

How Asian and Global Economic Crises Prevail in Chinese IPO and Stock Market Efficiency

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Abstract

By considering two time windows of crises, first one is the time period of Asian financial crisis (1997-1999) and the other one is prevailing global economic crisis (2007-2009), the pattern of underpricing and aftermarket performance are studied. A sample of 626 companies and Market adjusted return model are used. Result indicates that in the recent global economic crisis IPO activity is on shrinking trend and there is 10% increase in average underpricing as compared to last Asian financial crisis. There is a fluctuating trend in aftermarket performance of IPO returns. A minimum return of 62% in 2009 is observed. This study also endeavors to examine the efficiency of Chinese stock market and how the Asian and global financial crisis influences the efficiency of Chinese stock market. In order to determine the efficiency of Chinese stock market we apply efficient market hypothesis of random walk. Here we apply ADF, DF-GLS, PP and KPSS tests on stock market returns in order to check the unit root in data series for both Shenzhen and Shanghai stock exchanges separately. The results of the study shows that Chinese stock market is weak form efficient and past data of stock market movements may not be very useable in order to make excess returns. In both periods of crises Chinese stock market is observed weak form efficient.

Keywords: Asian financial crisis, Global financial crisis, IPO, Stock market efficiency

1. Introduction

The Asian financial crisis was a period of financial crisis that gripped much of Asia beginning in July 1997, and raised fears of a worldwide economic meltdown due to financial contagion. The crisis started in Thailand with the financial collapse of the Thai baht caused by the decision of the Thai government to float the baht. Indonesia, South Korea and Thailand were the countries, most affected by the crisis. Hong Kong, Malaysia, Laos and the Philippines were also hurt by the slump. The People's Republic of China, India, Taiwan, Singapore, Brunei and Vietnam were less affected, although all suffered from a loss of demand and confidence throughout the region.

One the other hand global economic crisis of 2007–2010 has been called by leading economists the worst financial crisis since the Great Depression of the 1930s. Economists have now started calling it "The Great Recession." It contributed to the failure of key businesses, decline in consumer wealth estimated in the trillions of U.S. dollars, and a significant decline in economic activity. Many causes have been proposed, with varying weight assigned by experts. Both market-based and regulatory solutions have been implemented or are under consideration, while significant risks remain for the world economy over the 2010-2011 periods. Strong early economic growth, no debt crisis and stable Yuan are the key features due to which china was among the least effected countries in this crisis.

Although the literature on financial crisis setback is very extensive but one dimension that has not taken much attention is the massive falling of stock prices and generation of investments through IPOs in several Asian countries including China, in both crisis especially in recent prevailing global economic crisis. This issue was firstly raised by Kim and Shamsuddin (2006), Cheong et al. (2007) and Hoque et al.,

Now we will come to second part of our study, which is about stock market efficiency. The term market efficiency is broadly used in capital markets to explain the degree to which the present asset price or stock price reflects all available information in the market place and thus relying upon this information one can buy or sell the stocks which should, on average return investors only a fair measure of return after deducting transaction costs for the associated risk. Samuelson (1965) provides the concept of efficient market hypothesis (EMH) according to which the price of an asset fluctuate randomly and further this concept is revised by Fama (1970,1991) in which he evidenced for market efficiency on the basis of development in research. For making investment policies both in emerging and developed markets, the concept of market efficiency has important implications. Different investment strategies could be adopted after deciding whether the market is efficient or inefficient. For example, in an efficient market the best strategy to make optimal profit is to concentrate on risk and return feature of an asset or portfolio, because when the market is efficient the price of an asset reflect the market, so the best way to estimate the risk and expected return of the asset, taking into account what is known about the asset at that time. Therefore, in such case there will be no undervalued assets offering higher than expected return or overvalued assets offering lower than the expected return. In contrast, if the market is not efficient the best way to make investment is to spot winners and losers in the market and correct identification of miss-priced assets could help to enhance or optimize the performance of overall investment (Rutterford; 1993). The factor of globalization and rapid growth in technology innovation enhance integration of financial markets world over, so the understanding of market efficiency even in emerging markets is becoming more important as a consequence of integration with more developed markets and free movement of investments across national boundaries. In developing countries like China, the contribution of equity markets in the process of development is less as compare to developed markets and the equity markets of western developed world considered more efficient than developing nations. Due to factor of integration and reform process to open economies in emerging markets provide chances of getting heavy capital inflows from developed markets to developing markets and make this possible for investor to diversify their investments and risks across boundaries.

China is one of the fastest growing emerging economies in the world and rapidly growing from last 30 years since its opening in 1979. The two stock exchanges in Shanghai and Shenzhen were established in early 1990s and different reform process were initiated as a result demand for investment funds still growing significantly and capital market growth expected to play an increasingly important role in the process of development. At this transitional stage to development, it is very important to access the level of efficiency of the Chinese equity market in order to establish its long-term role in the process of economic development. The purpose of this study is to test whether Chinese stock market is weak form efficient or not in normal circumstances and what impact global financial crisis has on the efficiency of Chinese stock market. Under Efficient Market Hypothesis (EMH) to predict future expected prices or returns, we could use past actual prices or returns. The behavior of share price changes could tested for serial independence and random walk theory for equities prices show an equities market in which new information is quickly discounted into prices and abnormal or excess returns cannot be made from observing past prices.

In order to identify principle process and behavior of market return generation the pattern of short-term movements of combined market return is the key through which we could measure the historical market efficiency. The concept of market efficiency based on the theory of random walk process through which we determine underlying market is efficient or inefficient. If the market is efficient then it follows a random walk process and model will fail to identify any pattern, in such case historical data cannot be useful to determine expected returns. On other hand if market is not efficient then it means market is not following a random walk process and the model used will identify the pattern of market movement, in this case data series is considered to be stationary and historical data can be useful to identify future returns. Here from above discussion it is clear that identification of pattern in time series data is the main key to determine that market is efficient or inefficient. Eugene Fama (1970) identified three levels of market efficiency:

Weak-form efficiency: The market said to be weak-form efficient when prices of the securities instantly and fully reflect all information of the past prices, so the future price movements cannot be predicted by using past prices.

Semi-strong efficiency: In such case, the prices of securities or assets fully reflect all the publicly available information. Therefore, only investors with additional inside information could have advantage in the market.

Strong-form efficiency: In this category, the prices of securities fully reflect all the publicly available information along with private information (inside information). Therefore, in such a case, no one can have advantage in predicting returns in the market, because there is no data that would provide additional value to the investors.

The purpose of this study is to examine the degree of under pricing and after market performance in new issues of Chinese stock market during last Asian financial crisis and prevailing global financial crisis because in such kind of circumstances the volatility of market is sometimes unpredictable for both emerging firm and its stakeholders.

2. Literature Survey

Ritter (1984) argue that the Underpricing or high IPO return is a phenomenon common to most stock markets, regardless of whether these markets are in developed or emerging economies. Under pricing seems to be contradicted for market efficiency and may hurt emerging firms trying to raise capital for expansion. Under pricing also depends upon the time period a firm decides to go public. Ritter and Welch (2002) point out, that there is no single dominant theoretical cause for under-pricing. Hence, there is no universal IPO underpricing theory or hypothesis applicable for all times and across countries. A large positive gain of a new issue immediately after market relative to its offering price is a recurring phenomenon in many markets, has been noted as one of the 10 puzzles in financial research Brealey and Myers (2002). Underpricing have been put forward and tested against the data of various stock markets. Ibbotson et al., (1988) found that the average first-day IPO return was 16.3 percent in the years 1960–1987 in the US market. Levis (1990) studied a sample of 123 offers for sale on the London Stock Exchange for the period 1985–1988 and found that on average the market-adjusted discount was 8.6 percent on the first day of trading. Some of the previous studies have noted that Chinese IPOs enjoy the world's highest initial returns at around 200–300 percent etc: Datar and Mao (1997), Mok and Hui (1998), Chan et al (2004). Loughran et al (1994) confirmed this IPO under pricing phenomenon in 25 countries, with higher IPO underpricing in developing than in developed markets. The extent of IPO underpricing ranges from a few percent. Muscarella and Vetsuypens (1989) studied 38 US investment bank issues for the period between 1980 and 1981 and observe 48% underpricing for 'hot' issues. However, an astounding underpricing of 149.3% has been found in the developing Malaysian market Hanley and Ritter (1992). Evidence of this IPO under pricing phenomenon also abounds in Asian stock markets such as Japan, Hong Kong and Singapore Hanley and Ritter (1992), Dawson and Kiraki (1985), Mc Guinness (1992), Wong and Chiang (1986), Saunders and Lim (1990), Dawson (1984), Korea Lim(1992). Although lot of empirical studies have been carried out and theoretical literature written to enhance people's knowledge towards these issues; yet it is arduous for people to clearly understand the various issues related to IPO especially with different types of equities in different industries and in different markets and also in different time periods. As for reasons of Chinese IPOs under pricing is concern, a long time lag, some institutional characteristics Aggrawal and Prabhala (2002), regulations and government ownership Xiao Chen et al(2008), poor accounting disclosure and auditing standards Benveniste and Spindt(1989), distribution mechanism Chowdhry and Sherman(1996) and uninformed investors Rock(1986) are the main reasons for high under pricing of new issues.

As far efficiency of stock market is concern the essence of this theory was taken from the concept of random walk theory. Bachelier in 1900 introduces the idea that asset prices may follow a random walk pattern. The future path of the price level of a security is no more predictable than the path of a series of accumulated random numbers or in statistical terms successive price changes are independent and identically distributed random variables Fama(1965). In contrast to this theory Andrew W. Lo (1988) totally reject the theory of random walk by taking the data into sample period from 1962-1985 and concluded that the past prices data cannot attribute completely to the effects of infrequent trading or time varying volatilities. In following to these earlier studies some other researchers conduct

same random walk concept hypothesis to test its implication on financial data of different countries markets which can be grouped into developed and emerging markets e.tc. Korea (Ryoo and Smith (2002) use a variance ratio test and find that the market follow random walk pattern, if the price limits are relaxed. China, (lee et al 2001) uses GRAPH and EGRAPH models and found that the volatility is highly persistent and predictable. Hong Kong (Cheung and Coutts 2001) by using variance ratio test found that the index on Hong Kong stock market follow a random walk. Spain (Regulez and Zarraga, 2002), Africa (Smith et al. 2002; Appiah-kusi and Menyah, 2003), and Middle East (Abraham et al. 2002) they all use variance ratio tests and runs test on the financial data of different countries for testing random walk hypothesis and found week form efficient these markets are and follow a random walk. The concept of efficient market hypothesis was firstly introduced by Samuelson (1965), that properly anticipated price of an asset fluctuate randomly. Fama (1970) presented a formal review of theory and evidence for market efficiency. To prove the theory in his empirical work he divided security prices into three information subsets first one was "week form test", second is "semi strong form test" and third one was "strong form test". He characterized an efficient capital market in which security prices fully reflect all available information and further revised his theory on the basis of development research in 1991. In his revised work he hypothesize on information and trading costs, the costs of getting prices to reflect information (Fama 1991). Upon the connection information and market efficiency Bernard and Thomas (1990) present a robust testing model in which they conclude that prices may partially reflect the information regarding future earnings, but not reflect all available information by focusing on abnormal returns at the time of earnings announcements, and also argue that these can be predicted from the unexploited information in past earnings. They also demonstrate that the signs of average abnormal returns at quarterly earnings announcement dates agree with those predicted by a model that exploits the (+,+,+,-) signs of the serial correlation. Burton G. Malkiel (2003) examines the attacks on the efficient market hypothesis and believe that the stock prices are partially predictable by focusing on statistical findings of relationship between predictability and efficiency, crash of 1987 and internet bubble, he conclude that our stock markets are far more efficient and far less predictable. In his point of view an efficient market do not allow investors to earn above average returns without accepting above average risks and sports the view that stock market has no memory and the way past prices changed cannot be use in divining how it will behave in future, same survey and empirical results were concluded in the study of cootner (1964). Balvers et al., (1990) argue on predictability of returns, intertemporal asset pricing, and macroeconomic fluctuations by using a simple equilibrium model with relation to consumption opportunities and output. Consumption opportunities vary along with variations in aggregate output investors are forced with a less smooth consumption pattern. Investors adjust their required rate of return on stock in order to smooth consumption. This linkage provides a base in which returns could be predictable up to an extant related to the predictability of aggregate output. The change in utility consumptions further result in utility-increasing intertemporal transactions, so under this scenario we could say that predictability is consistent with efficient markets. Rendleman, Jones and Latané (1987) hypothesize that the investors are not fully aware about the serial correlation in earnings which prevail among quarterly earnings changes, so they do not use this information to enhance their earnings.

Efficient market hypothesis has a twofold functions firstly it could be use as a theoretical and predictive model for operations in a financial market and secondly it could be use as a technique in impression management campaign to attract more peoples for investment in stock market (Will 2006). Traditionally more developed western equity market is considered to be more efficient and the contribution of equity markets in the process of development in developing countries is less due to restrictions and controls which resulted in a weak markets (Gupta, 2006).

Along with empirical literature on efficient market hypothesis, many other researchers try to explain it through behavioral perspective. Robert J. Shiller (2001) tries to explain efficient market hypothesis through behavioral principles. According to Shiller behavioral principles are derived from psychology, sociology and anthropology. In his work, he discussed some behavioral principles, which are relevant in context of efficient market hypothesis. The principles discussed are prospect theory, regret and cognitive dissonance, anchoring, mental compartments, overconfidence, over- and underreaction, representativeness heuristic, the disjunction effect, gambling behavior and speculation, perceived irrelevance of history, magical thinking, quasi-magical thinking, attention anomalies, the availability heuristic, culture and social contagion, and global culture. Joseph E. Finnerty (1974) on the topic of insider's access to information and market efficiency conclude that market is not strong-form efficient and insiders are able to outperform the market because they can identify profitable as well as unprofitable situations within their corporations.

3. Data and Methodology

The data used in this study in order to measure the performance of IPOs market is comprises of 626 companies, which issue and list their shares on either Shanghai or Shenzhen stock exchanges during the period of January 1,

1997 to December 31, 1999 and January 1, 2007 to December 31, 2009. The primary source of data for daily prices and IPO is CCER, (Chinese Center for Economic Research) database.

Table 1 reports that, total of 626 companies are considered out of which 210 companies listed their share on Shanghai stock exchange and 416 companies listed on Shenzhen stock exchange. IPO activity is on peak in 1997 with a record of 188 IPO brought into the market and then went down sharply in 1998 up to 95 after that a slight increase up to 97 IPO in 1999. In second sample period of time 126 IPO are brought into market in 2007, which is the starting year of global economic crisis and then came down to 77 in 2008 and further came down to only 43 IPO in 2009. It can be seen from Table 1 the IPO activity is increasing with the passage of time on Shenzhen stock exchange as compared to Shanghai stock exchange.

The stock market adjusted first day returns ($MAR_{i,1st}$) Carter et al., (1998) is used in the following research as the proxy for underpricing of IPO in the first trading day.

$MAR_{i,1st}$ is computed as following:

First day stock return $FR_{i,1st}$

$$FR_{i,1st} = (P_{i,1st} / P_{i,o}) - 1 \quad (1)$$

Where $P_{i,1st}$ is the price of stock i on the first trading day and $P_{i,o}$ is the offer price of stock i .

First day stock market return ($SMR_{m,1st}$)

$$SMR_{m,1st} = (P_{m,1st} / P_{m,o}) - 1 \quad (2)$$

Where $P_{m,1st}$ is its corresponding SHSE or SZSE overall composite indexes on the first trading day and $P_{m,o}$ is SHSE or SZSE overall composite indexes on the offering day. Stock market adjusted first day return ($MAR_{i,1st}$)

$$MAR_{i,1st} = FR_{i,1st} - SMR_{m,1st} \quad (3)$$

Stock market return (SMR) is the change in the first listing date of an IPO compared with that on offering date, on the corresponding stock exchange overall composite index. It indicates market sentiment of the total stock market in the duration period. So MAR_{1st} can value underpricing more accurately because it extracts the impact of the overall stock market on an individual IPO's underpricing.

For the sack of measuring stock market efficiency number of techniques can be used to identify pattern in a series of data and all have their own merits and demerits. In order to measure the stock market efficiency, this study will use the stock market return of Shanghai and Shenzhen stock exchanges. Different methods have been used in past studies to measure the stock market efficiency. Etc: Runs Test (Bradley 1968), LOMAC variance ratio test (Lo and MacKinlay 1988), Durbin-Watson test (1951). After going through the merits and demerits of above mentioned tests we decided to apply Augmented dickey fuller (1979) test in order to check unit root in data series. Most of the new studies are using this test due to its more reliability in measuring unit root. This test do not follows the conventional t-distribution. This test can be used to derive asymptotic results and could simulate critical values for various tests and sample sizes. This test has multiple choices for its use. It can be used with a constant, a linear time trend and with regression. For our study we will use the regression model in its standard form, with drift and with drift and trend for testing unit root.

$$SPI_t = \alpha SPI_{t-1} + \varepsilon_t \quad (4)$$

$$SPI_t = u^* + \alpha SPI_{t-1} + \varepsilon_t^* \quad (5)$$

$$SPI_t = u^{**} + \beta(t - T) + \alpha^{**} SPI_{t-1} + \varepsilon_t^{**} \quad (6)$$

The denomination of these equations is as follows. Equation (4) is for standard model, (5) is for standard model with drift, (6) for standard model with drift and trend. SPI_t is the logarithm of stock price index at time t . u^* and u^{**} are drift parameters. "T" is the total number of observations. $\varepsilon, \varepsilon^*, \varepsilon^{**}$, are error terms that could be

autoregressive moving average process with time dependent variance. “U” is an arbitrary drift parameter, while α is the change in index and ε_t is a random disturbance term.

For checking the non-stationarity of the data the Augmented Dickey-Fuller unit root will be applied in the form of following regression equation in order to check the null hypothesis.

$$y_t = \theta y_{t-1} + u_t \quad (7)$$

If the series will be stationary then $\theta=1$, and against this, if model detect non-stationarity in data series then $\theta < 1$. Therefore, the hypotheses of our study are

H_0 : Time series is stationary.

H_1 : Time series is non-stationary.

The null hypothesis of the study will be rejected if the statistical value is lesser than the critical value and data series will be considered as non-stationary (following the random walk). In this study, we will calculate daily market return by applying a formula(8) on daily stock market indices for both Shanghai and Shenzhen stock exchanges.

$$R_t = \text{Log} \left(\frac{I_t}{I_{t-1}} \right) \quad (8)$$

The sample data for testing efficiency is also collected from CCER (Chinese centre for economic research) database. Saturday and Sunday are the weekend days in china, so both stock exchanges remain close on these days. According to basic time series requirement, the observations should be taken at a regular space interval. The requirement however, is that the frequency be spaced in terms of the processes underlying the series. The underlying process of the series in this case is trading of stocks and generation of stock exchange index based on the stock trading, as such for this study the index values at the end of each business day is appropriate (French, 1980).

For robust testing we use DF-GLS, PP and KPSS tests. The data characteristics are mentioned in Table 2 (a) and 2 (b). In order to check the stationarity of data series, study uses Augmented Dicky Fuller (ADF) Test in its standard form with drift and with drift and trend for both periods of time separately.

4. Results and Findings

The cumulative market adjusted returns for 5th, 10th, 20th, 30th, day of trading are computed in order to look at the short run under pricing of newly issued stocks and for the sake of further evaluation of under pricing and sustainability of prices the time window of 50th, 100th, 200th, and 300th, day is taken. Along with their corresponding Median, t-value and standard deviation are also computed. A brief summary of results is given in Table 3.1, 3.2 and Table 4 for all 626 IPO either issued on Shanghai or Shenzhen stock exchanges.

Table 3 (a and b) shows that the first day market adjusted returns are highly significant at 1 percent, i.e. for Asian financial crisis (1997-1999) 135.73% , while for the second and recent global economic crisis (2007-2009) is 145.20%, which on average, shows a 10% increase in the level of under pricing of newly issued stocks as compared to last crisis. The IPO activity also shrinks to 246 IPOs in the recent crisis (380 IPOs in 1997-1999), which may due to the high volatility of initial returns and instability of prices in the long run.

In 1997, 188 new IPO were placed into the market which is the peak point of new issues ever in Chinese stock exchanges and their first day market adjusted returns were 158.89%, on the other hand in 2007 the beginning of the global crisis, the IPO activity shrinks to 126 IPO in the whole year with the first day market adjusted initial returns of 189.32%, which represents an inverse relationship, a decrease in number of IPO and increase in the level of under pricing up to 30.43%. However, in the second year of both crisis (1998 and 2008) the number of new issues were 95 and 77 respectively, which is a huge decline as compared to the first years of both crises (188 in 1997 and 126 in 2007). The degree of under pricing is 132.97% and 119.44% in 1998 and 2008 respectively. It indicates that the degree of underpricing also decreases along with the number of IPO. In third year of Asian financial crisis 97 new IPO were issued which is a slight increase of IPO activity as compared to last year's 95 IPO and their degree of under pricing shrinks up to 110.89%, while in 2009 the IPO activity is at its minimum level. Only 43 IPO were issued and they were under-priced up to 62%, which is the lowest level of underpricing as compared to the average level of underpricing usually in Chinese stock market.

As far short run performance is concerned, table 4 shows that there is a decreasing trend in market adjusted returns on average up to 50th day in first financial crisis .The average initial abnormal returns from the 1st trading day to the 5th, 10th , 20th ,30th and 50th trading days slightly decrease from 135.73percent to 135.04, 133.95, 133.15,

133.02 and 132.57 percent respectively, and then regain their returns and there is upward trend from day 100th, 200th and 300th with some slight increase of 133.84, 136.82 and 140.32 percent. As indicated in Table 3.

In second period of global economic crisis the performance of stock is not too different from first period of crisis. The average initial returns decreases sharply from 1st, 5th, 10th, 20th, and 30th day of trading from the level of 145.20 percent to 140.70, 139.57, 139.57, 137.09 respectively, and then a surprising gain up to 50th day of 151.17 which is more than its first day initial returns but again there is downward trend on 100th, 200th, and 300th trading days, i.e. 148.34, 147.96 and 145.20 percent respectively.

In comparison of other studies on Chinese IPO market, the initial returns are 200-300 percent Datar and Mao (1997), Gu (2000). The returns obtained here are much lower. There are some reasons for this. First the earlier researches are carried out mostly before 1996. On that period of time Chinese IPO market was very immature and volatile, the supply of new issues was also very limited as compare to huge demand, and the initial returns were tremendously high. Liu and Li (2000) documented that the first day's initial and abnormal returns of IPOs in China were much higher in 1991, 1992 and 1993 than those in other years. In addition, with less experience in pricing IPO in the early years, the CSRC tended to underprice to a greater degree in order to encourage the growth of the primary market secondly, due to the shortage of data, some researchers calculate the initial returns without considering the growth of the whole market, while in our study the initial returns are market-adjusted, unadjusted initial returns that do not consider market impact would be higher than real returns, while only market adjusted returns can give us accurate pictures of the degree of underpricing in the Chinese IPO market.

4.1 Efficiency test during Asian financial crisis (1997-1999)

The statistical value of ADF test in Shenzhen stock exchange is -5.900187 which is lesser than its corresponding critical values (-3.632900, -2.948404, -2.612874) at 1%, 5%, and 10% level of significance respectively. So here we will reject our null hypothesis and accept alternative hypothesis. The series is considered as non stationary and having the unit root. In robust testing the statistical values of DF-GLS and PP tests are also lesser than their critical values and proving series has the unit root. But the case is different in KPSS test, here the statistical value is greater than its critical values at all levels of significance. So here we reject the alternative hypothesis and will accept the null, that series is stationary, which has no unit root and past stock market data could be useable for making abnormal returns. The same statistical conclusion is obtained from Shanghai stock market returns. The statistical values of all tests except KPSS are lesser than their critical values and depicting that the series is non stationary. Table below mentioned is depicting the picture of above discussion.

The results are not different when we check the regression line with intercept and trend (table-5-a and b). The statistical values for all tests are lesser than their critical values at all levels of significance except for KPSS test. Series is non stationary in ADF, ADF-GLS, and PP tests, but stationary in KPSS test statistics.

4.2 Efficiency test During global financial (2007-2009)

Table 7 (a, b) shows that during the period of Global crisis the ADF test in Shenzhen and Shanghai stock exchanges are -5.149318, and -5.522392, which are lesser than their critical values of -3.679322, -2.967767, -2.622989 at 1%, 5%, 10% significance levels respectively. So the null hypothesis is rejected and data series are considered non-stationarity by accepting alternative hypothesis. Same results are obtained by robust testing.

The test statistics with intercept and trend for the period of crisis are also not too different. The statistical values of all ADF, DF-GLS, PP and KPSS with drift and trend are lesser than their critical values (Table 8) at all significance levels. So here again the study rejects the null hypothesis and consider that the data series on both exchanges as non-stationary.

5. Conclusion

The periods of Asian and global economic crisis are considered drastic for the world economy in which most of the world economies face loss to their paper wealth and balance of payments were disrupted. The impact of such kind of conditions on stock markets is obvious due to financial integrations of world economies. In both crises a chain reaction is observed, which start from one economic sector, then move to other sectors and finally gripped the world economy as whole. China is also among the Leading emerging economies and having close integration with other economies of world. Stock markets are among the leading indicators in such kind of circumstances for depicting the picture of severity. Lot of stock market crashes were observed in both period of crises, especially in recent global economic crisis in which stock prices touch to its bottom in many developed and emerging stock markets. Chinese stock market also effected by this crisis in which stock prices continuously dropped over the period 2007 and 2008. The purpose of this study is to assess and compares the impact of Asian and Global financial crisis on Chinese IPOs and stock market efficiency.

This study focuses on the extent of IPO under pricing and their performance in the event time window of last Asian financial crisis and prevailing global economic crisis. It is interesting to note that the extent of underpricing in prevailing global economic crisis has increased up to 10% on average and in short run performance initial returns to investor fell more sharply than the period of Asian financial crisis. In the Asian Financial crisis, the trend of market adjusted returns is very smooth. On the other hand, in this crisis, the aftermarket performance has a fluctuating trend of market adjusted returns due to unexpected movements in market returns and stock prices. Only 246 IPO are issued from 2007-2009, as compared to 380 IPO from 1997-1999, and the IPO activity is also shrinking as the period of crisis goes on to its critical point. There are only 43 IPO in 2009 with initial returns of 62 percent which indicates a decreasing trend in IPO activity and shows the investors are more informed and psychologically affected by sudden movements of market which forces the new companies not to come in the market.

Analysis of Market Efficiency is an important concept for the investors who wish to hold internationally diversified portfolios. With increased movement of investments across international boundaries owing to the integration of world economies, the understanding of efficiency of the emerging markets is also gaining greater importance. The results of the study shows that Chinese stock market is weak form efficient in both period of crises and data series are non-stationary, here exist unit root in data series. It means that Chinese stock market is following the random walk process. The investors can not generate excess profits by using and observing past behavior of stock price movements. Here is no significant difference in market efficiency in both periods of crises. One good possible way to enhance the market efficiency is to introduce financial innovation in the emerging stock markets. New financial products create the opportunities for investors to mobilize their savings and very useful in breaking the relation between origination and ownership. When new financial instruments come into market, this will provide opportunities to the investors to allocate their risks in different securities and in different investor classes. This financial innovation is also very helpful in reducing the cost of capital and allocation of capital at its maximum, which will finally result in maximum utilization of sources and enhance market efficiency at its best. It is observed in major developed world markets that when new financial instruments and technological advancements come into market, it boosts the market efficiency significantly. The most common examples of these innovative advancements are the markets of Europe, USA, and Australia, where these financial innovations contribute a lot in their economic growth. Thus, financial innovations in emerging financial sector in China as whole are beneficial. The recent global financial crisis remind the world that this financial innovations are mixed blessings, not risk free and also has its shortcomings.

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Table 1. Summary of IPO in Sample Period

Year category	Shanghai	Shenzhen	Total
1997	78	110	188
1998	49	46	95
1999	47	50	97
2007	24	102	126
2008	6	71	77
2009	6	37	43
Total	210	416	626

Table 2(a). Data Characteristics – SHZ and SHN – January 1997-December 1999 (Asian financial Crisis)

Index	Obser.	Mean	Median	Minimum	Maximum	Skewness	Kurtosis	Variance
SHZ	728	0.0003	-0.0006	-0.0946	0.0835	-0.219	3.609	0.0004
SHN	727	0.0007	0.0005	-0.0891	0.0758	-0.447	4.509	0.0003

Table 2(b). Data Characteristics – SHZ and SHN – January 2007-December 2009 (Global financial Crisis)

Index	Obser.	Mean	Median	Minimum	Maximum	Skewness	Kurtosis	Variance
SHZ	730	0.0005	0.0025	-0.0124	0.0101	-0.685	-0.646	0.00004
SHN	730	0.00008	0.0024	-0.0137	0.0081	-0.886	-0.450	0.00004

Table 3(b). First Day Market Adjusted Return during Asian Financial Circes

	Mean	Median	t-stat	Std-deviation
1997-1999	135.73	122.15	30.88	85.68
1997	158.89	138.76	32.74	93.10
1998	132.97	122.57	15.07	85.98
1999	110.89	94.50	10.94	99.84

Table 3(b). First Day Market Adjusted Return during Global Economic Circes

	Mean	Median	t-stat	Std deviation
2007-2009	145.20	110.06	21.36	106.62
2007	189.32	173.44	19.16	110.91
2008	119.44	84.64	11.78	88.96
2009	62	47.70	11.520	35.30

Table 4. Aftermarket Performance of IPO

	5 th day	10 th day	20 th day	30 th day	50 th day	100 th day	200 th day	300 th day
1997-1999								
Mean	135.04	133.95	133.15	133.02	132.57	133.84	136.82	140.32
Median	123.81	120.60	119.60	118.95	119.49	119.85	123.10	128.29
t-stat	31.13	30.76	30.62	30.62	30.77	30.87	31.10	31.14
Std-deviation	84.56	84.90	84.76	84.69	84	84.52	85.78	87.83
2007-2009								
Mean	140.70	139.57	138.07	137.09	151.17	148.34	147.96	145.20
Median	111.31	109.31	109.65	109.70	132.83	127.18	130.51	127.61
t-stat	21.07	21.21	20.99	21.40	21.33	19.57	20.15	19.45
Std-deviation	104.73	103.19	103.17	100.45	100.98	108	104.64	106.07
1997								
Mean	155.74	154.51	152.82	151.61	149.87	147.53	151.81	152.79
Median	139.32	137.10	132.07	130.69	132.69	129.18	132.48	134.69
t-stat	32.60	32.63	32.42	32.79	30.81	30.72	31.94	30.85
Std-deviation	92.51	91.69	91.26	89.54	88.44	92.99	92.05	95.90
1998								
Mean	133.70	133.50	133.94	134.18	134.46	138.11	136.37	135.53
Median	124.12	122.77	125.69	129.20	122.82	126.39	123.81	133.07
t-stat	15.08	14.96	14.86	14.93	14.94	15.39	15.59	15.75
Std-deviation	86.44	86.96	87.82	87.60	87.73	87.46	85.28	83.89
1999								
Mean	110.31	109.25	109.37	110.31	110.45	111.54	111.72	115.06
Median	92.18	95.49	92.77	97.37	88.52	94.89	96.83	104.55
t-stat	11.10	10.97	10.94	10.96	11.10	10.84	11.18	11.81
Std-deviation	97.89	98.05	98.52	99.12	97.98	101.39	98.42	95.93
2007								
Mean	185.12	183.74	182.25	179.40	176.65	171.69	161.14	160.88
Median	170.25	170.44	171.60	170.19	166.57	162.87	147.27	145.69
t-stat	19.14	19.37	19.25	19.43	19.34	17.19	16.05	16.43
Std-deviation	108.57	106.50	106.27	103.65	102.54	112.13	112.69	109.90
2008								
Mean	112.61	110.68	108.39	109.06	109.48	110.14	126.39	119.19
Median	81.52	82.21	87.32	90.66	94.05	98.70	106.32	97.82
t-stat	11.29	11.20	10.95	11.28	11.51	10.85	12.84	10.10
Std-deviation	87.51	86.74	86.89	84.81	83.50	89.11	86.35	94.47
2009								
Mean	60.88	61.87	61.74	63.31				
Median	50.49	56.05	57.97	58.14				
t-stat	11.74	11.78	10.88	10.76				
Std-deviation	33.98	34.43	37.21	38.57				

Table 5(a). Test statistics with intercept and no trend

Index	ADF test Statistics With 5 lags	DF-GLS test Statistics With 5 lags	PP unit root test (Newey-West Bandwith)	KPSS (Newey-West Bandwith)
SHZ	-5.900187	1.727347	-5.911941	0.207356
SHN	-4.742969	4.771136	4.735363	0.204108

Table 5(b). Critical values

Level	ADF Test	DF-GLS Test	PP unit root test	KPSS Test
1%	-3.632900	2.634731	-3.632900	0.739000
5%	-2.948404	1.951000	-2.948404	0.463000
10%	-2.612874	1.610907	-2.612874	0.347000

Table 6 (a). Test statistics with intercept and trend

Index	ADF test Statistics With 5 lags	DF-GLS test Statistics With 5 lags	PP unit root test (Newey-West Bandwith)	KPSS (Newey-West Bandwith)
SHZ	-5.864159	2.655333	-5.868968	0.117895
SHN	-4.847802	4.992151	-4.894173	0.079998

Table 6 (b). Critical values

Level	ADF Test	DF-GLS Test	PP unit root test	KPSS Test
1%	-4.243644	3.770000	-4.243644	0.216000
5%	-3.544284	3.190000	-3.544284	0.146000
10%	-3.204699	2.890000	-3.204699	0.119000

Table 7 (a). Test statistics with intercept and no trend

Index	ADF test Statistics With 5 lags	DF-GLS test Statistics With 5 lags	PP unit root test (Newey-West Bandwith)	KPSS (Newey-West Bandwith)
SHZ	-5.149318	-2.174585	-5.154930	0.180375
SHN	-5.522392	-2.205404	-5.514943	0.186881

Table 7 (b). Critical values

Level	ADF Test	DF-GLS Test	PP unit root test	KPSS Test
1%	-3.679322	-2.65014	-3.679322	0.739000
5%	-2.967767	-1.953381	-2.967767	0.463000
10%	-2.622989	-1.609798	-2.622989	0.347000

Table 8 (a). Test statistics with intercept and trend

Index	ADF test Statistics With 5 lags	DF-GLS test Statistics With 5 lags	PP unit root test (Newey-West Bandwith)	KPSS (Newey-West Bandwith)
SHZ	-5.258361	-2.609317	-5.279356	0.150786
SHN	-5.597081	-2.608892	-5.620397	0.144993

Table 8 (b). Critical values

Level	ADF Test	DF-GLS Test	PP unit root test	KPSS Test
1%	-4.309824	-3.770000	-4.309824	0.216000
5%	-3.574244	-3.190000	-3.574244	0.146000
10%	-3.221728	-2.890000	-3.221728	0.119000