies this clear vision of where we want to go and what we want to be" (Mohamad, 2007). The aim of this program was to turn Malaysia into a fully industrialized country and to give it the status of a developed country. The aim was also to quadruple the per capita income by 2020. This means that Malaysia will have to climb the ladder of production from a low-tech to high-tech type of industrial production (Drabble, 2004). The challenge of globalization and a knowledge-based era has made it vital for Malaysia to move towards a KBE. In the foreword of the Eight Malaysian Plan 2001-2005, Mahathir said "during the Eight Malaysia Plan period, we will be faced with even greater challenges from globalization and liberalization as well as the rapid development of information and technology. We will have to shift the growth strategy from being input-driven towards one that is knowledge-driven" (Abdulai, 2004).

In order to attain the status of a developed country by 2020, Malaysia has integrated the development of a KBE into its new vision policy. Two components of the new vision policy are:

1). to develop a KBE as a "strategic move to raise the value added of all economic sectors and optimizing the brainpower of the nation: and 2). "strengthening human resource development to produce a competent, productive, and knowledgeable workforce." (Abdulai, 2004). A substantial knowledgeable workforce has to be created therefore Malaysia has developed plans to strengthen its human resource pool as follows:

2) to expand the supply of highly skilled and knowledgeable manpower in order to support the development of a knowledge-based economy.

3) to increase the accessibility to quality education and training in order to enhance income generation capabilities and quality of life.

4) to improve the quality of education and training delivery system in order to ensure that manpower supply is inline with technological and market demand"

5) to promote lifelong learning to enhance employability and productivity of the labor force.

Besides plans to create a strong and skilled human resource pool that will have access to quality education, the Malaysian government has also been highly involved in the process of moving towards a KBE. The government of Malaysia has set up measures to set up institutions, infrastructures, and infostructures that will help move the country towards a KBE. Some of these include the following: 1). National Information Technology Council (NITC), 2). the Malaysian Institute of Microelectronic Systems (MIMOS) 3). the Multimedia Super Corridor (MSC) project 4). the New Multimedia and Cyber laws and 5). The Human Resource Development Council Funding for Training (HRDCF) (Abdulai, 2004). The details of each of the measures taken are discussed further in this section:

1) National Information Technology Council (NITC)–The NITC was set up in 1994 with the aim of serving as advisor to the government of Malaysia on matters related to ICT. But the greater aim of NITC was to create (in order) an information society, followed by a knowledge society, and finally a value-based knowledge society.

2) Malaysian Institute of Microelectronic Systems (MIMOS)–MIMOS, established in 1985 was established to serve as a research and development (R&D) organization with three main core sections which are: technology, policy, and business.

3) Multimedia Super Corridor (MSC) project–The MSC project was created in 1996 and is divided into three phases that spans from 1996 to 2020. The vision that the government of Malaysia had in creating the MSC was to attract global companies to locate in this region that would provide them with world-class environment for ICT. The effort to move Malaysia towards a knowledge-based economy is enormous therefore flagship applications have been developed to help charter this course. Flagships such as Electronic Government Flagship, National Multi-Purpose Card Flagship, Smart School Flagship, Telehealth Flagship, R&D Clusters Flagship, Technopreneur Development Flagship, and the Multimedia Development Corporation (MDC).

4) New Multimedia and Cyber laws–The benefit of advancement in technology has led to growth, however the challenge of laws must also be addressed. In order to address this issue the government of Malaysia has passed several cyber laws such as: the Digital Signature Act which took effect in October 1998, Copyright Amendment Act which took effect in April 1999, Computer Crime Act which took effect in June 2000. The other acts that have existed are the following: the Telemedicine Act in 1997, and the Communications and Multimedia Act in 1998.

5) Human Resource Development Council Funding for Training–According to renowned British economist Alfred Marshall "the most valuable of all capital is that invested in human beings." Therefore for Malaysia, the development of human capital has become one of the most important priorities in its efforts to move to a knowledge-based economy. Not only will the human capital help achieve the status of a developed country and a knowledge-based economy but it will also help with the challenges of globalization. The government's strategy in creating the HRDCF was to ensure that unskilled or low skilled Malaysians would receive training necessary to equip them with skills needed for the knowledge-based economy (Abdulai, 2004).

Thailand's efforts to transform the Thai economy into a KBE, on the other hand, began with the initiation of the IT 2000 (1996-2000) policy framework established in 1996. The target for the IT 2000 policy framework was to establish a basic foundation for the ICT infrastructure including human resource development. The first policy framework was followed by a second policy framework called IT 2010 (2001-2010), established in 2001 and was approved by the Cabinet in March 2002. The IT 2010 policy framework sets a higher goal of the transformation to a KBE. The IT 2010 policy framework has three objectives stated as follows:

1) "to upgrade the status of Thailand's technological capability from a "dynamic adopter" into a "potential leader." (which will be measured using the United Nations Development Program's Technology Achievement Index).

2) "to increase the number of knowledge-based workers in Thailand from 12 percent to 30 percent of the total labor force."

3) to increase the proportion of knowledge-based industries to 50 percent of the country's GDP."

Five main areas have been targeted as areas of development as set forward as the strategy of the IT 2010 policy framework. The five main areas are as follows:

e-Society, e-Education, e-Government, e-Commerce, and e-Industry (The Government Public Relations Department, 2004). Figure 1 illustrates the ambition of the IT 2010 policy framework.

The five pillars comprise the IT 2010 flagships and the three supporting components comprise the IT 2010 cross-cutting infrastructure (National Information Technology Committee, 2002). The details are what are planned for each pillar is discussed in the next section of this paper. There are five pillars planned by the Thai government as follows:

1) e-Society–In creating an e-Society, the government aims to eliminate or at least reduce the digital divide thereby creating equal opportunities for Thais to develop their quality of life.

2) e-Education–The Ministry of ICT established the Thailand Knowledge Center which has the objective of storing, processing, and disseminating knowledge (both explicit and tacit). E-Education also involves the use of ICT for educational development so that Thais are able to achieve a better quality of life.

3) e-Government–"involves the use of ICT tools, such as the Internet and electronic systems, to enhance the efficiency of major systems in national administration. The e-Government program is part of the e-ASEAN and e-Thailand initiatives. It will provide services to citizens more quickly and with greater efficiency. The Government intends to improve the ICT system and expand it for public services at all stages by 2010."

4) e-Commerce–The main idea is to make use of e-communication in different types of businesses. Thailand has to pay

greater attention to developing the use of e-Commerce if she wants to be competitive because in 2001 the Economist Intelligence Unit ranked sixty countries in terms of their e-Business indicators, and Thailand was only placed in the third group.

5) e-Industry–The use of back office administration, logistics and marketing, plant management, production management, process control, and process measurement are the main components of the e-Industry (The Government Public Relations Department, 2004).

Besides the above mentioned pillars, the government has also established e-Learning projects as undertaken by the Ministry of ICT, the Ministry of Education, and the Ministry of Science and Technology. The Ministry of ICT has set up the following projects: National ICT learning center, One temple one e-Learning center (OTEC), Goodnet, Teacher Training, and National Grid Technology Center while The Ministry of Education is responsible for the Schoolnet and Uninet projects (Tongdhamachart, 2005).

The government also understands the importance of establishing cyber laws in particular the Electronic Transaction Bill, the Electronic Signature Bill, the National Information Infrastructure Bill, the Computer Crime Law, the Data Protection Law, the Electronic Funds Transfer Law, and the Credit Law (National Information Technology Committee, 2002).

**3. Comparative Results of Knowledge-Based Economy between Malaysia and Thailand**

The Gross Expenditure on R&D (GERD) for the public and private sectors for Malaysia and Thailand and the personnel in R&D per 10,000 population are presented in table 1 and 2. Table 3 shows the international test assessment scores such as the Trend in International Mathematics and Science Study (TIMSS).

The government efforts towards the establishment of the KBE for both countries presented shows that Malaysia's program to initiate the drive towards KBE started in 1991 while Thailand's started in 2001 hence giving Malaysia an added advantage and a head start with infrastructure, infostructure and institutions as evident from the setting up of the NITC, MIMOS, the MSC project, and the HRDFC. Malaysia is also ahead in terms of R&D expenditure and R&D personnel as evident from table 1 and table 2. The TIMSS test score may not be an entire indicator of human resource development but it provides an insight into the quality of education provided which in turn breeds improved human capital. Besides Malaysia also has established the HRDCF for training which aims to equip low skill workers to adapt to the KBE, an organization that Thailand clearly lacks.

The global services location index compiled by A.T. Kearney also shows Thailand to be behind Malaysia in the total score compilation as shown in table 4 and is also behind Malaysia in terms of competitiveness when compared to Malaysia (details presented in table 5).

The data presented above clearly indicates that Thailand still lags behind Malaysia in almost every aspect and should use Malaysia as the benchmark towards the progress towards KBE. Thailand can learn several lessons from Malaysia in its drive towards the KBE. Firstly, compared to Thailand, Malaysia has a better plan and a longer vision for a sustainable information economy. Not only are they striving towards the KBE but they also are on track towards creating a value-based knowledge society. In order to enable them to accomplish that the Malaysian government has set up the NITC that acts as an advisor to the government. Secondly, the setting up of the MSC has given Malaysia a head start and has put Malaysia ahead in this race towards the KBE. Examples of flagships created in the MSC are the R&D Clusters and MDC. Comparatively, Thailand is nowhere near the policies of establishing the above mentioned infrastructure and applications. Thirdly, even though technology leads to growth, the challenge is to ensure that issues such as laws must be addressed. Although Thailand has made initiatives with cyber laws, Malaysia is still ahead with more laws and acts being put into use. The Thai government's ICT policy should focus more rigorously on cyber laws ensuring that global standards should be met. And lastly, in its efforts to ensure that the Malaysian citizens are not left behind the government established the HRDCF that trains and equips people with skills necessary for the transition. The Thai government should initiate such policies as there is a big problem with the digital divide gap in Thailand.

Statistical indicators are important in understanding the degree/level at which an economy is becoming a KBE. A framework must first exist in order to be able to measure data statistically. Several frameworks have been created by several international organizations such as the OECD, Asia-Pacific Economic Cooperation (APEC), and the World Bank. Although different statistical indicators have been created for each framework, they can be categorized broadly into four dimensions which are shown in figure 2 where KBE is the dependent variable and the four dimensions are independent variables (Leung, 2004).

The proposed additions to the framework consist of the following variables which are also presented in figure 3:

1) government incentives,

2) improved human resource development, and

3) institutional factors.

These three variables are important to the development of KBE in Thailand because of the following reasons: Firstly, the market failure theory stresses that in a pure market economy (without government intervention), there is tendency for the private sector to invest very low (minimal) on knowledge and education. Therefore the government must gain incentive for the market to increase investment in knowledge. Secondly, understanding the EGT is crucial as the theory stresses on the importance of human capital (which is one of the components of the Thai KBE component) because human capital will lead to more learning by doing and spillover effects of knowledge. Thirdly, the transaction cost theory stresses the importance of institutions such as laws and regulations that reduce transaction cost of the private sector. If a country has good laws and regulations and good intellectual property rights protection, then the private sector would probably invest more in IT.

## 4. Policy Recommendations and Conclusion

To further understand the factors and effect of the degree of successful KBE one needs to understand the following 1) the market failure theory, 2) the EGT and 3) the transaction cost theory. In the recommended framework, the degree of KBE acts as the dependent variable while government incentives, better human capital, and institutional factors act as independent variables. This section proposes policies and recommendations that can be used for each component of the new framework.

### 4.1 National public policy on Innovation/Institutional factors

The Thai government should aim to enhance investment potentialities in intellectual property and innovation, as well as the commercialization of the property. Despite an increase of R&D, the investment of Thailand in R&D still lags behind other developed countries. The government should establish an incentive for intellectual property and invention. In action, research and development should be set forth as a national agenda and incorporated into the National Economic and Social Development plan, as well as other related government strategies. Incentives may be either monetary or non-monetary. In non-monetary incentives, invention and intellectual property may be calculated as a component in Key Performance Indicator (KPI) of an organization or a petition for academic title. In the private sector, an inventor should be credited with tax incentives and marketing support. Government however should generate social, rather than private returns through reasonable period of IPR protection and public-private transfer of knowledge (Pholphirul and Bhatiasevi, 2008).

### 4.2 National public policy on Information and Communication Technology

Several researchers show that investment in ICT contributes to productivity and economic growth (Jorgenson, 2001). In countries such as Japan, the economic growth is dominated by investment and productivity growth in information technology (IT) (Jorgenson and Namura, 2005). Although the number of Internet users and Internet bandwidth has been increasing, Thailand still lags behind other developed countries. Thailand has to steadily invest in telecommunication infrastructure and Internet connectivity. The government should also do more to integrate IT into the classrooms. Although initiatives have been made towards this in the form of National IT 2000 and National IT Policy 2010, there is still no legislative or measurement such as the key performance indicator (KPI) of how successfully are IT and education being integrated.

Infrastructure such as the MSC in Malaysia with state-of-the art information, communication, and physical facilities should be provided by the government. The efforts to build these facilities should also be implemented outside of Bangkok as the need to bridge the digital divide remains crucial to the development of KBE.

The government should also push initiatives to promote IT and business process outsourcing (BPO). Initiatives should be taken by Software Information and Promotion Agency (SIPA) to ensure that Thai software firms have an opportunity to compete globally. The government should encourage the building and incubation of the Thai-based venture capital sector as Malaysia already has over 200 venture capital companies with about 25 focusing exclusively on technology. The government should provide support with funding and revise outdated regulations. If the government continues to lack vision, support, limits the access to investment capital, and lacks regulations such as those governing security or privacy then the move towards the KBE will be slower than anticipated.

### 4.3 National public policy on Human Resource Development/Improved Human Resource/Government Incentives

In order to develop human resource equipped with skills necessary for the KBE the government should develop two main areas which are education and human resource skills. In order to improve education the government must look at improving the quality of education provided in schools. This quality can be improved firstly by recruiting quality instructors. The first step towards improving the quality of education should start the primary and secondary levels followed by universities. Universities should be given more autonomy to make decisions and provide competitive salaries to attract faculty members. The government should also emphasize research among universities. Increased funding and access to them should be a primary target. Incentives for conducting research and lab facilities should be provided for faculty members and students to indulge in active research. The government should also provide grants that encourage universities to collaborate with the private sector. Intermediary organizations should be established to

bridge the gap between universities and organizations. The role of these organizations would be important for those faculty members that lack first hand knowledge of the technical details of the private sector firms (The World Bank, 2008).

Human resource skills should be improved as there is a shortage in Thailand for people with science, engineering, language, and communication skills. Students graduating universities are doing so at the ratio of 62:38 in favor of the social sciences rather than pure science. The government therefore must also provide continuous training to the employees or encourage the private sector to do so in the form of in-house training or outsourcing the training. What the government can also do is study the approaches adopted by countries such as the US, the UK, Canada, Korea, Israel and other countries. And that approach is to assist the funding of programs which help finance post-doctoral internship positions in participating firms. (The World Bank, 2008).

*4.4 National public policy on business environment*

The government should prioritize the following objectives: 1). improving the policy framework and 2). creating a more favorable environment for firms' innovation. The objectives can be accomplished if the government continues the openness in goods and increases the openness in services such as the financial sector and look to enhance the efficiency of the labor market (The World Bank, 2008).

In conclusion, this paper defined the KBE as the term that "stems from the fuller recognition of the place of knowledge and technology." The development and growth of a KBE in two developing countries, namely Malaysia and Thailand were presented with emphasis on the government efforts to move Malaysia and Thailand to a knowledge-based economy respectively. A comparison was made between the two countries with data being presented in tables for the following categories: 1) gross expenditure on R&D (GERD) for the public and private sectors, 2) personnel in R&D per 10,000 population.

3) TIMSS Test Score, 4) global Services Location Index, and 5) competitiveness comparison between Malaysia and Thailand. The data showed that Thailand is behind Malaysia in almost all of the data and index presented. The conceptual framework established for statistically measuring the success of knowledge-based economy (KBE) comprise of the following variables: 1). innovation, 2). ICT, 3). human resource development and 4). business environment. Recommended additions to the framework were proposed in this paper based on the integrating the following variables: 1). government incentives, 2). better human capital, and 3). institutional factors. Furthermore, the findings in the paper shows that Thailand is lagging behind Malaysia in several aspects such as planning and long term vision, investment in R&D, cyber laws, government efficiency, business efficiency, infrastructure, policies that support the shift towards KBE and human capacity building. Thailand should therefore use Malaysia as a benchmark and make efforts like they have by improving the above mentioned aspects in its drive forward towards the KBE.

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Table 1. Gross Expenditure on R&D (GERD) for the public and private sectors

| Country | Public Sector | Private Sector |
|---------|---------------|----------------|
| Malaysia (2002) | 82% | 0.25% |
| Thailand (2004) | 36% | 0.69% |

Source: National Science and Technology Development Agency (NSTDA), 2006.

Table 2. Personnel in R&D per 10,000 population

| Country | Public Sector | Private Sector |
|---------|---------------|----------------|
| Malaysia (2004) | 4.6 | 2.4 |
| Thailand (2003) | 5.5 | 1.2 |

Source: National Science and Technology Development Agency (NSTDA), 2006.

Table 3. TIMSS Test Score

| Country | Math | Science |
|---------|------|---------|
| Malaysia (1999) | 519.26 | 492.43 |
| Thailand (1999) | 467.38 | 482.31 |

Source: Mullis *et al*, 2000.

Table 4. AT Kearney Global Services Location Index, 2005

| Economy | Financial Structure | People and Skills Availability | Business Environment | Total Score |
|---|---|---|---|---|
| Malaysia | 2.95 | 1.12 | 2 | 6.07 |
| Thailand | 3.27 | 0.94 | 1.51 | 5.72 |

Source: AT Kearney Global Services, 2005.

Table 5. Competitiveness comparison between Malaysia and Thailand

| IMDB 2005-06 | Malaysia | Thailand |
|---|---|---|
| Overall Ranking | 23 | 32 |
| Economic Performance | 11 | 21 |
| Government Efficiency | 20 | 21 |
| Business Efficiency | 20 | 28 |
| Infrastructure | 31 | 48 |

Source: IMD World Competitiveness Yearbook, 2005, 2006.
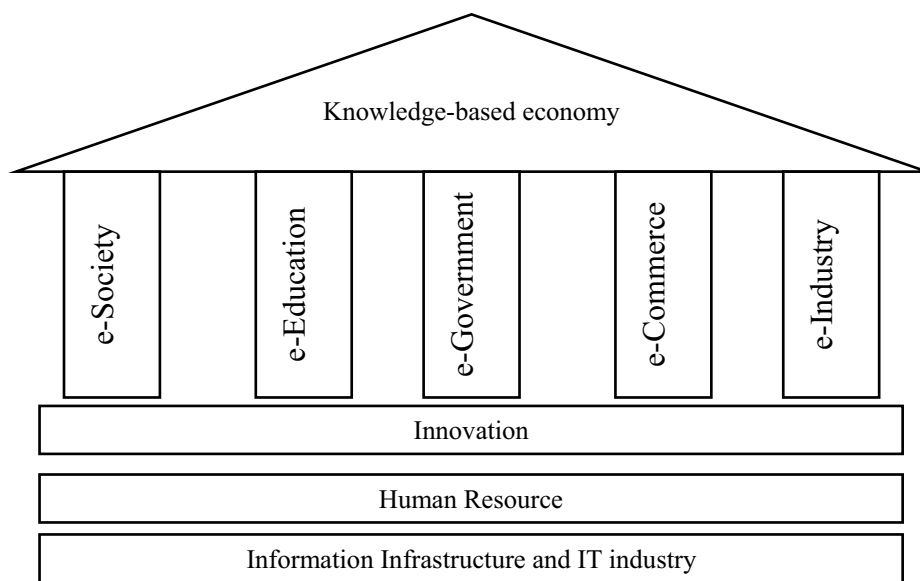
Figure 1. IT 2010 Dimensions

Source: National Information Technology Committee (2002)
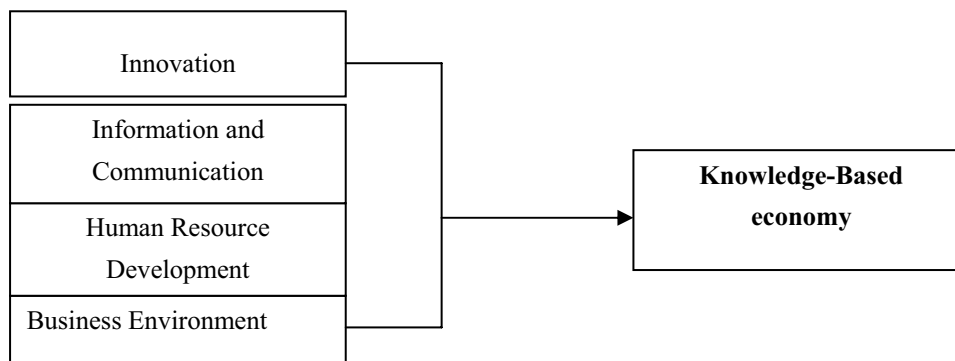
Figure 2. Conceptual framework

| Innovation |
|---|
| Information and Communication Technology |
| Human Resource Development |
| Business Environment |
| Government Incentives |
| Improved Human Resource Development |
| Institutional Factors |

**Degree of KBE**
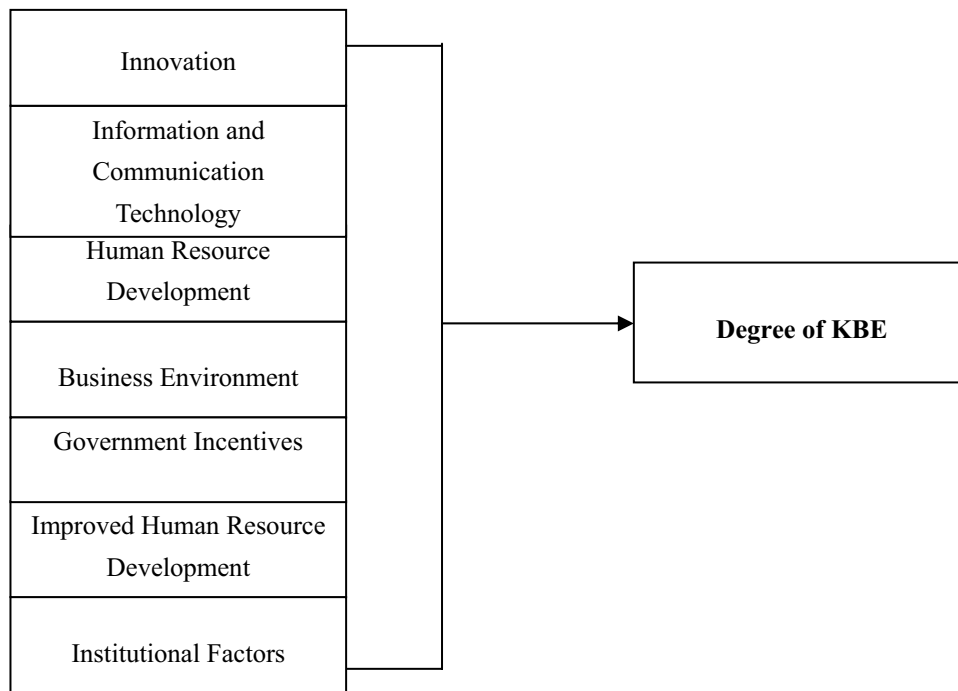
Figure 3. Proposed additions to the conceptual framework

# Empowerment Practices and Performance in

# Malaysia – An Empirical Study

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## Abstract

This study focuses on the factors affecting the empowerment practices in education, information technology and telecommunication service sectors in Malaysia. A total of 305 employees were interviewed using a convenience sampling method and a set of well-structured questionnaire. Logistic Regression Models (LRMs) in four sets of variables and paired-sample *t*-test in one set of variables (orientation) were employed to test the data and analyze empowerment and related performance. The results appear as inspiring on certain factors which eventually propelled empowerment as a means of organizational performance. Based on statistical results, this study concludes that the higher education, information technology, and telecommunication service sectors in Malaysia used empowerment as a strategy to accelerate organizational performance. This advancement is in line with Malaysia's national vision of 2020.

**Keywords:** Empowerment, Participative management, Focused freedom, Awareness, Orientation, Empowerment success-failure, Organizational performance

## 1. Introduction

Managers in the new millennium have been facing stern challenges in this cutting edge of technological advancement and the process of globalization. The entire globe is moving towards unprecedented challenges of changes resulting in some surprises of economic patterns of the countries. Free market competition, open-market economy, trade liberalization, cross-border mega-mergers and acquisitions, deregulation, satellite telecommunication, technological advancements, and growing global economic interdependence have brought countries closer than ever. Further, e-commerce, Internet revolution, regional power integration (such as, EU, NAFTA, and ASEAN etc.), common currencies (such as, Euro) and cross-cultural diversity in the workforce have continuously been changing the traditional business practices and leadership roles around the world. This study was based on Malaysian empowerment in higher education, IT and telecommunication service sectors in new economic and ecological realities. Basic objectives of this survey were (i) to determine the level of awareness of empowerment; (ii) to ascertain the orientation toward

empowerment; (iii) to examine the conditions of success or failures of empowerment; and (iv) to identify whether organizational performance has resulted from empowerment practices.

Empowerment concept is, to a great extent, more complicated and can not entirely be elucidated in a single 'dimensional construct' (Thomas and Velthouse, 1990; Ugboro, I. O., 2006). Practitioners observe empowerment as an instrument to support employees to imagine for themselves concerning the necessities of the work and to shift away from utterly doing what they are advised (Thorlakson and Murray, 1996; Laschinger, H. K. S. et al., 2004). Empowerment is looked upon a process by what citizens, institutions, and civilizations recapture power above their personal lives (Rappaport, 1984; Hage, A. M. et al, 2005). Minkler (1989) and Wolff, T. J. (1993) define empowerment as the method by which persons and societies achieve 'mastery over their lives'. Rodwell (1996),   Hage and Lorensen (2005) label empowerment as an 'enabling process' or an object occurs from a joint allocation of possessions and prospects which boost 'decision making' to accomplish change. Empowerment in self-help teams brings about the improvement of societal characteristics, internal muscles, and societal capital, as people contend with their general problems by collective understandings, emotional assistance and social scholarship (Gartner & Riessman, 1998; Mok, 2005; Parsons et al., 1998; Riessman et al., 1993; Simon, 1994; Solomon, 1976; Staples, 1984). Mainly the literature links empowerment with individual control (Rappaport, 1987). The Cornell University Empowerment Group (1989) and   later, Wolff, T. J., (1993) depict that empowerment is a premeditated, continuing 'process centered in the local community', linking shared respect, serious reflection, care giving and team involvement in the course of which citizens lacking an identical distribution of treasured resources gets larger entrance to and manage over those resources.

Systematic research reports on empowerment and its real impact upon divergent formal and non-formal sectors in Malaysia do not exist. However, recently, due to wave of globalization concepts, free-world notions and facts of collective interdependence may have pushed some of the aggressive Asian nations to embrace changes and therefore, privatization, industrialization, de-bureaucratization, and public-private partnerships may have come up as strategic initiatives for them. It seems certainly true; Malaysia has been playing a catalyst role in these areas as one of the fastest growing nations in Asian continent.

## 2. Literature Review

Nicholls J. (1995) describes empowerment as a '*state of mind and not a verb*'. He interprets empowerment being a way of idea and manners rather than anything that is to be executed to any person or organization. Empowerment campaigners assert that worker empowerment facilitates firms to whip up support and allows staffs to take accountability for the service stumble upon (Barbee and Bott, 1991; Lashley, C., 1999). Klagge J. (1998) sees the literature in a way indicating the meaning of empowerment as to release improved '*power and authority*' along with the relevant duties and expertise to employees. Hilton R. W. (2002) terms employee empowerment as the insight of reassuring and permitting employees to embark on proposals to advance operations, diminish costs, and develop the product and customer service quality. Some of the precedent leadership literature (e.g. Conger and Kanungo, 1987; Evans, 1990) explain '*command and control*' forms of administration are likely to pin down the application of job autonomy by the subordinates (Hilton R. W., 2002). Empowerment seems to be a powerful management tool, which is used to exchange the shared vision that the organization expects to materialize into common goals. The reality is that empowerment could be utilized as an expression to explain diverse plans providing an expedient oratory, advocating that empowerment is hypothetically a fine object that fabricates a 'win-win' condition for workers and administrators. (Lashley, C., 1999, p-169). Tsai W (1998) argues that a shared vision represents the cohesive goals and ambitions of the organizational members. When members of the firms hold same insights about how mutual interactions take place, they could evade potential misapprehension in the process of their communications and have additional chances to swap their thought or wherewithal liberally. Wilkinson (1998) finds that the conventional forms of work organizations knock down into numerous obvious problems and the involvement of the workers was getting intensifying interest. Almost certainly that involvement process could effectively have necessitated the practice of empowerment (Wilkinson (1998). Margulies J. S., and Kleiner, B. H., (1995) argue that the perception of involvement and participation was practiced in the era of 1960s, trying to encourage common decision making and recognizing the growth of problems that the organization was stumbling upon. At this stage, according to them, "brainstorming" and other apparatus of participation procedure were used. Minett, S. and Ellis S (1997) state that inspiring self-growth of the staffs was appraised as vital to an anticipated change in the culture of the organizations, and the pledge to convert the organization into 'learning organization'.

Sashkin, M. (1984) and Nykodym, N., *et all. (*1994) point out that staff empowerment or participative management is neither a novel nor straightforward management thought. Over 50 years of studies had proven that staff participation is a multifaceted administration tool, and when used appropriately, can be instrumental in civilizing performance, efficiency and satisfaction of the job (Sashkin, M., 1984, Nykodym, N., *et all*, 1994). Burke (1986), Koh, J., and Lee M (2001), Conger and Kanungo (1988) and Likert (1967) recommend that empowerment is an inspirational ("*motivational*") construct more willingly than a "leader-member relational construct", accusing the literature, that

depicted empowerment as power allocation, or simply the "participative management techniques". Keiffer, (1984) states that new participation structure developed by 1980s which was not apprehensive enough with the dual negotiation concepts and employee involvement was highlighted in broader context, like quality *circles, group conference* and *profit distribution* as part of the extensively restructured operational practices. Participation advanced the process of personal empowerment (Keiffer, 1984). The significance about these methods was that the managerial prerogative had not been challenged by these ideas (Ackers *et al*., 1992; Marchington *et al*., 1992; Wilkinson, 1998).

Hennestad, B.W. (1998), Wilson, (1996) and Ahanotu, N. Duru (1998) portray this atmosphere as: "inform-and-entrust" meaning that the staffs are accorded with maximally possible *liberty* to speak, disseminate "information and knowledge", and earn knowledge in an organization, like the self-governed teams.

Peccei and Rosenthal (2001) suggest that involvement in official training and learning programs is, nonetheless, merely a means through which staffs may be able to get hold of relevant job expertise and incorporate norms and values of the pro-social clientele service. Kriemadis, T. and Papaioannou, A. (2006) point out that the necessity to support the premature phases of empowerment procedure with training to explicate the scope and implications of its exercise was of identical importance.   Nachshen, J. S. (2005) finds an approach of parent empowerment as a response variable is to study the effects of parent training agenda. Kreitner (1999) mentions that empowerment takes place when staffs are sufficiently trained, given all relevant information and the best possible instruments, completely engaged in key assessments, and lastly rewarded for their outputs. Empowerment needs momentous endeavor to realize the desirable managerial changes (Ransom, 1994, p.325; Klagge J., 1998); necessitates extensive venture in training that 'may or may not pay off' (Kappelman and Prybutok, 1995, p.15; Klagge J., 1998); lead the firms to offer novel capabilities to every affiliate, management and member of staff alike (Staples, 1990, p.32; Klagge J., 1998); and involves the organization to build up and outline basis of new strength for management and workers alike (Staples, 1990, p.30; Klagge J., 1998). Richard, S. and e*t all* (1998) argue that 'compensation or rewards' attached with enough grounding and training those individuals who experienced lack of familiarity with a team-setting or functioning as part of a team.

Heslin, P. A. (1999) discovers that in circumstances where employees acquire sufficient motivation, aptitude, wherewithal and *self efficacy* to fruitfully carry out their empowered role, the empowerment typically capitulate noteworthy performance and satisfaction which are beneficial to both the managers and their subordinates. Conger and Kanungo, (1988) and Lashley, C. (1999) term empowerment as a motivational construct and explain that empowerment is both individual and personal. They further view that facets of empowerment became the significant attribute of the scheme. Empowerment also has a tendency to move up the degree of interest of the employees, pleasure and inherent inspiration to incessantly advance how they execute their tasks (Block, 1987; Heslin, P. A., 1999). Ongori, H. (2007) cites the literature as it accentuated that employee empowerment will bring about superior productivity, recital, and satisfaction of the job and diminish staff turnover in the organizations. Researchers explained that the interest on empowerment had been extended as international contest that necessitated employee inventiveness and novelty (Drucker, P.F., 1998 and Ezzamel *et al*., 1996). Kaplan R. S. & Atkinson A. A, (1998) suggest that investing to boost the competencies and performance of staffs offers the podium for continuing scholarship and development, a prerequisite of genuine potential growth. Johnson (1992) and Hennestad B.W. (1998) explain that the empowerment concept represents not only the independence to act but the magnification of know-how and learning on which appropriate decision can be taken.

The notion of conducting this study primarily prompts upon the focus of empirical findings from a leading culture study contributed by Hofstede (1980). The author, however, rated Malaysia as the highest in power distance (PD) scale. That nearly indicated an environment of non-empowerment as opposed to individualistic societies. Today, about decades after Hofstede's study, a considerable lack of empirical studies prompted us to test the empowerment hypothesis for Malaysia. Empowerment had well been studied in the U.S. and some of the western countries while very little research was conducted in Asian region. Further, we considered some new aspects in assimilating ideas on our selected variables as Nachshen, J. S. (2005) predicted that "*Areas for future study include empowerment as a predictor of relevant family variables or empowerment as an outcome of experimental manipulations*".

## 3. Materials and Methods

A convenience sampling procedure was used to collect data from 600 potential respondents drawn from Kuala Lumpur, Johor Bahru, Melaka, and Penang. Only 305 respondents returned the filled-in questionnaires, which constitute 51% of the questionnaires distributed. They were contacted either in person or by telephone, postal and/or e-mails and requested to participate in the study.

*3.1 Scale developments*

For this study, four specific scales (instruments) were developed, e.g., (i) Empowerment Awareness (11-items); (ii) Empowerment Orientation (11-items); (iii) Empowerment Success-Failure (13-tems); and (iv) Empowerment Related to Performance (5-items). Statistical Package for the Social Sciences (SPSS) software was used to test and analyze data

and develop logistic regression models. Moderating variable asks the question whether the respondents were empowered. Other statements/questions were rated on 5-point Likert Scales (5 = Strongly Agree to 1= Strongly Disagree).

### 3.2 Test of data reliability and validity of the data

Nunnaly (1978) points out 0.7 to be a satisfactory reliability coefficient but lesser thresholds are occasionally used in the literature (Nunnaly, 1978; Reynaldo J. and Santos A., 1999). In our survey, 11-item scale for empowerment awareness scale results a Cronbach's alpha of 0.774, 11-item scale for empowerment orientation: 0.895, 13-item scale for empowerment success or failure: 0.774 and 5-item scale for empowerment leading to performance: 0.826. Researchers may judge 'content validity, criterion validity, or construct validity' (McTavish, D. G., 1997; Peter, J. P., 1981, Malhotra, N. K,.1999). While conferring the validity of a theory, Lacity and Jansen (1994), Chong Ho Yu, (2006-online) defines validity as building general sense, and being persuasive and seeming right to the reader. A similar criterion of validity was used in this study.

### 3.3 Hypotheses of the study

Spreitzer, G. M. (1996, p-501) proposes that her expectation is that expounding these associations (variables relationships with empowerment) will persuade further managerial scholars to set out on extensive research dealing with the empowerment dynamics in the place of work. The author (Spreitzer, G. M., 1996, p-501) further adds that these research results will make direction to practitioners as they attempt to generate empowered organizations. In Malaysian public sector, a relevant study was conducted by Lunjew, M. D., *et al* (1994) where worker participation was evident to be optimistically associated with job satisfaction and performance of the job. However, in Malaysia, it seemed hard to find a direct empirical study on empowerment in general, and in these three sectors in particular, since it has been a new concept and probably would have been under a test model. Therefore, due to lack of sufficient and direct empirical evidence on empowerment (except very little evidences), the selection of particular independent variables was based on available literature and personal observations from which the following hypotheses were drawn:

#### 3.3.1 Empowerment Awareness

People are unacquainted with their factual character (Watson, 1985:46; Myatt, A. 1992). This absence of attentiveness may generate discord between the psyche, 'body and soul' or between the individual and the globe. Such dissimilarity may boost wariness, misery, sickness and ailment (Watson, 1985:56; Myatt, A. 1992). Awareness falls between 'supply and implementation' that has been overlooked till today. Managers practice divergent echelon of awareness from each other. Consequently, one may anticipate that conditional on certain contextual and personal distinctiveness; dissimilar subgroups of managers are susceptible to a variety of concepts in dissimilar ways (Rossem, A. V., and Veen, K. V., 2009).

Top management people are also human being and since not all leaders should be presumed to be charismatic or transformational, few of them may potentially lack adequate awareness of the requirements suitable for the perceived empowering conditions. This study considered four basic dimensions of empowerment awareness, for instance, (1) managerial prerogative; (2) empowered psychology; (3) participative behavior; and (4) management's empowerment expertise.

An outlook is often articulated by the line mangers arguing that empowering subordinates will cause in loosing managing power. In veracity, empowerment as a service tactic and is concerned with both loyalty and organizing employees (Lashley, C., 1999). It serves further in a change in the 'locus of control' (Friedman, 1977; Lashley, C., 1999). Effectively worker empowerment raises [apex management's] power at the same time as producing the sense of shrinking it (Robbins, 1983, p. 67; Lashley, C., 1999). In fact, empowerment creates respectful positions for the management members due to their sacrifice of powers to satisfy the hearts and minds of the employees that creates simultaneous independent thinking of solutions to the problems that everyone keeps busy to engage his/her own neurological power, build togetherness, search value-added solutions and nurture accountability for their organization's missions.   These positive values underpin the value chain of the organization and indeed create stakeholders' greater interests in the form of added revenues, extended wealth and firm's reputation toward creating a truly sustainable impression management. Above all, a powerful position of the corporation manages a sustainable competence that further makes the management people strategically powerful. So, if fear works to preserve managerial prerogatives, management power, indeed, will remain undernourished and the agenda of empowerment will remain unfulfilled. The lesson here is that any negative psychology would have detrimental effects on empowerment.

There are quite a few factors that may put off staff empowerment in firms, such as dejected standing of the management, distrust in management, scaring of loosing employment and workers not eager to take accountability for their own actions (Ongori, H., and Shunda, J.P.W., 2008). Spreitzer and Quinn (2001) and Conger and Kanungo (1988, p.476) argue that lack of empowering actions may be theorized as practices that utterly promote dependence, rebuff self-eloquence, and engross the use of dictatorial management modes and pessimistic types of exploitation. Labonte

(1989) discovers the political features of empowerment and suggests some concerns on the subject of its widespread usage in the l990's. He endorses that empowerment is a gracious word, but the actuality of political and economic power allocation does not capitulate 'win-win scenarios' (Labonte, 1989; Wolff, T. J., 1993). Measuring empowerment practices focuses on administrative behavior that proceeds to empower workers. Such conducts comprise of fostering an optimistic emotional environment, satisfying and cheering in perceptible and private ways, conveying buoyancy, nurturing scheme and accountability, and structuring on accomplishment (Conger, 1989; DuBrin, 1998; Niehoff, B. P. et al., 2001). Eventually, the triumph of a scrupulous scheme will be reliant, in the first illustration on the empowered being given the power and liberty to craft decisions that they judge to be precious, momentous and essential (Lashley, C., 1999).

Employee empowerment model proposed by Mallak & Kurstedt (1996) contends that worker empowerment has been developed based on the 'concept of participative management' (Ongori, H., and Shunda, J.P.W., 2008). Thus, participative management is defined as the process of empowering employees to assume greater control of the workplace (Randolph W. A., 1995).

Eylon, D., and Au, K. Y. (1996, p-17) notes that in spite of extensive accord that empowerment is a useful goal, there is slight perceptive of what does it mean, how it evident itself, and how its processes can be grown. Zimmerman (1990) deviates from the job level and argues that to attain empowerment, diverse contextual fundamentals, such as ecological pressures, managerial factors, and '*social, cultural, and political contexts*', are required to be judged (Zimmerman, 1990; Eylon, D., and Au, K. Y. 1996). Spreitzer and Quinn, (2001) recognize five rationales for the malfunction of most efforts to squeeze empowerment: ambivalence (an emotion of uncertainty), 'bureaucratic' climate, divergences within the firm, individual time constrictions, and an elementary misapprehension of how empowerment can be realized (Whittington, J. L. and Evans, B., 2005).

Based on the above discussions and supports from the preceding works, the following hypothesis was established for this study:

Hypothesis$_1$: Awareness is perceived to positively affect empowerment in the higher education, information technology and telecommunication sectors in Malaysia.

### 3.3.2 Empowerment Orientation

These different stratums of organization's culture are upheld and conceded on through the process of socialization among workers. Since a firm's culture is conceded on to new workers, it is pretty steady and rather defiant to change (Schein, 1985; Kwantes, C. T., Arbour, S., and Boglarsky, C. A., 2007). Hence the organizations face hurdles to incorporate new areas, skills and expertise which are the necessity of this information age to cater to the need to achieve sustainable competence. The speedy world economy needs that firms learn and adjust to change swiftly, and workers have a major role to demonstrate here (Lashley, C., 1999), 'Organizational learning' occurs to emerge when the members of the organization detect the incongruity between genuine and projected results, and put forward their efforts to rectify the mistakes or disputes underlying conjectures. They search for advancing actions through enhanced 'knowledge and understanding' (Hong, 1999; Othman, R. and Hashim, N. A., 2004).

Heslin, P. A. (1999) argues, whereas empowerment may elevate 'the self-efficacy, productivity and satisfaction' of the employees, it is not an instant process or excuse to slice center management. Rather, it calls for 'a reinvestment of managerial resources' from watching and controlling employees, to earning knowledge as how to efficiently lead and motivate them (Heslin, P. A., 1999). The term 'motivation' means to the psychosomatic procedure that provides behavior intention and route (Kreitner, R., 1999). Creation of appropriate motivation depends on the organizational leaders as how they value and recompense their employees, care for their psychosomatic feelings, reduce perceptual gaps in positive directions, and trim down their emotional stress.

Empowerment has been measured as an act: the act of conceding authority to the individual(s) being empowered. It is considered as a process: the process resulting in the experience of power (by the employees). It is also well thought-out as a psychological status that evident itself as cognitions that may well be measured (Menon, 2001, p. 157; Dimitriades, Z. S., 2005). Kreitner (1999) states, by being individually and 'meaningfully' engaged, over and further than just doing allocated responsibilities; people are turned into more motivated and industrious. Empowerment does not only focus on autonomy (or liberty) to act, but also having upper extent of duty and answerability. This designates that authority must empower their staffs so that they will be inspired, faithful, pleased and aid the organization in realizing goals and curtail the workers' intent to quit (Honold, 1997, Ongori, H., and Shunda, J.P.W., 2008; Lashley, C. (1999). Kriemadis, T. and Papaioannou, A. (2006) state that the managers and the firms should empower and facilitate employees to carry out their work in momentous ways. The authors further argue that empowerment has been portrayed as a way to allow employees to formulate decisions and as an individualistic fact where persons acquire accountability for their own actions (Kriemadis, T. and Papaioannou, A., 2006). When individuals come into a process of freedom, fighting for their humankind, they also presume accountability 'for the reconstitution of which they are part' (Hage, A. M., and Lorensen,

M., 2005). The above discussions reflect the fact that orientation of empowering people is of crucial importance by nurturing motivation; acquiring learning, new skills and expertise, applying effective empowering mechanisms, and providing psychosomatic stability and nourishments of the people working in organizations. Hence the following hypothesis had been established:

Hypothesis$_2$: Orientation is perceived to positively affect empowerment in the higher education, information technology and telecommunication sectors in Malaysia.

### 3.3.3 Input Success of Empowerment

Teachers had a propensity to become further empowered when they were skilled as researchers (Hollingsworth, 1992; Edwards J. L. et al., 2002) and they developed into counselor (Butler et al., 1989; Edwards J. L. et al., 2002). A further survey (Curley, 1990) instituted the fact that when supervisors were qualified 'as coaches', they improved in individual empowerment since they were having the ability to develop their personal performance and assist others in taking the same actions (Curley, 1990, Edwards J. L. et al., 2002). Future capabilities and competence of the employees in line with organizational goals largely depend on how employee feedback is received by the management to decide upon the appropriate needs of training. The term 'focused freedom' implies that empowerment appears to be recognized and there is no barrier that the employees feel hesitations in juggling their independent lives by innovating newer means of organizational strategies and techniques. The varieties of definitions and empowerment notions should be interpreted in the context of 'focused freedom'; actually a knowledge organization – which smooth the progress of all the members' learning and incessantly renovate itself (Pedler *et al*., 1998, Schonberger, 1990; Pearson, G., 1992; Hennestad B.W., 1998). Lashley, C. (1999) argues that eventually, the achievement of painstaking scheme will be dependent, in the foremost example, on the empowered people being given the power and liberty to craft decisions that they themselves judge to be precious, noteworthy and vital.

As an input, training must be designed based on receiving feedback from the employees as this can unearth the practical necessity of the areas in which adequate competence must be generated to fulfill the vision and mission of the organization. 'Freedom' must be focused in a way that the members of the management and employees are behaving positively without hesitation and with polygonal interests, mutual respects and collective harmony. Based on the aforementioned discourse, the following hypothesis was developed:

Hypothesis$_3$: Input success is perceived to positively affect empowerment in the higher education, information technology and telecommunication sectors in Malaysia.

### 3.3.4 Organizational Performance

When empowerment occurs, the institution would experience lesser labor turnover (Cook, 1994; Lashley, 1999), there will be soaring employee confidence and staffs would take accountability for their own recital and its development (Barry, 1993; Lashley, 1999). Workers' intrinsic expertise and aptitudes will be instrumental for the firm (Ripley and Ripley, 1993; Lashley, 1999) in order to create further contented consumers (Johns, 1993; Lashley, 1999) and larger earnings (Plunkett and Fournier, 1991; Lashley, 1999). Competitive advantage can be accomplished by the guidance of an empowered labor force (Moye and Henkin, 2006; Ongori, H., and Shunda, J.P.W., 2008). The worker empowerment literature places of interest that empowered employees will bring about attaining a competitive benefit (Conger and Kanungo, 1988; Forrester, 2000; Quinn and Spreitzer, 1997; Sundbo, 1999; Ongori, 2009). Hilton R. W. (2002) termed staff empowerment as the insight of reassuring and permitting employees to embark on proposals to advance operations, diminish costs, and develop the product and customer service quality. Conger and Kanungo (1988, p.476) and Eylon, D., and Bamberger, P., (2000) agree that 'disempowering acts' may be depicted as practices that utterly promote 'dependency', rebuff 'self-expression', and engross the exercise of dictatorial management manner and pessimistic types of exploitations. Underprivileged personnel fitness (Sashkin, 1982) and an enlarged possibility of workplace insanity and aggression (May, 1972) as well, time and again, consequence from 'disempowerment' (Heslin, P. A., 1999). On the reverse side of the band, 'un-empowerment' covers the anxiety, disappointment, and 'hopelessness' (Koegel, Brookman, and Koegel, 2003; Nachshen, J. S., 2005).

Empowerment as a strategic management tool serves as a vibrant tonic to overcome all the negative cognitions or attributes resulting in 'lack of frustration'. This condition further fosters bunch of proactive human qualities, such as, dignity, respects, integrity, competence, empathy, hopefulness, tolerance, patience, work-motivation, hard-working efforts, collaboration, togetherness, cooperation, collective efficacy, and support. 'Lack of frustration' outcome of empowerment needs concrete 'empowered psychology' of the management leaders both by heart and by appearance so that the employees may feel intrinsically that their leaders do not maintain dual-standards, which means, keeping authoritarian philosophy in mind in one hand and encouraging empowerment on the other. This may be one of the most critical reasons of the failed empowerment strategy experienced by some firms.   In search for superior output, firms invest extensive capital in choosing 'high quality' people (Schmitt & Chan, 1998; Wright & Bonett, 2007). Managerial leaders have long acknowledged the significance of preserving little echelons of 'turnover' so as to encourage

sky-scraping ranks of performance and to keep away from the costs related with employing and training fresh personnel (Abelson and Baysinger, 1984; Harvey, P. et al., 2008). Literature evident that worker empowerment leads to enhanced output, performance, work satisfaction and decreased staff turnover in firms (Ongori, H., 2007). Finally the current study launched the following hypothesis based on these observations:

Hypothesis[4]: Empowerment is perceived to positively affect the organizational performance in the higher education, information technology and telecommunication sectors in Malaysia.

## 4. Results

### 4.1 General profiles of the respondents

Out of total 305 data sets as obtained from 305 respondents, 169 sets of data or 55.4% were collected from education sector, 72 sets of data or 23% from information technology (IT) sector, and 64 sets of data or 21% extracted from telecommunication sector. A total 48 or 15.7% were collected from Kuala Lumpur area, 114 or 37.4% from Melaka, 94 or 30.8% from Johor Bahru and 49 or 16.1% from Penang. Out of 305 sets of respondents' data, 161 or 52.8% respondents were male and 144 or 47.2% were female. Malaysia is a multi-ethnic cultural nation having three divergent races. The country possesses a national solidarity based on the concrete association among the multi-ethnic cultural patterns and religious diversity. With this end in view, respondents' ethnicity was considered to identify the work compositions of the respondents' organizations. Out of the total respondents 305, a total of 199 or 65.25% represents ethnic Malay people, 72 or 23.61% represents Chinese, 34 or 11.14% represents Indian employees. Diploma/Bachelors Degree and Postgraduate Degrees were considered as higher education, which constitutes a total of 252 respondents representing 82.62% (43.93+38.69 respectively). Table: 1 shows that 40 or 13.11% of the total respondents had over 10 years of practical job experience. 91 or 29.84% had 6-10 years experience, 158 or 51.80% had 1-5 years experience, while only 16 employees or 5.25% had less than 1 year overall job experience.

"Insert Table 1 about here"

### 4.2 Estimated logistic regression model for determining factors influencing empowerment practices and related performance in three industries

In fact, the logistic regression model (LRM) is a special type of the general log-linear model, and consequently it became progressively more important as an excellent framework for the analysis of categorical data (Klecka and Lewis-Beck, 1980). King J. E. (2003) writes: "*logistic regression is a more general analytic technique and permits greater diversity in variable scaling than traditional approaches*".

### 4.3 Empowerment awareness model

Based on estimated Logistic Regression models (as a part is depicted in Table: 2), the following mathematical relationships were developed:

$$Ln\frac{P_i}{1-P_i} =$$

$-35.951 + 0.613\,(X_4) - 0.309\,(X_8) + 0.623\,(X_{14}) \quad + 1.055\,(X_{18}) + 0.899\,(X_{19}) \quad + 0.975\,(X_{20})$

$(-3.9974) \quad (1.8920) \quad\quad (-1.7657) \quad\quad (2.1263) \quad\quad\quad (3.8514) \quad\quad\quad (2.7577) \quad\quad\quad (2.1861)$

Since the observations were made on individual employees and not on groups, the logistic regression model was estimated using a maximum-likelihood estimation procedure.

"Insert Table 2 about here"

It is observed from Table 2 that two demographic variables and four independent variables are statistically significant. Out of two demographic variables, education $(X_4)$ and current job experience $(X_8)$ are significantly affecting empowerment. The output of Logistic Regression reveals that empowerment and education are positively correlated. It simply means that the respondents with higher level of education felt greater empowerment in their workplace compared to those with lower level of education. In fact, employees with higher level of education are usually more knowledgeable, matured and skilled and are placed in positions enabling them to administer and exercise their duties with greater flexibilities and hence the study has produced a logical evidence of these effects. This evidence is so appreciative in the sense that the model has generated a very low standard error (0.324) and a considerable level of significance (P<0.10) for both the dependent and independent variables. So, higher education heightens empowerment among employees and is considered as vital for realizing a greater empowerment in the corporate workplaces. The 'current experience'$(X_8)$ was considered as a demographic variable with a view to observing its relationship with empowerment, which is the dependent variable in the model. The model, however, created an interesting result in that both variables are negatively correlated. Such a finding reveals that employees with lower working experience enjoyed a greater empowerment in relation to their highly experienced counterparts. In fact, the most respondents (a total of 158) in the study were having work experiences from 1 to 5 years while 91 respondents had work experiences from 6 to 10

years. Only 40 respondents had work experiences of over 10 years. Assuming that having longer work experience of an employee does not mean s/he is holding a higher position in an organization, the above finding could be justified in the way that the young employees with lower work experiences had enjoyed greater empowerment in their workplaces. This may have happened due to the fact that the young employees were given greater empowerment and work flexibility by their senior and highly experienced counterparts, reflecting good leadership. The above result is reasonably acceptable as the standard error for this two-variable correlation is found to be very low (0.175) with a 90% confidence level (P<0.10).

The estimated equation also shows that independent variable 'managerial prerogative ($X_{14}$), empowered psychology ($X_{18}$), participative behavior ($X_{19}$), and management's empowerment expertise, (X 20) have significant relations with empowerment. Independent variable $X_{14}$ is statistically significant (P<0.05), which postulates that the employers do not have the fear of loosing power if power is being delegated to the employees for the creation of empowered culture. Independent variable $X_{18}$ stands for 'empowered psychology' which was found to be statistically significant (P<0.01) meaning that the management held firm belief of their standpoint that empowering people meant to them as empowering their own organization. This ideology fosters empowering culture being devoted to produce excellent outcomes. Independent variable, namely 'participative behavior' ($X_{19}$) was found to be significantly (P<0.01) affecting empowerment, which validates the management's preference to exercise decision making process by ensuring enterprise-wide participative management. Independent variable $X_{20}$ indicated 'management's expertise of empowerment' as recognized by the respondents and this variable was also found to be significantly (P<0.05) influencing empowerment. In other words, the quality or expertise of Malaysian management may have significantly attributed to the process of empowerment. While pointing out benefits of empowerment, Crawford, (1995) hints "*increased abilities to achieve full personal potential*".

The Table 2 shows an excellent picture on advanced statistical results. The Cox & Snell $R^2$ is 0.563 and Nagelkerke $R^2$ = 0.753. The Nagelkerke $R^2$ depicts that 75% of the variation in the outcome (dependant) variable has been explained by this logistic regression model. Further, Wald statistics in the Table 2 shows positive and higher figures as Chan, Y. H. (2004) suggests that the contribution of every variable importance is reflected by the Wald statistics. He further argued that the larger the value, the greater the importance. Further, King J. E. (2003) suggests that stepwise methods produce outcome in the same faulty *df* and values of the probability, while the majority researchers act like if their anticipated probabilities were perfect. He further noted that "this dynamic should especially be considered" when taking to mean significance tests for precise model stricture, for instance the Wald's test (King J. E. (2003). Among other tests in this model, Hosmer and Lemeshow (H & L) Test shows a Chi-Square value of 11.327 at 0.184 significance level, and we know a tested result of non-significance in the H & L Test predicts an appropriate goodness-of-fit, although we may not have been able to conclude from this test that our model explains much of the variance in the outcome. However, the result seems to have been satisfactory. As a surrogate to H & L test above, we also conducted Omnibus Test of Model Coefficients which showed results at Step: Chi-Square $(\chi^2)$ = 148.574 at df 11 and significance P=0.000; Block: $\chi^2$= 148.574 at *df* 11 and P=0.000; and Model: $\chi^2$=173.183 at *df* 20 and P=0.000. These results show a strong and collective capacity of the predictors (independent) in our model to envisage or predict the response (outcome) variable. Therefore, it may be concluded that the variables that were considered above adequately fit into the model.

Based on all the above test results, a sufficient conditionality is prevalent in the empowerment awareness model and therefore, first hypothesis (*Hypo₁*) of this study is considered to be correct. This model can, therefore, conclude that these three components of the service sector of Malaysian economy produced awareness that was linked to employee empowerment.

*4.4 Empowerment orientation model*

Based on Logistic Regression results (as a part is depicted in Table: 3), the following mathematical relationships were developed:

$$Ln \frac{P_i}{1 - P_i} =$$

-42.575 − 0.840 ($X_2$) + 0.960 ($X_4$) + 1.361 ($X_7$) + 0.930 ($X_{21}$) + 0.986 ($X_{25}$) + 1.671 ($X_{26}$)

(-4.8363)   (-2.8475)        (1.8972)        (2.3547)         (1.9914)         (1.7359)          (2.8761)

+ 3.785 ($X_{28}$) + 1.243 ($X_{31}$)

   (4.0568)           (2.3277)

Since the observations were made on individual employees and not on groups, the logistic regression model was estimated using a maximum-likelihood estimation procedure.

"Table 3 about here"

From the Table 3, we observe that five independent variables are statistically significant along with three demographic variables. The estimated equation shows that out of the predicted independent variables, new expertise and experience ($X_{21}$), organizational learning ($X_{25}$), employee motivation ($X_{26}$), application of effective empowerment tools ($X_{28}$), and consistency between plan and execution ($X_{31}$) have all significant relations with empowerment (the dependent variable). The table further shows that out of the demographic variables, Area ($X_2$), Education ($X_4$), and Employees' Ethnic Groups ($X_7$) were having statistical significance with the dependent variable meaning that these factors significantly attributed to the process of empowerment.

The variable of area ($X_2$) as an independent dummy was considered in the Logistic Regression model to see if empowerment practices of employees vary among four surveyed states. The model has produced a negative correlation value which is highly significant ($P<0.01$). The coding for four states was given individually e.g., 1 for Kuala Lumpur, 2 for Johor Bahru, 3 for Melaka and 4 for Penang. With such individual coding given for area variable, it can be stated that the employees in Kuala Lumpur have had enjoyed greater empowerment than their counterparts in other three states, Johor Bahru employees enjoyed greater empowerment than their counterparts in Melaka and Penang and the employees in Penang had experienced the least empowerment in their workplace. While developed a Logistic Regression model for assessing empowerment awareness among employees, the independent variable of education ($X_4$) was considered to examine whether it influenced the dependent variable of empowerment. The correlation was then found positive. This study again considered both variables in the empowerment orientation model and found that the level of education ($X_4$) of the surveyed employees was positively influencing their empowerment orientation. Such correlation was found to be considerably significant at $P<0.1$ level. So, again, higher level of education is one of the important keys to realize a greater empowerment among corporate employees. An independent variable, namely ethnic group ($X_7$) was also considered in this model for observing whether it had any meaningful influence on empowerment. The result, however, was found not to be very interesting as the model generated a positive coefficient value for the variable with a medium level of statistical significance ($P<0.05$). The facts are that a vast majority of the respondents (>65%) of this study were the ethnic Malays and that the Chinese and Indian respondents together made up only about 35% of those interviewed. Since the variation in sample size with regards to ethnic combination was high obtaining a positive coefficient, which is favoring firstly the Indian and secondly the Chinese respondents with respect to empowerment, is not really meaningful and representative in this study.

Independent variable, namely new expertise and experience ($X_{21}$) was found as statistically significant ($P<0.05$) which means that the employers of the respondents' organizations were involved in outsourcing new expertise and experience for potential innovation that attributed to the process of empowerment. Independent variable $X_{25}$, (organizational learning) was found to have statistical significance at $P<0.10$ level. This means that the respondents' organizations were very much prone to learning organizational characteristics. Continuous learning thus created a sense of self-worth, self-conscious minds, and self-ownership that significantly contributed to the process of empowerment. Independent variable $X_{26}$ (employee motivation) showed a significance at 0.004 or ($P<0.01$) in relation to empowerment. This means the motivational efforts of the respondents' organizations was successful and largely contributed to the process of empowerment. Independent variable $X_{28}$ (application of effective empowerment tools) was proven to be strongly and significantly ($P<0.01$) associated with empowerment. The statement indicates that the employees had experienced with effective empowerment techniques as applied by the management resulting in the change of their traditional ways of doing things and their conventional behavioral traits. This situational and consequential change in traditional lifestyles ensured the process of empowerment. Independent variable $X_{31}$ (consistency between plan and execution) is found to have been strongly and significantly ($P<0.05$) associated with empowerment. Most of the respondents agreed with the statement that indicated flawlessness between the objectives of empowerment and the implementation of empowerment and such consistency had obviously attributed to empowerment (outcome variable).

Paired-sample *t* test was also performed to see whether other variables have individual relations with the dependent variable (Empowerment). The tests results had all been positive. Finally results of the above model (Table 3) shows the Cox & Snell $R^2= 0.664$ and Nagelkerke $R^2 = 0.887$. The Nagelkerke $R^2$ illustrates that almost 89% of "the variation in the outcome (dependant) variable has been explained by this logistic regression model. Further, Wald statistics in the Table 3 shows positive and higher figures as consistent with Chan, Y. H. (2004) and the test was considered based on the suggestion of King J. E. (2003) as mentioned earlier.

Among other tests in this model, Hosmer and Lemeshow Test shows significance at $P>0.1$ level (Chi-Square: 0.935 at *df* 8). A tested result of non-significance in the H & L Test predicts an appropriate goodness-of-fit, though it cannot be concluded from this test that the model explains much of the variance in the outcome. As a proxy to H & L test above, Omnibus Test of Model Coefficients was conducted, which showed results at Step: Chi-Square ($\chi^2$) =227.779 at *df* 19 and significance P =0.000; Block: $\chi^2$= 227.779 at *df* 19 and P 0.000; and Model: $\chi^2$=227.779 at *df* 19 and P = 0.000. These results demonstrate a well-built and shared capacity of the predictors (independents) in the model to predict the response (outcome) variable. Therefore, a conclusion can be drawn that the variables under consideration are adequately fit into the model. Based on all the above test results, it can be revealed that a sufficient conditionality is prevalent in the

empowerment orientation model and therefore, $2^{nd}$ hypothesis (*Hypo$_2$*) of this study is considered to be correct. This model can, therefore, conclude that these three emerging service sectors in Malaysia embraced the orientation of empowerment. Therefore, empowerment orientation model in this study seems to have been successful and on the basis of empowerment practices, the orientation techniques of Malaysian employers worked well toward empowerment.

*4.5 Empowerment input success-failure model*

Based on Logistic Regression results (as a part is depicted in Table: 4), the following mathematical relationships were developed:

$$Ln \frac{P_i}{1 - P_i} =$$

-34.915 + 0.600 ($X_4$) - 0.297 ($X_8$)        + 0.990 ($X_{33}$) + 0.906 ($X_{36}$)

(-3.7985) (1.9048)        (-1.6409)             (2.7809)             (2.6569)

<div align="center">"Insert Table 4 about here"</div>

From the Table 4, it is revealed that two independent variables and two demographic variables were found to be significantly associated with empowerment. Demographic variable "education" ($X_4$) was significant at P<0.10 level. Once again, the level of education as an independent variable is proven to affect the empowerment input success positively among corporate employees. This observation is found to be significant at P<0.10 level with a low standard error of 0.315. In fact, the coefficient sign of the variable of education as regressed against empowerment is found to be consistent throughout the analysis. The interpretation of this result is that people having higher education would be more capable of being empowered. This indicates a strong relation of education with empowerment process in these three emerging service sectors in Malaysia. Higher education provides greater skills, stronger sense of maturity, and critical understanding and analytical capabilities of the people, which can work well on exercising empowerment and producing outcomes. Demographic variable "current experience" ($X_8$) shows a statistically significant (P<0.10) relationship with empowerment. This indicates that employees who had been working long duration (in years) with their current employers, they felt more empowered than those who stayed for shorter duration. The variables of both current experience and empowerment were already considered in the empowerment awareness model. Both variables were again considered in the empowerment input success model. The results, however, do not differ at all from the ones we obtained from the empowerment awareness model.

Independent variable $X_{33}$ (Training Feedback) produced a *p*-value of 0.005 (P<0.01), showing a strong relationship with empowerment (the response variable). It indicates that obtaining feedback on employee training from the employees appears to be a criterion to make the training programs consistent with the employees and the organizational needs that could have positively contributed to the empowerment process. Independent variable $X_{36}$ (Focused Freedom) describes: "*We enjoyed our freedom of speech, dignity and status*" which is highly significant at P<0.01 level. Employees in Malaysia felt that they had appropriate environment to exercise their freedom of speech and their perceived dignity and status had reflected that 'focused freedom'. This liberal perception was nurtured well and that attributed to the empowerment process.

Other demographic and independent variables in the category of "success-failure" rating were statistically insignificant or nearly-significant. However, none of the failure variables had been significant in the tests, meaning that the process of empowerment had been succeeded.

Further, revealing from the logistic regression results of the "success-failure" model (Table 4), it shows that in terms of Cox & Snell $R^2$ (0.523) and Nagelkerke $R^2$ (0.700). The Nagelkerke $R^2$ portrays that 70% of the variation in the outcome (dependant) variable has been explained by this logistic regression model. Wald statistics in the Table 4 show positive and higher figures which are consistent with the arguments of Chan, Y. H. (2004) and King J. E. (2003) as mentioned earlier. Among other tests in this model, Hosmer and Lemeshow Test shows a statistical significance at P=0.317 level (Chi-Square: 9.307). Based on the previous assumption and as a substitute to H & L test, Omnibus Test of Model Coefficients was also employed, which showed results at Step: Chi-Square ($\chi^2$) =130.242 at df 13 and significance P=0.000; Block: $\chi^2$=130.242 at *df* 13 and P = 0.000; and Model: $\chi^2$=154.851 at *df* 22 and P = 0.000. These results demonstrate a well-developed and pooled competence of some of the predictors (independent) in the model to predict the response (outcome) variable. Therefore, it may be concluded that these success variables deemed to have been fitted into the model. On the basis of the foregoing results, a satisfactory conditionality appears to have been prevalent in the empowerment success model while none of the failure predictions became correct. Therefore, the $3^{rd}$ hypothesis *(Hypo$_3$)* that considered "Input success' to affect empowerment significantly has been accepted. This model can consequently, accept the $3^{rd}$ hypothesis that concludes that these three emerging service sectors in Malaysia exercised successful drives (inputs) that significantly attributed to the process of empowerment.

*4.6 Empowerment related to performance model*

Based on Logistic Regression results (as a part is depicted in Table: 5), the following mathematical relationships were developed:

$$Ln\frac{P_i}{1-P_i} =$$

-34.263 + 0.897 ($X_3$) + 1.437 ($X_{45}$) + 0.747 ($X_{46}$) + 0.787 ($X_{47}$) + 1.048 ($X_{48}$) + 1.065 ($X_{49}$)

  (-3.4182) (1.8195)      (4.0940)               (2.3056)               (2.4748)               (2.9274)               (2.9420)

"Insert Table 5 about here"

The Empowerment Related to Performance Model (as depicted in Table 5) appears to be the most exciting one out of four models as all of its important or key dependent variables were proven to be statistically and significantly associated with empowerment (moderating variable) which represent the fact that empowerment had been practiced well that resulted in expected organizational performance. Dependent variable $X_{45}$ (empowered productivity to enhanced profit); $X_{46}$ (competitive advantage); $X_{47}$ (cost savings); $X_{48}$ (lack of frustration); and $X_{49}$ (employee retention) – all are statistically significant at different levels, meaning most of the respondents agreed with these questions which contributed to the process of empowerment that finally resulted in related performance.

A dummy independent variable of gender was included in the Logistic Regression model to examine whether the level of empowerment to organizational performance differs significantly for the cause of gender diversity. The results, however, are found to have been interesting as the female employees are proven to be worthy for the organizations in realizing a greater empowerment in corporate environment. This also means that the female employees have had enjoyed greater empowerment than their male counterparts. The positive correlation value for both variables is also found to be significant at $P<0.1$ level.

Dependent variable $X_{45}$ (empowered productivity to enhanced profit) was found as statistically significant at $P<0.001$ level. The statistical evidence reflects the fact that empowerment intensified employee productivity that attributed to enhanced profit or financial performance. Dependent variable $X_{46}$ (competitive advantage), showed a statistically significant ($P<.05$) relation with empowerment. This means that empowerment not only enhanced performance but also enabled the organization to have sustainable competitive advantage. Dependent variable $X_{47}$ (cost savings) was proven to be statistically significant at $P<.05$ level. The result has confirmed a prevailing culture of empowerment which was significantly conducive to cost savings in the respondents' organizations. Dependent variable $X_{48}$ (lack of frustration) was proven to have strong statistical relationship ($P<0.01$) with empowerment that eventually reflected inspirational work attitudes, meaning that empowerment practices had created employee enthusiasm in getting the jobs done. Dependent variable $X_{49}$ (employee retention) was found significantly ($P<0.01$) associated with empowerment. This means, empowered employees had been retained in the organization which was also consistent with the finding of another outcome variable, namely, 'lack of frustration'. When employees do not hold frustrations in their mindsets, they truly enjoy their workplace with proactive attitudes and behavior and that they used to show strong loyalty and pure commitment to their organizations and hence, the organization in reciprocal role is being able to retain their employees. Employee retention and loyalty is proven crucial for steady growth and developments of any organization.

Overall, logistic regression model has produced excellent results both in terms of Cox & Snell $R^2$ (0.545) and Nagelkerke $R^2$ (0.729). The Nagelkerke $R^2$ describes that almost 73% of the variation in the outcome variable has been explained by this logistic regression model. Wald statistics in the Table 5 shows positive and higher figures which are consistent with Chan, Y. H. (2004). In addition, Hosmer and Lemeshow Test shows a significance at $P=0.245$ level (Chi-Square ($\chi^2$) = 10.301 at *df* 8). Viewing the limitation of Hosmer and Lemeshow Test, Omnibus Test of Model Coefficients was also employed, showing results at Step: Chi-Square ($\chi^2$) =140.105 at *df* 5 and significance $P=0.000$; Block: $\chi^2$= 140.105 at *df* 8 and $P = 0.000$; and Model: $\chi^2$=164.714 at *df* 14 and $P = 0.000$. These results show a strong and combined power of the predictors (independent) in the model to foresee the response (outcome) variable. Therefore, it can be concluded that the variables under consideration are adequately fit into the model. Based on all the above test results, a sufficient conditionality is prevalent in the empowerment related to performance model and therefore, the 4th hypothesis of this study that presumed 'empowerment would affect organizational performance' has been accepted. This model can accept the 4th hypothesis and conclude that the management of these three service sectors in Malaysia applied empowerment strategies and subsequently produced relevant organizational performance.

## 5. Discussion

In many instances, past research on empowerment evident those psychologically positive behaviors were significantly associated with empowerment. One of the most primitive advocates of empowerment, Kanter (1977) in her influential book, '*Men and Women of the Corporation*' states that organizational characteristics settle on the matter of empowerment (Kanter, 1977; Laschinger et al., 2004). Recognizing a variety of empowerment instruments, over and above reviewing what ideas would work better, would be merit investigating someday (Hechanova, Ma. M, *et al*., 2006,

p-78). Diverse organizational aspects are indispensable to position the juncture for successful empowerment (Siegall, M. and Gardner, S., 2000). Managerial factors added to people's wisdom of empowerment (Spreitzer, 1996; Siegall, M. and Gardner, S., 2000). Nonetheless, theorizing empowerment as a set of variables of the organization, a multifaceted psychosomatic condition and a succession of behaviors is valuable (Siegall, M. and Gardner, S., 2000). Based on these views, we positioned empowerment under four constructs hypothesizing that empowerment awareness comes first before its formalized orientation and subsequently input success behaviors, those are likely and positively influencing empowerment deem to be workable. Finally, we test the influence of empowerment on organizational performance.

The logistic regression model yields that empowerment and education are positively associated with each other. Respondents with high level of education felt better empowerment in their workplace compared to those having lesser rank of education. This evidence is interesting that the model has generated a very low standard error (0.324) and a considerable level of significance (P<0.10) for both the dependent and independent variable. So, higher education heightens empowerment among employees and is considered vital for realizing a greater empowerment in the corporate workplaces.  Unrealistic supposition of some past managers indicated fear of loosing managerial power as they felt 'empowerment' as a tool to seize their bona fide managerial power if they would delegate authority down the hierarchy. In fact, 'empowerment' does not diminish managers' prerogatives, rather increase in a sense that enhanced organizational power would create many newer opportunities and achievements that could be otherwise unavailable with the ordinary exercise of managerial powers. If employees feel respects, dignity, and status in a corporate workplace, wherein the leaders created an empowering culture in which they could internalize such psychologies, then they would likely become more productive and would likely show high respects to their leaders and offer loyalty and spontaneous supports to their organization. That is the real accomplishment of a sound management that created an empowered organizational climate. Independent variable $X_{14}$ (managerial prerogative) was found statistically significant (P<0.05), representing the fact that the employers do not hold fear of loosing control if power is delegated to the employees. This further indicates that the members of the management smartly dealt with the notion of empowerment sufficiently reflecting their desire to build and nurture a truly empowered culture in which employees exercise their independent capacity of decision-making. Managerial prerogatives are not the concerns for the management, indicating a liberating culture which promotes collectivity, mutual respects, confidence and strong decisiveness.

Empowerment is a compound interactive method that absorbs the performance of growing and rising authority to the subordinates (Melhem, 2004; Ongori, H., and Shunda, J.P.W., 2008). Indisputable empowerment necessitates a transformation in the frame of mind of power to figures. This transfer needs the formation of bosses who hold the bravery to renounce power and put their belief upon empowered populace to act with the correct thing (Spreitzer and Quinn, 2001; Whittington, J. L. and Evans, B., 2005). Independent variable $X_{18}$ indicates empowered psychology which was found to be statistically significant (P<0.01) sensing a management's ideology or belief that if they empower their subordinates that could be meant to them as empowering their own organization. This superior philosophy promoted an empowering culture that largely contributed to the empowerment process. The notion of empowerment, originates from the assumption of 'participative management' and worker involvement, upholds the thought that managers distribute decision-making practices and authority with subordinates to boost performance (Wagner, 1994; Martin, C. A., and Bush, A. J., 2006). Independent variable 'participative behavior' ($X_{19}$) was found strongly significant (P<0.01) with empowerment, providing the fact the management's fondness to get the employees involved in the participation of decision making process was successful which effectively contributed to empowerment. It was assumed in this research that respondents' perceived understanding and evaluation on management's empowerment expertise deemed to have been important factor which could affect empowerment. Reason behind such an assumption was that any ambiguity in management's deliberation of empowerment process due to lack of appropriate empowerment skills could negatively affect the process of empowerment and in fact, the workforce would not be empowered. As expected the independent variable namely 'Management's Empowerment Expertise' ($X_{20}$) was found to have been positively significant and associated with empowerment (P<0.05), indicating the fact the managements of the respondents' organization held excellent understanding and abilities on the process of empowerment.

Considering accelerated technological changes and business strategies, this study assumed that new skills and experience could be one of the key factors to materialize empowerment. The reason behind such a conjecture is that managers who fail to impart new expertise and experience which is contrary to the traditional skill patterns, might also fail to attain empowerment success. Examples are: sophisticated computer software skills, data mining and administration skills, e-commerce skills, etc. As anticipated, the independent variable under empowerment orientation construct, namely 'new expertise and experience' ($X_{21}$) was found as significantly (P<0.05) associated with empowerment, meaning that   that the employers of the respondents' organizations were successful in outsourcing new expertise and experience for impending innovation process that effectively contributed to empowerment. A learning organization is a society that makes easy, the learning of all of its members and frequently renovates itself (Pedler et al., 1989; Othman, R. and Hashim, N. A., 2004). Firms need to be able to use the knowledge spawned from their learning to generate business worth and competing benefits (Tiwana, 2000; Othman, R. and Hashim, N. A., 2004). A learning

organization is a free place for discussions where people could express their assertions, perceptions, views, feelings, logical expressions and knowledge-based judgments freely. Discussions and cross-discussions enable them to pin-point troubles and make uniform decisions leading to transform the organization from a traditional stage into a powerful phase. Therefore, a free learning organizational culture is needed to foster empowerment. Independent variable $X_{25}$, (organizational learning) was found significantly (P<0.10) associated with empowerment (0.082). The result proves a fact that respondents' organizations were responsive to learning organizational characteristics that fostered empowerment. Continuous learning thus created a sense of self-worth, self-conscious minds, and self-ownership that significantly contributed to the process of empowerment. Being a motivational construct the concept of empowerment '*is both individual and personal*', it is concerning judgment, independence, authority, and power. Such motivational feature to empowerment turns out to be the essential characteristic of the scheme (Conger and Kanungo, 1988; Lashley, C. 1999). Independent variable $X_{26}$ (employee motivation) illustrates an empirical significance (P<0.01) in relation to the dependent variable (empowerment). This demonstrates a fact that the motivational efforts at the respondents' organizations were thriving and that largely contributed to empowerment. There are evidences that management applied empowerment but the organization failed and could not reap up the benefits of empowerment. One of the possible grounds could be lack of application of effective empowerment tools. This study assumed an importance to gain an understanding from the respondents as whether their management applied effective empowerment tools. Independent variable $X_{28}$ (application of effective empowerment tools) was found as strongly and significantly (P<0.01) associated with empowerment. Respondents agreed that they had experienced with useful empowerment techniques from their management resulting in the change of their conventional conduct of doing things and their traditional attitudinal traits.

Spreitzer and Quinn (2001) recognize five causes of the malfunction of most endeavors to hold empowerment: ambivalence, authoritarian customs, disagreements within the firm, individual time constriction, and a basic misapprehension of how empowerment is attained (Spreitzer and Quinn, 2001; Whittington, J. L. and Evans, B., 2005). Our study perceived these and other diverse negative factors can create lack of consistencies between organizational plans and actions, which may serve as barrier to foster empowerment. Further, one of the popular measures in accounting is variance analysis through which managers understand how their outcomes deviated from the plans and based on that analysis they correct future measures, techniques and devise new plans to keep the corporation competitive. When consistency between plan and execution differs largely that might distort the framework of empowerment as empowerment needs accurate precision of plan and execution of that precision. This study presumed if a firm retains consistency between plan and execution, then it might positively affect empowerment. As with this expectation, the result shows that independent variable $X_{31}$ (consistency between plan and execution) was found to be strongly and significantly (P<0.05) associated with empowerment. Majority respondents agreed with the statement, as saying: "*Objectives of empowerment have been matched with courses of action and therefore, we are successful in implementing empowerment in our organization*". This indicates aptness between the goals and realization of empowerment and such steadiness had perceptibly contributed to empowerment.

According to Spreitzer, G. M. (1996, p-498-499), training and growth plans are prone to have corresponding consequences on empowerment. For individuals ill-equipped to undertake additional or advanced echelons of accountability or powerless to practice larger amounts of (or more complex) data, empowering acts may really succumb to pessimistic outcomes (Pasmore and Fagans, 1992; Eylon, D., and Bamberger, P., 2000). In our study, training feedback was perceived to be more important than training itself. Human Resource Management of many firms imposes training on their employees without having feedback and appropriate need analysis. Such action disfigures the objective of training and employees who do not like such training feel frustrated. Imposing mandatory training upon employees acts as contrary to the principle of empowerment. As with our expectations, independent variable $X_{33}$ (Training Feedback) created a *p*-value of 0.005 (P<0.01), viewing a strong and significant relationship with empowerment. It designates that acquiring feedback on employee training deems a criterion to make the training programs reliable with the employees and the organizational needs that positively contributed to empowerment. Empowered employees hold a sense of individual control jointly with the freedom to utilize that authority (van Oudtshoorn and Thomas, 1993) and a sense of individual efficacy and self willpower (Alpander, 1991). If people recognized that their supervisor values them and offers them with proper power and influence in their career, they will sense more convinced over their works (Kriemadis, T. and Papaioannou, A., 2006; Yoon et al., 2001; Babin and Boles, 1996). Meaning of empowerment seems like giving freedom for employees to do fruitfully what they feel like to do, more willingly than making them to act what managers desire them to do (Salazar, J., Hubbard, S. & Salazar, L., 2002). Independent variable $X_{36}$ (Focused Freedom) was found to have been highly significant at P<0.01 level. Employees in the aforesaid sectors in Malaysia internalized a fact that they perceived to have gained a suitable atmosphere to apply their freedom of speech, dignity and status. This free-thinking perception was cultivated well and that contributed to the process of empowerment.

Organizational performance from the financial point of view can be interpreted in divergent ways and out of the empirically tested variables available in the literature, productivity, profit or financial performance, competitive advantage and cost savings gained considerable attention. Employees who are empowered are almost certainly to be

further productive, variable, and supportive (Stone, 1992), and they sight themselves as more successful in their job and are appraised as more efficient by their colleagues (Quinn & Spreitzer; 1997; Beomcheol, P. K. and George, R. T., 2005, p. 469). Past researchers propose that empowered people are additionally prolific, more fulfilled, and more inventive, and that they craft 'higher-quality' goods and services than 'non-empowered' people (Sashkin, 1982, 1984; Kanter, 1983; Greenberger & Stasser, 1991; Spreitzer, 1992; Whetten & Cameron, 1998). Our study also claims that empowerment creates productivity and business profits Dependent variable $X_{45}$ (empowered productivity to enhanced profit) was found as significantly ($P<0.001$) associated with empowerment, reflecting that empowerment strengthen employee productivity which contributed to improved profit or financial performance. Empowered labor force will bring about accomplishing 'a competitive advantage' (Moye and Henkin, 2006; Ongori, H., and Shunda, J.P.W., 2008). One of the dependent variables of organizational performance, $X_{46}$ (competitive advantage) demonstrates a statistically significant relation with empowerment at $P<.05$ level. This establishes a fact that empowerment facilitates the organization with a competitive advantage. Empowered workers will generate swift decisions and proposals that will perk up speedy services delivery in their specialty of operations and will save lots of cash and time in their organization (Flohr and Host, 2000; Ongori, H., and Shunda, J.P.W., 2008). Dependent variable $X_{47}$ (cost savings) was found as significantly ($P<0.05$) associated with empowerment. This result points out that the respondents' organizations nurtured empowerment well that significantly contributed to save the costs of the organizations. This finding is also consistent with other outcome variables which were resultant from empowerment, such as, improved productivity to enhance profit and competitive advantage.

Absence of staff empowerment in numerous firms is well thought-out as a foremost foundation of managerial 'stress and conflicts' (Ongori, H., and Shunda, J.P.W., 2008). Likewise, 'it has been clear that disempowerment proceeds and a 'sense of powerlessness' are connected with inferior ranks of performance (Ashforth, 1989 ; Eylon, D., and Bamberger, P., 2000) and work satisfaction (Blauner, 1964; Hochschild, 1983; Eylon, D., and Bamberger, P., 2000). Dependent variable $X_{48}$ (lack of frustration) was found to be significantly ($P<0.01$) associated with empowerment or that, in due course, replicated an enthusiastic work role behavior meaning that empowerment practices had created good psychological sense of the employees who were able to remove job tensions and untoward anxiety. Such state of minds of the employees is helpful in creating organizational commitment and loyalty which support positive opportunities and work ethics and attach them with the organization for long time. 'Empowerment' itself is psychological, structural, as well as philosophical or ideological and very sensitive to occupy the hearts and minds of the employees. Pleasant hearts nurture healthy psychologies which in turn, provide enormous human energy and support for work motivation, dynamism and extraordinary performance. Study on the association of empowerment to commitment of the organizations, turnover intention (conversely employee retention), and organizational citizenship and so on, may additionally clarify the impacts of empowerment on firms (Hechanova, Ma. M, et al., 2006, p-78). If staffs judge they are being unjustly cared by the firm or by their manager, they will probably think that the social exchange has been dishonored. If these staffs see that the price of lingering in the association be more important than the benefits, they will depart from the relationship (Blakely, G. L., Andrews, M. C., and Moorman, R. H., 2005). Empowerment creates organizational justice and positively ensures employee retention. Literature holds evidence emphasizing that worker empowerment will bring about enhanced productivity, recital, work satisfaction and lessen staff turnover in firms (Ongori, H., 2007). Reduced staff turnover ensures employee retention. In our study, a dependent variable $X_{49}$ (employee retention) was found to be significantly ($P<0.01$) associated with empowerment, indicating a fact that empowered employees had been retained in the organizations. Employee retention takes place when employees sense good in mind and feel free from frustration that eventually creates employee commitment and loyalty to the organization and as a result they do not keep interest to relocate from their current job.

Logistic regression models in this study produced strong results on advanced statistics, such as, the Cox & Snell $R^2$ and Nagelkerke $R^2$. Empowerment awareness model shows Cox & Snell $R^2$ as 0.563 and Nagelkerke $R^2 = 0.753$; orientation model explains Cox & Snell $R^2 = 0.664$ and Nagelkerke $R^2 = 0.887$; success-failure model (in this case "input success" since no failure statements proved significance) demonstrates Cox & Snell $R^2$ (0.523) and Nagelkerke $R^2$ (0.700); and performance model confirms Cox & Snell $R^2$ (0.545) and Nagelkerke $R^2$ (0.729). These results sufficiently reveal the facts that the models meet the conditions of 'goodness of fit'. As Plubin, B. and Techapunratanakul, N., (2006) mentioned that the pseudo R square reveals that the variation proportion in the outcome variable was influenced by the independent variables. The bigger the pseudo R square, the improved the model fitting is (Plubin1, B. and Techapunratanakul, N., 2006). In addition, we tested Hosmer and Lemeshow (H & L) Tests and as a surrogate to these tests, we also performed Omnibus Tests of Model Coefficients for all the above four models. By demonstrating these results, we have already explained a strong and shared capacity of the predictors (independent) in our model to envisage or predict the outcome (response) variables. Therefore, in all perspectives, it may be concluded that our variables are adequately fit into the models.

Based on foregoing analysis of results and discussions on the logistic regression models, it may be concluded here that Malaysia has gradually been embracing the outstanding Western management philosophy "empowerment" process to

enhance organizational performance. This study contained several arguable limitations. *Firstly*, we were arbitrarily selective in choosing the variables from the available literature even from theoretical studies. This research was focused on the experiment of new scales of empowerment variables based on past divergent literatures and personal observations and did not consider well-established empowerment scales. *Secondly*, a representational sample of 305 respondents may not be an appropriate projection of the views of the entire population, in addition to the exclusion of important stakeholders. For example, in higher education, data was collected only from staff, excluding students who were also the major stakeholders of this sector. Moreover, a non-parametric sample procedure (convenience sampling) was used, which should not have been precluded from the idea of biases. Empowerment practices in this study is said to be "moderate" as   some of the scale-items that were established had eventually been dropped due to non-significance or near-significance status or for considerations surrounding the concept of 'goodness-of-fit' to the models. Notwithstanding the facts, the findings of this research could serve as a potential signal for the future researchers that "empowerment" as a powerful concept of human potential and performance, has truly been active in Malaysian corporate practices. It can therefore, be argued that despite the aforementioned broad limitations, this research serves as a practical evidence of Malaysian empowerment which is expected to encourage other researchers to apply broad concepts of empowerment to test the conditionality in different formal and non-formal sectors or sub-sectors and also in the divergent sets of environmental standpoints.

The result of this study is deviated, at least partially, from the finding of Chow I. H-S. (2005) who, by citing others, argued that the employees in the largely participatory firms seem to be more successful, in any case in the Western communities and on the contrary, the majority of Asian firms do not exercise participatory management culture (Redding S. G., and Richardson, S., 1986; Chow I. H-S., 2005) or merely saying, traditions of empowerment (Chow I. H-S., 2005).

A predominantly attractive matter with respect to this is whether performance and methods of human resource management that were planned or developed in the socio-cultural framework of north-American and/or West European nations perhaps evenly winning in institutions in essentially dissimilar socio-cultural surroundings, distinguished by diverse paces of economic growth (Mendonca and Kanungo, 1996, p. 65; Dimitriades, Z. S., 2005). The authors' conjecture has perfectly been materialized in our study. A moderate result of empowerment in this study based on new scales suggests that even a society that is characterized by collectivism can successfully implement a best ideology of an individualistic society, or may be, vise versa. The important thing is the conceptual nourishments and willingness to adopt a beneficial or positive concept is important. We should not view a culture in a way that a particular society cannot accept divergent philosophies that had been practiced in other societies. Within the paradigm of cultural diversity, adoption of a well-regarded system or philosophy can be generalized in any society to withstand; provided their leaders have proactive roles to educate citizens and a mass enthusiasm is being created and cultivated to implement that. Malaysian firms in this study showed that sensible example.

Hofstede's analysis of national culture on over 50 countries took place in 1967-1973 (with renewed analysis and interpretations by the researchers) which drew global attention. His analysis rated Malaysia as the highest in power distance (PD) scale that virtually indicated an environment of non-empowerment as opposed to individualistic societies. However, in the mean time, significant amount of time or over three decades have been elapsed and further lack of empirical study prompted the matter to justify whether Malaysia had adopted empowerment and if so adopted and practiced, whether the efforts had been succeeded or failed. Generally, however, there should be a basis on which it could be predicted that there might be possibility that Malaysia may have adopted empowerment. Observations revealed that facts that de-bureaucratization efforts of Malaysian government clearly indicate a desire to empowering people through privatization and establishments of partnership links between the private and public sectors. As Hofstede's high power-distant country Malaysia effectively drew up de-bureaucratization policy based on private-public sector harmony and a better social relation, there may be likely possibility that the country would transform her authoritarian culture into effective empowerment and human capability-building efforts. Future research must draw ample evidences as to whether Malaysian firms had produced expected level of performance toward adopting empowerment culture and if so happens; it may have embraced a culture of low power-distance. Our survey certainly serves an evidence that empowerment is prevalent here as opposed to 'high power distance'.

## 6. Conclusion

Workplace values in Malaysia postulates a truly admirable system which contain definitive values and which may well be conducive to back up the process of empowerment. Malaysian culture is enriched with trio-racial sophistication, symbolizing a collectivist society with multiple proactive qualities and Islamic principles, such as, respects, honor, dignity, decency, acceptance and harmony. However, in order to attain maximum achievable benefits from designing and implementing empowerment, Malaysian firms should have to focus significantly on certain fundamental perspectives. For example, (i) considerably relinquishing the authoritarian (domineering) way of treating the employees in workplaces; (ii) giving them respectful power and authority to make their own decisions; (iii) valuing their

individualistic talents, ideologies and philosophies;    and (iv) training them to acquire innovative ways to nurture their talents, scholastic aptitudes, technological knowledge, entrepreneurships and leadership skills. Firms must realize that empowering people means to empower organizations, which in turn, empower its central leaders to further carry out matchless strategic options, renewed vision   and mission which would likely influence the minds and abilities of its people to reinforce their sustained capabilities for ongoing and unprecedented future performance. This study signifies that an excellent scenario is forthcoming as philosophical changes are apparent due to moderate empowerment is taking place in the workplace here. It is expected that, empowering strategies in Malaysian service sector will gain strength in future in order to achieve heighten organizational performances. Future researchers must come forward to eliminate the systematic research lacking in empowerment area and produce learning outcomes for the business entrepreneurs, leaders and practitioners. This article shortly ends up with a powerful predisposition of "power nature" that was reflected in the potent writing of Denton, K. D. (1997) who stated: "*Today's competitive climate demands that everyone feel powerful, in control and be willing to help carry the organization toward peaks of greater competitiveness. This means redistributing power from the few to the many*" (Denton, K. D., 1997).

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Table 1. General profiles of the respondents

| Sl. No. | Demographic Variables | No. of Respondents | % | Cumulative % |
|---|---|---|---|---|
| 1. | *Sectors that the Respondents Represent* | | | |
| | Education | 169 | 55.4 | 55.4 |
| | Information Technology (IT) | 72 | 23.6 | 79.0 |
| | Telecommunications | 64 | 21 | 100.0 |
| 2. | *Gender of the Respondents* | | | |
| | Male | 161 | 52.8 | 52.8 |
| | Female | 144 | 47.2 | 100.0 |
| 3. | *Respondents' (Malaysian) Ethnic Groups* | | | |
| | Malay | 199 | 65.25 | 65.2 |
| | Chinese | 72 | 23.61 | 88.8 |
| | Indian | 34 | 11.14 | 100.0 |
| 4. | *Respondents' Education* | | | |
| | SRP/LCE;   SPM/MCE | 18 | 5.90 | 5.90 |
| | STPM/HSC | 35 | 11.48 | 17.38 |
| | Diploma and/or Bachelors | 134 | 43.93 | 61.31 |
| | Postgraduate Degrees | 118 | 38.69 | 100.0 |
| 5. | *Overall experience of the Respondents* | | | |
| | Less than 1 year | 16 | 5.25 | 5.25 |
| | 1 to 5 years | 158 | 51.80 | 57.05 |
| | 6 to 10 years | 91 | 29.84 | 86.89 |
| | Over 10 years | 40 | 13.11 | 100.0 |

Table 2. Partial results of logistic regression analysis indicating awareness in higher education, information technology and telecommunication sectors in Malaysia ($p_i = 1$, if employees are empowered and $p_i = 0$, if they are not empowered)

| Variable | Estimated Coefficient ($\beta$) | Standard Error | Wald Statistic |
|---|---|---|---|
| Constant ($\alpha$) | -35.951 (-3.9974)[NS] | 8993.622 | 0.000 |
| Education ($X_4$) | 0.613 (1.8920)* | 0.324 | 3.575 |
| Experience (Current Job) ($X_8$) | -0.309 (-1.7657)* | 0.175 | 3.107 |
| Management does not feel that by delegating the power to the employees, they will loose considerable power (Managerial Prerogative) ($X_{14}$) | 0.623 (2.1263)** | 0.293 | 4.517 |
| Management Believes that Giving People Power May Extensively Increase Organizational Power (Empowerment Psychology) ($X_{18}$) | 1.055 (3.8514)** | 0.370 | 8.112 |
| Our management prefers enterprise-wide participation in the decision making process (Participative Behavior) ($X_{19}$) | 0.899 (2.7577) ** | 0.326 | 7.620 |
| Management Shows Excellent Understanding and Abilities on Empowerment and its Process (Management's Empowerment Expertise) ($X_{20}$) | 0.975 (2.1861) ** | 0.446 | 4.783 |
| Chi-square Statistic = 173.183 d.f. = 20 -2 Log Likelihood = 114.823 Cox & Snell $R^2$ = 0.563 Nagelkerke $R^2$ = 0.753 Hosmer and Lemeshow Chi-square = 11.327 at 0.184 level of significance. | | | |

Note:

1. Figures in parentheses are t-values of the logistic regression coefficients.

2. *** Indicate significant at 0.01 level.

3. ** Indicate significant at 0.05 level.

4. * Indicates significant at 0.10 level.

5. NS Indicates not significant at 0.05 level.

Table 3. Partial results of logistic regression analysis indicating orientation of empowerment in higher education, information technology and telecommunication sectors in Malaysia ($p_i = 1$, if employees are empowered and $p_i = 0$, if they are not empowered)

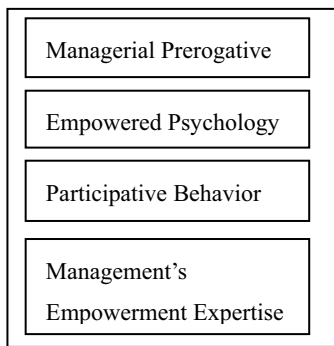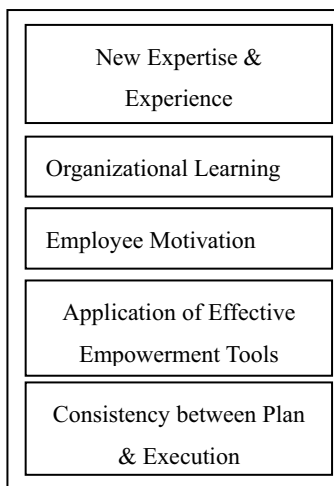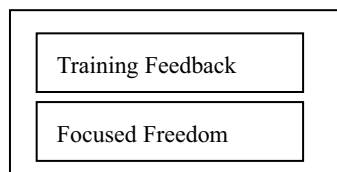| Variable | Estimated Coefficient ($\beta$) | Standard Error | Wald Statistic |
|---|---|---|---|
| Constant ($\alpha$) | -42.575 (-4.8363)[NS] | 8803.248 | 0.000 |
| Area (X$_2$) | -0.840 (-2.8475)*** | 0.295 | 8.086 |
| Education (X$_4$) | 0.960 (1.8972) * | 0.506 | 3.603 |
| Employees' Ethnic Groups (X$_7$) | 1.361 (2.3547) ** | 0.578 | 5.546 |
| Our management always tries to get new sources of expertise and experience (New Expertise and Experience) (X$_{21}$) | 0.930 (1.9914) ** | 0.467 | 3.961 |
| Management views empowerment as a means to organizational experiments, continuous learning and developments (Organizational Learning ) (X$_{25}$) | 0.986 (1.7359)* | 0.568 | 3.020 |
| While employees work independently, our management always provides feedback, encouragements and motivation which lead to heightened enthusiasm for innovation and learning (Employee Motivation) (X$_{26}$) | 1.671 (2.8761) *** | 0.581 | 8.281 |
| Our management has changed our ways of doing things by empowerment techniques (Application of Effective Empowerment Tools) (X$_{28}$) | 3.785 (4.0568) *** | 0.247 | 0.154 |
| Objectives of empowerment have been matched with courses of action and therefore, we are successful in implementing empowerment in our organization (Consistency between Plan and Execution) (X$_{31}$) | 1.243 (2.3277) ** | 0.326 | 7.620 |
| Chi-square Statistic = 227.779 d.f. = 19 -2 Log Likelihood = 60.227 Cox & Snell $R^2$ = 0.664 Nagelkerke $R^2$ = 0.887 Hosmer and Lemeshow Chi-square = 0.935 at 0.999 level of significance. | | | |

Note:

1. Figures in parentheses are t-values of the logistic regression coefficients.

2. *** Indicate significant at 0.01 level.

3. ** Indicate significant at 0.05 level.

4. *Indicates significant at 0.10 level.

5. NS Indicates not significant at 0.05 level.

Table 4. Partial results of logistic regression analysis indicating the input success factors affecting empowerment in higher education, information technology and telecommunication sectors in Malaysia ($p_i = 1$, if employees are empowered and $p_i = 0$, if they are not empowered).

| Variable | Estimated Coefficient ($\beta$) | Standard Error | Wald Statistic |
|---|---|---|---|
| Constant ($\alpha$) | -34.915 (-3.7985) [NS] | 9191.860 | 0.000 |
| Education ($X_4$) (EDUCATION) | 0.600 (1.9048)* | 0.315 | 3.640 |
| Current Experience ($X_8$) (CURRENTEXP) | -0.297 (-1.6409)* | 0.181 | 2.692 |
| Management always took our feedback to identify appropriate training needs (Training Feedback) ($X_{33}$) | 0.990 (2.7809)*** | 0.356 | 7.714 |
| We enjoyed our freedom of speech, dignity and status (Focused Freedom) ($X_{36}$) | 0.906 (2.6569)*** | 0.341 | 7.076 |
| Chi-square Statistic = 154.851 d.f. = 22 -2 Log Likelihood = 133.155 Cox & Snell $R^2$ = 0.523 Nagelkerke $R^2$ = 0.700 Hosmer and Lemeshow Chi-square = 9.307 at 0.317 level of significance. | | | |

Note:

1. Figures in parentheses are t-values of the logistic regression coefficients.

2. *** Indicate significant at 0.01 level.

3. ** Indicate significant at 0.05 level.

4. * Indicates significant at 0.10 level.

5. NS Indicates not significant at 0.05 level.

Table 5. Partial results of logistic regression analysis indicating empowerment related to organizational performance in higher education, information technology and telecommunication sectors in Malaysia ($p_i$ = 1, if employees are empowered and $p_i$ = 0, if they are not empowered).

| Variable | Estimated Coefficient ($\beta$) | Standard Error | Wald Statistic |
|---|---|---|---|
| Constant ($\alpha$) | -34.263 (-3.4182) NS | 10023.558 | 0.000 |
| Gender ($X_3$) (GENDER) | 0.897 (1.8195) * | 0.493 | 3.314 |
| Empowerment has enhanced our productivity and that results in continuous increase of our yearly profits (Empowered Productivity to Enhanced Profit) ($X_{45}$) | 1.437 (4.0940)*** | 0.351 | 16.746 |
| Because of empowerment, our organization holds accelerated performance and has captured sustainable competitive advantage (Competitive Advantage) ($X_{46}$) | 0.747 (2.3056)** | 0.324 | 5.305 |
| We have savings of opportunity costs due to our empowered culture and resultant organizational Effectiveness (Cost Savings) ($X_{47}$) | 0.787 (2.4748)** | 0.318 | 6.117 |
| We never feel frustrated as we realize that through empowerment and motivation, our job inspiration has been increased to a considerable extent (Lack of Frustration) ($X_{48}$) | 1.048 (2.9274)*** | 0.358 | 8.555 |
| Employee retention with loyalty could easily be achieved through empowerment (Employee Retention) ($X_{49}$) | 1.065 (2.9420)*** | 0.362 | 8.642 |
| Chi-square Statistic = 164.714 d.f. = 14 -2 Log Likelihood = 123.292 Cox & Snell $R^2$ = 0.545 Nagelkerke $R^2$ = 0.729 Hosmer and Lemeshow Chi-square = 10.301 at 0.245 level of significance. | | | |

Note: Figures in parentheses are t-values of the logistic regression coefficients.

1. *** Indicate significant at 0.01 level.

2. ** Indicate significant at 0.05 level.

3. * Indicate significant at 0.10 level

4. NS Indicates not significant at 0.05 level.

**Appendix**

*Awareness*

| |
|---|
| Managerial Prerogative |
| Empowered Psychology |
| Participative Behavior |
| Management's Empowerment Expertise |

*Orientation*

| |
|---|
| New Expertise & Experience |
| Organizational Learning |
| Employee Motivation |
| Application of Effective Empowerment Tools |
| Consistency between Plan & Execution |

*Input Success*

| |
|---|
| Training Feedback |
| Focused Freedom |

*Performance*

| |
|---|
| Empowered Productivity to Enhanced Profit |
| Competitive Advantage |
| Cost Savings |
| Lack of Frustration |
| Employee retention |

**EMPOWERMENT**

Figure1. Combined Model of Empowerment and Performance

# Study on Multi-level Rural Finance Service System

# with Establishment of Village or Township Banks

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**Abstract**

The problem of rural finance is one of key and difficult questions in Chinese finance reform. With the establishment of village or township banks, the condition on shortage of fund in rural areas will be gradually relieve. However, multi-level rural finance service should be established in order to sever for the new rural reconstruction. This article analyzes that the village or township banks have an important effect on and play an active role in rural finance service system from the connotation and characteristics of the village or township banks and the characteristics of rural economy in China.

**Keywords:** Village or township banks, Rural finance, Rural economy

## 1. Introduction

By the People's Bank of China and the Asian Development Bank jointly organized to "improve the rural financial markets, the international workshop" was held in Beijing on 19 to 20 April 2008. Experts and scholars who are researching in the rural financial and relevant government department are responsible for more than 160 people taken part in the workshop to explore the problem of diversification of financial services in rural areas. Now, the problem of rural finance is one of key and difficult questions in Chinese finance reform.

## 2. The Connotation and Characteristics of Village or Township Banks

The village or township banks hereunder refer to the banking financial institutions set up by domestic or foreign financial institutions, domestic non-financial legal entities, and/or domestic natural persons in rural areas with the approval of the China Banking Regulatory Commission (hereinafter referred to as the "CBRC") in accordance with applicable laws and regulations, to provide financial services mainly to local farmers, agricultural production and rural economy. A village or township bank is an independent legal entity that enjoys the entire property of the entity that is formed by the investments of its shareholders. It shall fully enjoy civil rights and assume civil liabilities to the extent of all its assets. About characteristics of village or township banks, this article sums up the CBRC Guidelines on Adjusting and Relaxing Banking Financial Institutions Market Access Policy in Rural Areas to Support Socialism New Countryside Construction and Provisional Rules Governing Village or Township Banks as follows:

*2.1 Property Right Structure*

The village or township bank is a joint-stock Bank with clear and diversified ownership structure. Establishment of a village or township bank requires at least one of the initiators or contributors shall be a banking institution. The controlling shareholder or sole shareholder of a village or township bank must be a banking institution. The controlling shareholder who is a banking financial institution shall hold at least 20 per cent of the bank's total equity. The individual natural persons and their related parties shall hold no more than 10 per cent of the bank's total equity and the individual non-bank financial institutions or non-financial enterprises shall hold no more than 10 per cent of the bank's total equity. Any organization or individual who wants to hold more than 5 per cent of a village or township bank's total equity shall obtain prior consent of the CBRC local offices.

*2.2 Governance Structure*

A village or township bank different from the bank office is a primary corporation setted up by modern enterprise system. This kind of flat structure makes its decision-making chain has a quick response, innovates financial products in view of the current development for agriculture and rural economy and opens business according to the principle of marketization to form the operation flow close to the countryside. A village or township bank shall put in place a simplified and flexible organizational structure tailored to the complexity of its decision making management, business dimension as well as service features. This organizational structure shall not only improve operational efficiency of

decision-making but also strengthen the resumption control for senior management to prevent the abuse power.

*2.3 Operation Objective*

Village or township banks shall not grant loans to those other than local borrowers.They provide financial services mainly to local farmers, agricultural production and rural economy as well as in pursuit of bank profitability, which is dicided by their sustainable development.

*2.4 Operation Characteristics*

Village or township banks have advantages of paying relational loans to rural households and small and medium-sized enterprises with opaque information through the long-term and close contact with them to get various soft information as a result of its characteristics of regional and community. In service features, village or township banks are efficient with concise formalities and quick audit abandon of multifarious procedure. Especially, they can provide targeted personalized financial services by means of accurately mastering the local market and customer information. For example, village or township banks can take loans to the fields where villagers are cultivating to make them feel convenient.

## 3. The Establishment of Village or Township Banks

On December 22, 2006, the CBRC promulgated the access policy of adjusting to relax the banking financial institutions in rural areas, with the method of "lower the threshold and strict the regulation", in the Midwest, Northeast and the cities and counties in Hainan Province and the following counties and cities region, as well as other provinces (autonomous regions and cities) country poverty-stricken counties and audited in poverty-stricken counties (collectively, "the financial access area") permit a variety of organizations and individuals to enter the rural financial market, through investment, acquisition, and new approach set up various forms of rural banking financial organizations. On March 1, 2007 from the CBRC promulgated the policy less than 3 months, a group of innovative rural financial institutions from paper into reality: Yilon Huimin villages and small town's bank in Sichuan, Jilin Dongfeng Integrity villages and small town banks, and Jilin Panshi financial Fung villages and small town banks officially opening. The opening of the same period has opened the Sichuan Yilon Huimin loan company; By Beijing Rural Commercial Bank to set up wholly-owned national inter-provincial first new-type rural financial institutions - "Hubei Xiantao village's north agribusiness bank" on the April 28th at Xiantao City, Hubei Province opened a formal listing. So many types of rural financial institutions started a pilot on this big screen.

The creativity of the village or township banks is that it does not need mortgage, and comparing with the rural credit cooperatives and other traditional financial institutions ,the rural banks has a short processing time and the interests rate is relatively lower . Long before farmers are mainly loaning by rural credit cooperatives, the processing time is long and often delay the production of the best investment opportunity. According to the study, Ruifeng village or township banks will compress the time of farmers apply for a loan approval in a week or less, and the application procedures are more simple, according to information submitted by farmers (land situation, production, etc.) direct examination and approval, and the fee is always about 20-30 thousand, without ceiling, which is decided based on the peasant land actual operating conditions. For controlling the risks, ruifeng village or township banks require 5 UNPROFOR, that is, five farmers at the same time for a loan guarantee, which can also be 5 secured to each other. In addition, it also intend to work with the enterprises of acquainting grain in the farmer downstream and the upper reaches of the provision of seed fertilizer units, who provide guarantees, both security forces without physical collateral.

The first official introduction of competition in the banking sector in rural areas, which laid the foundation system of diversified financial organization for the banking sector in rural areas. Before it, the centralized top-down reform does not give the China's rural financial prosperity, the four state-owned banks merge institutions and authority on land, expansion of postal savings deposits and capital outflows, the system of rural credit cooperatives twist and poor management, the vast rural areas not only face their own plight of ischemia, but also a steady flow through the formal financial transfusion to the city.

However, writer thinks that the villages and small banks couldn't solve the all problems of the rural finance. As the largely unbalance of the development of rural economy in our country, which decide the diversity of finance forming, so reforming must adjust to the characteristic of rural economy.

## 4. The Current Predicament of Rural Finance and Contributing Factors

The problems currently faced by rural finance in China are the existence of serious financial constraints. These financial constraints are mainly centered on the official rural financial sector, with both shortage in thesupply of funds and insufficient demand for funds in this sector. However, the main issue is supply-relatedconstraints while that related to demand is less important.

*4.1 The supply-related and demand-related constrains on rural finance*

Currently, supply-related finance constraints in Chinese rural finance mainly reside in the insufficientnetwork of official

financial institutions and in an insufficient supply of funds by these institutions.

The first is that the network of rural financial institution is inadequate. At present, although nominally their situations providing financial services to the countryside include the ABC, the ADBC, RCCs, rural Post Office Savings and the PICC, those institutions which can in fact supply funds to the countryside are very limited. The ADBC acts as a policy bank and does not provide any loan to ordinary enterprises involved in agriculture orpeasant households. Rural Post Office Savings organizations only provide a savings service but no loans. Although the ABC provides loans for agriculture, most of which are for basic rural facilities and agricultural product processing companies, with few loan for peasant households. Moreover, after the withdrawal from the rural financial network over recent years by the Industrial and Commercial Bank, the Construction Bank and the Bank of China, the ABC has not filled the gap. Therefore, millions of peasant households and tens of thousands of rural enterprises can only apply for loans from RCCs. However, only about 40000 or RCCs are legal entities and they do not form a financial network. It can be seen that there is a lack of financial institutions which can provide credit services, which is one of causes for the insufficiency in the supply of rural fund.

The second is the defects in rural financial system. Macroscopically, the mechanism of access, regulation, and withdrawal of rural financial market have not been well established, resulting in monopolization and, herein, lack of competition on rural financial market. Microscopically, the ownership of rural financial institutions is not clarified, weakening the stimulating mechanism and restricting mechanism in management, and leading to the disconnection of responsibility with profits, which have directly negative impact on the operational behavior of financial institutions.

The third is the defects in rural financial management system. Under the leadership of the United Provincial Credit Cooperatives, rural credit cooperatives that used to scatter in countryside come into factual monopolization, which meets the demand for local economic and financial development. At present, United Provincial Credit Cooperatives basically follow the model prior to the reform in distributing administrative authority and responsibility among its subordinate credit cooperatives, while the power for decision-making in allocating creditsis more centralized than before.

### 4.2 The demand-related constrains on rural finance

The insufficient effective demand by peasant households for services offered by official financial institutions leads to the demand-related financial constraints. Currently, there is an insufficient demand for financing by peasant households. On one hand, there is insufficient natural demand which is mainly determined by the low degree of rural commercialization, high farmer self-consumption of grain, oil, meat and vegetables and a limited degree of monetization which have reduced the commercial demand by peasant households for funds. On the other hand, stimulation of demand is insufficient and this is the main cause of demand-related financial constraints. In turn, this is the result of policy limiting the development of rural finance institutions.

Firstly, as the provision of consumer credit services by official institutions is lagging, the demand by peasant households for such credit is weak. Currently, it is difficult to activate the rural market in this respect, partly due to low peasants' income. However, when peasants build houses, buy durable consumer goods, educate their children, or hold weddings or funerals, it is generally difficult for them to obtain loans from official financial institutions. This forces peasants to transfer the demand for consumer credit to unofficial financial institutions and, as a result, the demand for funds from official financial institutions is reduced.

Secondly, risks in agriculture and the low degree of rural mercerization have reduced investment demand by peasant households. As natural disasters frequently occur in China and farm produce is perishable, the natural risks in agricultural production are high. But agricultural insurance is backward. At the same time, because of the low degree of market development, the risks and costs for obtaining information and technology, as well as market transactions costs, are high for peasant households. Due to such risks and a lack of correlative policy tools, the majority of peasant households can only choose to operate within traditional industries instead of entering into other businesses, other than agriculture. This restricts their channels for investment and reduces their demand for borrowing capital from official financial institutions.

Thirdly, loans from official financial institutions are difficult to access which inhibits demand for investment by peasant households. Investment loans from official financial institutions such as RCCs and the ABC are difficult for peasant households, mainly because of the lack of collateral (for example, land use rights cannot be mortgaged), guarantees are difficult and formalities complex. Striking examples of this are the difficulties of obtaining loans by impoverished peasant families or by peasants living in backward areas, as well as by households with medium or high incomes for expanding their scale of production or adjusting their agricultural structure. Since the ABC has been transformed into a state-owned commercial bank, fewer and fewer loans have been extended to peasant households. The RCCs, the main official financial institution issuing loans to peasant households, find it difficult to meet the requirements of the majority who want loans.

### 5. The Characteristic of the Recently Rural Economy in China

After nearly 30 years of reform and opening up, China's rural economy has changed dramatically, mainly in rural areas the way of economy development has taken a big change .One is that with the developed areas of rural urbanization, which is totally integrated into the local economy at city economy, two is that parts of the developed and the central regions of the industrialization of agriculture, three are the central and western regions have substantial competitive labor output while retaining a small amount of necessary labor force engaged in agriculture at home, four are in poverty-stricken areas the traditional agriculture maintain the simple reproduction . In other words, under a condition of completely divided of the rural economic development mode, to take exactly the same mode of rural finance or system can no longer fit the current needs of rural economic development. Therefore, China's rural financial reform and positioning functions have to fit the status of the rural economy, and to adopt a different mode of development of rural finance. In china's rural areas the level of economic development different and financing needs of a wide range of diversity, it required the modernization of financial organizations and financing methods (such as agricultural enterprises demutualization, listing and financing) also have simple or even the existence of traditional financing side space. For many farmers are familiar with each other and the relatively easy credit or even the traditional credit form have the benefit of saving transaction costs. With their low-level and incompatible with the development of modern financial as an excuse to exclusive them is wrong.

China's rural financial development, we can not hope that a financial institution, nor are the local field of repair, but should be based on China's economic development stage, to serve the construction of new rural financial needs, focus on the rural economy can be sustainable development, reconstruction of a full-featured, running efficiently, multi-layered new rural financial system.

### 6. Establish a Multi-Level Rural Financial Service System

*6.1* In accordance with the functional expansion of the direction of the reform of the Agricultural Development Bank to expand the scope of business and service areas, enhance the service function of agriculture. Agricultural Development Bank should make the existing grain industry leading enterprise loans extended to agriculture, forestry, animal husbandry, fisheries within the scope of industrialization leading enterprises. Around the use of the loans in agriculture, forestry, animal husbandry, and fishery products plant (culture), circulation, or for processing, transformation, including working capital and technological transformation, storage and other agricultural infrastructure construction and production, processing base construction and long-term credit funds required .

*6.2* Definite the reform direction of the Agricultural Bank of China. Agricultural Bank of China the reform of commercial and should not be in accordance with other state-owned commercial banks to implement the reform model, and should take into account the Agricultural Bank as a "three rural" service specific features, developed to meet the concrete practice of China's reform model. As we all know, because of inefficient agriculture industry and the property's agricultural credit decide the high-risk, low efficiency, is bound to make agricultural credit business and the Agricultural Bank of contradictory nature of commercial banks, so that the Agricultural Bank will focus more and more moved the risk of small, high-yielding of non-financial sector . Should further clarify the direction of the Agricultural Bank reform, the reform should be limited commercialization. Concrete can take the following measures: First, clear the Agricultural Bank as a "three rural" services, so that the Agricultural Bank of mainly rural areas, provision of agricultural loans, rural credit cooperatives and rural finance, together take up the important task of building and promoting a virtuous circle of rural capital . Two are in order to increase support for rural finance, revenue at the bank to give more concessions in agriculture to reduce its rate of sales tax and to reduce the operating costs of the Agricultural Bank. Three are central banks give the Agricultural Bank more preferential refinancing to solve the shortage of funds of the Agricultural Bank and Agricultural Bank lending rates greater space to float in order to improve efficiency in the use of credit fund.

*6.3* Continue to deepen reform of rural credit cooperatives, support for the development of cooperative financial organization. About reform of rural credit cooperatives, we have explicitly at the structure of property rights can be taken on stock, stock cooperative system and the cooperative system in three ways, in the organizational model can be set up on commercial banks, cooperative banks and cooperatives in three forms of organization . All localities are required to select suitable conditions reform pattern, in general, the economically developed areas should be put stock and shares co-production models for major reform, the economy in underdeveloped regions should be based on joint-stock cooperative system and the co-production as the main mode of selection, while the poverty-stricken areas credit cooperatives reform and policy direction should be dominated cooperative system. However, regardless of what system of property rights and forms of organization, must be in accordance with the shareholding structure of diversification and the principle of investment diversification, and improve their corporate governance structures at concentrated efforts on a sound set up credit cooperatives operating incentive and restraint mechanisms, and enhance service rural economic development initiative. At the same time, some are willing to stick to the road of rural credit cooperatives financial cooperation, it is necessary to take measures to become members to become shareholders, democratic management, and services mainly for members of the really rural cooperative financial organizations and

foreign cooperation in the financial experience, through the free levy of interest tax, business tax and income tax relief, less deposit reserve mentioned in the loan than keeping the right amount of give another way to carry out the necessary loans and other support.

*6.4* Set up a comprehensive agricultural insurance system. This can enhance agriculture's ability to resist risks, improve the repayment ability of farmers, thereby reducing the loan risk, increasing their loans enthusiasm, the elimination of the lending bank's worries for the future. According to the reality of our country, at present, it is necessary to set up the policy of Chinese characteristics, agricultural insurance system, that is, to set up under the government-led policy-oriented insurance system model. The so-called policy is to regard agriculture insurance products as a quasi-public goods rather than personal belongings, adopting the form of commercial insurance and technology operation. The so-called government-led, that is, the government should provide a unified system framework for insurance of agriculture operated politically. All levels of government and a variety of organizations permitted should operate insurance and reinsurance in the framework. At the same time, the provisions of financial support are given by the government to the agricultural insurance product. So recommend the establishment of professional part of the Central Government or a department of the Chinese agricultural insurance companies, the companies operating the country's rural insurance business. The government, the insurance industry, farmers and financial institutions benefit from the establishment of professional Chinese agricultural insurance company. Agricultural insurance can significantly reduce the risk of loans of financial institutions coefficient, Farmer's default risk is also greatly reduced, so that rural financial institutions, "credit crunch" of the situation will be alleviated on a large extent.

*6.5* Guide and open rural folk financing. Private finance is to ensure the stability of local economic development agents and the catalysts. China's formal finance is significantly affected by the state- controlled tradition .It is a top-down strategy of credit. Credit is controlled by a number of ministries and department director of financial control; we call it a "first supply" type, more susceptible to national macro-control policy intervention, not in conformity with the laws of economic operation. In addition, the internal control problem, the formal financial members are often unable to represent the shareholders interests. Private Finance is different, it is "needs follow-up" type, there is what kind of market demand will have what kind of supply, and it is very scattered, it is precisely in line with the small amount of money farmers scattered required. Rural folk have many financial forms, they scattered in small and medium-sized farmers and the provision of financial services has a natural advantage: First, based on popularity, blood and fate industry relations of mutual trust and understanding, as well as social exclusion of informal sanctions mechanisms, such as gossip. With these social network, information obtained is the most full and most symmetrical. Second, loans are simple, in general it do not need collateral, guarantee, pledge and so on. If you need to mortgage or pledge, you can receive some goods which formal lenders are unacceptable, non-standardization of mortgage and pledge of goods, such as land tenure security, labor security, there is no evidence of real estate mortgage, the fields are not harvested, such as Young mortgages. Third, loans are generally concentrated in a fixed narrow geographical range, a relatively fixed group of clients, many borrowers are assumed to unlimited liability. Fourth, both lenders and borrowers usually at the same time maintain a working relationship, the relationship between business transactions and financial transactions relations, inextricably linked to make credit transactions more easily to set up, such informal credit transactions depend on the conditions at other markets on terms of trade, credit minimal risk. China's rural financial reform and control is necessary to change the country's traditional thinking, planning and centralization of power because only a small number of people to take care of preferences will not solve the problem of asymmetric information. Market is not, small businesses and a lot of small farmers, their demand is totally different, it may be policy-makers formulate policy in the first did not understand. Therefore, what the policy-makers need to do is to rule out a small part might lead to bad results, other may let financial between civil, civil financial and between the formal financial freely compete. When the market supply side is particular perfect , each person will be in the best approach to financing, so market interest rates will reach equilibrium, but the interest rates is otherwise not high. In contrast, if the market does not open, privilege will play a role, corruption will breed.

## 7. The Village or Township Banks Playing an Active Role in Rural Finance Service System

It is important significance for forming an multi-layered and emulous rural financial market to establish village or township banks. It is an useful attempt to solve the problem of low network coverage of financial institutions due to undersupply and ease the shortage of funds. However, we also hard to predict and confirm their negative impact on rural finance due to short experimental time and inadequate empirical data. As things stand, village or township banks play an positive role in rural finance in china.

*7.1 Favoring the formation of multi-level and competitive financial markets in rural areas*

Theoretical and regulatory circles generally form such a consensus, that is to say, to set up a multi-level financial service system for rural financial reform ideas. However, rural finance belongs to small profits finance compared with other forms of finance. The most financial subjects are reluctant to participate in rural finance for a long time, which make the reform on rural finance always revolve around the rural credit cooperatives. The rural credit cooperatives in a

monopoly in rural finance. Although China make reform attempts for the rural credit cooperatives many times, the rural financial reform started late, progress is slow and there are still some profound contradictions and problems relative to the city finance owing to a variety of reasons. Now, these problems have become "bottleneck" restricting the development of rural economy that the network coverage of financial institutions in the banking industry is low, financial supply is not enough and competition is inadequate. The monopoly situation of the existing rural credit cooperatives is broken and the new subject is increased so as to aggravate competition in rural financial market in a certain extent through the establishment of village or township banks.

*7.2 Relieving the diminution of the rural financial resources*

The characteristics of agricultural "vulnerability" restricts the development of the rural finance. Its outstanding performance are the lack of financial resources and the phenomenon of fund outflow of rural financial market by state-owned commercial Banks and the postal savings. This situation is relieved effectively after four state-owned commercial banks withdraw their branch offices in the county towns and postal savings maked postal savings bank. However, the rural credit cooperatives will remain strong wish for commencing business in the town. Each year they still transfer part of agricultural deposits to the city in disguised form, which leads to the development of rural economy by capital "bottleneck" limitation. The author estimates through measuring that capital outflow of the rural areas by the rural credit cooperatives is about 40 million yuan, 14.4 percent of total absorption deposits of rural credit cooperatives, across the country in 2005. From this, it can be seen that the phenomenon of fund outflow is very serious. The village or township banks can relieve rural financial resources in a certain extent.

*7.3 Forming the substitute for the private finance*

The state-owned commercial banks gradually withdraw the rural financial markets from the angle of financial institutions in recent years, resulting in the rural credit cooperatives dominant in rural finance. Owing to the scarcity of financial institutions and the shortage of normal development channels, large numbers of civilian capitals participate in various forms of underground financial activities with various "grey" status, which disturbs the country's financial order to a certain extent and gives capital owners bring huge financial risks. The village or township banks can form the substitute for the private finance in a certain extent. First, The relevant provisions of the establishment of the village or township banks makes it clear that a domestic natural person can take shares in a village or township bank, which is very attractive to long-term discriminated folk capitals in formal finance. It is reported that many merchants in zhejiang province value village or township banks and Some of them have submitted the relevant application plans for the establishment of the village or township banks after the village or township banks are piloted in selected provinces and cities. Second, the village or township banks expand the formal financial institutions in the rural areas and can bring a certain proportion of private financial resources into the formal financial system under the premise of constant total financial resources.

## 8. Conclusions

Return on investment in the village or township banks as new rural financial institutions is very considerable in the conditions of starved financial needs and insufficient financial supply in the vast rural areas. The village or township banks are springing up all over the nation in the norms of national policy and market commercial interests drive. The author believes that the village or township banks in China will play an more and more important role in the rural economy with the continuous improvement of the rural financial system and the steady development of agricultural economy.

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# Evaluation of Customer Relationship Management's

# Performance under Networked Manufacturing

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**Abstract**

Networked manufacturing is an advanced manufacturing technology, and efficient customer relationship management is critical for networked manufacturing's resource allocation and scheduling. Evaluation of customer relationship management's performance under networked manufacturing and effective optimization measures are preconditions for improving on CRM's performance. Development process's quality, operational process's quality, customer relationship's quality and emergency ability are critical factors of CRM's performance under networked manufacturing. Evaluating CRM's performance should build index system based on these four factors and make grey correlative analysis combined with analytic hierarchy process. The performance evaluation way proposed is feasible and effective, and combines the advantage of quantitative analysis and qualitative analysis.

**Keywords:** Networked Manufacturing, Customer Relationship Management, Grey Correlative Analysis, Relevance

## 1. Introduction

Customer relationship management of networked manufacturing is important for resources optimum allocation and scheduling. Customer classification according to the customer characteristics is the basis of CRM. The CRM's performance evaluation is a multipurpose and multilevel evaluating process. The critical factors of CRM's performance have fuzziness, so it has to build a scientific index system and use an evaluating method combining the advantage of qualitative and quantitative analysis. This research studies the critical factors of the CRM's performance and builds a effective index system according to the factors. And study the evaluating process of CRM's performance with grey correlative analysis method combined with analytic hierarchy process method.

## 2. Evaluation Index System of CRM under Networked Manufacturing

The performance of CRM under networked manufacturing is restricted by the Development process's quality, operational process's quality, customer relationship's quality and emergency ability. Evaluating of the performance of CRM under networked manufacturing must study the critical factors in all aspects (Zhang,2007,PP.2455-2458).

*2.1 Quality of development process*

The evaluation of CRM under networked manufacturing should considering the whole life cycle of the system. Before the operation of CRM, the quality of the development process is the critical factors for the performance evaluation.

During the development process, whether the development method is effective, whether the customer demand analysis is effective, whether the controlling measures is effective, whether the whole organization structure is supportive, are important for the CRM's performance in future. All of these aspects must be examined during the evaluation.

*2.2 Quality of operational process*

The CRM's operational process quality is the primary foundation for the system's performance. So evaluation of CRM's operational process quality is key job for the CRM's performance evaluation.

During the operational process, CRM's hardware quality, reliability, expendability, human-computer interface, data veracity, timelessness, maintainability, environmental suitability, information integration quality, and so on, are the important factors which must be concerned.

*2.3 Quality of customer relationship*

The quality of operational process and development process is evaluation in the sight of life cycle. It is essential to evaluate the CRM's performance from the customer relationship quality under networked manufacturing.

Study the CRM's customer relationship quality form three aspects. They are customer relationship cost, customer conservation rate and customer loyalty.

*2.4 Emergency ability*

The CRM should provide well capacity of emergency early warning and response.

First, the CRM should collect the customer data, and be capable of data mining for early warning according to the clue of emergency; then, provide the response measures suggestion according to the characteristics of networked manufacturing resources and customer relationship, in purpose of success loss control.

According to the four aspects, build the hierarchical structure of the index system. Destination layer is customer relationship performance; criteria layer contains development process quality, operational process quality, customer relationship quality and emergency ability. Strategy layer contains the subsection index as stayed above.

This study use four example programs evaluation to explain the practicability of the index system, and use the simulation data to explain the evaluation method proposed. The qualities of the four programs are described by the four index aspects as stayed above.

## 3. Grey Correlative Analysis of Customer Relationship

At first, determine the evaluation criteria. Shown as Table.1.

Organize the experts to evaluate according to the indexes and calibrations, the results are shown as Table.2

*3.1 Data normalization*

The grey correlative analysis demand the data is dimensionless. So data normalization is essential. Convert the data in Tab.2 to data columns which are dimensionless, equative degree, positively additive(Zan,2008,PP.49-50).

Data contained in Tab.1 is extremely large style. The larger the performance of CRM is stronger. Set up $d_{ij}$ as initial data, $u_{ij}$ as normal data, $M_j$ as the j-th index's maximum($i=1,2,…,4;j=1,2,…, 4$).

$$u_{ij} = \frac{d_{ij}}{M_j} \tag{1}$$

After converting, the normalization data is shown as Table.3.

*3.2 Determine the incidence coefficients*

Customer relationship performance index system could be decomposed into four indexes, $A_1,A_2,A_3,A_4$.every index contains one program's evaluation data in four index aspects(Tang,2008,PP.10-12).

A1:
$$\{x_1\} = \{x_1(1) \quad x_1(2) \quad x_1(3) \quad x_1(4) \quad \};$$
A2:
$$\{x_2\} = \{x_2(1) \quad x_2(2) \quad x_2(3) \quad x_2(4) \quad \};$$
A3:
$$\{x_3\} = \{x_3(1) \quad x_3(2) \quad x_3(3) \quad x_3(4) \quad \};$$
A4:
$$\{x_4\} = \{x_4(1) \quad x_4(2) \quad x_4(3) \quad x_4(4) \quad \}.$$

Appoint the reference data column $x_0$ from $x_1,x_2,x_3,x_4$ :
$$x_0 = (x_0(1), x_0(2),\cdots,x_0(k)) .$$

$x_0$ could be one of $x_1,x_2,\cdots x_n$ or their linear combination. Choose the largest as the reference data column. Then,
$$\{x_0\} = \{1, \quad 1, \quad 1, \quad 1\}.$$

Compute the incidence coefficient according to (2).

$$\xi(k) = \frac{\min_i\min_k|x_0(k)-x_i(k)| + 0.5\max_i\max_k|x_0(k)-x_i(k)|}{|x_0(k)-x_i(k)| + 0.5\max_i\max_k|x_0(k)-x_i(k)|} \tag{2}$$

*3.3 Determine the index system weight*

Determine the index system weight with analytic hierarchy process method. The process of definition of weight is as follows.

$$k_{ij} = \begin{cases} 0 \\ 1 \\ 2 \end{cases}$$   0, the i-th index is less important than the j-th index;1,the i-th index is equal to the j-th index; 2, the i-th

index is more important than the j-th index(Peng, 1999, PP.10-12).

According to the actual project background, definite the comparison matrix shown as Tab.4.

Then, $K_{max}$=7,$K_{min}$=2, according to (3):

$$Q_{ij} = \begin{cases} 1 + 2(k_i - k_j)/7 & k_i = k_j \\ 1/[1 - 2(k_i - k_j)/7] & k_i < k_j \end{cases} \tag{3}$$

*3.4 Compute the relevance*

Computer the relevance $r_1$, r2, r3, r4, according to the formula shown as follows (Hu, 1993, PP.26-29):

$$r_i = \frac{1}{N} \sum_{i=1}^{N} \xi_i(k) \tag{4}$$

## 4. Conclusion

According the magnitude sequence of $r_1$,$r_2$,$r_3$,$r_4$, determine the optimum program. The evaluation method of CRM's performance utilizes the advantage of grey correlative analysis and analytic hierarchical process. The evaluation process studies the Development process's quality, operational process's quality, customer relationship's quality and emergency ability. It's an effective and practical evaluating way for CRM's performance evaluation under networked manufacturing.

**Acknowledgment**

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Table 1. Importance calibration

| Calibration $a_{ij}$ | definition |
|:---:|:---:|
| 1-3 | Very feeble |
| 3-5 | feeble |
| 5-7 | normal |
| 7-9 | Relative strong |
| 9-10 | Very strong |

Table 2. Every program's index data

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Development process | $a_{11}$ | $a_{12}$ | $a_{13}$ | $a_{14}$ |
| Operational process | $a_{21}$ | $a_{22}$ | $a_{23}$ | $a_{24}$ |
| Customer relationship | $a_{31}$ | $a_{32}$ | $a_{33}$ | $a_{34}$ |
| Emergency ability | $a_{41}$ | $a_{42}$ | $a_{43}$ | $a_{44}$ |

Table 3. Normalizing data

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Development process | $x_1(1)$ | $x_2(1)$ | $x_3(1)$ | $x_4(1)$ |
| Operational process | $x_1(2)$ | $x_2(2)$ | $x_3(2)$ | $x_4(2)$ |
| Customer relationship | $x_1(3)$ | $x_2(3)$ | $x_3(3)$ | $x_4(3)$ |
| Emergency ability | $x_1(4)$ | $x_2(4)$ | $x_3(4)$ | $x_4(4)$ |

Table4. Judgment matrix

| | $Q_{i1}$ | $Q_{i2}$ | $Q_{i3}$ | $Q_{i4}$ | $\sum_{j=1}^{4} Q_{ij}$ | $\omega_i$ |
|---|---|---|---|---|---|---|
| Development process | 1 | 0.41 | 0.47 | 1 | 2.88 | 0.15 |
| Operational process | 2.43 | 1 | 1.29 | 2.43 | 7.15 | 0.38 |
| Customer relationship | 2.14 | 0.78 | 1 | 2.14 | 6 | 0.32 |
| Emergency ability | 1 | 0.41 | 0.47 | 1 | 2.88 | 0.15 |

# Confirmatory Factor Analysis of TQM Practices

# in Malaysia and Thailand Automotive Industries

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**Abstract**

Automotive companies must implement and maintain a high degree of Total Quality Management (TQM) practices due to competitive automotive market and customer pressure. In the operations management research field, TQM has been considered as infrastructural strategy. It has become one of the most recognized models for operational excellence besides Lean Operation, Supply Chain Management, and Technology Management. The authors have reviewed updated literature on TQM research and one question that arrised was in re-validating the TQM constructs. Eight constructs were consolidated from literature. Can these eight constructs validly represent TQM as a whole? This paper presents findings of Confirmatory Factor Analysis (CFA) on TQM practices in Malaysia and Thailand automotive industry. Data were obtained from 161 and 150 automotive companies and related suppliers in Malaysia and Thailand with 25% and 21% response rate respectively. The results indicate that from the eight TQM constructs, only seven TQM constructs are acceptable for further analysis. The paper with a proposed future direction ends of this research.

**Keywords:** Automotive Industry, TQM constructs, Confirmatory Factor Analysis, Structural Equation Modeling, Malaysia and Thailand

**1. Introduction**

In a competitive market, the demand for quality is emerging as the single most critical factor for companies to survive in the ever expanding global market place. Quality is vital in determining the economic success of manufacturing companies (Garvin 1988; Curkovic, *et al*., 2000). World class manufacturing companies gain competitive edge and greater market share through extraordinary levels of performance by providing a quality product with a competitive price as required by demanding customers.

The concept of Total Quality Management (TQM) has been developed as a result of intense global competition. Organizations with international trade and global competition have paid considerable attention to TQM philosophies, procedures, tools and techniques. According to Juran, international competition requires higher levels of quality by organizations (Blackiston, 1996).

However, the implementation of quality management has not occurred at the same pace in different regions of the world. While early implementation started in Japan, US, Europe, and followed by the developing countries. To compete in the global market, these countries need to implement quality management practices, tools, and techniques within all sections of their industries. Despite the number of publications and quantity of research on TQM, little empirical work has been carried out in developing countries, particularly in the ASEAN region. This research contributes to understand some of the differences that could exist in this part of the world with regard to quality management implementation.

In Malaysia automotive industry itself, there are a few studies that have been conducted on the implementation of quality practices. Noviyarsi (2005) had developed a framework for quality engineering implementation which can assist

the automotive companies to meet their customer satisfaction. Deros *et al*. (2004) had suggested a framework for benchmarking implementation for automotive manufacturing SMEs. Meanwhile, Sohail *et al*. (2003) had compared the TQM practices and organizational performances of companies with and without ISO 9000. They pointed out there are significant differences in performances between certified and non-certified companies. However, all of them focus within Malaysian context, and till date no research has been conducted in quality practices and implementation especially on comparative study among ASEAN country dedicated to automotive industries.

Since the realization of ASEAN Free Trade Area (AFTA) in 2005, it shows the impact on Malaysia's car manufacturer sales. Prior to AFTA, most of Malaysian automotive market is protected by the government with instruments such as tariffs, refunds schemes and investment control in order to compete with their overseas competitors. Actually, AFTA, for automotive industries, in a positive perspective would drive the regional manufacturing integration and cost competitiveness among ASEAN countries rather being a threat to them. Based on analysis for the world vehicles market for the year 2000 and projected 2010 by The Malaysian Automotive Association report (2006), ASEAN is the fifth largest market in the world and Malaysia is far behind when compared to Thailand by the year 2010.

Given the importance of automotive industries to the Malaysian economy, the author decided to evaluate the relationship between TQM and organizational performance. To survive in a competitive market place, quality practices implementation is one of the key issues that can help align organization's to stay competitive. Besides that, based on current situation, comparative study among ASEAN, especially Thailand, is gives a good opportunity that could provide an overall perspective and understanding of the main differences and similarities for TQM practices and the impact of ISO/TS16949 certification. Those strength that exist within the Malaysian automotive practices can be maintained, while those lacking in practices from Thailand counterparts could probably absorbed and copied by Malaysian automotive industry players.

## 2. Literature Review

The importance of quality management in business organizations has increased significantly over the past 20 years. TQM from an international perspective require studying different countries and aims at understand TQM in a global context. The concept of international serves as the motivation for developing a global TQM standard for evaluating TQM practices within countries (Rao *et al*, 1999). The practice of TQM also affects from the national level to the international level which helps organizations to compete internationally and gain a competitive edge in the global market.

*2.1 Quality in International Context*

Currently, developed and developing countries are in different stages of the quality movement especially in automotive industries. In this industry, most quality practices research has focused on developed countries since the early 1990's such as United States and Japan (Benson *et al.,* 1991; Ebrahimpour and Johnson, 1992; Flynn, 1992; Rogers, 1993). Studies on the implementation of quality practices in developed countries are found to be very common and thus most quality practices nowadays is based on the experienced of developed countries such as Toyota, GM and Ford (Dale, 2003; Womack *et al*., 1990). Benito and Dale (2001) had reported some empirical observation of the way in which Spanish auto components industry is implementing supplier quality practices. They pointed out that suppliers which are more advanced in the use of quality practices are achieving better operational performance in terms of quality, reliability, cost, flexibility and design. Johnson and Khan (2003) had conducted a study into the use of failure mode and effect analysis (FMEA) in the automotive industries in the UK. He had established how the effectiveness of FMEA could be determined. A recent study by Iwaarden *et al*. (2006) in a European automotive manufacturer showed that the application of a management control model in the field of quality management practices is found to be useful in explaining what changes are necessary to maintain high quality levels.

Quality practices research has been extended beyond developed countries to other countries around the world such as China and India (Rao *et al*., 1999). In China, Lee (2004) conducted a study to investigate the status of quality practices and its perception among Chinese small manufacturing companies. He pointed out that by adopting certain quality management practices, it can help Chinese small manufacturers to achieve competitive advantages in both domestic and international markets. Lin *et al*. (2004) showed that Taiwanese and American firms can benchmark the efficient practices of Japanese firms in order to be the best-in-class. The study found that the efficiency of quality management practices for Japanese-owned firms is the highest, even though almost all of their employees are Taiwanese; also, American-owned firms' efficiency is higher than that of Taiwanese-owned firms.

Some studies have compared quality practices between developed and developing countries. Yoo *et al*. (2006) discusses the differences in implementation quality practices in manufacturing companies among four countries which are Korea, USA, Mexico and Taiwan. They noted that transferring quality practices from a home country to another country or in another way are required to achieve overall business objective and to consider similarities and differences in the context globalization. Meanwhile, Raghunathan *et al*. (1997) surveyed 228 USA, 78 China and 168 Indian manufacturing

including automotive industries. They found that it is important to consider quality practices between developed and developing countries to understand the status and there may be opportunities for developing countries to learn from the successes and failures of the quality practices of developed countries. They also suggested, whether commonalities and differences found, both developed and developing countries need to use uniform instruments and method analysis for future studies.

Aziz *et al*. (2000) surveyed 540 Malaysian and 180 UK companies emphasising on manufacturing small and medium enterprises (SMEs). From the survey results, they found there is a reliance on inspection and relatively low use of more sophisticated statistical methods for quality improvement for both countries. They also stated that the types of quality practices used by the UK and Malaysian SMEs are related to the types of quality practices promoted by their own governments. Parast *et al*. (2006) conducted a comparative analysis of quality management practices between USA and Mexico manufacturing companies, using the Malcolm Baldrige National Quality Award (MBNQA) criteria as a framework. The results show there are differences between the critical success factors of quality management practices within USA and Mexico. In both countries, social responsibilities and supplier quality were significant in explaining variability of quality results. More similarities in both countries were found in the effect of quality management practices on customer focus and satisfaction.

Schniederjans *et al*. (2006) conducted a study on quality management practices in manufacturing companies between three countries which are India, Mexico and USA. A reason for selecting the USA and Mexico for comparison can be suggested by the movement of USA firms to Mexico under the North American Free Trade Agreement (NAFTA). Another, reason for selecting the USA and India for comparison is the outsourcing phenomenon that is a result of Indian firms being the greatest beneficiary of USA firms that outsource to India (Lee *et al.*, 2003). Schniederjans *et al.* (2006) stated that cross comparison study may be helpful in understanding the similarities and differences in quality management practices in various countries.

The international comparative studies on quality practices implementation can provide an insight into quality practices in global scale. Sila and Ebrahimpour (2002) had investigated comparative study on quality practices survey based research between 1989 and 2000. Table 1 shows the results of countries investigated and the number of corresponding article.

<Insert Table 1 here>

In relation to that, some of the past related researches on comparative study in quality practices implementation between countries from the year 2000 to 2007 have been summarized in Table 2.

<Insert Table 2 here>

*2.2 TQM Constructs*

Numerous studies have examined what constitutes quality management, what the common barriers to quality management implementation are, and what factors are critical for the success of quality management (Saraph *et al.*, 1989, Flynn *et al*., 1994, Ahire *et al.,* 1996, Rao *et al*., 1999, Yusof and Aspinwall, 2000 and Sila, 2007). Although these studies have provided different results such as critical factors, they have identified a common set of practices considered essential to the success of a quality management implementation.

TQM constructs have been reviewed extensively here. To generate distinct generic construct, a list of constructs proposed in a large set of articles was analyzed. Table 3 presents, for each generic construct, a list of similar practices proposed by other authors. Each construct was then analyzed whether it was different or similar to the constructs previously analyzed. This process resulted with a proposed set of eight constructs which are: quality leadership, customer focus and satisfaction, quality information and analysis, human resource development, strategic planning management, quality results, and quality assurance.

The above eight constructs were derived from the comparison of quality management practices across different studies as shown in Table 4 and also by combining the constructs in the Malcolm Baldrige National Quality Award Criteria, TS 16949, and the ISO 9000 certification requirements. Furthermore, those constructs also,

i.    Constitute practices that represent the hard and soft aspects of quality management.

ii.    Cover the most prestigious quality award criteria that are widely accepted by quality management scholars and practitioners.

iii.    Have been considered as critical practices in quality management (Sila and    Ebrahimpour, 2002).

iv.    Correspond to the Malaysian Prime Minister Quality Award (PMQA) and Thailand Quality Award (TQA) criteria. It is believed that there are suitable for testing in the Malaysian and Thailand automotive industry context.

<Insert Table 3 here>

<Insert Table 4 here>

**3. Research Methodology and Data Collection**

Mail survey was conducted to collect data in this study. Mail surveys are used because they are relatively simple way to collect quantitative data. The survey packet consisted of a large (9" x 12") mailing envelope that included the instrument and cover letter stapled together, as well as a post-paid self addressed envelope. The survey packet was mailed in various batches to the target sample. The target population of this study will be from the automotive industries in Malaysia and Thailand. In this study automotive industries can be defined as a car manufacturer and their tier 1 and tier 2 suppliers.

The second mailing was done to non-respondents about one month after the first mailing. In order to minimize survey costs, a decision was made to send a complete survey packet with reminder letter to every alternate non-respondent on the mailing list. The other non-respondents were sent a post card that was post-paid. It requested the recipient to complete the questionnaire and return it, if the original survey was lost, and the recipient would be willing to complete a survey, a new survey package will be sent.

Even after second mailing was done, the response rate was still low of around 10% especially in Thailand. To increase the response rate telephone calls and follow-up fax transmission were made persuading them to fill up the questionnaires. In Thailand, due to most of the companies representative preferred to converse in Thai language, the follow-up process was carried out with the help of researchers from Thammasat University. A well-designed training program was provided to the researchers before they conducted the survey. This was helpful to increase the response rate and get the respondents answer the questionnaire.

The data was collected between July 2008 and December 2008. In the case of Malaysia, the questionnaire was distributed to a total of 650 companies and 161 completed forms received giving a response rate of 25%. Meanwhile, for Thailand, the questionnaire was distributed to a total of 700 companies with 150 returning the forms, thus giving a response rate of 21%.

*3.1 Treatment for missing data*

Since the structural equation modeling (SEM) software was used to analyze part of the data, missing data became an issue. SEM requires that "complete data are required for the probability density and adjustment must be made to data sets that are incomplete" (Brown, 1994). Thus, a method for handling missing data was required. A question in a given survey dataset may be missing a value for different reasons. Reasons include:

i.     Omission during entering data from original questionnaire

ii.    Accidental lack of response by the respondent

In this study, it would appear that both reasons come to play. A different procedure was used to adjust to the missing data for each situation. The first step was to eliminate input errors on the part of the data entry. The hardcopy of each questionnaire that presented missing value was examined and the data entry error was input. There were five cases in Malaysia dataset and only one case in Thailand dataset.

The second step was to face the issue of respondent non-response. In this study, if less than 5% of the data is missing, the missing data will be filled in with the mean (Tabachnick and Fidell, 1996). Otherwise, if more than 5% of the data is missing, the information will be dropped from the study. For Malaysian respondents, there were 10 cases the missing data filled in with the mean and four cases was dropped from the dataset since more than 5% of the data is missing. Meanwhile, none of the cases was found in Thailand dataset. Table 5 shows the summary of the final dataset.

<Insert Table 5 here>

**4. Results and Discussions**

The next stage involves testing the measurement model, where TQM constructs are tested based on two steps:

(1)    Single factor

(2)    First order confirmatory - multiple factor

Chinna (2009) suggested testing a measurement model that underlying a full structural model first. If the fit of the measurement model is found acceptable, then one should proceed to test the structural model. The confirmatory factor model is conducted to assess construct validity by using the maximum likelihood method. The confirmatory factor analysis (CFA) technique is based on the comparison of variance-covariance matrix obtained from the sample to the one obtained from the model.

*4.1 Confirmatory Factor Analysis for TQM Constructs – Single Factor*

Consequently, a CFA is conducted for each factor of TQM constructs and the results are presented as follows:

i)       Quality leadership (QL)

QL is presented by seven items and based on results of the CFA (see Figure 1), QL constructs indicate an excellent fit with $\chi^2$ statistic of 35.158 (degrees of freedom = 12, p < 0.001), with the $\chi^2/df$ ratio having a value of 2.930 that is less than 3.0. Joreskog and Sorbom (1993) suggested that it should be between 0 and 3 with smaller values indicating better fit. The goodness fit index (GFI) was 0.970, adjusted goodness of fit index (AGFI) was 0.930, comparative fit index (CFI) was 0.972, and Tucker-Lewis coefficient (TLI) was 0.950. These scores are very close to 1.0 where a value of 1.0 indicates perfect fit (Bentler, 1992; Bentler and Bonett, 1987). The next set of fit statistics focus on the root mean square error of approximation (RMSEA) which is 0.079. Browne and Cudeck (1993) proposed that values less than 0.08 indicates good fit, and values high than 0.08 represent reasonable errors of approximation in the population.

<Insert Figure 1 here>

With regard to factor loadings, the standardized coefficient estimates are between 0.56 and 0.85. All these are considered good which is above the acceptable level of 0.3 (<0.30 shows convergent validity not satisfactory) with p-value < 0.001. R-squared value (0.38, 0.43, 0.34, 0.73, 0.31, 0.34, and 0.56) indicates the percentage of variation in each indicator (QL6, QL7, QL5, QL2, QL4, QL3, and QL1), that is explained by the factor QL. From this result, it is noted that QL2 presents the best indicator for this construct which is 0.85 followed by QL1 with the value of 0.75, and lowest indicator is QL4. The first two highest values represent the "responsibility of the top management" as the best indicator for QL. Therefore, these seven items can measure the construct "Quality leadership".

ii)    Customer focus satisfaction (CFS)

The results of the CFA indicate an excellent fit, with $\chi^2/df$ value of less than 3, GFI, AGFI, CFI and TLI more than 0.9 as very good and RMSEA value less than 0.08. The R-squared values for each indicator (0.35, 0.30, 0.30, 0.57 and 0.69) of this construct are graphically displayed in Figure 2.

<Insert Figure 2 here>

Based on factor loadings as shown in Figure 2, the standardized coefficient estimates (0.830, 0.757, 0.550, 0.547, and 0.593) are above the acceptable level (0.3) with p-value less than 0.001. It might be noted that "Resolved customer complaint" (CF6) is the best indicator for this construct with standardized estimate 0.830. The construct CFS may be designed using the above five observed variables.

iii)   Quality information and analysis (QIA)

The results of CFA shows $\chi^2/df$ value of 2.675 with other indices (GFI, AGFI, CFI and TLI) indicating excellent fit which is more than 0.9 with RMSEA less than 0.08. Based on R-squared value, QIA6 indicates the highest percentage of variation that is explained by the factor QIA (0.71) and the remaining R-square value for each indicator (0.34, 0.33, 0.54 and 0.71) of this constructs are graphically presented in Figure 3.

<Insert Figure 3 here>

With regard to the factor loadings, the standardized coefficient estimate for the first indicator (QIA1) is 0.571 which is somewhat lower than the remaining standardized loadings (0.581, 0.734, and 0.843). It can be said that "used of quality data by workers" (QIA6) is perceived to have the strongest impact on this factor with regression weight of 0.843. Based on the CFA results, the QIA construct can be designed using these four items of measurement.

iv)    Human resources development (HRD)

The results of the CFA show that $\chi^2/df$ value 1.595 has good fit with other indices GFI (0.995), AGFI (0.974, CFI (0.997) and TLI (0.992) more than 0.9 indicating excellent fit. Root mean square error approximation (RMSEA) is less than 0.08 indicates a good fit. The highest variation percentage, R-square value is 0.69 (HRD3) and the lowest variation percentage is 0.44 (HRD7) as presented in Figure 4.

<Insert Figure 4 here>

On the factor loading, the standardized coefficient estimate are acceptable with HRD3 (0.829) giving the highest value. Based on this loading, it should be noted that "training" is the best indicator to measure human resource development construct. The factor loading value (0.829, 0.779, 0.692 and, 0.664) is more than 0.3. Thus, the construct of HRD can be designed using the four observed variables.

v)    Strategic planning management (SPM)

The results of the single factor CFA show that the $\chi^2$ is rather high (6.892) but the $\chi^2/df$ value is less than 3 showing a good fit with GFI (0.991), AGFI (0.956), CFI (0.992) and TLI (0.974) shows excellent fit. Based on R-square value, SPM 3 (0.26) gave the lowest variation percentage that explained by this construct. The remaining R-square values are 0.48, 0.52, 0.50, and 0.53 as displayed in Figure 5.

<Insert Figure 5 here>

On the factor loading, the standardized coefficient estimate shows convergent validity is met with values of 0.727, 0.512, 0.724 and 0.692 respectively. The highest value is SPM1 (0.727), indicating that "strategic plan" is the best indicator for strategic planning management construct. With the CFA results, these five items may measure the construct of strategic planning management.

vi)   Supplier quality management (SQM)

The results of the CFA indicate an excellent fit, $\chi^2$/df = 1.354 with GFI equals to 0.993, AGFI of 0.974, CFI of 0.997, and TLI of 0.994. The RMSEA also shows a good fit with a value less than 0.08. The highest percentage variation explained by construct SQM is SQM7 (0.60). The remaining R-squared values are 0.45, 0.40, 0.47 and 0.54 as presented in Figure 6.

<Insert Figure 6 here>

Regarding the factor loading, all values (0.775, 0.734, 0.684, 0.633, and 0.669) are more than 0.3 that shows convergent validity. The highest value is question 7 (0.775) and it shows that the indicator "relationship with supplier lead to continuous improvement" have the strongest impact on this construct.   Thus, the construct SQM may be designed using the five indicators.

vii)   Quality results (QR)

The results of the CFA show that $\chi^2$/df value 1.339 has good fit with other indices GFI (0.995), AGFI (0.975), CFI (0.997) and TLI (0.990) which is more than 0.9 shows excellent fit. Root mean square error approximation (RMSEA) is less than 0.08 indicates a good fit. The highest variation percentage, R-squared value is 0.65 (QR1) and the lowest variation percentage is 0.19 (QR4) as presented in Figure 7.

<Insert Figure 7 here>

Based on the factor loadings, the standardized coefficient estimates (0.674, 0.809, 0.440, 0.375 and 0.592) are above the acceptable level (0.3) with a p-value less than 0.001. It can be seen that "rework levels" (QR2) is the best indicator for this construct with standardized coefficient estimate 0.809 while "warranty costs" is the lowest indicator with standardized coefficient estimate 0.375 to this construct. Therefore, the construct QR can be designed using the above five observed variables.

viii)  Quality assurance (QA)

The result of the CFA indicated an excellent fit, $\chi^2$/df = 2.271 with GFI= 0.992, AGFI= 0.958, CFI= 0.987, and TLI= 0.956. RMSEA also show a good fit with value less than 0.08. The highest percentage variation explained by construct QA is QA3 (0.63). The remaining R-square values are 0.27, 0.25, 0.21 and 0.31 as presented in Figure 8.

<Insert Figure 8 here>

As to the factor loading, the standardized coefficient estimate are acceptable with QA3 (0.792) giving the highest value. Based on this loading, it should be noted that "productivity" is the best indicator to measure this QA construct. The value of the factor loading (0.560, 0.505, 0.521, 0.792, and 0.462) is more than 0.3. Thus, the construct of QA may be designed using the five observed variables.

*4.2 First Order Confirmatory Analysis of TQM Constructs – Multiple Factor*

This stage of analysis is called First Order Confirmatory with Multiple Factor. It involves testing the measurement model. TQM constructs are tested using the first order confirmatory factor model to assess construct validity using the maximum likelihood method with multiple factor. The results consistently supported the factor structure for TQM constructs with eight factors.

4.2.1 TQM Constructs with Eight Factors

The model tested shows that TQM is a eight constructs structure which composed of quality leadership (QL), supplier quality management (SQM), quality information and analysis (QIA), customer focus satisfaction (CFS), quality results (QR), quality assurance (QA), human resource development (HRD), and strategic planning management (SPM). The model is tested for the combined data from Malaysia and Thailand respondents (n=307).

The first order confirmatory test with multiple factors result showed an adequate fit as shown in Figure 9. The $\chi^2$ statistic was 1336.128 (degrees of freedom = 712, p < 0.001), with the $\chi^2$/df ratio having a value of 1.877 that is less than 2.0 indicating a good fit. However, the Goodness Fit Index (GFI) was 0.820 and Adjusted Goodness of Fit (AGFI) was 0.793. The comparative fit index (CFI) was 0.899, Tucker-Lewis coefficient (TLI) was 0.882. These scores are less than 0.9 which is not satisfactory.   The next set of fit statistics focus on the root mean square error of approximation (RMSEA) which is 0.056 which is less than 0.08 indicating good fit.

<Insert Figure 9 here>

Regarding the factor loading, the standardized coefficients estimate is somewhat low but above the acceptable level (> 0.3). However, there is one canonical correlation ($r_c$) value of more than 1.0 which is between quality results (QR) factor and quality assurance (QA) factor that showed multicollinearity is high (1.04). This means that the items under the factor (QR) and (QA) are duplicating between each other. This result also showed that discriminant validity is not met (China, 2009).

Given this situation, it is suggested to remove one of the factor or consolidate both factors. Based on literature review, both factors are important for TQM implementation. Thus, the authors decided to consolidate these two factors and rename as "quality results and assurance (QRA)". Before proceeding with seven TQM constructs, reliability test was performed once again to confirm whether the consolidated factors (QRA) are reliable. The Cronbach's alpha result is 0.856 which is more than 0.7. Thus, it implies that the new factor (QRA) for TQM is statistically reliable. All the items have reliability coefficients (alpha value) less than 0.856 and more than 0.7, they are statistically reliable and no items should be dropped for further analysis (see Table 6).

<Insert Table 6 here>

The modified TQM model with seven factors result showed an adequate fit as shown in Figure 10. The $\chi^2$ statistic was 1068.914 (degrees of freedom = 707, p < 0.001), with the $\chi^2$/df ratio having a value of 1.512 that is less than 2.0 indicating a good fit. The Goodness Fit Index (GFI) was 0.850 and Adjusted Goodness of Fit (AGFI) was 0.826 meaning moderate fit. The comparative fit index (CFI) was 0.941, Tucker-Lewis coefficient (TLI) was 0.935. These scores are more than 0.9 which is an excellent fit.   The RMSEA value is 0.041 which is less than 0.08 and thus indicating good fit. All canonical correlation ($r_c$) show values less than 1.0, implying that the discriminant validity has been tested and acceptable.

On the factor loading, the standardized coefficient estimates are between 0.517 and 0.811 are good since they are above the acceptable level of 0.3 with p-value < 0.001. Therefore, it is suggested that these seven constructs be used to measure the TQM implementation and the results of CFA showed that the new TQM constructs exhibit both convergent and discriminant validity.

<Insert Figure 10 here>

## 5. Conclusion and Future Research

In this study, the original model of TQM constructs proposed by literature was not proved to be valid. The main problem was that it is not a eight-factor model but only a seven factor model. That is, 'quality results' and 'quality assurance' are identical. Therefore, the authors have modified the model by consolidating these two factors and renamed it as 'quality results and assurances (QRA)'. The results of seven-factors showed that the measurement model for TQM constructs had a good fit and the model is valid and reliable for Malaysia and Thailand automotive industries. In conclusion, it can be described that TQM is a latent exogenous variable, which is represented by seven observed endogenous variables namely, 'quality leadership', 'customer focus satisfaction', 'quality information and analysis', 'human resource development', 'strategic planning management', 'supplier quality management' and 'quality results and assurance'. The next step in this study is to propose a structural model of the relationship between TQM practices and organizational performance using structural equation modeling (SEM).

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Table 1. Countries investigated and the number of corresponding articles (Sila and Ebrahimpour, 2003)

| Country | No | Country | No |
|---|---|---|---|
| Australia, New Zealand | 7 | Germany, UK | 1 |
| USA, Canada | 4 | Spain, Nertherland, UK | 1 |
| USA, UK, Middle East, Singapore/ Malaysia | 1 | Asia/South Pacific, Europe, North America | 1 |
| India, China, Mexico | 3 | China, Norway | 1 |
| Australia, Europe | 3 | Argentina, Brazil, Chile, Mexico | 1 |
| USA, Japan | 3 | Twelve countries – Russia, USA etc. | 1 |
| USA, Canada, Germany, Japan | 2 | Eastern and Western Companies | 1 |
| USA, Mexico | 2 | Nordic countries and East Asia | 1 |
| Japan, UK | 2 | Japan, Korea | 1 |
| USA, Spain, Europe | 1 | USA, UK, Japan | 1 |
| USA, Spain | 1 | USA, Taiwan | 1 |
| USA, Costa Rica | 1 | USA, Luxembourg | 1 |
| USA, India, China, Mexico | 2 | USA, Mexico, Australia | 1 |
| USA, Germany, Denmark, Canada | 1 | USA, Japan, Korea, EU, Mexico | 1 |
| USA, India, China, Mexico, Taiwan | 1 | Australia, Japan | 1 |
| An international survey of 45 major corporations | 1 | Australia, Singapore | 1 |
| USA, Germany, Japan | 1 | Australia, New Zealand, UK | 1 |
| USA, Germany, UK | 1 | Australia, UK | 1 |
| USA, UK, Canada | 1 | Brazil, UK | 1 |
| USA, Korea, New Zealand | 1 | Denmark, East Germany, West Germany, Finland, France, UK, Ireland, Italy, Netherlands, Norway, Sweden, Switzerland, Spain, Turkey | 1 |
| USA, Canada, Western Europe, Japan, the Pacific Basin, Mexico, Latin America, Southeast Asia, Eastern Europe | 1 | East (Japan, Korea and Taiwan) and West (Denmark, Finland, Sweden and Australia) | 1 |

Table 2. Research on comparative study in quality practices implementation between countries from the year 2000 to 2007 (Zakuan and Yusof, 2007)

| Year | Author | Focus area | Sector | Countries |
|------|--------|-----------|--------|-----------|
| 2000 | Aziz *et al.* | Quality practices | Manufacturing | UK, Malaysia |
| 2002 | Ahmad and Schroeder | TQM | Automotive | US, Germany, Italy, Japan |
| 2003 | Noronha | TQM | Manufacturing | China, Hong Kong, Taiwan |
| 2003 | Khoo and Tan . | TQM | Manufacturing | US, Japan |
| 2005 | Jabnoun | TQM | Manufacturing | Saudi Arabia, Australia, Canada |
| 2005 | Rothenberg *et al.* | Benchmarking | Automotive | US, Japan, Europe |
| 2006 | Schniederjans *et al.* | MBNQA | Manufacturing | India, Mexico, US |
| 2006 | Iwaarden *et al.* | Quality practices | Automotive | European |
| 2006 | Yoo *et. al.* | Quality practices | Manufacturing | Korea, USA, Mexico, Taiwan |
| 2006 | Parast *et al.* | Quality practices | Manufacturing | USA, Mexico |
| 2006 | Hermann *et al.* | Quality tools | Automotive | Germany, France, England, Italy |
| 2006 | Feng *et al.* | TQM | Manufacturing | Australia, Singapore |
| 2007 | Tari *et al.* | TQM | Manufacturing | Spain, US, Korea |

Table 3. Constructs proposed by literature

| Constructs | Related constructs |
|-----------|-------------------|
| Quality leadership (QL) | The role of top management leadership (Saraph *et al*., 1989), top management support (Flynn *et al.,* 1994), top management commitment (Ahire *et al.,* 1996), management leadership (Yusof and Aspinwall, 2000), leadership (Sila, 2007) |
| Customer focus and satisfaction (CFS) | The role of quality department (Saraph *et al*., 1989), customer involvement (Flynn *et al.,* 1994), customer focus (Ahire *et al.,* 1996), customer orientation (Rao *et al.,* 1999) |
| Quality information and analysis (QIA) | Quality data and reporting (Saraph *et al.,* 1989), quality information (Flynn *et al.,* 1994), quality information and availability (Ahire *et al.,* 1996), information and analysis (Sila, 2007). |
| Human resource development (HRD) | Workforce management (Flynn *et al.,* 1994), employee training (Ahire *et al*., 1996), support for human resource development (Sila, 2007), human resource management (Parast *et al.,* 2006). |
| Strategic planning management (SPM) | Process design management (Saraph *et al.,* 1989), process management (Flynn *et al.,* 1994), design quality management (Ahire *et al.,* 1996), strategic planning process of quality management (Parast *et al.,* 2006). |
| Supplier quality management (SQM) | Supplier involvement (Flynn *et al*., 1994), supplier quality management (Ahire *et al.,* 1996), supplier quality (Rao *et al.,* 1999, Parast *et al.,* 2006), supplier quality assurance (Yusof and Aspinwall, 2000), supplier management (Sila, 2007). |
| Quality results (QR) | Product quality (Ahire *et al.,* 1996), internal quality results (Rao *et al.,* 1999), quality results (Parast *et al.,* 2006), organizational effectiveness (Sila, 2007). |
| Quality assurance (QA) | Supplier quality assurance (Yusof and Aspinwall, 2000), quality assurance of products and service (Rao *et al.,* 1999). |

Table 4. Comparison of quality management constructs across different studies

| No. | Saraph et al., 1989 | Flynn et al., 1994 | Ahire et al., 1996 | Rao et al., 1999 | Yusof and Aspinwall, 2000 | Parast et al., 2006 | Sila, 2007 | Proposed constructs |
|---|---|---|---|---|---|---|---|---|
| 1 | The role of top management leadership | Top management support | Top management commitment | Top management commitment Quality citizenship | Management leadership | Quality leadership | Leadership | Quality leadership |
| 2 | The role of the quality department | Customer involvement | Customer focus | Customer orientation | - | Customer focus and satisfaction | Customer focus | Customer focus and satisfaction |
| 3 | Quality data and reporting | Quality information | Internal quality information usage Benchmarking | Quality information availability | Measurement and feedback | Quality information and analysis | Information and analysis | Quality information and analysis |
| 4 | Training | Workforce management | Employee training | Employee training | Education and training Human resource development | Support for human resource development | Human resource management | Human resource development |
| 5 | Employee relations | - | Employee empowerment Employee involvement | Employee involvement | Resources | - | - | - |
| 6 | Product/service design Process management | Product design Process management | Design quality management Statistical process control usage | Product/process design | System and process Improvement tools and techniques | Strategic planning process of quality management | Process management | Strategic planning management |
| 7 | Supplier quality management | Supplier involvement | Supplier quality management | Supplier quality | Supplier quality assurance | Supplier quality | Supplier management | Supplier quality management |
| 8 | - | - | Product quality | Internal quality results | - | Quality results | Organizational effectiveness | Quality results |
| 9 | - | - | - | - | - | Quality assurance of products and services | - | Quality assurance |
| 10 | - | - | Supplier performance | External quality results | Continuous improvement process | - | Financial and market results | - |

Table 5. Summary of final dataset

| | Malaysia (cases) | Thailand (cases) | Remark |
|---|---|---|---|
| Received | 161 | 150 | |
| Data entry error | 5 | 1 | Edit and accept |
| Less than 5% missing | 10 | 0 | Fill in with mean and accept |
| More than 5% missing | 4 | 0 | Drop |
| Total | 157 | 150 | |

Table 6. Results of internal consistency analysis for QRA items

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|---|
| QR5 | 37.86 | 19.513 | .536 | .326 | .842 |
| QR3 | 38.01 | 19.752 | .517 | .356 | .844 |
| QR4 | 37.95 | 19.867 | .493 | .350 | .846 |
| QR1 | 37.56 | 19.391 | .681 | .503 | .832 |
| QR2 | 37.79 | 18.499 | .615 | .450 | .835 |
| QA7 | 37.95 | 20.161 | .465 | .240 | .848 |
| QA4 | 37.89 | 19.422 | .546 | .367 | .842 |
| QA3 | 38.04 | 19.100 | .611 | .399 | .836 |
| QA1 | 37.50 | 19.806 | .579 | .366 | .839 |
| QA2 | 37.77 | 19.259 | .558 | .404 | .841 |
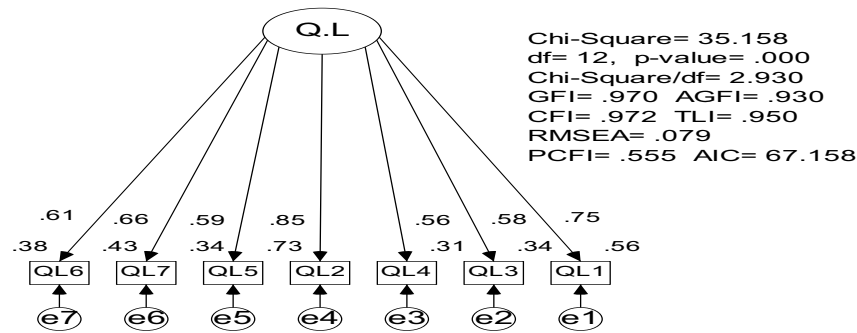
Figure 1. QL- Statistic results and factor loading
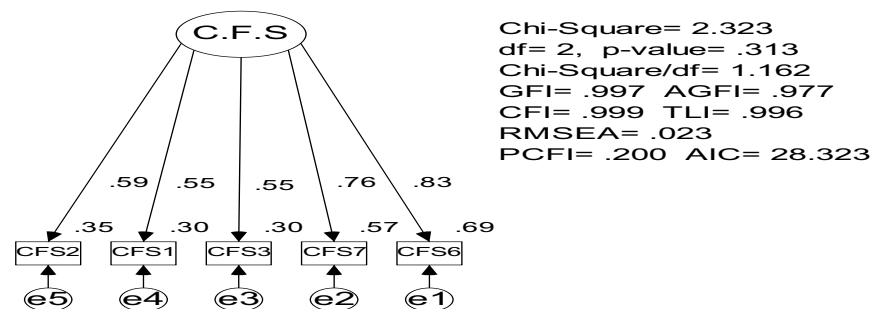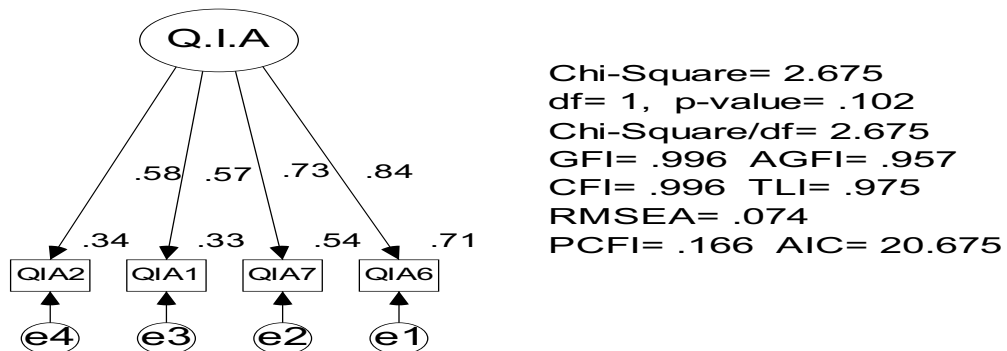


Figure 2. CFS- Statistic results and factor loading



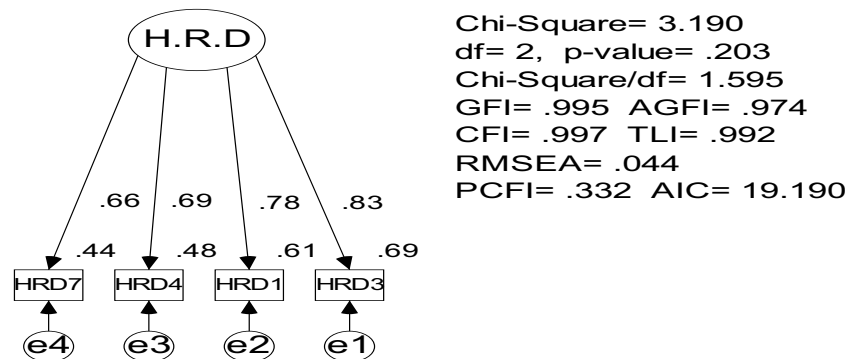Figure 3. QIA- Statistic results and factor loading



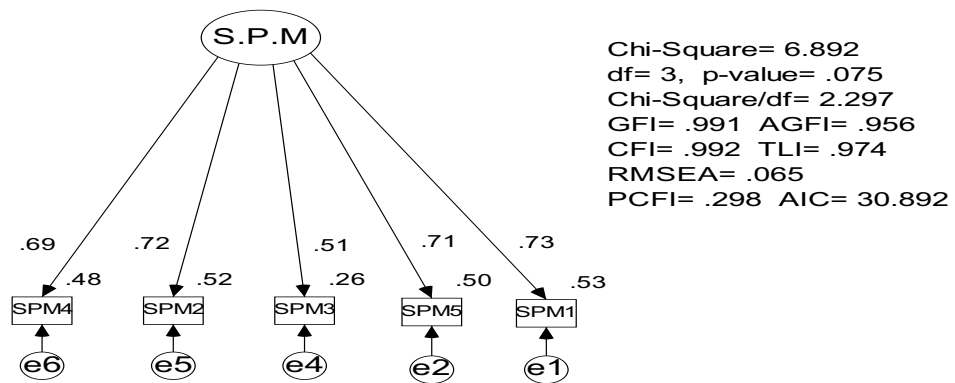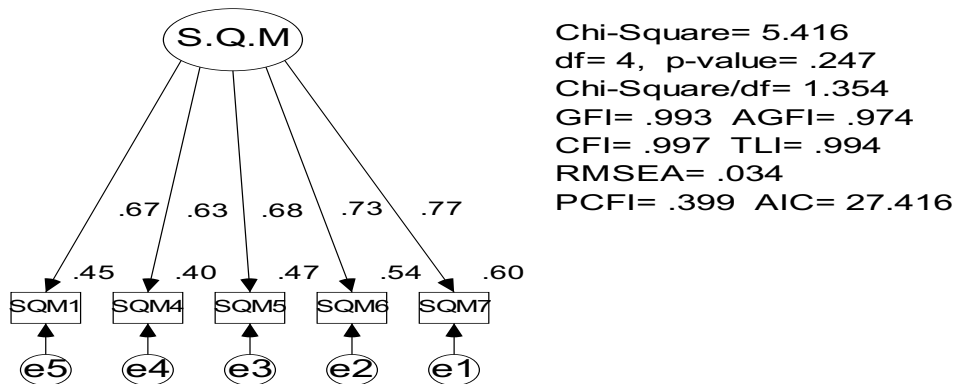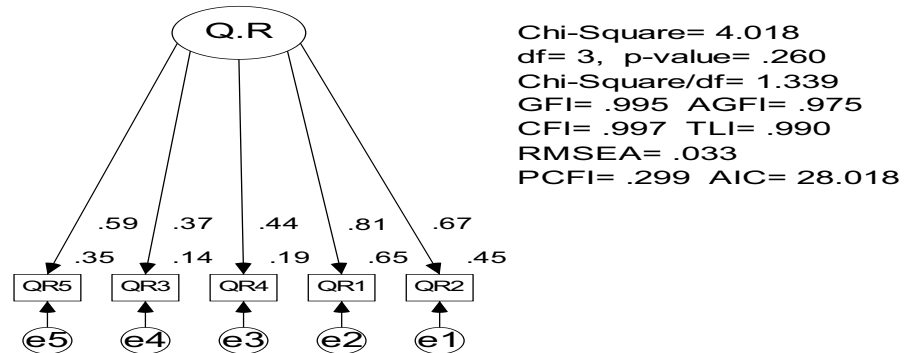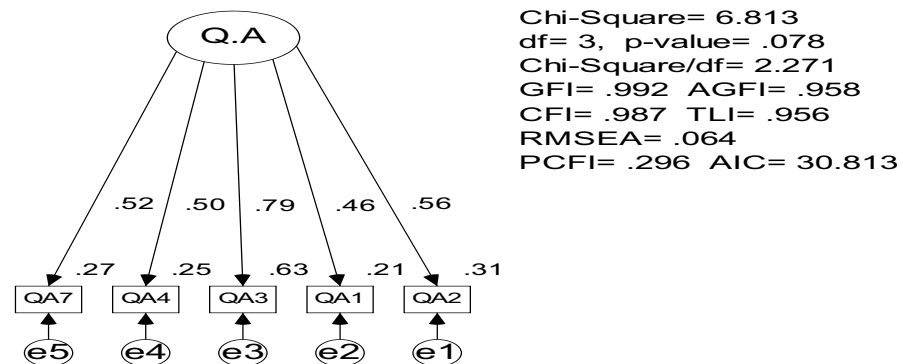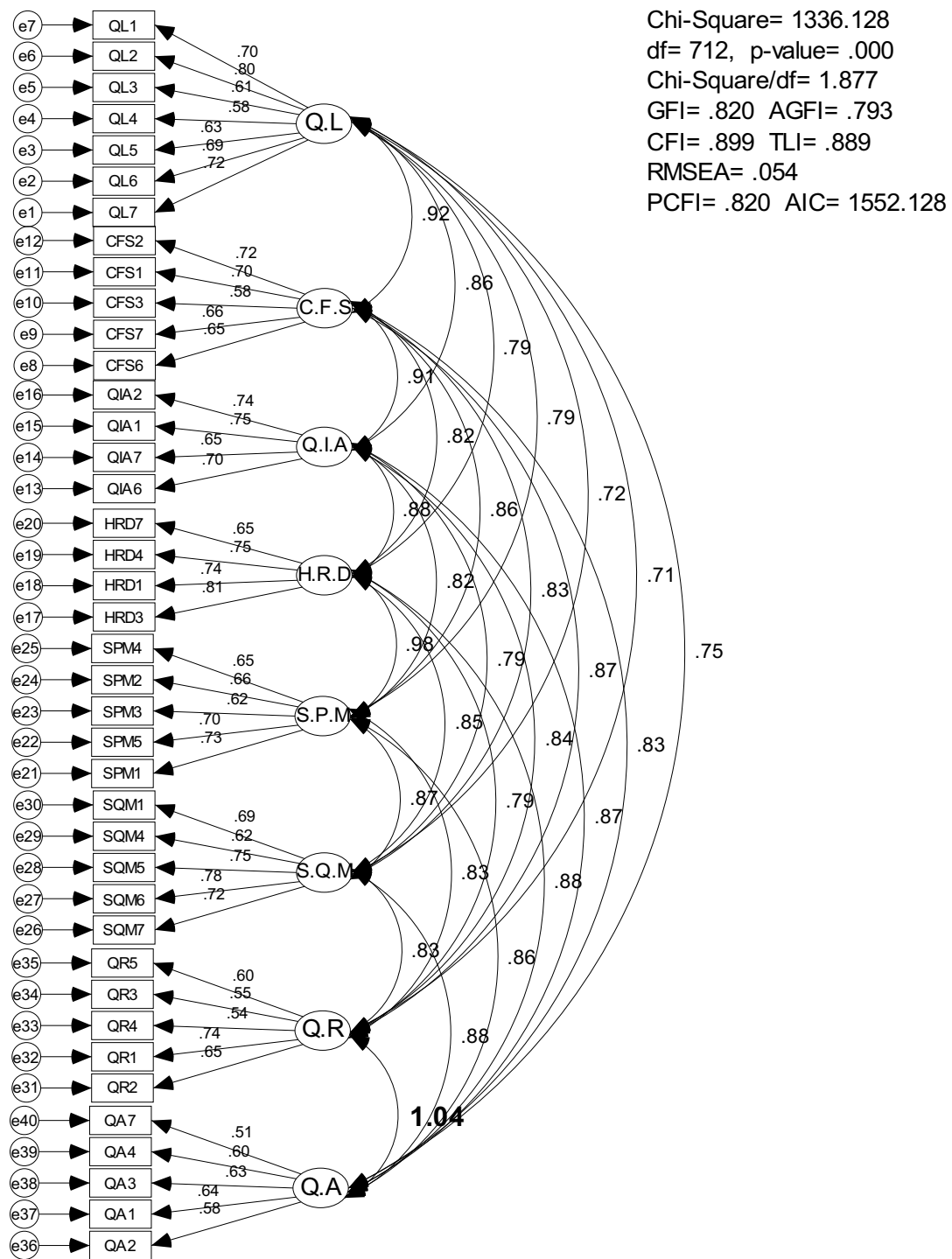Figure 4. HRD- Statistic results and factor loading

Chi-Square= 6.892
df= 3,  p-value= .075
Chi-Square/df= 2.297
GFI= .991  AGFI= .956
CFI= .992  TLI= .974
RMSEA= .065
PCFI= .298  AIC= 30.892

Figure 5. SPM- Statistic results and factor loading



Chi-Square= 5.416
df= 4,  p-value= .247
Chi-Square/df= 1.354
GFI= .993  AGFI= .974
CFI= .997  TLI= .994
RMSEA= .034
PCFI= .399  AIC= 27.416

Figure 6. SQM- Statistic results and factor loading



Chi-Square= 4.018
df= 3,  p-value= .260
Chi-Square/df= 1.339
GFI= .995  AGFI= .975
CFI= .997  TLI= .990
RMSEA= .033
PCFI= .299  AIC= 28.018

Figure 7. QR- Statistic results and factor loading



Chi-Square= 6.813
df= 3,  p-value= .078
Chi-Square/df= 2.271
GFI= .992  AGFI= .958
CFI= .987  TLI= .956
RMSEA= .064
PCFI= .296  AIC= 30.813

Figure 8. QA- Statistic results and factor loading

Figure 9. The output path diagram for eight factors TQM model
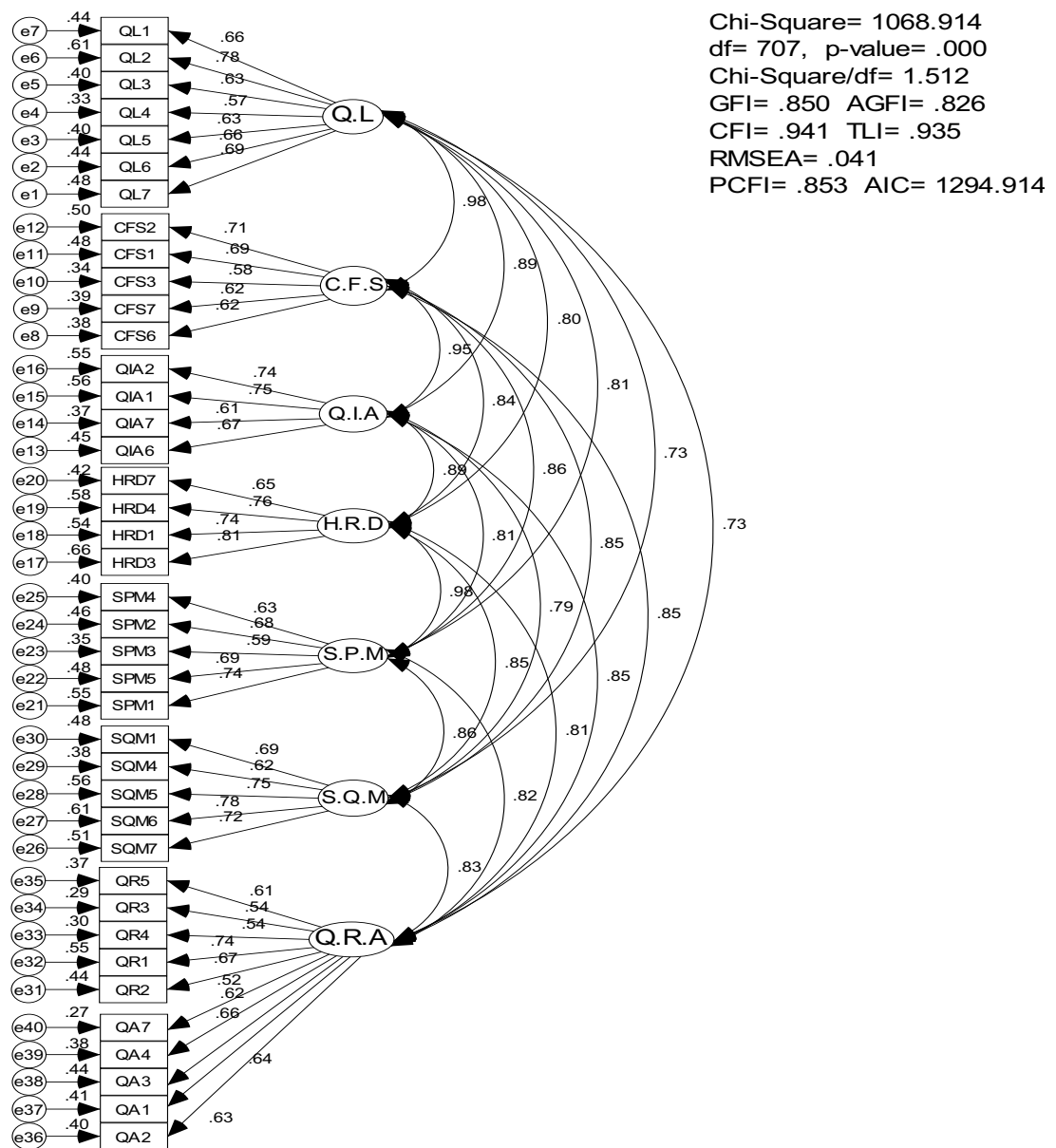
Figure 10. Modified TQM model: The output path diagram with seven factors

# Research on Technological Innovation Capability Evaluation

# of Guangxi Pharmaceutical Industry

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**Abstract**

According to the information of inputs and outputs of technology innovation, this paper analyzed the current situation of technology innovation in Guangxi pharmaceutical industry and then gave an evaluation index system of technology innovation capability. Based on the theory of analytical hierarchy process (AHP), this paper discussed the technology innovation capability by using basic data of Guangxi Pharmaceutical industry. The results showed that it would be improved in the ability to commercialize innovations.

**Keywords:** Guangxi pharmaceutical industry, Technology innovation capability, Evaluation index system

## 1. Introduction

With the development of economic and improvement of living standard, more and more people are starting to focus on health care and the traditional Chinese medicine have received more and more close attention from international area. In recent years, the natural medicine accounted for about 30% market share in the international Medicinal Plant market and the demand of plant medicine is increasing by the average annual growth rate of 10% in market.

Guangxi is very rich in resources of Chinese medicine and has unique advantages in developing Chinese medicine industry. Guangxi has the most medicinal plant species in China. Guangxi Botanical Garden of Medicinal Plants which has been named the "Asia's first drug Park", has most varieties of medicinal plants and is the largest of professional Medicinal Botanical Garden in the Asia Pacific. In 2008, the Guangxi Botanical Garden of Medicinal Plants, which was confirmed as national engineering laboratory by the State Development and Reform Commission. In Guangxi, not only the kinds of medicinal plant species are rich, but also the scale of artificial cultivation of medicinal herbs is large. And now Guangxi Botanical Garden of Medicinal Plants has 28000 various planting of medicinal drugs farm, has formed 12 large-scale plant bases and is one of the four largest herbs bases in China. The area of planted medicinal herbs accounted for one-fifth of the total cultivated area in China. Last year, Guangxi had more than 150 Chinese medicine production enterprises, planted 50,000 hectares of Chinese medicine and had 320000 tons output of Chinese medicine annual. The Chinese medicine industry output reached 6.7 billion, accounting for 70% of the total output value of the pharmaceutical industry. Chinese medicine industry played a dominant role in the Guangxi pharmaceutical industry.

Therefore, it should be taken into consideration how to turn advantages of traditional Chinese medicine resources in Guangxi into industrial advantages, and how to promote the Guangxi medicine industry sustainable development with technology innovation. Innovation is the driving force to promote industrial development and also is one of important factor for industry to get a competitive advantage (Albayrakoglu, 1996). The role of innovation in high-tech pharmaceutical industry is more obviously. Based on the historical data of Guangxi pharmacy, the paper attempted to study on the technological innovation capability of Guangxi pharmacy by using the theory of analytical hierarchy process (AHP). And then the paper analyzed the influencing factors of the technology innovation in Guangxi pharmaceutical industry and tried to find the bottleneck of pharmaceutical industry development. It is significant for Guangxi medicine industry to be sustainable development.

## 2. Analyzing on Technological Innovation Capability

*2.1 Technological innovation input ability*

(1) Technological innovation fund input

In recent years, the total funding for science and technology activities in Guangxi pharmaceutical industry showed a higher growth trend. The fund of technology innovation increased from 6.17 million Yuan in 1995 to 137.9 million Yuan in 2007 (showed by table 1) and an average annual growth reached 177.92%. It showed that Guangxi pharmaceutical industry had entered the stage of rapid development. However, the fund of scientific and technological activities accounted for the proportion of sales revenue showed a downward trend in recent years. In 2007, a total of 137.9 million Yuan funding for science and technology activities was sales income's 1.71%, lower than the national average. This meant that innovative consciousness would not go hand in hand with innovation input.

(2) Technological innovation personnel

The total number of employed person in Guangxi pharmaceutical industry was increasing year by year and the number of S&T (science and technology) activities personnel showed the changing trend, showed by table1. In 2007, Guangxi pharmaceutical industry in S&T activities personnel account for the proportion of employees was 3.32%, lower than the national average which was 5.34%. But the scientists and engineers in scientific and technical personnel accounted for the proportion was 74.04%, higher than the national average which was 67.79%. This meant the scientific and technological talents of Guangxi pharmaceutical industry did not form a stable team. We need to create an environment and atmosphere to ensure the development of human resources.

<Insert Table 1 here>

*2.2 Technological innovation output ability*

(1) New products sales revenue

Fig.1.visually described sales revenue of Guangxi pharmaceutical industry. Sales revenue of Guangxi pharmaceutical industry was increasing year after year, from 8.079 billion Yuan in 1995 to 1.904 billion Yuan in 2007; but the new product sales revenue increased slowly in recent years. The ratio of new product sales revenue in the pharmaceutical industry's total sales income fluctuated from 5.15% in 1995 up to 15.36% in 2004, and then down to 9% in next two years. It reflected that the rapid development of the industry mainly depended on traditional products and that innovation output had not brought significant benefits.

<Insert Figure 1 here>

(2) Patent condition

Fig.2 described patent applications received of Guangxi pharmaceutical industry. The number of patent applications of Guangxi pharmaceutical industry presented ever-changing phenomenon. In 2005, the number of patent applications increased to 85 units and decline in subsequent years. The last five years, the average number of patent applications was 54.8 units. However, the quality of patents was improving; the number of invention patents was increasing year by year. Particularly, the proportion of owned inventive patent applications accounted for the total number of patent applications received had significant increased, from 25% in 2003 to 90% in 2007. It showed that Guangxi pharmaceutical industry has gradually strengthened the emphasis on the patent. And this meant that technological innovation has accumulated some capacity, but it should further enhance ability of patented product's commercialization.

<Insert Figure 2 here>

## 3. Building Evaluation Index System of Technology Innovation Capability

Based on the previous study, an evaluation index system of technology innovation capability was constructed. The index system integrated with the advantages of traditional Chinese medicine resources and the characteristics of technological innovation in the pharmaceutical industry. According to the information of inputs, outputs of technology innovation, marketing capability and technology innovation resource base, the index system of technological innovation capability of Guangxi pharmaceutical industry was investigated from four aspects. It included 4 targets at first level, 9 indexes at second level, and 28 indexes at third level. The evaluation index system included A11 Government Funds; A12 Loans from Financial Institutions; A13 Funds Raised by Enterprises; A21 Number of S&T Institutions; A22 Number of S&T Institutions; A23 Projects of New Products; A24 Intramural Expenditure for S&T Activities in the S&T Institutions; B11 Personnel for S&T Activities; B12 Scientists and Engineers in S&T Personnel; B13 Full-time Equivalent of R&D Personnel; B14 Labor Expenses in the Intramural Expenditure for S&T Activities; B21 Intramural Expenditure for R&D; B22 Expenditure on Purchase of Domestic Technology; B23 Expenditure for Developing New Products; B24 Expenditure on Technical Renovation; B25 Expenditure on Technology Import; B26 Expenditure on Technology Absorption; B31 Original Value of Micro-electronic Equipments; B32 Original Value of Fixed Assets; C11 Patent Applications Received; C12 Owning Inventive Patent; C21 Innovation Output Ability; C22 fund Input efficiency of New Products; C23 Personnel Input Efficiency of New Products; D11 Industrial Output Value of New Products; D12 Sales Revenue from New Products;D21 Original Value of Fixed Assets; D22 Export.

## 4. Survey Data, Evaluation Methodology and Analysis

*4.1 Survey data*

Based on the above-mentioned evaluation index system, we got the basic data of Guangxi pharmaceutical industry and the national pharmaceutical industry (the data came from China Statistics Yearbook on High Technology Industry (2008), in order to evaluation and determine it with the theory of analytical hierarchy process (AHP).

*4.2 Analytical hierarchy process (AHP)*

The AHP approach, initially developed to study complex, multi-attribute problems, is a multi-objective decision methodology combining both quantitative calculation and qualitative analysis (Saaty,1980). It has been widely used to justify the acquisition of strategic technologies, in the evaluation of strategic projects, to characterize the environmental quality of housing and so on (Sarkis & Sundarraj, 2002). It could effectively analyze the targets for system-level relationship between the non-sequential; it is systematic, simplicity and practicality (Zhangbao WANG & Lei LI, 2007).

(1) Index system

This evaluation system was set up according to metric demands of technological innovation capability of Guangxi pharmaceutical industry, including the one total target (technological innovation capability of Guangxi pharmaceutical industry), rule (4 indexes at first level), sub- rule (9 indexes at second level), and indexes (28 indexes at third level) .

(2) Judgment matrix

First, some scholars, experts and governors in Chinese pharmaceutical industry were invited to compare and determine relative importance of factors at same level. Second, judgment matrix was be built, $C = (C_{ij})n * n$ ,($C_{ij}$ means the factors $i$ and factors $j$ relative to the important value of target)

(3) Consistency check

Coherence check Conduct a consistency validation of the judgment matrix forms. $CR = CI/RI$ , $CI = (\lambda_{max} - n)/(n - 1)$ (n means the order of the matrix, RI is stand for the mean random consistency index). If $CR = CI/RI < 0.10$ , it means that the comparison matrix has satisfactory consistency; otherwise, it need to adjust the comparison matrix in order to obtain a satisfactory consistency.

<Insert Table 2 here>

(4) Calculate

Calculate the relative importance of each factor and weight the overall ratings of every layer

(5) Obtain final results

Give a score to each factor based on the score index system and local situations to obtain final results.

*4.3 Data processing*

Firstly, this paper discussed the technology innovation capability by using basic data of Guangxi Pharmaceutical industry from China Statistics Yearbook on High Technology Industry (2008). Secondly, with the software yaahp5.0, it combined with quantitative calculation and qualitative analysis on the technological innovation capability of Guangxi pharmaceutical industry. Thirdly, according to above-mentioned method, author established layer weight matrix using the theory of AHP. The rule layer weight matrix was $U = (0.19, 0.33, 033, 0.15)$ .The Index layer weight matrix was $A = (0.35, 0.65)$ , $B = (0.45, 0.30, 0.25)$ , $C = (0.40, 060)$ , $D = (0.77, 0.23)$ $A_1 = (0.34, 0.20, 0.47)$ , $A_2 = (0.20, 0.18, 0.34, 0.28)$ , $B_1 = (0.20, 0.26, 0.26, 0.18)$ , $B_2 = (0.21, 0.11, 0.25, 0.12, 0.14, 0.17)$ , $B_3 = (0.40, 0.60)$ , $C_1 = (0.40, 0.60)$ , $C_2 = (0.40, 0.31, 0.29)$ , $D_1 = (0.69, 0.31)$ , $D_2 = (0.65, 0.35)$ .

Based on the above weight matrix and the basis data of Guangxi pharmaceutical industry, we marked each evaluation index and then calculated the value of comprehensive evaluation of Guangxi pharmaceutical industry: w=89.4.The Scores was based on the evaluation standard that technological innovation capability of national pharmaceutical industry was 100 points. It was observed that the technological innovation capability evaluation of Guangxi pharmaceutical industry has already had a foundation. However, there were still some problems when we analyzed every index value. That basically reflects the following respects:

(1) Innovation resources foundation

All indicators were underdeveloped except the indicator of funds Raised by Enterprises and Intramural Expenditure for S&T Activities slightly higher than the national average. It meant that the development fund of Guangxi pharmaceutical industry was low and development funds from the government was limited. The Science and Technology fund was far less than other developed provinces in China. Innovation organizational competence needs to be improved.

(2) Technological innovation input ability

Guangxi pharmaceutical industry attaches great importance to the cultivation of high-level talents. The number of

Personnel for S&T Activities was higher than the national average; the number of personnel for S&T was weaker compare to the national level 62.3%, which still need to adjust the personnel structure. It also needs to invest more on technological digestion, absorption and transformation. Overall, Guangxi pharmaceutical industry is still in the developing phase and independent innovation is still in its infancy. The production technical level was low, the technical structure remained irrational, and the technological innovation capacity and the reserve strength for technological progress were weak.

(3) Technological innovation output ability

Guangxi pharmaceutical industry gradually strengthened emphasizing on intangible assets, especially the number of applications for invention patents, but it was still below the national average. Sales revenue from new products accounted for the low proportion of revenue and innovation output capacity was still weak.

In a word, Guangxi pharmaceutical industry had a certain degree of development and the certain foundation, especially has already reached the national average level in the personnel, funding, equipment, etc. But, compared to the advanced provinces, it was still in the developing phase. The pharmaceutical industry need to be further improved the ability to commercialize innovations.

## 5. Conclusion

This paper built an evaluation system of technological innovation capability based on the theory of analytical hierarchy process (AHP). After that, author analyzed the technological innovation capability of Guangxi pharmaceutical industry, according to the information of inputs and outputs of technology innovation. The results showed that Guangxi pharmaceutical industry has made quick development in recent years but would pay more attention on improving ability to commercialize innovations.

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Table1. 1995-2007 science and technology activities of Guangxi pharmaceutical industry

| year | 1995 | 2000 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|
| Expenditure for S&T Activities (10000Yuan) | 617 | 4005 | 10462 | 10584 | 13119 | 12498 | 13790 |
| Annual Average Number of Employed Personnel (person) | 28183 | 23885 | 30943 | 29251 | 33260 | 31739 | 31284 |
| Personnel for S&T Activities (person) | 286 | 633 | 866 | 975 | 1306 | 989 | 1040 |
| Scientists and Engineers in S&T Personnel (person) | 177 | 451 | 689 | 656 | 946 | 902 | 770 |

Table 2. 1-9 the mean random consistency index

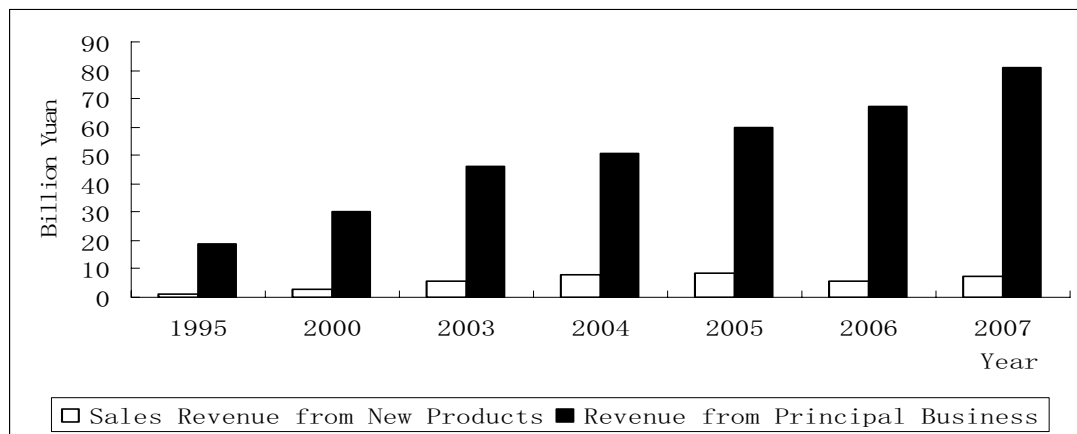| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.58 | 0.90 | 1.42 | 1.24 | 1.32 | 1.41 | 1.45 |

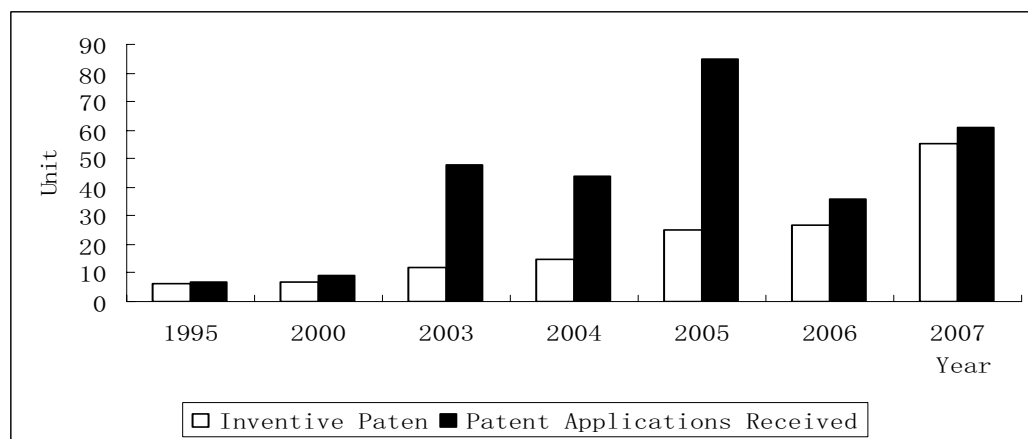Fig 1. Sales revenue of Guangxi pharmaceutical industry



Fig 2. Patent applications received of Guangxi pharmaceutical industry

# The Study on Influencing Factors of Team Brainstorming

# Effectiveness

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**Abstract**

Brainstorming is a creative and innovative tool. As a team problem-solving tool, team brainstorming can help the team conceive a lot of creative ideas and methods. Through a review of relevant literatures, this paper summarizes the three main factors of team brainstorming effectiveness: the heterogeneity of team composition, processing mode of team social information and interactive mode of team members. In addition, a conceptual model is built to show the interaction among the three.

**Keywords:** Team Brainstorming, Efficiency, Influencing Factors

Brainstorming is a creative and innovative tool. As a team problem-solving tool, it is perhaps the most popular and commonly used. Brainstorming is an approach to consciously leave team members unfettered to identify opportunities and challenges, choose a variety of issues and solve problems, as well as a way to generate ideas. This approach advocates producing derivative ideas and inconsistent thoughts. Successful team brainstorming can conceive more creative visions. The successful implementation of team brainstorming must possess the necessary conditions, and this paper will try to discuss some influencing factors of team brainstorming effectiveness.

## 1. The Basic Meaning of Team Brainstorming

The team brainstorming involves each participant generating new ideas in front of other people, which is aimed to promote a new combination of divergent ideas. Priority is given to the quantity and imagination of the vision.

Brainstorming (Osborn, 1957), a technique to produce visions, is extensively applied in the context of the team. Osborne's main concern is how to improve the team's creativity. Osborne (Osborn, 1957, 1963) provides a theoretical basis for the results of team brainstorming.

## 2. Influencing Factors of Team Brainstorming

### 2.1 The heterogeneity of team composition

Osborne (Osborn, 1957, 1963) and other scholars proposed a number of prerequisites for the successful high-yield of team brainstorming (Grossman, Rodgers &Moore, 1989; Rawlinson, 1981). One particular consideration is that the team composition should have a heterogeneous structure. The different perspectives and different knowledge backgrounds with which team members to look at problems will offer more space and potential for the generation and impact of creative ideas. Thinking combinations of brainstorming compatible with intelligence will produce a very effective thinking resonance (Osborn, 1963). Careful choice of team brainstorming participants and attracting the participation of members from different backgrounds will maximize cognitive incentives, allowing the team to generate more ideas (Milliken, Bartel & Kurtzberg, 2003). In addition, the new vision provided by a team member may cause other members to generate new ideas and recommend the idea one would not think of if it is not in this way (Diehl, 1991; Stroebe & Diehl, 1994). Team diversity is the most essential conditions for maximizing cognitive incentives. (Diehl, 1991; Stroebe & Diehl, 1994).

The heterogeneity degree of team can be quantified by Blau heterogeneity index $H = 1 - \sum P_i^2$ (Blau, 1972) or

$$H = -\sum_{i=1}^{s} P_i \times (\ln P_i)$$

Teachman diversity index                                                          (Teachman, 1980).

## 2.2 The processing model of team social information

Osborne (Osborn, 1957, 1963) believes that one of the reasons why the team has a higher creativity lies in the fact that there are a lot of stimulating factors in interactive teams. In other words, the cognitive advantage of team brainstorming is as follows: it is believed that the visions generated from teams can not be available if people think independently (Collins & Loftus, 1975). This is why the processing model of team social information has this kind of advantage.

Our knowledge is stored in the semantic network model. A group of conceptually related information is easier to remember than the conceptually unrelated information, and the relevant information tends to be recalled in groups, even if they appeared in groups in the past (integration, Bousfield, 1953; Mandler, 1967). Under normal circumstances, when people have to recall information, an initial offer of some classification labels can be helpful in recalling (the hints of information types, Tulving & Pearstone, 1966). In addition, if there is a conceptual relationship between the former word and latter word, it will help make the second word put forward (semantics should be provided in advance, Meyer, 1971; Neely, 1991). Clearly, the relevant information raised from a person's long-time semantic network model is an important step in the process of team brainstorming: one can not carry out effective brainstorming about the topics that they know nothing of.

According to associative memory model theory, the individual brainstorming of team members is linked into an interactive team through the process of paying attention. In the possible structure of the model, attention represents the fundamental probability of the fact that individual team members will regard the current thinking of others as their own next vision, which is to allow the existence of disparity when an individual is dealing with peers' opinions. Among the cognitive network characteristics, the availability of information is a decisive factor which is crucial to team brainstorming. Meanwhile, Coskun, Paulus, Brown and Sherwood (2000) pointed out: the outside beforehand provision can also promote the performance of interactive brainstorming team. Coskun et al. have also further demonstrated that what is also essential is the information presented in advance by the outside. The effectiveness provided continuously in advance is based on reducing the cognitive load caused by tracking the past idea. External messages offered in advance may liberate brainstorming participants, thus making them utilize cognitive resources specially in the development process of an interactive idea.

According to the SIAM (Search for Ideas in Associative Memory) theory, brainstorming is the repeated search for visions in the associative memory. It consists of two processes: phase of information activation, and phase of idea generation. Brainstorming process can be considered as a process of producing a series of thought chains. The thought chains are used to provide information, which is related to a certain question, in the specific semantic field. Prior to the each generation of a series of ideas, some thinking are required to activate information in another semantic field.

According to the SIAM theory, it is assumed that other people's ideas, an external motivation, will stimulate the production of new ideas, and it can reduce the information search hints and the time needed by information search memory. Therefore, it is assumed that the process of information sharing can strongly influence the thought process of team members. According to the incentive-envisaged semantic content, two positive effects are likely to appear, that's to say that different incentives may increase the width of the ideas generated, while a similar incentive will increase the depth of the ideas generated (Paulus & Brown, 2003). On the other hand, incentive ideas would interfere with thinking chains (cognitive interference). This may lead to the shrinkage of thinking chains and the loss of potential vision, increase the number of semantic conversion, and reduce the depth of the ideas generated. According to the SIAM theory, incentive ideas will increase the availability of semantic information, while reducing the time needed for information search memory. In the meantime, envisaged sharing is a more dynamic process. Envisaged sharing may lead people to gradually tend to produce cognitive consistency (Ziegler, Diehl & Zijlstra, 2000), which probability is very high in the relatively homogeneous team (Ziegler, etc., 2000; Larey & Paulus, 1999). When the team members have a diversity characteristic, the probability of cognitive consistency will be smaller, because the heterogeneous team deals with more semantic categories than the homogeneous team (Diehl, 1991; Stroebe & Diehl, 1994).

Therefore, when conducting the team brainstorming, attention should be paid to the following modes of social information processing: (1) Pause intervals. Studies by Mitchell and Horn (Mitchell, 1998; Horn, 1993) have shown that brainstorming participants' possession of some strategic pause intervals in the process of brainstorming will enable them to generate more ideas. In a team brainstorming environment, the short interval allows the individual to transform his own ideas from the previous viewpoint or understanding to a new angle or category. To some extent, intervals can be seen as an efficient way to overcome the restriction of cognition to one category of information. (2) Combination of individual and team brainstorming. Studies reveal the brainstorming of "team - individual" order is the mechanism of giving full play to advantages (Leggett, Putman, Roland & Paulus, 1996). The awareness promotion reflected in team

brainstorming extends to the individual brainstorming process. During this period the individual will no longer be obstructed by group constraints and continue brainstorming. In particular, when the team is composed of those heterogeneous individuals with knowledge in various related fields, the impact of the order is particularly important. (3) Mind writing method. The study found that conducting written communication among the team can generate more ideas than just as many people do individual brainstorming (Brown & Paulus, 2000). The study also showed that for the team made up of heterogeneous members, interactive written communication is very effective; secondly, those individuals benefit the most that can make the best balance between the two objectives of "paying attention to the other's vision and adhering to their own inner thinking chains".

*2.3 The interactive mode of team members*

The low yield of interactive teams relative to non-interactive teams is called "process losses" (Shepperd, 1993; Steiner, 1972). Studies have indicated that a lot of factors can influence process losses, and those factors mainly include the evaluation of other team members (Camacho & Paulus, 1995), lack of motivation brought about by an individual weak sense of work responsibility (Diehl & Stroebe, 1987), and competition by an interactive team for speaking time (creating obstacles; Diehl & Stroebe, 1991).

Findings show that team members can not effectively use this waiting time during which the other members speak (Diehl & Stroebe, 1991). This is the main reason for the creativity loss of team brainstorming. The mechanism plays an important role in the constraint of cognitive ability. Team members will face the challenge of listening to others, controlling the discussion, and at the same time suggesting the vision, which are counted as overloading in terms of the cognitive system. This is due to cognitive interference. There may be a most appropriate pace of information sharing, thus not only offering to other members the high level of motivation and cognitive incentives, but also not hindering the cognitive abilities of other members.

Team brainstorming should have the "social promotion" on the activity level. High-yield members may promote the high-output of other members. This is a simple process of competition (Brown & Paulus, 1996; Paulus & Dzindolet, 1993). The team must also have the effect of strengthening the society, which can be reinforced by visions. Team members may encourage each other in teams of perceptions to stimulate the relevant ideas. Motivation and cognitive motivation will be affected by external factors of the team. Team motivation is subject to factors such as competition within the team or between teams, task structure, coordinators and team leader. Cognitive incentives can be influenced by the task structure, envisioned sharing models, concepts, as well as information categories from external coordinators.

The social comparison theory elaborates on the fact that information from others has a large impact on the motivation. Festinger (1954) suggested that the people themselves will always have a driving force to compare yourself and others in terms of viewpoints and capacity. He held that people always harbored a degree of uncertainty about our own pinions and abilities, and attempted to reduce this uncertainty by means of comparison. Studies suggest that, if emphasis is placed on responsibility and related performance, social sharing may lead to competition. If the appropriate feedback mechanisms can be established during the brainstorming, team members will make an upward comparison (Paulus, Larey, Putman, Leggett & Roland, 1996), or else they will make a downward comparison (Paulus & Dzindolet, 1993; Dugosh & Paulus2001). Hence, social comparison process can influence the brainstorming team in a variety of ways. For those teams adopting the upward comparison method, having a team culture with its emphasis on high standards or high performance is very important (Gammage, Carron & Estabrook, 2001). The other is the degree of trust within the team. If team members believe each other's motives, then they will make up for those deficiencies brought about by members who do not have high motivation (Williams & Karau, 1991).

Based on the aforementioned analysis, when teams are conducting brainstorming, the following points should be noted: (1) Concern assessment, lack of motivation and obstacle creation ought to be minimized in the process of group interaction (Pinsonneault, Barki, Gallupe & Hoppen, 1999 ). (2) The team should carry out an effective brainstorming training and employ coordinator or specially trained persons to bring the team into the continuing operation and high-motivation state (Osborn, 1957). (3) A feedback mechanism needs to be established. If a higher standard for comparison or a positive feedback is given to an individual or team brainstorming participants, the number of generated visions will be increased (Paulus & Dzindolet, 1993; Coskun, 2000). (4) A coordinator must be set up. A coordinator can ensure that the team avoids some unexpected difficulties (Grossman, etc., 1989; Sutton, Hargadon, 1996). (5) Task rules need to be drawn up. The rules of Osborne brainstorming (1957, 1963) help creative teams to work more effectively. At the same time, additional guidance can increase the effectiveness of the brainstorming process, or be conducive to the formation of an additional motivation for the participants. Putman (2001) found some basis supporting this valid hypothesis: those individuals or teams who receive additional guidelines may use fewer words to express their point of view. (6) The appropriate team leader ought to be appointed. Studies confirmed that the executive leadership is very effective for producing or generating of ideas, while the transformational leadership provides an incentive for individuals' persevering in those ideas and implementing it as much as possible. In fact, perhaps the most effective leader is one with combined traits of both above-mentioned leaders (Avolio & Bass, 1988).

## 3. Conclusions

Through the aforementioned analysis, it can be seen that as an effective tool to solve problems, the team brainstorming must meet certain requirements to really play its role.

First of all, team brainstorming participants should have a certain degree of heterogeneity, as this will be conducive to enhancing the performance of team brainstorming.

Secondly, the processing mode of team social information should be consistent with the laws of our knowledge memory, information search, as well as envisaged utilization, thereby making the social information of team fully utilized so as to improve the actual performance of team brainstorming.

Finally, an interactive mode of team members should be able to overcome obstacles arising from team interaction. Positive measures and actions should be taken to ensure that the team interaction is kept in a sound condition. Only in this way can the role of team brainstorming be maximized.

In short, all three above-mentioned factors should be equipped and left in an interacting state, which would maximize the effectiveness of team brainstorming. (For details, please refer to attached Fig. 1)

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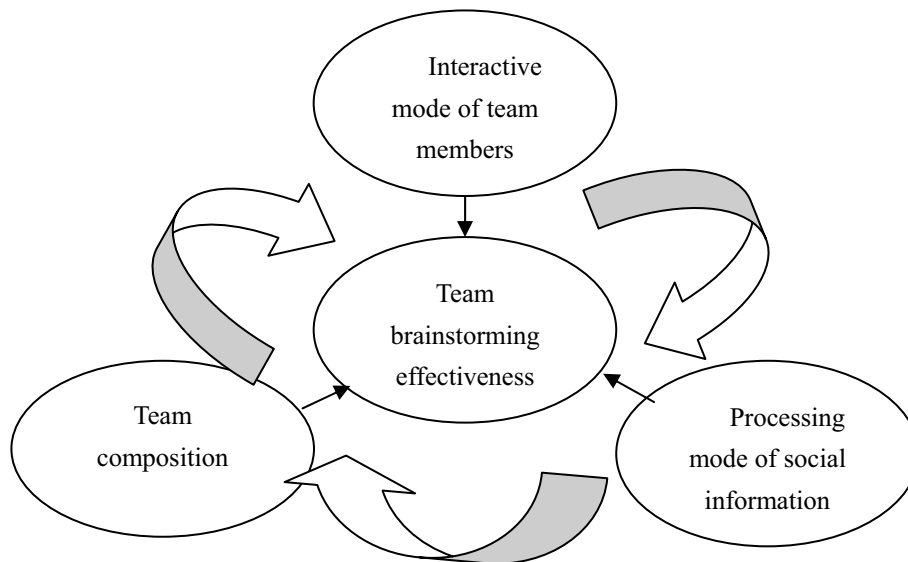
Fig 1. Influencing factors of team brainstorming effectiveness

# Internal Marketing- A Tool to Harness Employees' Power

# in Service Organizations in India

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## Abstract

Customer service is one of the most crucial aspects of an organization's competitive advantage and it is the critical element which internal marketing (IM) influences, whatever business or industry the organization operates. Internal marketing is based on the notion of communicating with internal markets and treating employees like customers. Implementing an internal marketing plan helps in educating, stimulating, guiding and leading workforce to higher levels of performance and gratification. The service employee often represents the organization in the eyes of the customer. Due to this, the role of employee is both complex and multi-dimensional. The internal customer concept is a promising area of study in the marketing and organizational behaviour literature. This study contributes to the understanding of what IM is and focuses on importance of employees in service encounters. Further, the paper focuses on rationale for adoption of this concept within services organizations in India.

**Keywords:** Internal marketing, Service encounters, Service industry, Internal customer

## 1. Introduction

Employees are the backbone of any business success and therefore, they need to be educated, motivated and maintained in organization at all cost to support the organization to be globally competitive. In service organizations, frontline employees are critical to the success of the organizations as they are in direct contact with external customers. Accordingly, these employees can have an elevated impact on the quality of products and services delivered by the firm and this influence should be fully leveraged by supervision (Hartline and Ferrell, 1996). The increasing recognition of the importance of the employees' role in the service industry has led service organizations to adopt Internal Marketing (IM) and hence, treat their employees as internal customers. The approach basically inverts the organizational pyramid and puts customers on top and divides the employees into two categories, viz., (i) those who serve customers and (ii) those who serve those serving the external customers. Hence, the front-line employees became internal customers to the back-office support service staff, supervisors and management. Internal marketing is emerging as a central theme of increasing importance in both academic and practitioner discourse. Snell (2009) indicated that internal marketing is practiced within professional services, albeit with varying degrees of sophistication, in order to execute wide ranging projects related to marketing and human resources. Internal marketing can refurbish the face of a company (George 1990), as has been reported by case studies and anecdotal accounts indicating clear gains in employee understanding of corporate values, employee commitment, service quality, customer satisfaction, and loyalty (Opoku et al, 2009; Sartain 2005; Ahmed and Rafiq 2002; Bergstrom, Blumenthal, and Crothers 2002; Hallam 2003).

The objective of internal marketing is to get motivated and customer conscious employees in order to achieve service excellence. Motivated employees are crucial to a company's success, this has never been truer than today, when margins are thin and economic recovery remains elusive. According to Fisk et al. (1993) there are two main issues in internal marketing. Firstly, the idea of the employee as the internal customer and secondly, the organizational need to satisfy the internal customer so that s/he is best prepared to serve the external customer. Although external marketing remains the most important business development task, it is essential to sell inwardly toward a company's people. When employees understand and commit to the value proposition of the company, external marketing becomes more effective, because the employees become product campaigners. The internal market of employees is best motivated for service-mindedness and customer oriented behavior by active, marketing approach, where a variety of activities are used internally in an active, marketing-like and coordinated way.

Internal marketing is a means of involving staff at all levels in effective marketing programmes by enabling them to understand their role within the marketing process. Internal marketing programmes consist of training and staff development, effective internal communications and integration schemes, de-signed to enhance knowledge and

understanding of the overall marketing orientation within the organization. Internal marketing encompasses a number of elements, all of which help contribute towards enhanced customer service and a greater degree of marketing orientation within the organization. Service orientation has become a key source of competitive advantage and only a 'service attitude' among staff can lead to the delivery of outstanding customer service and increased market share (Varey and Lewis 1999). The internal marketing concept has been developed largely within the context of services marketing; however, internal marketing is now becoming more and more important to all organizations striving for marketing success.

## 2. Research Methodology and Objectives

Service sector is the largest and fastest growing sector, globally contributing more to the global output and employing more people than any other sector. As the Indian economy is growing, there is significant development   happening in various service sectors viz. retailing, banking, BPO, ITES, health, education, hospitality etc. Despite the growth in the overall employee base, companies in service sectors are struggling to retain their existing employees. Analysts observed that managing attrition in the industry is one of the pertinent issues because high attrition rate not only affects the quality of service and also leads to higher training and development expenditure, affecting the overall performance of the organization. For any organization, employee behavior as a touch point with customers is exceptionally important and a negative experience will cost an organization more than just the opportunity of doing business with an individual.

The framework presented in this paper integrates and synthesizes conceptualizations of Internal marketing from the marketing, services and organizational behaviour literature to aid practitioners to understand the dimensions of HR challenges in services industry and examine how internal marketing will help HR practitioners to improve their HR skills and employee performance.

The specific objectives of this paper are:

1. To analyse HR challenges in service industry globally and specific issues to Indian service industry
2. To understand role of employee in service encounter
3. To review and provide a critique on the literature on internal marketing and its impact on organization
4. To provide rationale behind adopting internal marketing and identifying areas where IM can play a vital role

## 3. HR challenges in Service Industry

The phenomenal expansion of the Services Sector worldwide has led to services being considered as one of the most important sectors contributing to world gross domestic product. In developed countries, more people are employed in the services sector than in agriculture or industry, unlike the developing countries. Managing talent in service industry is the most critical HR challenge worldwide and will remain at or near the top of executive agendas in every region for the foreseeable future. The ability to gain competitive advantage through people strategies requires an overall HR approach.

According to Hillmer et al. (2004) fast changing work environments, combined with how service operations are managed, often lead to high stress which can result in increasing employee turnover. Besides this, service organizations are more labour intensive than manufacturing organizations therefore employees have become critical success factor in service companies (Normann, 2000). It is important that they are taken care of so that it can result in lower employee turnover, economic growth and satisfied customers. Czaplewski et al (2001) mentioned that while nearly every service company says its goal is to provide excellent service, evidence shows that the service quality of many organizations is below customer expectations. One of the basic reasons for service quality problems is the lack of commitment and skills of the frontline employees who are interacting with customers.

In last two decades with growing Indian economy, a significant development took place in various service sectors. Regardless of growth and opportunities in this sector it also faces several HR issues which are a key challenge for the industry in India. One of the main problems for service organizations has been attracting and retaining high quality employees (Heskett et al., 2008). An analysis of secondary sources (mainly articles from newspapers and business magazines and the very few available research papers on Indian service sector) reveal problems that can seriously impact the high growth rates predicted for this sector. These include issues such as increasing employee turnover, stressful work environment and poor career development (Singh, 2005, Grossman, 2006). In addition, finding and retaining talented people, training, and career planning are pertinent areas which need to be addressed. Service organizations interface with customers through various touch points and these touch points are not secluded but immediate and inter-connected. Globally, there has been increasing attention to the personal interaction between the customer and the employee on the frontline of service businesses (Mattson, 1994). Employees who are happy in their place of work are more motivated to contribute and can do so more effectively. This also translates into better consumer experiences and in turn, leads to stronger financial performance by the firm and overall economic growth.

In India there is an increasing demand and supply gap for professionals. It is sometimes difficult for HR managers to maintain consistency in performance and keep the motivation levels high especially when the work is monotonous. Despite the large number of students graduating every year, there is now an increasing scarcity of appropriate skills

gained through the education system, which is low on quality and relevance. Because of shortages, the hiring of new talent has become more expensive.

Employee attrition represents significant costs to service industry companies. High attrition rates drive up training costs, and increase human resources, recruiting, and productivity costs. They also increase the prospect of customer service complaints or quality problems, and create substantial continuity problems for longer-lived projects. Because of high turnover, companies are required to hire more aggressively, resulting in a gradual loss of the basic cost-effective. model of Indian service industry. In India, the average annual attrition rate in the business process outsourcing (BPO) sector hit a high of close to 50% a few years ago.  Better attrition management and the 2008-2009 global economic slowdown have helped reduce the figure to 24-30%, but this still has a significant impact on costs and quality (Mike, 2009). The hospitality industry suffers from a high-attrition rate at almost all levels. Whether hiring people at entry level or in senior management roles, there are many challenges (Jauhari and Manaktola, 2009). This increases the costs of hiring and training employees. Therefore, being a people intensive sector, service industry companies need to pay special attention to the internal marketing activities. They must attract, retain and keep employees motivated and committed at all times (Deery and Kinnie, 2004), which, in turn, ensures delivery of high quality service to customers (Schneider and Bowen, 1995). Employees are the strength of any business success since their value to the organization is essentially intangible and not easily replicated Meaghan et al. (2002) therefore; managers in various organizations must ensure that there is employee continuity in their organizations to enhance organizational competitiveness. Dunmore (2002, p. 5) advocated that internal marketing is increasingly important to organizations due to growth in significance of the service sector and the knowledge-based economy.

## 4. Role of the Employees in Service Encounter

In service organizations employees are vital part of the services offered to customers and hence, there is a need to ensure that they can proficiently deliver the promises made to customers in all service delivery encounters. In literature, service encounters are also labeled as moments of truth. Contact employees have undoubtedly one of the most difficult yet rewarding jobs in the service organizations. Since the service employee works on the boundary of the organization and performs boundary spanning roles (Friedman and Podolny, 1992), the organization has high stakes on how the service employee behaves in service encounters. These service employees are faced with multiple challenges on a daily basis ranging from technical faults to badly behaved customers. It is the manner in which these challenges are dealt with and the degree to which one can cope with the strain of boundary spanning roles, which distinguishes excellent service providers. The boundary spanning role has been defined as activity which links an organization with the environment within which it operates (Bateson and Hoffman, 1999, p.62). It is the task of people in boundary spanning roles to create these links by communicating with those in the outside environment. Those operating in a boundary spanning capacity must be motivated to fulfill two tasks information transfer and representation. Singh et al. (1994) stated that personnel who are operating in boundary spanning roles are prone to high levels of emotional burnout and role conflict.

While interacting with the service, the customer comes not only in to contact with the contact personnel but also with the physical facilities, the other customers and other visible elements. In these cases, customer perceptions of service quality are affected by the physical environment as well as by the behavior of the relevant service personnel (Zeithaml et al 2006). Regardless of whether contact points are visible or not, they constitute moments of truth – points in time during which customers are afforded the opportunity to gauge service quality. If multiple touch points are involved in performing a job function, it may very well be feasible to remove some contact points while still performing the function. Each touch point provides the customer an occasion to gauge the performance of an organization; leaving in unnecessary touch points increases the probability of an unpleasant evaluation (Spence & Kale, 2008).

From an Internal Marketing perspective, many researchers have argued that by satisfying the needs of their internal customers, firms enhance their ability to satisfy the needs of their external customers. However, both customers and employees need to be seen as part of a virtuous circle in which attention given to one reinforces attention given to the other. George (1990) illustrated that relational exchanges between employees within an organization should be considered a prerequisite for successful exchanges with external markets. The satisfaction of the internal customer is of critical importance as satisfaction will ultimately effect the satisfaction of the external market (Ballantyne, 1997, Heskett et al., 2008). Therefore, good organizations carefully manage employee–customer interactions to mitigate the possibility of an unfavourable encounter which could ruin the overall experience. Contact personnel in the service encounter have an opportunity to customise the service delivered to each customer. Customisation of the service encounter adds value to the customer's experience of the service and also contributes to the creation of a sustainable competitive advantage (Lewis and Entwistle, 1990).

## 5. Concept of Internal Marketing

Berry et al. (1976) were probably the first ones who proposed internal marketing as a way out to the problem of delivering consistently high quality of service. They developed the idea that because people were the most common form of service delivery, their actions probably had a major impact on customer acquisition, retention and migration,

and thus the definitive success of the firm. Gronroos (1981) proposed that each customer facing employee be trained as marketer that would enable the building of customer relationships. The remaining employees of the organization should support these customer-facing employees. It was emphasized that the focus of the organization was not only providing an excellent experience, but based on developing an ongoing relationship with the customer which would result into additional sales and profits. The major thrust of the internal marketing concept is that by treating employees as internal customers, one can ensure higher employee satisfaction and, subsequently, the development of a more customer-conscious, market-oriented, and sales-minded work force (Gronroos 1981).

Kotler (1991) defined internal marketing as .the task of successfully hiring, training and motivating able employees to serve the customer well. In this respect it represents elements of good human resources management (HRM) (Bateson, 1991). Rafiq and Ahmed (2000) developed a hybrid approach and proposed that internal marketing was inherently difficult to implement because of inter-functional conflicts and therefore the focus was on overcoming organizational inertia by identifying the specific behavioural changes employees needed to make. Internal marketing was defined as a planned effort using marketing like approach to overcome organizational resistance, to change and to align, motivate, and inter-functionally co-ordinate and integrate employees towards the effective implementation of corporate and functional strategies in order to deliver customer satisfaction through the process of creating motivated and customer-orientated employees. Internal marketing focuses on people inside organizational boundaries and places emphasis on the satisfaction of employee needs (Ahmed and Rafiq, 2003). Davis (2001) suggested that internal marketing can bridge the gap between the different internal constituencies and establishing cooperation among them. In a similar vein, Ballantyne (2003) mentioned that internal marketing is a relationship development strategy. Nowadays the concept is being increasingly discussed in the literature as a strategic tool for meeting and exceeding customers' expectations (Lings 2004; Papasolomou-Doukakis 2002; Mudie 2003). Consequently, IM can be seen as a way of managing the exchanges among organizational members that are required to achieve a high level of service for the external customers. Increased awareness of employee importance in organizational change and implementation has contributed to the adoption of internal marketing (Gronroos, 1994; Papasolomou, 2006; Varey and Lewis, 1999).

## 6. Literature Review on Internal Marketing and Its Effect on Organizations

The rationale for the adoption of Internal Marketing is to ensure that employees feel that management cares about them and their needs are met. The successful application of the concept is transformed into positive employee attitudes towards their work including organizational commitment, job involvement, work motivation and job satisfaction (Tansuhaj et al, 1991). De Brum (1998) emphasized that the foremost objective of internal marketing is to assure that all employees are informed about the firms' vision, i.e. their management initiatives, goals, outcomes, services, products and served markets. However, Vasconcelos (2004) highlighted internal marketing as a vital mechanism in which one can build work environments where employees can find and enjoy unique job experiences as well as they are fostered to achieve their full potential.

One of the important outcomes of internal marketing is to increase the organizational commitment of employees (Tansuhaj et al., 1991). This in turn should result in increased job satisfaction; increased job performance and lower turnover of staff (Jenkins and Thomlinson, 1992; Mathieu and Zajac, 1990; Schlessenger and Haskett, 1991) thus help the interactive process. Caruana and Calleya (1998) also examined internal processes associated with delivering customer satisfaction focusing particularly on the relationship between the nature and extent of internal marketing and its outcome in terms of the level of organizational commitment on the part of employees. The findings confirm a significant relationship between internal marketing and organizational commitment. The relationship of internal marketing is most significant with the affective dimension of organizational commitment. There is some empirical support for a significant relationship between internal marketing and service quality (Yafang Tsai, 2008; Opoku, 2009) and between internal marketing and business performance (Panigyrakis, 2009).

The objective of internal marketing is to create an internal environment in which customer consciousness propagates among personnel. The satisfaction of internal customers is important to the success of a service firm (Gremler et al., 1994).The ability of organizations to develop and gain a competitive advantage through an emphasis on service quality is substantively influenced by the organizational culture. A number of researchers also relate enhanced organizational performance with a strong organizational culture (Barney 1986; Saffold 1988) and improved employee productivity (Deal and Kennedy 1982; Schein 1985). Internal marketing is believed to contribute towards achieving organizational goals (Gilmore, 2003).

Organizations that select, develop, manage and motivate their workforce to produce outstanding business results have an extraordinary competitive advantage that others can not copy (Nalbantian et al., 2004). Hogg (1996) has suggested that internal marketing could be the answer to gaining employee commitment, succeeding where traditional internal communications programmes have failed. Lack of commitment from employees can be harmful to an organization, resulting in poorer performance arising from inferior service offerings and higher costs. Drake et al. (2005) suggested that the effective implementation of marketing techniques internally can create significant bottom-line results. Drake et

al. (2005) asserted that by engaging in a carefully planned internal marketing plan the corporation can convert employees into company fanatics who will generate financial rewards. Similarly, Dunmore (2002) posited that a strong internal marketing strategy can be critical to achieving and sustaining competitive advantage, as well as being a key driver of change and enhanced performance. The successful implementation of internal marketing can lead to: improved employee retention, stronger individual performance, better teamwork, and more effective overall communications (Drake et al., 2005). Empirical results demonstrate that a significant relationship exists between internal marketing and consumer satisfaction and between internal marketing and service quality (Bansal et al., 2001; Ewing and Caruana, 1999).

## 7. Rationale for the Adoption of Internal Marketing

It is clear, therefore, that internal marketing is concerned with more than treating the employee as a customer; it signifies that the organization should constantly endeavour to develop programmes and strategies for enhancing employee satisfaction in much the same way as external marketing plans which are continuously updated and improved to meet external customer demands. Internal marketing is becoming increasingly important and growing recognition as an implementation tool for adoption by all organizations. Prasad and Steffes (2002) mentioned that internal marketing must precede external marketing, if not the organization may offer a service it is unable to provide. From the organizational perspective, the need of the hour is a well-structured and rationalised internal marketing approach that can significantly improve employee relations with management and overall organizational competitiveness and performance. Only then can these organizations hope to respond to the challenges presented by globalization (Budhwar,2009). There are a number of areas where internal marketing can play a vital role:

**Management of change**: Many companies are undergoing some form of transformation through mergers, alliances, or downsizing. The need for communication is stronger in these circumstances. Moreover, constant organizational change can loosen the ties between employer and employee. Internal marketing can bring the parties together with shared goals and values. Internal marketing may be used to place, and gain acceptance of new systems such as the introduction of information technology and new working practices, and other changes. It creates good coordination and cooperation among departments of the business.

**Building corporate image**: When companies change their brand, their name, or their values, it is essential to communicate the change to all stakeholders including employees. Internal marketing can play a key role in creating awareness and appreciation of the company's aims and strengths - as all employees are potential company ambassadors. It integrates business culture, structure, human resources management, vision and strategy with the employees' professional and social needs.

**Employee empowerment**: Internal marketing empowers employees and gives them accountability and responsibility. Zeithaml and Bitner (1996) stipulated that many organizations accept that in order to be responsive to customer needs, front-line staff need to be empowered to accommodate customer requests, and to recover on the spot when things go wrong. As companies empower staff to build stronger customer relationship, internal marketing underpins the drive for greater involvement, commitment, and understanding.

## Enhancing Organizational Commitment

Lack of commitment from employees can be harmful to an organization, resulting in poorer performance arising from inferior service offerings and higher costs. The major thrust of the internal marketing concept is to ensure that employees feel that management cares about them and their needs are met. If these are not met then the satisfaction of external customers is difficult, if they are met then employees become committed, co-operative, and enthusiastic about the organization (Ahmed et al., 2002; Ballantyne, 2003). Internal marketing encourages employees to offer superb service to customers by appreciating their valuable contribution to the success of the business. Hogg (1996) has suggested that internal marketing could be the answer to gaining employee commitment, succeeding where traditional internal communications programmes have failed. Caruana and Calleya (1998) also confirmed a significant relationship between internal marketing and organizational commitment.

**Employee satisfaction:** In service environments in which customers are highly demanding of employees, coupled with employees who in turn hold high expectations from their jobs as sources of self-actualization and self-development. Under these conditions, internal marketing approach can assist in creating more satisfied customer-contact employees who appreciate clearly the logic and benefit of courteous, empathetic behavior when dealing with customers, lead to greater customer satisfaction. Internal marketing which aims at reducing interdepartmental and inter-functional conflict and developing the co-operation and commitment needed to make external marketing strategies work.

Several researchers have criticized this concept of internal marketing and advocated that through internal marketing marketers are trying to extend their influence throughout the organization. Critics of internal marketing argued that the term is simply a synonym for good human resources management. However, internal marketing and human resource effectiveness are distinct and the former represents the antecedent of the latter (Ewing and Caruana, 1999).Gilmore and

Carson (1995) criticized the dependence on techniques and concepts, designed for the implementation of external marketing programmes that may be inappropriate for internal markets. Rust et al. (1996) postulated that there is an overemphasis on the importance of frontline personnel, which can potentially create conflict and discontent among other staff members. Rafiq and Ahmed (1993) mentioned that internal marketing is highly incompatible in striving to meet both the requirements of internal and external customers simultaneously. Hales (1994) is very critical of the application of internal marketing to HRM. He argues that internal marketing is unable to provide a solid conceptual base emphasising, among others, the point that while HRM focuses on teamwork; internal marketing stresses individualism. Later, Ahmed and Rafiq (2004) criticised the concept of .employee as customer. Since it raises the question of whether the needs of external customers have predominance over those of employees.

## 8. Conclusion

In the service industry, human resources are the only assets that need to be nurtured generously. Many organizations corroborate that their employees are their most valuable resource. Keeping talent within organization is now becoming a central goal for HR professionals. Organizations provide freedom to their employees to perform by attaching them to a right job profile according to their preference and they are constantly encouraged to grow up the ladder through regular trainings. The training should be focused on what the employees are expected to achieve. Along with the motivation, they should also be equipped with enough tools to help themselves on their way. Customers often base their perceptions of the service on the quality of the interaction with service personnel. Service industry organizations now recognize the importance of quality and attempt to exceed the expectations of customers. For this reason it is essential that the employee is motivated to consistently deliver a high quality service experience to the customer. Motivation is especially important when employees operate in a boundary spanning position, as this involves high levels of stress and burn out.

In this paper internal marketing is proposed as a mechanism for ensuring the motivation of service employees. The implementation of an internal marketing program ensures that motivation is at the forefront of managements' priorities and is not solely the responsibility of human resources but must be adopted by all managers throughout the organization. It is believed organizational problems are internal, not external and therefore, implementation of an internal marketing program creates the opportunity to improve quality throughout the organization (Prasad & Steffes, 2002). It can be concluded that internal marketing is a tool that harnesses the employee power and creates an environment where every member acts as both a client and customer in order to create responsibility.

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# Factors Affecting Preference of Short-Term Financial Borrowing: ISE (Istanbul Stock Exchange) Application

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**Abstract**

We tried to determine the relation between short-term financial borrowing levels and various financial parameters of the firms trading on Istanbul Stock Exchange. In our study covering the years of 1994-2007, we used such data for the firms which were traded on Istanbul Stock Exchange in this period uninterruptedly and had short-term financial debts in each of their financial statements for 3 months. We created three different models in the study we carried out by using panel data analysis method. It was seen based on the results we obtained that there is a significant negative relation between short-term financial debt level and earning before interest and taxes/total assets ratio. In addition, it was also found that there is a significant positive relation between short-term financial debt level and asset turnover, current assets/total assets ratio. It may be construed based on these results that firms use their preferences for borrowing term as a sign of expectation of the firm for its future.

**Keywords:** Short-term financial debt, Signal Models, Panel data analysis

## 1. Introduction

One of the study subjects which take an important place among the studies carried out regarding corporate finance but upon which no final agreement could be reached is capital structure decisions. Traditionally, there are two different approaches in such studies in which effect of the decisions for formation of capital structure on market value of the firm is dealt with. One of these approaches is the approach of "irrelevance" of Modigliani-Miller. Modigliani-Miller suggest that preferences of a firm on its capital structure would not affect market value of the said firm under efficient capital market conditions. However, it is emphasized in a significant part of the studies in which capital structure decisions are discussed that preferences on formation of capital structure would affect market value of the firm for certain reasons such as tax, bankruptcy costs, agency costs and asymmetric information.

In general, focus point in the studies on capital structure is the rate of debt and equities to finance the firm. However, it is not considered so much that nature of liabilities used by a firm may also affect capital structure and consequently market value of the said firm. It must be considered that possibility of variance in borrowing costs depending on the source indebted and term of debt must be considered for decisions on capital structure.

In our study, the aim is to determine the relation between financial debts used by firms and various financial parameters for the firm since liabilities used by the Turkish firms are mostly the loans granted by banking system. In this study, firstly the factors affecting term structure of liabilities used by firms will be discussed and details on the method used in the study and parameters used will be provided in the third part. In the fourth part, findings and results obtained will be presented.

## 2. Factors Effective on Term Structure of Liabilities

In the studies regarding capital structure, it may be suggested that the main reason of insufficient consideration of term structure of debt funds is unclearness of effect of preferences for borrowing term on firm value. Starting point of the studies included in the modern finance literature on this matter is mostly asymmetric information phenomenon. Where asymmetric information phenomenon is valid among market participants, preferences on borrowing term would affect market value of the firm. The point separating the studies conducted on this matter from each other is related to the question that whether the said effect is caused by term preference arising from the conditions specific to the firm or by the fact that the firm management uses borrowing term preference as the means to transfer information possessed by the firm regarding its future to the market. In the finance literature, approaches which associate debt term preference with the

conditions specific to the firm are called as contracting cost models; however, the approaches based on the fact that the management uses borrowing term preference as the means to transfer information possessed by the firm regarding its future to the market are called as signal models (Megginson, 1997).

According to the approach called as contracting cost models, it is suggested that firm assets, field of activity of the firm and ownership structure would be effective on preference of the firm to borrow money on debt term. In the study carried out by Myers (1977) on this matter, it is argued that preferences on debt term structure may solve the problem of undercapitalization.   In the study of Myers (1977), the problem of undercapitalization is considered as reluctantly actions of shareholders in implementation of some profitable projects where the said projects do not promise a sufficient earning for the shareholders. The reason for this problem is presented as the fact that since term of the debts incurred become expires before acquisition of the profits to be derived from the project, the shareholders have to pay the lenders substantially full of their profits to be acquired from the project. Myers (1977), suggests that term structures of asset and liabilities should be matched (matching) in order to solve the problem (Barclay & Smith, 1995). In the study of Stohs & Mauer (1996), it was concluded that companies tend to match debt term structure and term of their assets and small companies get into debt for shorter terms relatively. It is also possible for firms to get into debt with high assurances for solution of the problem of undercapitalization. As stated in the study of Chen, Jen & Choi (1999), debts with high assurance is associated with high growing opportunities of the firms, high marketability of its assets and features such as business risk and finance of new investment projects with high assurances will limit asset transfers from shareholders to the current debt owners and reduce tendency of shareholders in withdrawing from these projects. On the other hand, in case of a borrowing term preference mostly involving short-term sources, firstly creditors and as a whole the market will follow the firm more closely. Many firm managers do not desire such a close monitoring. In the study of Jiraporn & Kitsabunnarat (2007), it was concluded that managers who avoid to be the focus point of the market have a tendency in long term borrowing in such firms with a weak shareholder efficiency.

Existence of asymmetric information is an acceptable phenomenon in financial markets. Reason of this the assumption to the effect that the most accurate information for the status of a firm attempting to find borrowed fund to financial markets is known by the firm's managers to use the loan, not the creditors. In such a case, it is possible for the information reflected by the firm's managers to out of the firm regarding status of the firm to include the information requested by creditors to grant loan to the firm, not actual status of the firm. Possibility of any application of such an information transfer method which is inconsistent with the real status of the firm causes some problems which are the following; the adverse selection problem and the moral hazard problem.

Adverse selection problem is related to the risk assumed by the creditors by granting debt fund to the firm which would not be granted any debt if its real status is known instead of the firms on the financial markets to use debt fund status of which is really eligible for using liabilities. Moral hazard problem, however, means use of provided sources by the debtor firm in excessive risky fields or in a manner to increase total risk.

Although it is possible to develop regulatory and restrictive measures both for the entire financial markets and for borrowing contracts respectively in order to be protected from each of the risks stated above, it is necessary to determine whether firm managements tend to use the asymmetric information phenomenon through the financial decisions they made. Thus, financial decisions are used as a means of information transfer, accuracy of the information on status of the said firm transferred to the market and manner of perception by the market may not be disregarded in such studies regarding operation of financial markets.

In the event of availability of asymmetric information, shares may be mispricing (Halov & Haider, 2005). There are different findings on significance of degree of asymmetric information for firm size. Tong & Green (2005), express that since large firms have a more complex structure, degree of asymmetric information is higher for these firms as well. In the study of Mitchell (1991), however, it was emphasized that such companies with high levels of asymmetric information would have a tendency to short term borrowing in order to minimize their adverse selection costs. However, Berger & Udell (1995), suggest that asymmetric information is more important for small firms. According to signal models, managers who have more information regarding future of the firm may use borrowing term structure as the means to transfer the information they possess to the external investors.

In the study of Flannery (1986) on this matter, it is argued that managers of strong firms prefer shorter term borrowing contrary to managers of weak firms. Managers of strong firms select short term borrowing and may encounter the risk of failure in financing debts again following delivery of more information on the firm to the market. Firm managers with lower level of expectations for the future, however, would not want to take this risk and prefer long term borrowing. Flannery (1986) explained that weak firms would prefer long term borrowing when security issue is costly and stronger firms would prefer short term borrowing.

In the study of Diamond (1991), an analysis similar to the study of Flannery (1986) is made. Diamond (1991) have dealt with selection of debt term structure as a relation between desire of the borrower on short term borrowing and liquidity risk which may occur on short term borrowing. It is suggested in the study that firms from which sufficient information on

their future earnings would prefer short term borrowing. However, short term borrowing would face the firms with a high level of liquidity risk. In the study, liquidity risk is considered as undesireness of lenders on extending debt if they receive any negative information. In such a case, firms with high credit rating would prefer short term borrowing. Because reborrowing risk would be low for these firms. Firms with lower credit rating prefer long term borrowing in order to reduce the risk of reborrowing. Firms with higher credit rating would prefer short term borrowing. According to Diamond (1991), short term borrowing would increase the liquidity risk for the firm management and sensitivity of financing costs to new information would increase due to increased liquidity risk. This case is the basis reason of preference by strong firms on short term borrowing. Diamond (1991), suggests that short term borrowing would a start for long term debt and long term borrowing would allow additional initial borrowing (short term borrowing). Also in the study of Berger, Espinosa-Vega, Frame & Miller (2005), it is stated that the low risky firms tend to use short term debt.

In the study of Guedes & Opler (1996), it is stated that the liquidity risk may be reduced by financing the assets yield of which takes a long time for long term debts. Thus, term structure of debts and term structure of assets would be matched.

It is also assumed that financing decisions are no associated with market value of a firm. Most of the studies carried out on this matter assume that those in the firm and market participants would share all information which may be obtained regarding distribution of the profits derived from real investment decisions. In such a case, those inside and outside agree on the value of financial changes and equilibrium price of the security makes the firm against alternative financing plans.However, if the information possessed by the market is not complete (in comparison with information of those inside), those outside would be unable to distinguish the firms with different real value.

## 3. Data and Method

In our study, data on the manufacturing firms traded on Istanbul Stock Exchange in the period of 1994-2007 was used. Data regarding the firms considered was compiles from financial statement data of the firms for 3 months. We considered two main criteria in selection of the firms included in the study. They include;

- firms continuously traded on Istanbul Stock Exchange in the period of 1994-2007 and

- firms each of which has short term financial debt in their financial statements for 3 months presented to Istanbul Stock Exchange in the period considered.

Number of firms which meet these two conditions and are included in the study is 24. This number represents 16% of number of manufacturing firms (150) traded on Istanbul Stock Exchange as of September 2009. In our study, we tried to analyze the relation between short term financial debt level and various financial variables on three different models. Data we used in the study was derived from Istanbul Stock Exchange files. Aim of Model 1is to determine the relation between short term financial debt level considered as a percentage of total financial debts of firms and variables   in the current situation (t period). In Model 2, the aim is to determine the relation between the expectations for the financial indicators discussed and short term financial debt level. In Model 3, we tried to find effect of previous period levels of the financial indicators discussed on the current short term financial debt level. It is possible to show the models that we created for the purposes stated as follows;

Model 1;

$$SFD_{it} = \beta_0 + \beta_1 CAL_{it} + \beta_2 EBITTA_{it} + \beta_3 AT_{it} + \beta_4 ROA_{it} + \varepsilon_t$$

Model 2;

$$SFD_{it} = \beta_0 + \beta_1 CAL_{it+1} + \beta_2 EBITTA_{it+1} + \beta_3 AT_{it+1} + \beta_4 ROA_{it+1} + \varepsilon_t$$

Model 3;

$$SFD_{it} = \beta_0 + \beta_1 CAL_{it-1} + \beta_2 EBITTA_{it-1} + \beta_3 AT_{it-1} + \beta_4 ROA_{it-1} + \varepsilon_t$$

The variables that are in all three models are as follows:

$SFD_{it} =$  Short Term Financial Debt Level for the period of t

$CAL_{it} =$  Current Assets Level for the period of t

$EBITTA_{it} =$  Earning Before Interest and Taxes Level as a Percentage of Total Assets for the period of t

$AT_{it} =$  Asset Turnover for the period of t

$ROA_{it} =$  Return on assets for the period of t

$CAL_{it+1} =$  Current Assets Level for the period of t+1

$EBITTA_{it+1} =$  Earning Before Interest and Taxes Level as a Percentage of Total Assets for the period of t+1

$AT_{it+1} =$  Asset Turnover for the period of t+1

$ROA_{it+1} =$  Return on assets for the period of t+1

$CAL_{it-1} =$ Current Assets Level for the period of t-1

$EBITTA_{it-1} =$ Earning Before Interest and Taxes Level as a Percentage of Total Assets for the period of t-1

$AT_{it-1} =$ Asset Turnover for the period of t-1

$ROA_{it-1} =$ Return on assets for the period of t-1

Calculation methods of the variables given are shown in Table 1.

An analysis was made by panel data estimation method by testing steadiness of the series of the variables used in both models given above. Testing steadiness of the series by Levin, Li and Chu unit root test, the series of the data used in model 1, model 2 and model 3 were found stable at a level significance of 5% and 10%.

In the models in which sectional data is used, the problem of varying variance may occur and this problem must not be disregarded (Gujarati, 1999). Therefore, in case of varying variance, White estimating correction technique may be applied. In Model 1, Model 2 and Model 3, white estimating correction technique was used against the risk of varying variance which may be encountered in the models involving sectional data and no autocorrelation problem is seen according to Durbin-Watson values obtained as a result of analyses. Hausman test was performed in order to determine whether fixed effects model or random effects model would be used in the analysis. According to the results obtained, it was found appropriate to use random effects model for all of three models. The values derived from the analysis are shown in Table 2.

## 4. Findings and Conclusion

For model-1, model-2 and model-3 we used in the study, the relation between short term financial debt level and the variables discussed is shown in Tablo-2. Existence of a significant positive relation between current assets level (CAL)as a percentage of total assets and short term financial debt level in all of three models shows that short term financial debts were used in finance of current assets. This result reflects a tendency appropriate for the general approach regarding to term structures of asset and liabilities should be matched.

In the three models discussed, it was concluded that there is a significant positive relation between asset turnover (AT) and short term financial debt level. Accordingly, where asset turnover of firms increases or an increase is expected in asset turnover, it may be said that they tend to get short term financial borrowing. This result also supports the relation between current assets level and short term financial debt level. Requirement for current asset required by any increase or expectation of increase in sales volume also causes an increase in short term financial debts.

A significant negative relation was found between short term financial debts level and earning before interest and taxes level as a percentage of total assets (EBITTA). This result shows that where there is a decrease in the earning before interest and taxes as a percentage of total assets or any expectation for decrease, firms tend to get short term financial borrowing which may be acquired at a lower cost and more easily. Low earning before interest and taxes as a percentage of total assets lead firms to shorter term borrowing and this situation will increase financial risk of the firms.

## 5. Conclusion

Term preferences for the bank loans to be used by firms are not a decision to be made considering only their own financial indicators. The sector they are connected and their expectations for general economic conditions will play a role in these preferences. However, the relation between various financial variables and borrowing term preferences relating to the firms must be explained at least in theoretical terms. In the study, a significant negative relation was found between level of earning before interest and taxes as a percentage of total assets and short term financial debt level. In addition, a significant positive relation was found between short term financial debt level with current asset/total asset ratio and asset turnover. These results may be assessed that firms use the short term financial borrowing preferences as an indicator to reflect future expectations of the firms.

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Table 1. Variables names and accounting of   variables

| Variables Symbol | Variables Names | Accounting of Variables |
|---|---|---|
| SFD | Short Term Financial Debt Level | Short Term Financial Debt/Total Financial Debt |
| CAL | Current Assets Level | Current Assets / Total Assets |
| EBITTA | Earning Before Interest and Taxes Level as a Percentage of Total Assets | (Term Profit+ Financing Expenses)/Total Assets |
| AT | Asset Turnover | Sales / Total Assets |
| ROA | Return on assets | Net Income/ Total Assets |

Table 2.a. The Relationship between the short term financial debt level and variables

| | Model 1 (for t period) (Random Effects Model) | | |
|---|---|---|---|
| | Coefficient | t-value | p-value |
| $CAL_{it}$ | 0.535214 | 7.162113 | 0.0000* |
| $EBITTA_{it}$ | -0.003369 | -7.954278 | 0.0000* |
| $AT_{it}$ | 0.032026 | 2.273347 | 0.0232* |
| $ROA_{it}$ | -0.044130 | -0.600766 | 0.5481 |
| c(constant) | 0.356506 | 5.086018 | 0.0000 |
| $R^2$ | 0.077381 | | |
| Adj. $R^2$ | 0.074625 | | |
| F-ist. | 28.07597 | | 0.000000 |
| D.watson | 1.5383999 | | |
| Hausman | 3.198487 | | 0.5252 |

Table 2.b.

| | Model 2 | | |
|---|---|---|---|
| | ( for t+1 period) | | |
| | (Random Effects Model) | | |
| | Coefficient | t-value | p-value |
| $CAL_{it+1}$ | 0.464688 | 6.408083 | 0.0000* |
| $EBITTA_{it+1}$ | -0.002928 | -6.799559 | 0.0000* |
| $AT_{it+1}$ | 0.029373 | 2.095363 | 0.0363* |
| $ROA_{it+1}$ | -0.022424 | -0.338616 | 0.7350 |
| c(constant) | 0.402208 | 5.582727 | 0.0000 |
| $R^2$ | 0.059584 | | |
| Adj. $R^2$ | 0.056724 | | |
| F-ist. | 20.82947 | | 0.000000 |
| D.watson | 1.5401938 | | |
| Hausman | 3.654553 | | 0.4548 |

Table 2.c.

| | Model 3 | | |
|---|---|---|---|
| | (for t-1 period) | | |
| | (Random Effects Model) | | |
| | Coefficient | t-value | p-value |
| $CAL_{it-1}$ | 0.511332 | 7.643697 | 0.0000* |
| $EBITTA_{it-1}$ | -0.003427 | -7.991682 | 0.0000* |
| $AT_{it-1}$ | 0.031030 | 2.173868 | 0.0299* |
| $ROA_{it-1}$ | -0.085521 | -1.127821 | 0.2596 |
| c(constant) | 0.372004 | 5.768832 | 0.0000 |
| $R^2$ | 0.069514 | | |
| Adj. $R^2$ | 0.066734 | | |
| F-ist. | 25.00812 | | 0.000000 |
| D.watson | 1.6402874 | | |
| Hausman | 3.163441 | | 0.5309 |

Note 1. * means  5% significance level

# A Study on the Organization Structure of Third-party

# Logistics Enterprise Servicing for Manufacturing Enterprise

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**Abstract**

This paper introduces ways and advantages of third-party logistics enterprise servicing manufacturing enterprise, analyses supply-chain of manufacturing enterprise and further studies for the organization structure of third-party logistics enterprise servicing manufacturing enterprise, to seek to the enterprise organization structure which has the best combination in third-party logistics enterprise with manufacturing enterprise.

**Keywords:** Third-party logistics enterprise, Manufacturing enterprise, Organization structure

**1. Current Situation of Foreign Funds in China Insurance Industry**

Following the rapid development of third-party logistics enterprises and industrial structure entering the mid-term of industrialization in our country, the demand which logistics function is stripped from manufacturing industry is very intense. It becoming one of the necessary considering questions and one of the most effective way to wealth for more and more third-party logistics enterprises to servicing manufacturing enterprise. In sharping competition, logistics enterprises for enhancing the competitive power have began to innovate in technology, service, management and other aspects. But the most of third-party logistics enterprises in our country have been restructured from the traditional logistics enterprises, haven't enterprise organization structure matching to the characteristics of third-party logistics servicing manufacturing enterprise. In a great extent, it restricts the servicing efficiency of third-party logistics for manufacturing enterprises.

The promoting action of third-party logistics enterprises to manufacturing enterprises is following several aspects: (1) specializing service and reducing the cost; (2) making manufacturing enterprises concentrate in developing their core business; (3) improving the operating flexibility of manufacturing enterprises; (4) reducing supervisory cost of manufacturing enterprises; (5) reducing the operating dangerous of manufacturing enterprises; (6) improving the customer servicing level of manufacturing enterprises; (7) promoting the manufacturing enterprise image. (Donald, 2002, 169)

This paper, through analyzing organization structure of third-party logistics enterprises, researches the enterprise organization structure having the best bonding point between third-party logistics enterprises and manufacturing enterprises. It improves the servicing level of third-party logistics enterprises for manufacturing enterprises and realizes two-to-win and common development.

**2. Service Modes of Third-Party Logistics Enterprises Servicing for Manufacturing Enterprises**

"third-party logistics", in National standards "logistics terminology", is defined that "third-party logistics is the business mode of logistics services provided by logistics except supplier and demander".

Service modes of third-party logistics enterprises servicing for manufacturing enterprises is following several aspects.

(1) Third-party logistics enterprises provides service for manufacturing enterprises through taking the outsourcing of transportation, warehousing and other functions.

This is the fundamental level of logistics outsourcing. Manufacturing enterprises may consider to accredit transportation and warehousing which appropriates many source to one or several large-scale third-party logistics enterprises. They needn't build the relaxed information system web. That is better to the concentrative development of core ability.

(2) Third-party logistics enterprises provide service for manufacturing enterprises through taking the outsourcing of their internal logistics.

Manufacturing enterprises are just responsible for the action on product line, accredit the excellent Third-party logistics enterprises with materials out of storehouse, manufactured goods entering storehouse and other related processes. It may ensure the logistics specialization and efficiency of manufacturing enterprises, be better to the radical transformation of enterprise operating processes. (Linyong, 2007, 334-340). But simultaneously, manufacturing enterprises must pay large cost to realize it. So third-party logistics enterprises should have comparative strength and reliability.

(3) Third-party logistics enterprises provides service for manufacturing enterprises through taking the outsourcing of their logistics planning design and information management.

This is strategic cooperation based non-business layer. Manufacturing enterprises may replan and design the enterprise logistics operations with aid in professional talent and management experience of Third-party logistics enterprises. As for Third-party logistics service providers, updating and maintaining information system is necessary, is one of their core operations. So it nearly needn't be paid any extra cost, and promotes to realize two-to-win and common development.

(4) Third-party logistics enterprises provides service for manufacturing enterprises through taking the outsourcing of all their external logistics functions.

Third-party logistics enterprises provides service for manufacturing enterprises through taking the multi-level outsourcing strategy of manufacturing enterprises. Manufacturing enterprises strips all their external logistics function from their producing functions. This is the high level outsourcing. To a great extent, this mode may reduce the stock dangerous of manufacturing enterprises, even realize zero stock. On the other hand, with aid in the advanced and professional service system of third-party logistics enterprises. This mode may shorten production cycle of manufacturing enterprises, accelerate cash flow, promote service quality. The building of this function stripping process must base on supply-chain strategic association, simultaneously set the high request to the operating ability and supporting ability of information system of third-party logistics enterprises.

## 3. Analysis of Organization Structure of Third-Party Logistics Enterprise Servicing for Manufacturing Enterprises

Through analysing the supply-chain of manufacturing enterprises, we can see that manufacturing industry have its' particularity difference from other industries. So third-party logistics enterprise servicing manufacturing enterprises should have very strong flexibility and the ability of rapid reaction. Combining the characteristics of manufcturing enterprises, this paper carries out the introduction and the analysis the following several the organization structure models of third-party logistics enterprise.

### 3.1 Class Matrix Type Logistics Organization Structure

The design of Class Matrix logistics organization structure intruduces the item management into the operation of logistics activity. Because of the personalization of customer logistics demand, Class Matrix logistics organization structure is particularly suitable to the operating mode of item management. Class Matrix logistics organization structure is shown in figure 1.

According to the character and service range of manufcturing enterprises , the flexibility of Class Matrix logistics organization structure is quite strong. Because the transverse item unit may momentarily build, adapt and cancel according to requires. This kind of structure is in favor of the enough use of resources, in favor of strengthening the transverse relationship between departments, in favor of unifying administration and account management, in favor of concentrating attention on the vital strategic questions. So this kind of structure is better at fitting for the third-party logistics enterprises servicing manufcturing enterprises which have moderate business field, moderate service range and moderate scale.

### 3.2 Mixed Network Type Logistics Organization Structure

The design of Mixed network type logistics organization structure have the excellentces both centralized type of organization and decentralization of authority. Every branches's customers come from two parts. One part of customers comes from headquarter, is managed according to the cost center partern; the other part of customers is developed and

managed according to the profit center partern. Mixed network type logistics organization structure is shown in figure2.

Large-scale international manufacturing enterprises need global logistics distribution and service. Mixed network type logistics organization structure is both in favor of macro-planning of the headquarters and in favor of keeping the relative independence of branches. This kind of structure, through co-marketing between headquarters and every branch, greatly enhances the marketing level of the whole company, simultaneously has better responsible ability. (Niu Sihu, 2008, p.195-197). So this kind of structure is more fitting for the third-party logistics enterprises providing service for manufcturing enterprises which need strongly comprehensive strength, broad region and large scale.

### 3.3 Distributed Network Type Virtual Logistics Organization Structure

Distributed network type virtual logistics organization structure is shown in figure 3. From the figure, we can see that managers take the logistics basic activities to external forces. The organization core consists of cost control center and information center of the alliance which conposes of third-party logistics enterprise, carries out design, organization, surveillance and control directed at logistics activities.

Non-assets logistics service is better at enhancing profit ability and profit speed than assers logistce service. Investigation and study going deep into manufcturing enterprise is in favor of realizing the co-operation with manufcturing enterprises from strategic level. This kind of structure is mini-scale, not hardware facilities, but have advanced logistics management technology and information technology. It can help manufcturing enterprises working out marketing plan, transportation plan, order plan, production plan; even to carry out reforming enterprise process. (Linyong, 2007, p.341-346) When manufcturing enterprises alter their production plane according to market change, logistics enterprises can rapidly transmit information, work out elastic plan, and adjust all links correspondingly. Above all can deepen the bilateral cooperation to a great extend, enable the third-party logistics service provider to occupy more and more important and stable position in the entire production.

### 3.4 Front-Back-End Type Logistics Organization Structure

In this kind of structure, front-end is CRM customer relationship management system and the conformity of enterprise and market, back-end is ERP system and the conformity of point-of-purchase and each of enterprise eternal points. Both front-end and back-end are in the whole system, just like that CRM or ERP is only subsystem of large system, service for system integrity. Front-back-end type logistics organization structure is shown in figure 4.

The final function which third-party logistics enterprises provide service for manufcturing enterprises guarantees the efficient operation of manufacturing industry and the optimization of supply-chain management. This kind of structure is the new organizational structure which has both the flexibility of small enterprise and the resource advantage of large enterprise (Xu Zhifen, 2007, p.9-12). It may maximize to provide value-added service to a great extend and really reflect "customer-centric" organization structure. So this organization structure is fitting for third-party logistics enterprise providing service for the manufcturing enterprises which have special demand, customers and service is special important to.

### 4. Conclusion

Third-party logistics at home and abroad rapidly develops. The organization structure as the link between enterprise strategy and its carring out is facing to the challenge which is coming from marketing competition. According to the supply chain of manufcturing enterprises, this paper, just combing the service characteristics of manufcturing enterprises needing and the service way of third-party logistics enterprise, has carried on generally analyzing to third-party logistics organization structure. However, according to the difference of service type, service way, service range, service field and other special requirements, the same kind of third-party logistics organization structure maybe has great diversity. Therefore, the design of third-party logistics organization structure servicing manufcturing enterprises should be considering of time, field, the special situations of manufacturing enterprise.

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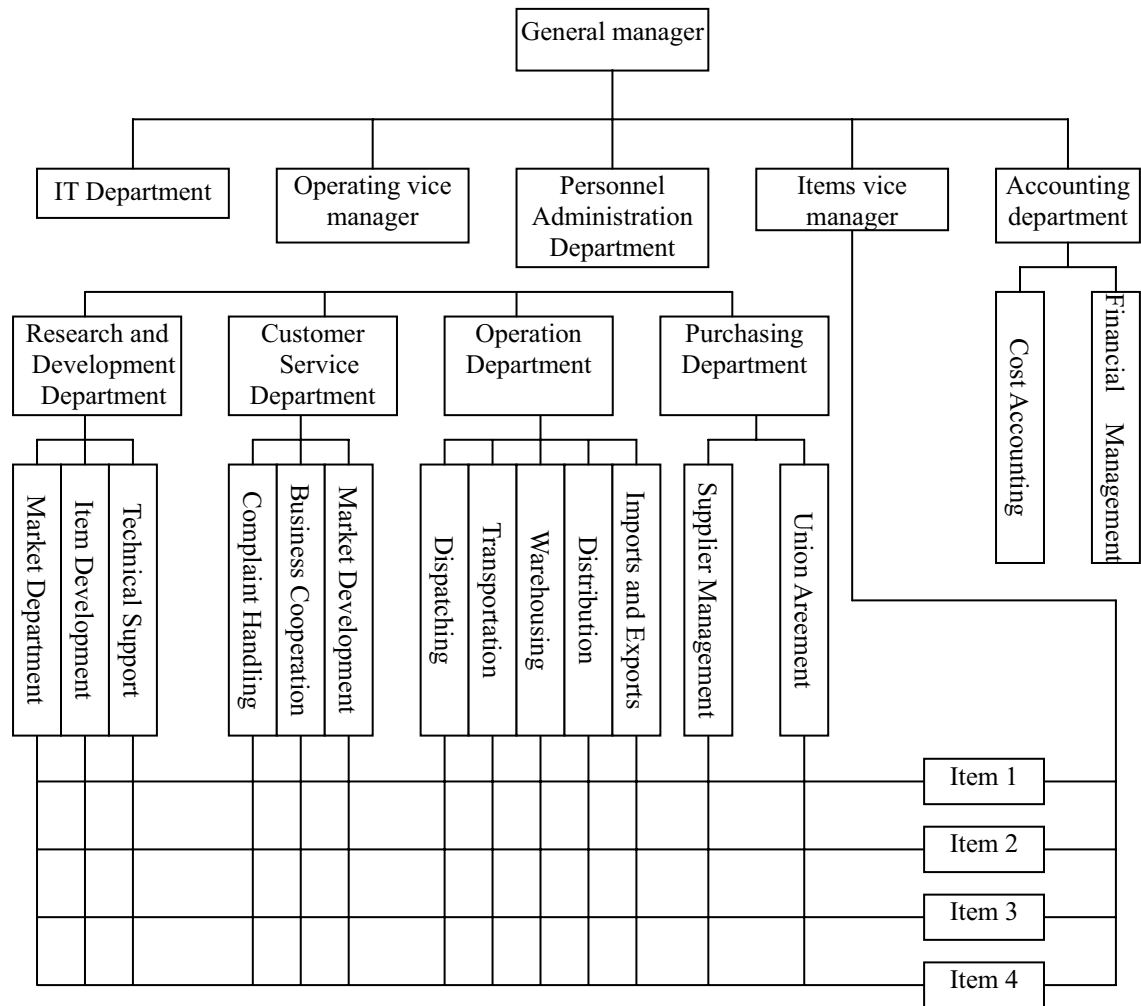
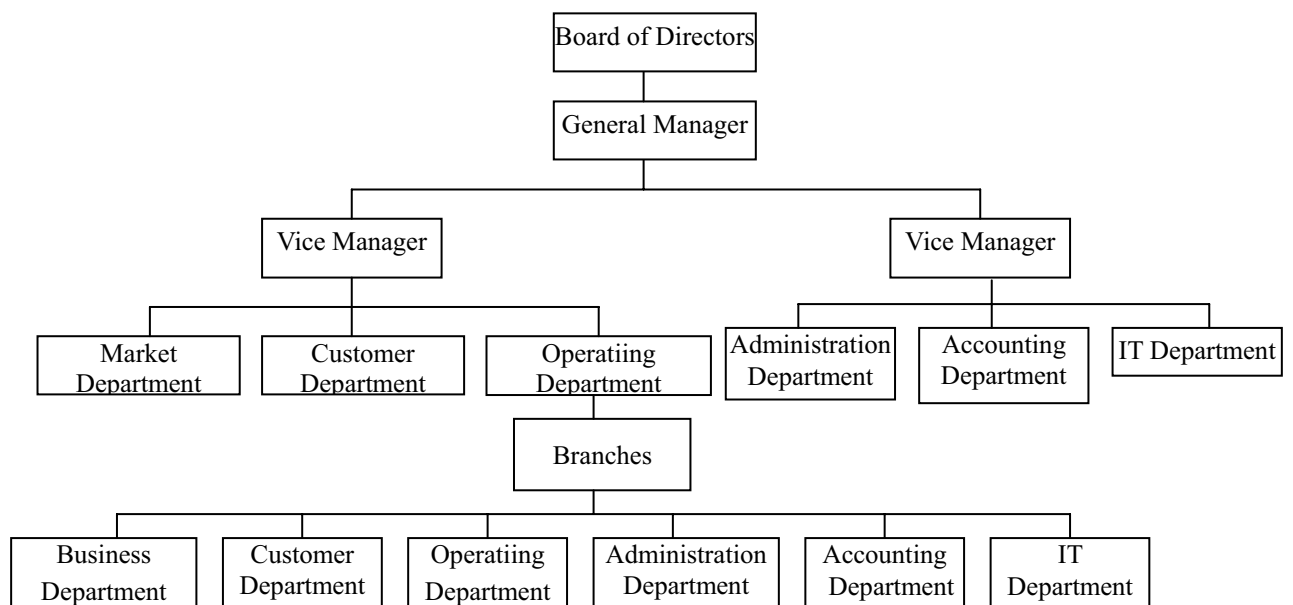Figure 1. Class Matrix logistics organization structure



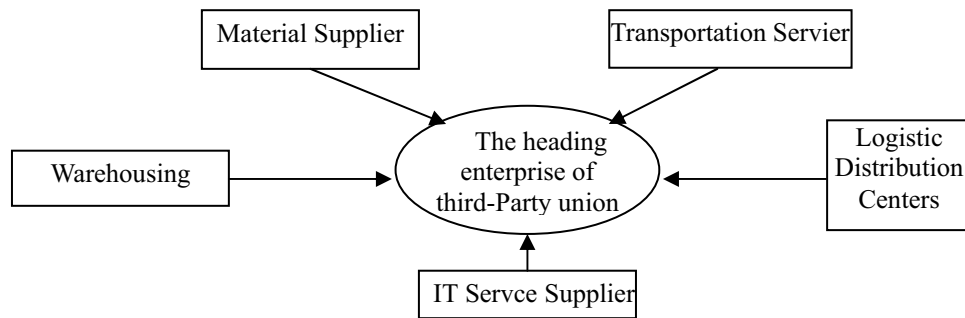Figure 2. Mixed network type logistics organization structure

Figure 3. Distributed network type virtual logistics organization structure
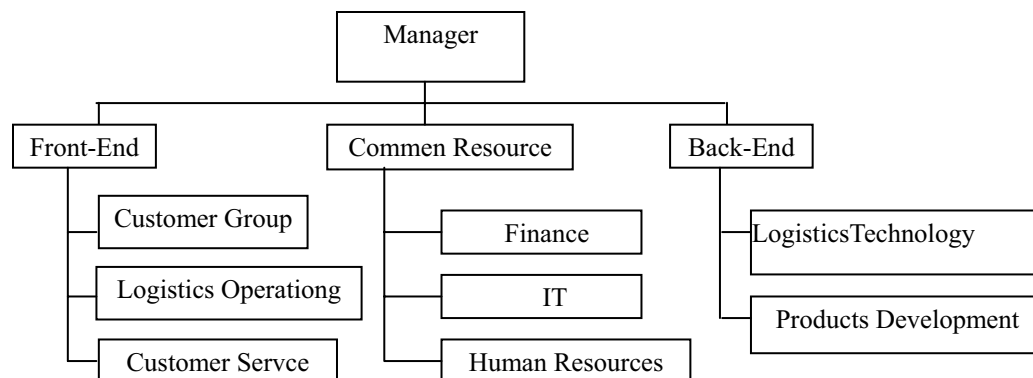


Figure 4. Front-back-end type logistics organization structure

# Environmental Management within Projects

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**Abstract**

The role of environmental management within projects is playing a more and more essential part to the firms and public. Because of the benefit of implementing environmental management, different methods are being used to improve environmental management in projects especially in industry. However, the application of these methods leads to an increase in labor use, materials costs and other costs, which can limit their implementation. This paper provides the benefits and the barriers to the implementation of environmental management within projects, and some effect ways to improve it. It should help stakeholders to adjust their environmental management policy by efficient resources distribution within their firms.

**Keywords:** Environmental Manangement, Global coorperation, Environmental pollution, Recycle

## 1. Introduction

In the modern world, making a high-quality project is playing a more and more essential part in the competitive life. There is no doubt that an initial blueprint of project management in the process of making a perfect project is very significant. Nevertheless, the environmental management is also doing a critical role in this course of action.

During the last few years, the consciousness of people for the protection of environment in the general public has been gradually increasing. Various kinds of pressure groups are acting in defense of the environment. The governments are also promoting more and more set of laws to protect the environment and the community in general (Chakrabarti and Mitra, 2004, pp 53-66). Environmental management has incessantly grown in importance over the last 2 decades not only in terms of the worldwide environmental market, but also as a driver of advances in the entire area of projects. The growth of pioneering environmental management is also the key factor towards the objective of developing a new sustainable project management (Centi et al. 2002, pp 3-15).

## 2. The Benefits of Implementing Environmental Management within Projects

Environmental protection has come a long way in the last 40 years. In the sixties and seventies of the last century it began with grudging application of technologies to clear out pollution caused by operation of plants, use of products and discarding of wastes. That technology has evolved from easy equipment based on simple principles to often complex equipment using the latest information in a variety of fields of engineering. Soon it became clear that prevention of pollution was much more useful and economically sound. This influenced the way the technology was used, from end of pipe to integrated solutions focusing on prevention. New technology and new optimization techniques have been developed. Over the last 20 years awareness has grown that pollution as such is not the major issue but just one of the side effects of wasting the resources we need for a sound and sustainable economy (Venselaar 2005, pp 58-65). From what have been mentioned above, we can see very easy that the environmental management within projects has become more and more important in our daily life. However, why it becomes so essential? We can get the answers from the benefits of implementing environmental management within projects.

From the last century, many firms have undergone rapid changes since adoption of the reform as well as the global cooperation. Nevertheless, meanwhile, these firms has paid a great cost for its rapid development: severe environmental deterioration including overexploitation of ground water, generation of solid and industrial wastes, obliteration of the ecosystem, and other problems related to land, water, and atmosphere. Especially in the construction industrial in which has undergone great changes due to rapid industrialization and urbanization during the past decades (Zeng et al. 2005, pp 645-656). Pollution been brought about by construction activities has become a serious problem. Pollution and risks do not only irritate residents nearby, but also affect the health and well-being of people in the entire urban.

There are noticeable benefits to the companies from putting environmental management into practice of project management, such as reducing the production of wastes, and decreasing the use of materials and techniques that could have hurtful effects on the environment. The benefits to the owners of these firms can be in a number of ways, for

instance, cost savings due to the reduction of fines connected with confidences as a result of going along with environmental legislation (Shen and Tam, 2002, pp 535-543).

Newman and Breeden(1992 cited Scanlon 2007, pp 711-723) imply that the acceptance of an environmental management program by a company would have the following benefits, just like a competitive advantage for green marketing as a reply to consumer expectations, media recognition of environmental efforts, the minimization of risks and future costs and positive recognition of environmental efforts by stakeholders.

## 3. The Barriers of Implementing Environmental Management within Projects

The environment is a term used to give explanation about a number of factors and relevant factors of a firm's environment which have an effect on the design of the project manager as well as the importance of pursuing benefits, technology and innovation, environment change, competition behavior, price competition and the number of different project managers faced by the level of barriers (Löfsten and Lindelöf, 2005, pp 725-738). From what has been mentioned above, we can see that implementing the environmental management is not an easy way to go. Getting a successful environmental management we must clean off many barriers.

Even though economic growth and environmental protection are not necessarily reciprocally exclusive pursuits (Kuntz-Duriseti,2004, pp 291-301), critics of the necessary of implementing environmental management still exist. Strengthen the knowledge of environment, when characterized as protecting the environment at all costs, may be infeasible, especially when there is demand for limited resources for more practical, creative and/or higher priority investments, including addressing other environmental troubles.

It seems that there is a certain level of bitterness to the full implementation of environmental management in projects especially in construction, and barriers exist both internally and externally (Shen and Tam, 2002, pp 535-543). For instance, increase in management costs, lack of trained staff, time-consuming for improving environmental performance and so on.

Ever increasing utilization is putting a strain on the environment, polluting the Earth and destroying ecosystems. Large-scale economic development in the developed countries occurring in the first half of the last century has left deep symbols on the accessibility and quality of natural resources. These are dangerous side-effects of the developing countries which will follow the named successful way. Changing the idea of being winning and reinforcing the environmental management with projects has been a common feature of most countries' firms in recent decades. As nations develop and their economies grow, so too does the pollution of environment. For instance, developing Asian countries have shown a steady growth in both population and in economic activity. In addition, the pollution of environment may not only be the result of too many firms competing over a limited market base but also some project managers utilizing environment extremely and abusively to the detriment of other sectors of society, poorer nations, future generations and other species (Hubacek et al. 2007, pp 1084-1096).

As we know, the industry is a project which makes the main contribution to environmental pollution (Shen and Tam 2002, pp 535-543). As a leader of such a industrial project, the project manager's consciousness plays an essential part in the process of implementing environmental management in a project. However, in general, these project managers do not seem to consider that the implementation of environmental management will bring cost savings. A large number of project managers' interviews suggested that there is a net cost increase in implementing environmental management as a consequence of the investment in equipment, staff training, human resources and technology such as water treatment and the application of noise-barrier materials. Industrial project managers' practice demonstrates that the cost of implementing environmental management is far more than the worth of the cost savings speculated (Shen and Tam 2002) which are very harmful for implementing environmental management in the project.

From a recent report (Chopra et al. 2001, pp 67-75), I get an information that nearly 71% of the people surveyed in one country have no knowledge about environmental management issues. The low level of consciousness regarding the environmental impacts of inappropriate management of environmental makes it difficult to implement environmental management in projects especially in industry. In putting the method to implement environmental management just like recycling and disposal programs into practice, cooperation between both the public and the private sectors is required to make sure the success of the environmental management program.

As can be seen from the description above, we can get a fact that the firms stated that the problem they typically came across while implementing the environmental management practices is lack of environmental awareness in all the areas including in the employees, suppliers and customers (Yüksel, 2008, pp 50-57). As a consequence of society does not have sufficient awareness, firms face many troubles in collecting the components to be recycled. If environmental awareness in the society increases, the success of the environmental plans is expected to rise. The firms also stated that they encountered with many troubles on account of the employees lack of education and awareness on environmental issues. For this reason, the practices for increasing the environmental awareness of the employees are those that the firms mostly concentrate on while implementing environmental programs. The fact that firms consider environmental

issues as cost drivers was explained in previous depiction. In this analysis, the firms stated the same trouble that environmental practices bring considerable costs. As well as these, the firms face challenges in the practices of dealing with pollution and complying with the laws. The support and incentive of the government on environmental issues may assist the firms to minimize these. In addition, customers have very important roles in the success of the environmental management implementation.

What is more, financial restrictions, increase in transport costs, improper location of landfills, shortage in industrial and bulk waste separation, the limited availability of trained and skilled personnel, and the low consciousness level regarding health and environmental impacts can slow the establishment and implementation of environmental management.

## 4. Finding an Effective Way to Improve Environmental Management in Projects

In the competitive world, the firms want to get much more benefits must pay for much more efforts than before. The number of factories in this world is increasing every year in company with production with the purpose of fulfill the market demand and to take advantage of opportunities to export to the other factories. The focal point of industry is on the number and quantity of products, but industrial waste production during the withdrawal of resources, production processes and use by consumers has been by no means considered in the overall manufacturing design which could cause serious environmental risks to the air, water and soil of the world (Mrayyan and Hamdi, 2006, pp 195-205). From what have been mentioned above, we can have a conclusion that finding an effective way to improve environmental performance in projects especially in industry is very important.

Recycling is an effective way which can reduce the pollution and produce beneficial materials. This method represents a significant way of dealing with the pollution with a high potential for future development. Recycling is growing all over the world, encouraged by the economic and environmental benefits it brings. The manufacturers can use recyclable materials which are mainly paper and cardboard. Manufacturers must be encouraged to recycle part of their industrial products though the successful implementation of recycling faces many difficulties such as low levels of consciousness and the lack of appropriate funding. Recycling can be supported by encouraging separation at the source. The best method of waste separation at the source can be stimulated by financial incentives, legislation and the raising of environmental awareness (Mrayyan and Hamdi, 2006, pp 195-205).

From a recent report we can see that in this first stage of the 21st century, all corporations must thoroughly understand how social pressures are affecting their markets as well as become accustomed accordingly. The pressure to evidence corporate social liability is causing companies to place increasing demands on manufacturers to be accountable for the full life-cycle of the products they manufacture (Hawken et al. 2000 cited Scanlon, 2007, pp 711-723).

From a research by Johnstone et al. (2004, pp 685-707) I know that the most important factors of making the firms adopt the environmental plan were government regulations, neighborhood/community groups and customers. The sales-to-asset ratio had a negative sign, but was not mainly important. What makes me surprising is that the firm size was not important. As what have been discussed above, I can see that the government must do something in implementing the environmental management. In order to deal with the environmental problems, the government should act out laws on environment protection such as the ratification of Environment Protection Act, Water Pollution Protection Act, Air Pollution Protection Act, Solid Wastage Pollution Protection Act and Noise Pollution Protection Act. Those regulations will provide guidelines for those practitioners to tighten up environmental protection (Zeng et al,. 2005, pp 645-656).

In the organization of project management, the effective way to leads much better environmental performance relies on the utilization of knowledge. As a result that many small actions and decisions that all parts of this organization can make in their everyday work can cumulate to large improvements in the environmental impacts of the organization. Employees should be brought to understand how they may contribute to the efforts for sustainability authorized by the organization. Without their ingenuity and expertise, the environmental management and sustainability proposals of an organization may be limited to a number of technical improvements and pass over large efficiency gains initiated by the work force. Cohen-Rosenthal and Hale (2000 cited Perron et al,. 2006, pp 551-562) make an appoint that an effective way for improved environmental performance requires that all employees in an organization have knowledge of the natural systems and their functioning in addition to understand their effect on project performance. This understanding allows the employees to take part in the environmental management effort, and helps develop environmental performance of the company.

Two recognized ways to manage uncertainty effectively in environmental decision making: safe minimum standards (SMS) that seek to keep away from worst case scenarios and an expectations approach that averages across possible outcomes. Taken together, the SMS and expectations approach place upper and lower bounds on a precautionary rule response. On the other hand, both of these methods are suboptimal from a welfare perspective, which is a significant consideration for policymakers. The SMS approach leads to policy advices that may be too precautionary from a

cost–benefit point of view, while the expectations way does not adequately address the welfare costs uncertainty itself imposes.

The promotion of environmental management and the assignment of sustainable development have given rise to pressure demanding the adoption of proper ways to improve environmental presentation across all projects including industry. Industry is not an environmentally friendly activity naturally. Existing research puts forward that industrial activity is a main contributor to environmental pollution (Shen and Tam, 2002, pp 535-543). As a result, we must put the most of our efforts in industry.

In following the mission of sustainable development, efforts towards practicing environmental management in the projects concluding industry have been growing rapidly. The environmental management system (EMS) is built as a tool based on this trend. An Environment Management System (EMS) is a tool for managing the impacts of a project management's activities on the environment. It provides a structured approach to planning and implementing environment protection measures. The EMS defined in the standard ISO 14000 is promoted as a vehicle for organizations to develop environmentally friendly performances. The system provides a standard structure that includes environmental policy, planning, completion and operation, checking and corrective action, and measurement review and development. It was developed to support project managements to improve their environmental management on a voluntary basis through logical allocation of resources, assignment of responsibilities, and continuing assessment of practice (Anon. 2007). An EMS is a structured method to managing the environmental effects of a group's operations and a positive tool for communicating the value of an environmental program to a broad variety of audiences. A complete EMS contains defining specific environmental indicators that can be tracked and regularly assessed to decide whether operations change to become more environmental friendly. The acceptance of an EMS as a framework for integrating company environmental protection programs and practices is growing among both domestic and multinational companies around the world. Hui et al. (2001 cited Argandoña 2004, pp 41-52) suggested that implementing the EMS provided an useful guidance for companies to concurrently establish, develop and review their business practices towards both corporate and environmental targets.

From what have been discussed in Hawken's et al. (2000, pp 87-90) article, we can see that in this first stage of the 21st century, all companies must thoroughly recognize how social pressures are affecting their markets and adapt accordingly. The stress to evidence corporate social responsibility is causing companies to place increasing demands on their project management to be accountable for the full life-cycle of the products they product. A project manager in environmental management is seen as a driving part in the success of implementing environmental management programs. From this we can get a conclusion that the corporate leadership—project manager's consciousness is also an essential part in the process of improving environmental management.

The consciousness and eagerness to improve industrial environmental performance depends on many different factors. Generally speaking, the higher the external stresses, the higher will be the commitment of any company leader. As bigger companies attract more attention, are more uncovered to external pressures and have a bigger impact they will naturally become more conscious and be more eager to improve their environmental performance. For this purpose, they will also allocate more resources than smaller companies. From a recent survey (Hicks and Dietmar, 2007, pp 395-408) we can know that large companies are demonstrating an increasing willingness to address environmental and social responsibility issues. It should be made a note of the survey that despite the restrictions of the survey, those companies involved must be considered to be the forerunners or "early adopters" that will set the performance standards for later followers. As a result, similar to environmental monitoring standards are of limited use if companies are incapable of meeting their criteria. In addition, unlike larger companies, small companies without a position in an international supply chain or division of labor are under less external pressures to improve their environmental performance. In general, raising the large company's awareness of improving environmental management in projects is bearing the brunt of all the activities.

## 5. Conclusions

The connection of results obtained from this paper has highlighted the fact that key barriers and drivers change on a national basis, owing to local circumstances, such as waste disposal costs, raw material costs, legislation and stakeholders' awareness and so on. The fact that these key barriers and drivers also differ on a part basis also highlights the current mistake by current research (Burke and Gaughran, 2006, pp 566-575). However, we still can get the sustained key drivers and barriers from these uncertainties. As a result, the majority of current research should focus on the benefit of implementing environmental management, the barriers about it and the effect ways to deal with it.

This paper observes the importance of various benefits, barriers and measures from and for implementing environmental management in projects within the industry. The results of the analysis point out that contribution to environmental protection, reduction of environmental risk, improving environmental management and cost saving due to the reduction of environment-related convictions were considered the most significant benefits of implementing environmental management in projects especially in industry. On the other hand, the existence of barriers for

implementing environmental management has been established, and major barriers include increasing management cost, lack of trained staff and expertise, lack of sub-contractor cooperation, lack of stakeholder awareness and time-consuming for improving environmental performance and so on. At last, it gives some ways to implement the environmental management.

As we know that a majority of firms is competing in a reality of limited resources and interlinked ecological systems. The implementation of environmental management methods requires that the values and culture of the company must permeate the activities of the organization and be adopted by all personnel. The implementation of environmental management systems or other forms of responsible environmental management require some level of change in the companies' values and culture to permeate the organizations' behaviors. These systems and this change in culture require a useful and sustained education and awareness effort to ensure that the information necessary for environmental management is acquired and retained, or the benefits of implementing environmental management will most probably not be realized (Power et al.2004, pp 37- 42).

When a firm realizes that its main stakeholders use their power to influence its environmental management practices, it tends to adopt an explicit mode of environmental management (Céspedes-Lorente et al.2003, pp 333-358). Hence, my investigation suggests that improving the stakeholder's awareness of environmental management is very essential. There is no doubt that much work remains to be done if we are to recognize how to improve environmental management in projects.

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# Quality Improvement in a Global Competitive Marketplace- Success Story from Nigeria

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**Abstract**

In today's global competitive marketplace, the demands of customers are increasing as they require improved quality products and services. This article puts forward a framework for quality management in organizations with reference to Owena Bank in Nigeria which launched the Programme code-named "Quality is Money (QIM)", a domesticated version of Total Quality Management and a scheme tagged "Error-Free Banking or We Pay". For this study, the fifty six (56) organizations in Nigeria that responded represent fifty five per cent (55%) of the total number sampled. The propositions are tested using simple statistical table with responses "YES" and "NO". The tables show that 35 organizations (62.5%) have actually implemented TQM, while 32 organizations (91.4%) were successful. The results support the argument that the level of success among organizations that have implemented TQM in Nigeria is high considering the fact that three out of every four that have implemented were successful. These results should encourage organizations that are still contemplating its implementation.

**Keywords:** Quality, Improvement, Marketplace, Competitive, Success, Global

## 1. Introduction

The increasing demand and sophistication of customers have virtually modified the rules of competition and forced organizations to focus on quality. Today, what underlies competitive advantage is the ability to provide products and services that meet or exceed the needs of customers. This implies that to survive, organizations must device new management systems based on the tenets of Total Quality, and by offering quality products and services. This will not only lower costs but also outperform the products and services of competitors spread across the world. This is the driving force behind Total Quality Management. Global economic competition has increased in the past few decades (Nosakhare, 2000).

Organizations are facing the kind of competition that was not envisaged a few years ago. They have to compete with goods and services from all over the world and satisfy a more educated and sophisticated customer. What is satisfactory to the customers today may not be regarded as such tomorrow as their expectations are continuously changing in a global changing environment. Moreover, the fall-outs of a deregulated global competition have offered customers choices among various alternatives.

According to Ho (1999, p. 69), "At the close of the century, the creation of the global market, the international orientation of management which sweeps national boundaries, the introduction of new technologies and shifts toward customer focused strategies, make the competition stronger than ever". Quality Management (QM) has been recognized as a comprehensive management paradigm for enhancing organizational performance and competitiveness. Empirical research shows that quality management practices affect firm performance and competitiveness (Das, Handfield, Calantone, & Ghosh, 2000; Douglas and Judge, 2001; Kaynak, 2003; Flores, 2008).

*1.1 Propositions for the Study*

i)   Many organizations have implemented TQM in Nigeria.

ii) TQM implementation among organizations in Nigeria is successful.

The purpose of this paper is to disseminate the research findings through the true story of Owena Bank in Nigeria as one of the organizations in Nigeria which implemented successfully quality improvement via a launched programme code-named "Quality is Money (QIM)", a domesticated version of Total Quality Management and a scheme tagged "error free banking" or "we pay".

From the story in this paper, it is expected that other organizations in the global economy which do not practice Total Quality Management or the implementation of continuous improvement, will learn from Owena Bank. Since no one

organization can boast of holding license to the development and delivery of quality products or services, many organizations have to embrace the concept and principles of Total Quality Management as a way of survival.

## 2. The Concept of Total Quality Management (TQM)

The definition of the concept of TQM is multifarious, but from whatever perspective it is defined, it talks about meeting customer requirements (providing customer satisfaction) which is a primary objective of quality management, if they are to succeed. Organizations exist to provide a service or product to its customers who are becoming more demanding and are seeking higher quality, better value, and lower costs. These customer requirements mirror the global economic pressures organizations face in their own businesses. Total Quality Management (TQM) is a quality management system which requires the cooperative endeavor of every one in the organization to produce services or products that looks at quality from the customer's perspective. All services or products must meet or exceed the customer's expectations. Under TQM, quality is an essential part of every stage of the production process and not merely an inspection at the end.

TQM is the foundation for activities, which include commitment by senior management and all employees, meeting customer requirements, reducing development cycle times, improvement of teams, employee involvement and empowerment, focus on processes and improvement plans, among others. This goes to show that TQM must be practiced in all activities, by all personnel, in all organizations (Hyde, 1992; Flores, 2008).

In the study of Total Quality Management in Nigeria, several important principles of this management philosophy that influence its successful implementation are brought to the forefront. These include management commitment, customer focus and satisfaction, employee empowerment, continuous improvement, and organizational culture and attitudes. Others are education, teamwork, communication, measurement, and process chain. It is these tenets of TQM that will constitute major areas of review.

### 2.1 Principles of Total Quality Management (TQM)

Among the key principles of TQM presented by Martin (1993), this paper pays attention on the principle of Continuous Improvement, Recognition of Staff, Customer Focused Satisfaction, Commitment by Senior Management and all employees and Training and Development.

#### 2.1.1 Continuous Improvement

Implementing continuous improvement in managing everyday business activities is relevant to all those who participate in and contribute to the success of the organizations. Continuous Improvement entails Systematic measurement and focus on product/service, Excellence teams, Cross-functional process management, Attainment, maintenance and improvement of standards. Global competition for increasingly demanding customers has necessitated changing acceptable standards. What appear to be best products/services today may be disregarded tomorrow.

Customer expectations are increasing and changing with the dynamics of global environmental changes. Organizations are benchmarking one another so as to unravel the secrets behind their successes. According to Quirke (1995), the major challenge to organizations is how to acquire customers, retain them, build relationships with them and discover ways of being more valuable to them before the competition does. No organization can achieve this without continuously improving not only its products or services but also processes and people.

Continuous improvement refers to "the constant refinement and improvement of products, services and organizational systems to yield improved value to customers" (Stahl, 1995, p. 261). One unique attribute of continuous improvement which has paid-off for organizations that have focused on it, is that looking for ways to continuously improve the quality of products or services in the absence of customer complaints and problems may preclude a future problem (Stahl, 1995). In the words of Ho (1999, p. 30), "TQM is a necessity. It is a journey. It will never end." Continuous improvement involves both innovation and maintenance, and improvement through small steps, however often leading to radical breakthrough (Wilkinson, Redman, Snape and Marchington 1998).

While the views of the aforementioned management scholars are in line with what any aspiring quality organizations are expected to implement, Nosakhare (2000) is of the view that as a requirement, Total Quality organizations should embark on benchmarking and self-assessment to drive continuous improvement. This will help to achieve the goal of continuous quality improvement in products or services and delivery processes. It will also avoid the common trap of allowing conformance to become a goal in itself.

#### 2.1.2 Training and Development

Crosby in analyzing how he founded Philip Crosby Associates (PSA) in 1979 and the Quality College said that the idea of causing quality to become a normal part of an organization's operating arsenal did not catch on automatically (Crosby, 1996). It takes training and development of staff towards the organizational objectives of continuous improvement to meet up with sophisticated customers needs and excel the competitors in the global market economy. Organizations should take into account that before external customers can be satisfied, some of the obstacles to the

internal customers, that is, the employees should be dealt with in order to create the conditions necessary for them to produce and deliver quality. It will be difficult if not impossible to meet and exceed the expectations of the external customers if quality is not delivered to and through the internal customers. Every employee in an organization must be provided with the necessary education and training. Although, many traditional organizations view employee training and development as unnecessary overhead and costly, but, it is the fulcrum in implementing the Total Quality Management process. Many Total Quality organizations view employee education and training to yield improvements in customers' value as the key to organizational success. TQM will not work unless all employees are trained to use the tools". Based on field research, Unruh (1996, p. 85) believes that "training is the number-one way that organizations focus their employees on serving customers". Oakland (1995, p. 309) agrees with him in terms of the importance of training as he believes "that training is the single most important factor in actually improving quality, once there has been commitment to do so".

In the past, organizations maintained the traditional notion of "If it is not broken, do not fix it". But in today's changing business environment where competition has increased the awareness and demands of customers, continuous improvement requires something more than the traditional method of solving problems when they arose. Today, "the spirit of continuous improvement" in Total Quality organizations, according to Stahl (1995, p. 47), is "If it is not perfect, make it better, and it strives for a continuous stream of base hits, rather than waiting for the home run".

This improvement theme requires several tools and different ideas, including understanding the kinds of variation in a process. It requires a proactive rather than a reactive mindset. The spirit of continuous improvement requires men and women who have the "can-do" attitude and desire for excellence. They must be committed to continually "improving a thousand things by one percent rather than one thing by a thousand percent". The most effective means of doing this is to use the people who do the job to identify and implement appropriate changes. This can only be achieved if employees are given adequate training and development.

In commenting on the effectiveness of continuous improvement in achieving organizational quality objectives, Stahl (1995, p. 261) posits that training and development should not be seen as a one-time event but a lifelong process. Many organizations recognize today that due to the massive changes taking place in the business world, booster shots of training and development are needed throughout employee careers. This will help them to acquire the necessary skills to initiate improvement strategies that would add value to customers.

### 2.1.3 Recognition of staff

Recognition should be provided for both suggestions and achievements for teams as well as individuals. Employees strive to receive recognition for themselves and their teams. Detecting and recognizing contributors is the most important job of a supervisor. As people are recognized, there can be huge changes in self-esteem, productivity, quality and the amount of effort exhorted to the task at hand. Reward and recognition systems which emphasize the achievement of quality objectives truly motivate the work force to fully participate in quality improvement activities. Recognition comes in its best form when it is immediately following an action that an employee has performed (Bhavin, Bhanubhai, Dineshbhai, Nilesh, & Ashish, 2007).

### 2.1.4 Customer Focus and Satisfaction

Customer satisfaction is the driving force that propels organization existence. Customer Focused Satisfaction entails supplier partnership, service relationship with internal customers, never compromising quality, customer driven standards. In considering the extent of customer satisfaction in Total Quality practice, the US Department of Commerce in a 1993 quality award criteria examined organizations relationships with customers, and knowledge of customer requirements and of the key quality factors that drive marketplace competition. They infer that an understanding of customer requirements derives from thoroughness and objectivity of the organization, customer types and product/service features. Other key excellence indicators for customer satisfaction, according to Ross (1995) are a resolution by management to empower frontline staff, strategic infrastructure support for frontline employees and attention to hiring, training, attitude, and morale for frontline employees. Ross is of the view that these activities will help employees relate to customers in highly professional manners and also provide services/products that will satisfy their requirements. While the researcher agrees to some extent with the propositions of Ross, frontline empowerment and other issues raised are not in themselves sufficient conditions to providing focus and satisfaction to the customer. Proactive customer service systems, proactive management of relationships with customers, and the use of all listening posts – surveys, product/service follow-ups complaints, turnover of customers and employees, should also be adopted as key excellence indicators for customer satisfaction.

Since the quality of a product is not in itself but in what the customer says it is, customer focus and orientation should provide a common goal for all organizational activities and members. It incorporates the quality of design and conformance to quality specification. According to Unruh (1996, p. 23), "even if an organization is not focused on its customers, its competitors are. And the customers know where to find those competitors". He also believes that

"customer focus is not a one-time-only program. It requires a permanent ongoing commitment of all organizational resources".

For an organization to achieve success in any customer focus initiative, it is crucial that it has an understanding of customers. According to Unruh (1996) Customer needs and values should influence every aspect of the organization: strategy, employee staffing and performance, product and service development, sales and marketing programs, operational procedures, information and measurement systems. Customer focus and satisfaction not only enable organizations to know what customers think about them, their products, and their competitors, but also to know about the personal lives of their customers.

### 2.1.5 Commitment by senior management and all employees

Customer focus and satisfaction is related to management commitment. According to Unruh (1996, p. 37), "Do not start a customer focus initiative without top management commitment. Employees and customers will not take the effort seriously. It will end before it has had a chance to begin". The focus on customer satisfaction applies to both internal customers and external customers. Ross (1995, p. 208) define Internal Customers as "the people, the activities, and the functions within the company that are the customers of other people, activities, or functions". To achieve the involvement of every employee requires their commitment. Commitment requires understanding. Understanding requires training. Training requires management commitment, planning and time (Munro, Munro, & Bones, 1993). Every employee needs to understand the reasons for TQM, what it means to them and how they are equipped to contribute. Commitment and communication by top management also influence fundamental beliefs, values, and attitudes necessary for employees' empowerment and commitment to quality and service (Quirke, 1995; Robertson, 2003). According to Mondy and Premeaux (1995, p. 572), "a TQM culture encourages more employee participation in problem solving and decision making.

## 3. The Nigerian Standards Organization and Quality Challenges

The Nigerian Standards Organization (NSO) was established by Decree No. 56 of 1971. It was vested with the sole responsibility for elaborating standards for products and processes, ensuring compliance with the Federal Government's policies on standardization and quality assurance of locally manufactured goods, services, imported products, as well as metrology, throughout the country. The Decree has undergone three amendments since the promulgation.

### 3.1 The Functions of the Standards Organization of Nigeria

The functions of the Standards Organization of Nigeria as spelt out in its enabling Decree No. 56 of 1971 and its subsequent amendments include:

a) To organize and do everything necessary to ensure compliance with standards designated and approved by Council;

b) To undertake investigations necessary into the quality of facilities, materials and products in Nigeria so as to establish a quality assurance system including certification of factories, products and laboratories;

c) To ensure reference standards for calibration and verification of measures and instruments;

d) To compile an inventory of products requiring standardization;

e) To compile Nigerian standards specifications;

f) To foster interest in the recommendation and maintenance of acceptable standards by industry and general public;

g) To develop methods for testing of materials, supplies and equipment including items purchased for use by departments of the Government of the Federation or a state and private establishment;

h) To prescribe standards for mandatory status;

i) To establish and maintain such number of laboratories for its functions under the law;

j) To undertake preparation and distribution of standards samples;

k) To compile and publish general scientific or other data, resulting from either the performance of its functions under the law or other sources when such data are of importance to scientific or manufacturing interest or to the general public and are not available elsewhere;

l) To advise any department of the Federal Government or a State Government, on specific problems relating to standards specifications;

m) To sponsor such national and international conferences as it may consider appropriate;

n) To co-ordinate all activities relating to its statutory functions throughout Nigeria and to co-operate with corresponding national or international organizations in such fields of activity as it considers necessary with a view to securing uniformity in standards specifications;

o) To undertake any other activity likely to assist in the performance of the functions prescribed for it under the Act setting up the organization.

In Nigeria, the co-ordination of the National Standardization work is the responsibility of the Standards Organization of Nigeria (SON). The organization is charged with the task of formulating, reviewing and adopting for suitable use, the Nigerian Industrial Standards (NIS) for products, processes and services and to ensure compliance with the various National Policies on Standardization (Quality Assurance).

## 4. Methodological Approach

This research attempted to discover how many organizations implemented TQM in Nigeria and the level of successful implementation.

### 4.1 Samples for Investigation

To achieve a fair level of representation, one hundred and two (102) organizations, covering manufacturing, trading, oil and gas, banking, insurance, investments, services, and government controlled corporations were selected. Both the privately owned and publicly quoted companies were well represented. The key sub-sectors of the economy were also considered and the leaders were selected as part of the sample. Based on the Nigeria Stock Exchange capitalization, the quoted companies included in the sample represent over ninety percent of the total market. Organizations that are fully or partly owned by foreign interest were also included, but, with a higher representation of wholly indigenous organizations.

These organizations have a wide network of operations spreading over all nook and cranny of Nigeria. Covering the whole country as their market, with every major participating sector represented, results of the research is expected to give a fair representation of this big country. The complete list of organizations in the sample and those that actually responded can be found at the end of this article.

The fifty six (56) organizations that responded represent fifty five per cent (55%) of the total number sampled. Five questionnaires were sent to each organization giving a total of two hundred and eighty (280). Out of the five questionnaires per organization, some of those that responded actually returned two, three or four. They were to be completed by five senior executives and a total of two hundred and thirty six (236) were actually returned completed. The response was representative enough of the different segment of the sample size. These 56 organizations and 236 respondents form the sample size for the data analysis.

### 4.2 Method of Data Collection

Two methods of data collection were adopted which include:

4.2.1 Structured Questionnaire

A well-structured questionnaire was drawn and administered on companies from various sectors of the Nigerian economy, including manufacturing and trading concerns; companies in the service industry such as banks, insurance companies, hotels; and the energy sector. Government controlled or public corporations were also included. The questionnaire was designed to elicit information from senior executives of organizations about their organizations and their persons.

4.2.2 Personal Interviews

Personal interviews were conducted with two consultants at Trithel Consulting, Lagos, who specializes on Total Quality Management training for organizations in Nigeria, and key officers of a few organizations that have implemented TQM successfully. The purpose was to get external opinion on how TQM had impacted on organizational successes in Nigeria as well as the level of awareness and appreciation generally. Another reason was to get insider knowledge of the success stories of some organizations that have successfully implemented TQM and one of them is presented in this article. The questionnaires and personal interviews constitute the primary source of data.

### 4.3 Method of Data Analysis

Considering the objectives of the study and the nature of the research, the statistical methods employed in the data presentation is a simple statistical table of percentage of frequency with responses "YES" and "NO" as presented in tables 1 and 2, believing that fairly accurate judgments can be made using this approach based on the number and spread of organizations as well as the number of individual respondents.

### 4.4 Findings

Table 1 shows that 35 organizations (62.5%) have actually implemented TQM, while 21 (37.5%) have not. This validates proposition 1 which states that many organizations have implemented TQM in Nigeria.

Table 2 demonstrates that 32 (91.4%) organizations were successful in TQM implementation, while 3 (8.6%) were not. This further confirms proposition 2 which states that TQM implementation among organizations in Nigeria is successful.

The level of success among organizations that have implemented TQM in Nigeria is high considering the fact that thirty two out of thirty five organizations that implemented were successful. This should be very encouraging to organizations that are still contemplating its implementation. The story below further discusses and confirms this discovery.

*4.5 TQM Success Stories in Nigeria - Owena Bank Plc*

In its 1993 financial year, Owena Bank posted a loss of N215.8 million and it was mired in the mud of distress. At that time, customers were moving their businesses away fast and even employee morale and confidence was very low. The shareholders decided to put a new management in place.

The objective of the new management was to reposition, restructure, and refocus the bank. One of the strategies was the initiation of a customer service orientation that was considered the most innovative and most successful in the banking industry since the deregulation of the money market. They launched the programme code-named "Quality is Money (QIM)", a domesticated version of Total Quality Management.

The programme was a comprehensive customer service package aimed at matching promises of quality with actual delivery. Under the programme, there was a scheme tagged "Error-Free Banking or We Pay". The bank offered to pay varying degree of compensation to customers for every error committed in the course of serving the customer. There is a guaranteed compensation

The success of QIM at Owena Bank earned the bank a new image of a customer service bank. The efforts also contributed to the bottom-line as well as staff morale. From a loss position of N215.8 million in 1993, the bank posted a profit before tax of N48.9 million and N50.4 million in 1994 and 1995 respectively. This figure grew to N122.3 million in 1997 and N235 million in 1998. The bank projected to post profit before tax of over N1 billion in 2000 (Nosakhare, 2000).

The bank has increased its market share and has won many awards including:

a). This Day Quoted Company of the Year Award for 1997
b) Bank with the highest Return on Investment (ROI) for 1997
c) PEARL Award for Market Excellence 1998
d) President's Merit Award of the Nigeria Stock Exchange for 1998 as the company with the highest Return on Equity (ROE).

With the focus on continuous improvement of processes to meet and exceed customers' needs and expectations by the bank, we cannot but agree with its slogan that "things are looking up at Owena Bank".

Owena Bank Nigeria Plc is today a leader in customer service. In fact, it is the only bank in Africa to offer to pay customers if unable to provide timely service under its customer service guarantee scheme – **"Error Free Banking" or "We Pay"** - the objective according to the chief executive was to make it one of the five leading banks by the turn of the century using specific measurable performance indicators. (Newswatch, 1998).

**5. Conclusion and Recommendation**

The story above has proved that in every organization, the framework to total quality management and continuous improvement should be adopted and implemented. It should be flexible and capable of fine tuning to meet the business needs and requirements of the customers in this competitive global marketplace. Owena Bank Plc employed all the concepts of TQM discussed in this paper and exceeded that with their launched programme code-named "Quality is Money (QIM) and its customer service guarantee scheme – "Error Free Banking" or "We Pay" to exceed their competitors.

Team work should be established and become part of the organization's method of working. Following these, task forces or project teams and cross-functional improvement teams should be established to address the major problem facing the organizations with lower quality.

Process analysis and improvement should be a continual part of the organization's improvement process. Process planning should focus attention on customer relationship. Once key business processes have been identified along with their process, rationalization, identification and simplification of key performance measures can occur. Indeed, recent work suggests that the high failure rate of quality management initiatives results from a mismatch between these processes and critical problems in their respective environments; in short, that quality management should be seen and properly executed as a contingent process (Melcher, Khouja, & Booth, 2002; Das, Handfield, & Ghosh, 2000; Claycomb, Droge, & Germain, 2002; Wang, 2004)

Discussion with customers about the performance expected, their needs and expectations using a variety of techniques should be undertaken in every organization. The main objective is to build partnership with customers, to develop customer loyalty and hence to build competitive advantage.

Organizations should note that quality improvement in total business activities, with a focus on the internal and external customers throughout the entire organization is one of the main means by which they meet these demands. This is why quality of products and services are looked upon by many organizations as the means by which they can maintain a competitive edge over their rivals.

In addition, the role of people within the organization should be recognized. The way these people are treated is pivotal to quality improvement, since they are intellectual asset whose value to the organization can be increased by careful nurturing. The means of involving people, making them to be committed, training and developing them must be identified. A skill audit is a useful starting point for this.

Above all, if critical factors like Commitment by Top Management and all employees, Training and Education, Focus on Customer Satisfaction, Total Involvement and Participation, Co-operation and Teamwork, Employee Empowerment, Adequate Planning and Monitoring, Reward and Recognition, Strong Leadership,  Effective Communication and Feedback Mechanism are effectively in place in organizations, quality improvement will be achieved successfully.

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Table 1. Has your organization implemented TQM?

| Responses | Out of 56 organizations | Percentage Frequency |
|---|---|---|
| Yes | 35 | 62.5 |
| No | 21 | 37.5 |
| **Total** | **56** | **100** |

Source: Field study, 2000

Table 2. Was your organization successful in TQM implementation?

| Responses | Out of   35 organizations | Percentage Frequency |
|---|---|---|
| Yes | 32 | 91.4 |
| No | 3 | 8.6 |
| **Total** | **35** | **100** |

Source: Field study, 2000

Table 3. The summary of the list of organizations sampled.

| Organizations | Number of Organizations | Sampled Responses |
|---|---|---|
| Banks | 26 | 19 |
| Discount Houses | 1 | 1 |
| Insurance Companies | 11 | 4 |
| Manufacturing/Trading Concerns | 42 | 22 |
| Energy Sector | 9 | 2 |
| Hotels | 4 | 2 |
| Government Corporations | 5 | 2 |
| Courier Company | 1 | 1 |
| Investment Companies | 3 | 3 |
| **TOTAL** | **102** | **56** |

# On Performance Audit Methods in Commercial Banks

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**Abstract**

Lying at the elementary stage of relevant research, China is still lacking in modern performance audit methods fit for commercial banks. This paper aims at applying data enveloping analysis in the linear programming theory as well as benchmarking management to commercial banks to effectively improve the efficiency and quality of their performance audit. In addition, the application of this method is illustrated in this paper to prove its reasonability and correctness.

**Keywords:** Performance audit, Commercial Banks, Performance audit methods

Performance audit is the mainstream of modern audit as well as the direction of audit development. It is of practical importance to implement performance audit in commercial banks in order to perfect their internal control system, improve their management efficiency and strengthen their duty implementation and so on. Accordingly, their performance audit should be enhanced. However, still lying at its elementary stage, the research on performance audit in commercial banks is confined to theories and short of efficient and feasible methods, which has become a major bottleneck in the development of performance audit in Chinese commercial banks. When having performance audit, only one bank can be audited at one time. This paper aims at applying modern methods to the performance audit of commercial banks to improve its efficiency, quality and level.

## 1. An Introduction to Performance Audit Methods in Commercial Banks

Here, performance audit methods refer to those means and measures utilized by the audit staff in the analysis of performance indicators to achieve their performance audit goals. In addition to general methods such as checking and inventory, some special methods in management accounting, probability theory, planning theory, queue theory, game theory, graph theory, network technology, system theory, control theory, information theory, statistics and econometrics are also employed to make up the method system of performance audit. In this paper, DEA and benchmarking management theory are the main methods employed for commercial banks' performance audit.

### 1.1 Data Envelopment Analysis

As a method of relevant effectiveness evaluation among organizations at the same level, data envelopment analysis (DEA) enables us to deal with relevant effectiveness evaluation among different input-output departments. This model based on the linear programming theory integrates multi-input indicators as well as multi-output ones into a single evaluation indicator. Each system can be viewed as a process of transformation from input to output in order to achieve the goal of a decision making unit (DMU). A system may include several units of this kind, each one of which is a kind of engagement and may be a school, a hospital, a courthouse, an air base, a bank or an enterprise. This system has the characteristics that all DMUs can be regarded as the same subjects, that is, they have the same input and output from the same perspective. Through comprehensive analysis on input and output data, DEA will result in the quantitative indicator of each DMU's comprehensive efficiency, confirm effective DMU, point out the reason and degree of other DMUs' ineffectiveness and then give some advice on performance audit to relevant departments.

The $C^2R$ model with non Archimedean infinitesimal vector serves as the main method used in this study because it is of great convenience in both judging the effectiveness of DMU and projecting ineffective DMU onto the relevant effective surface. Actually, the former is the evidence to measure the performance of banks in gaining certain amount of outputs at the expense of certain resources while the latter is the basis for giving relevant audit advice. Therefore, this $C^2R$ model is chosen as the basic model of DEA in this paper.

### 1.2 Benchmarking Management Theory

As a systematic and constant evaluation process, benchmarking management is intended to acquire information on the improvement of performance by constantly comparing a company's business process with that of those leading ones. Benchmarking management was put forward in U.S. enterprises in the beginning of 1980s to compete with the strongest opponents, to learn from the most outstanding companies' experiences and to have their reforms accordingly. Xerox

Company is the most typical representative to conduct such management.

In this study, benchmarking management is introduced mainly to compensate for a limitation of DEA, that is, with the relevant effectiveness of DMU evaluated in DEA, a bank with effective DEA can still be chosen even when none of the samples for performance audit has satisfactory performance, which departs from the actual demands of performance audit. In order to solve it, benchmarking management is used to revise DEA in the performance audit of commercial banks in this study.

## 2. The Application of the above Methods to Commercial Banks' Performance Audit

When applying DEA to commercial banks' performance audit, we can regard the audited bank as DMU and its performance indicators as the input and output of DMU. For example, the input section may include the average staff, the average assets and the overall expenses during the period; the output section may be composed of the total deposit, the total loans as well as the total profits. Data from both sections is used to evaluate the bank's performance. Based on the characteristics of commercial banks' performance audit, we choose the $C^2R$ model and conduct the audit process in the following steps:

After the establishment of the $C^2R$ model, by solving the input performance indicators with linear programming, we will learn about the DEA effectiveness of DMUs. Then, for those DMUs with effective DEA, another analysis should be conducted along with the model banks to see whether they really have excellent performance. For those ineffective ones, some problems in performance audit are exposed, showing that certain input cannot produce corresponding output, not only economics output but efficiency and effect one. As a result, analysis of DEA projection should be conducted to give relevant advice.

## 3. Advantages of the Employed Method

First, this method is characterized by its objectivity since it doesn't set corresponding weights and therefore the weights of all commercial banks' performance indicators are generated automatically by the model itself, hence avoiding being influenced by subjective factors.

Second, the judgment on DMU effectiveness in this method is vital to evaluate whether a commercial bank achieves excellent performance by gaining certain amount of output at the expense of certain resources.

Third, Projection analysis on ineffective DMU in this method can help to find out ways to convert ineffective DMU to effective one, hence providing an important basis to give audit advice.

Fourth, the analysis on DMU effectiveness can also tell us whether we should increase or cut down the input of relevant resources, hence providing another important basis for audit advice.

## 4. Case Study

Based on the performance audit of 7 commercial banks in a city conducted by its audit department, this paper will elaborate on the application of the mentioned method along with its reasonability, correctness and practicability.

The audit department has collected and evaluated these banks' performance audit evidences as well as conducted relevant pre-audit investigations and risk appraisals. The specific indicators and data are shown in Table 1.

By constructing the model and having analysis with DEA, we get the results shown in Table 2.

According to a relevant theorem of DEA, when $\theta$ =1, the DMU has effective DEA. As is shown in Table 1 and Table 2, A, C, D have effective DEA, hence having excellent performance, while B, E, F, G have ineffective DEA, hence leading to projection analysis. The result is shown in Table 3.

The projection analysis provides basis for advice on performance audit.

In the case of DMU with effective DEA, a comparison with the set model should be conducted. By checking on the internet and having on-the-spot interviews, the audit department collects materials on the most excellent performance and its data and sets the model unit abbreviated as $DMU_N$. It needs to be explained that the data of the model unit is not necessarily the actual data of a banks' performance indicators, but a complex of all the best performance indicators from all the banks. After eliminating disparity factors, DMU1, DMU3 and DMU5 have effective DEA. The data of the model indicators are listed in Table 4.

Then, another model is constructed to have DEA on the model data and that of the DMUs with effective DEA. The result is shown in Table 5.

It can be concluded from the above table that A, C, D are typical banks with excellent performance with their DMUs of effective DEA proved to be effective when compared with the model.

Then, relevant advice for audit can be given based on the projection analysis and returns to scale. In this paper, advice is given to B as an example.

The advice for B's performance audit is as follows: with its DMU of ineffective DEA, its performance needs to be improved and adjustments should be made to guarantee corresponding output at the expense of certain input of resources; with its average staff (26980) compared with that from the projection analysis (10928), a waste of human resources is in existence, hence calling for reduced scale of recruitment and improved staff quality and efficiency; its asset utilization rate needs to be improved with its average assets (1628.69 billion yuan) higher than that from the projection analysis (1581.76 billion yuan); its overall expenses need to be cut down properly to improve its overall performance with its overall expenses (72.8 billion yuan) higher than those from the projection analysis (70.69 billion yuan).

The conclusions from this study with the combined method of DEA and benchmarking management are basically in consistence with the actual performance of the city that year, exceeding 80%, hence having great reliability.

## 5. Conclusion

This paper is focused on how to employ proper technological methods to efficiently conduct performance audit on an array of commercial banks at one time, how to apply the model of linear programming theory and some methods and models of management to commercial banks' performance audit and the advantages and disadvantages of these methods. However, it must be pointed out that the standards and methods for commercial banks' performance audit do not stay immutable, but vary with different emphasized fields and goals in different audit projects. Therefore, the case study in the paper can only be a sample for reference instead of a fixed pattern for researches of this kind.

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Table 1.

| DMU | Bank | Input indicators | | | Output indicators | | |
|---|---|---|---|---|---|---|---|
| | | Average staff | Average assets | Overall expenses | Total deposit | Total loans | Total profit |
| DMU1 | A | 20505 | 2412.13 | 121.44 | 2291.99 | 1825.4 | 2.77 |
| DMU2 | B | 26980 | 1628.96 | 72.8 | 1466.18 | 1263.44 | 6.64 |
| DMU3 | C | 746 | 184.7 | 6.13 | 161.36 | 145.1 | 0.75 |
| DMU4 | D | 244 | 54.12 | 2.17 | 45.39 | 51.97 | 1.24 |
| DMU5 | E | 8481 | 168.19 | 6.21 | 122.71 | 102.41 | 0.56 |
| DMU6 | F | 1496 | 134.34 | 6.4 | 94.38 | 78.62 | 0.38 |
| DMU7 | G | 1004 | 85.6 | 3.14 | 58.33 | 47.35 | 0.36 |

Table 2.

| DMU | Bank | Efficiency value $\theta$ | Effectiveness of DEA |
|---|---|---|---|
| DMU1 | A | 1.000 | Effective DEA |
| DMU2 | B | 0.971 | Ineffective DEA |
| DMU3 | C | 1.000 | Effective DEA |
| DMU4 | D | 1.000 | Effective DEA |
| DMU5 | E | 0.803 | Ineffective DEA |
| DMU6 | F | 0.751 | Ineffective DEA |
| DMU7 | G | 0.758 | Ineffective DEA |

Table 3.

| DMU | University | | Average number of people | Average assets | Overall expenses |
|---|---|---|---|---|---|
| DMU2 | B | Before change | 26980.00 | 1628.69 | 72.80 |
| | | After changes | 10928.00 | 1581.76 | 70.69 |
| | | D-value | 16052.00 | 46.93 | 2.11 |
| DMU5 | E | Before change | 8481.00 | 168.19 | 6.21 |
| | | After changes | 688.00 | 134.99 | 4.98 |
| | | D-value | 7793.00 | 33.2 | 1.23 |
| DMU6 | F | Before change | 1496.00 | 134.34 | 6.40 |
| | | After changes | 775.00 | 100.89 | 4.80 |
| | | D-value | 721.00 | 33.45 | 1.6 |
| DMU7 | G | Before change | 1004.00 | 85.60 | 3.14 |
| | | After changes | 319.00 | 64.87 | 2.38 |
| | | D-value | 685.00 | 20.73 | 0.76 |

Table 4.

| DMU | Bank | Input indicators | | | Output indicators | | |
|---|---|---|---|---|---|---|---|
| | | Average staff | Average assets | Overall expenses | Total deposit | Total loans | Total profit |
| DMU$_N$ | Model bank | 1404 | 243.67 | 9.38 | 228.77 | 189.1 | 0.34 |

Table 5.

| DMU | Bank | $\theta$ | Effectiveness of DEA |
|---|---|---|---|
| Model unit | Model bank | 1.000 | Effective DEA |
| DMU1 | A | 1.000 | Effective DEA |
| DMU3 | C | 1.000 | Effective DEA |
| DMU4 | E | 1.000 | Effective DEA |

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