

CHANGES IN REGULATION AND PRICES OF DUAL-LISTED STOCKS IN CHINA

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Abstract

The share prices of a company listed on more than one stock exchange usually are in or close to equilibrium. Nevertheless, it has been observed the prices of the same Chinese company listed in China (A shares) and Hong Kong (H shares) are not anywhere close to equivalent. The article investigates whether the A and H share returns experience any co-movement, and whether changes in regulations have an impact on the correlations between the returns. Empirical results from this article show that the A and H shares only demonstrate very limited co-movement. In addition, the correlations between the returns are time-varying and are affected by changes in regulations by the Chinese government.

Keywords: Time-varying correlations, H shares, A shares, DCC GARCH

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1 – Introduction

Until the mid-20th century, most companies were only listed on one single stock exchange. Even for the small proportion of companies that were listed on more than one stock exchange, they were usually listed on stock exchanges within the same country, for example, on the New York Stock Exchange and another regional stock exchange in the United States. However, with the globalization of the world financial markets in the past couple of decades, more and more companies around the world began to have their stocks listed on stock exchanges in different countries. Other than being actually listed on the stock exchange in an overseas country, some companies decided to have their stocks listed as American Depository Receipts or Global Depository Receipts in the United States or other stock exchanges around the world.

Although there are huge costs associated with listing on stock exchanges other than the domestic ones, such as the legal, accounting, and regulatory fees, it is believed that the benefits brought by such a strategy would exceed the costs. One of the largest benefits through the dual-listing of stocks is the reduction of the cost of capital because of the diversification of the market risk. This is also very beneficial to companies that are facing the problem of illiquidity of trading in their shares. Finally, such listing is very important to companies that are expanding their operations globally as listing in foreign exchanges can increase their reputation and recognition.

According to the efficient market hypothesis, the market is supposed to be reflecting all the publicly available information in a timely fashion, resulting in a non-arbitrage environment. Applying this hypothesis to companies that are cross-listed in more than one stock exchange around the world, it is believed that the stock prices of the same company listed in different stock exchanges should be equivalent, when taking into account of the foreign currency exchange rates. Many empirical studies show that most cross-listed stocks exhibit stock price co-

movement among the different stock exchanges; however, this is not the case for Chinese companies cross-listed in both the Hong Kong Stock Exchange and the Chinese stock exchanges.

With the gigantic economic growth of China in the past decade, a large number of Chinese companies decided to list their shares in foreign markets, in addition to the local Chinese stock exchange. Nevertheless, the stock prices in China were trading at a premium relative to the stock prices in Hong Kong for most of the time in the past decade. The trading and ownership restrictions, as well as other governmental regulations, were believed to have contributed to such discrepancy in stock prices.

2 – Literature Review

There are many empirical researches focusing on the topic of dual-listed stocks in the past decades. Most of them find that the stock prices of the same cross-listed companies are equivalent. Garbade and Silber (1979) are among the first researchers who study the prices of identical assets that are traded in different stock exchanges. They investigate stocks that are dual-listed in the New York Stock Exchange and other regional stock exchanges in the United States in an attempt to study whether the stocks exhibit a common equilibrium price. They conclude that the stock prices are very close to equilibrium, with the stock prices being relatively more influential by the New York Stock Exchange.

Other than studies focusing on stock exchanges in the United States, there are a few studies with the emphasis on companies listed in the Hong Kong Stock Exchange and another stock exchange. Xu and Fung (2002) use daily data for 10 China-backed companies that are listed on both the Hong Kong Stock Exchange and the New York Stock Exchange as American Depository Receipt to examine whether stock prices in both markets are equivalent. They find that the stocks listed in both Hong Kong and New York stock exchanges affect each other,

resulting in an equilibrium state. They find that the home market, which is the Hong Kong stock market in this case, plays a relatively more important role in affecting the prices of the respective companies listed in the overseas market, which is the New York stock exchange, as American Depository Receipts. On the other hand, the overseas market tends to be more influential in terms of the volatility of the stocks. In addition, if the companies are broken down into domestically oriented companies and globally oriented companies, it is shown that information tends to flow from domestic market to the offshore market for the former and from offshore market to the domestic market for the latter. Su and Chong (2007) also study eight Chinese companies that are cross-listed in both the New York Stock Exchange and the Hong Kong Stock Exchange. They find that the stock prices of the exchanges are highly co-integrated and mutually adjusting, meaning that it is not expected to see a price difference between the exchanges.

Despite the above, some studies find that trading and ownership restrictions can contribute to the price differences, if any, between cross-listed stocks. Froot and Dabora (1999) study companies that are listed in stock exchanges that have different trading and ownership restrictions. They find that the location of the trade and ownership restrictions tend to influence the prices of the stocks. Chong and Su (2006) investigate 21 Chinese companies cross-listed in both the Shanghai or Shenzhen Stock Exchange and the Hong Kong Stock Exchange to see whether they exhibit the same price movement. They only find limited evidence of co-movement between the shares, implying that the Chinese stock exchanges and the Hong Kong Stock Exchange are segmented. For those that show signs of co-movement, the Chinese stock market tends to play a more important role in determining the stock prices. Such a study has an important implication for the efficient market hypothesis because a company dual-listed in two different stock exchanges is exhibiting different stock prices.

Wang and Jiang (2004) study Chinese companies that have dual-listed in both the Chinese and Hong Kong stock market before 2000, and find that the stock prices of the same company are different in the two stock exchanges, with the stock prices in Hong Kong being lower than the respective Chinese prices. They claim that the discounts are mainly due to the market illiquidity and ownership restrictions in the Chinese markets. They also find that the Hong Kong shares are more likely to be influenced by the Hong Kong market factors and are more correlated to Hong Kong market relative to the Chinese markets.

Based on all the above, it can be seen that price differences do occur for cross-listed stocks, and this is especially true for companies that are listed in both the Hong Kong Stock Exchange and the Chinese stock exchanges. This paper extends the above studies by covering all 45 Chinese-owned companies that are currently cross-listed in both the Chinese stock markets and the Hong Kong Stock Exchange. The purpose is to determine whether there are correlations and co-movements between the stock prices of the same company. In addition to the above extension, this paper is also different from the previous ones in the sense that three events associated with changes in regulations of China were identified to determine whether such events had an impact on the correlations and co-movements between the stock prices in China and Hong Kong.

3 – Background

In order to determine whether there are correlations and co-movements between the stock prices in Hong Kong and China for the 45 cross-listed companies, it is necessary to understand the background of the Chinese and Hong Kong stock markets, as well as those cross-listed companies. Due to the economic recovery in China in the early 1990s, China reopened its stock markets at that time. The first stock market of China – the Shanghai Stock Exchange – was

opened on November 26, 1990, followed by the opening of the Shenzhen Stock Exchange on April 11, 1991.

There are two classes of shares listed on the Shanghai and Shenzhen Stock Exchange: A-shares and B-shares. A-shares refer to those domestic shares which are open to domestic Chinese investors only. B-shares are the ones that could only be traded by foreign investors; however, such restrictions were lifted in February 2001. B-shares can be traded by domestic Chinese investors nowadays as long as they have the required foreign currencies. The B-shares listed in Shanghai Stock Exchange are traded in U.S. dollars, while those listed in Shenzhen Stock Exchange are traded in Hong Kong dollars.

Other than getting listed on local Chinese stock exchanges, Chinese companies are also allowed to be listed on foreign stock exchanges to get additional financing. Such companies are traded in stock exchanges such as the Hong Kong Stock Exchange, the New York Stock Exchange, the London Stock Exchange, and the Singapore Stock Exchange. There are two different types of Chinese companies listed in Hong Kong: the H-shares and the red chips. H-shares are companies headquartered in China that are incorporated in China but listed in Hong Kong, while red chips are companies headquartered in China that are incorporated in Hong Kong and also listed in Hong Kong. Both of these types of shares are traded in Hong Kong dollars.

Although the Chinese companies can be listed on both the Chinese stock exchanges and foreign stock exchanges, there are several restrictions placed by the Chinese government as to which shares domestic Chinese and international investors can trade. Although international investors are allowed to invest in B-shares, they sometimes find it difficult to directly invest in the Chinese stock markets because of ownership restrictions, restrictions on cash flows in and out of the country, cultural barriers, and huge transaction and information costs. In addition, most

large Chinese companies are not listed as B-shares. As a result, it may be easier for them to trade H-shares instead. On the other hand, domestic Chinese investors are only allowed to trade A-shares, as well as B-shares if and only if they have the required foreign currencies. The first H-share was Tsingtao Brewery Co Ltd, which was listed in Hong Kong on July 15, 1993. The number of companies dual-listed in China and Hong Kong as A-shares and H-shares increased from one on July 15, 1993 to 45 as of June 29, 2007, with the latest addition of China COSCO Holdings Co Ltd on June 26, 2007. However, the prices of H-shares were trading at a discount relative to the prices of A-shares for most of the time in the past decade.

There were a few changes in regulations that are worth mentioning in the past decade. Since the re-opening of the Shanghai Stock Exchange and the Shenzhen Stock Exchange in 1990 and 1991, there was a gradual increase in the market value of both exchanges until it reached the peak in 2001. The market value of the Shanghai Stock Exchange was cut into half during the time period from 2001 to 2005. The Shanghai Stock Exchange placed a ban on new initial public offerings (IPOs) in April 2005 until May 23, 2006 in an attempt to curb the depressed market. The lift of the ban on the new IPOs, along with the huge economic growth of China in the past few years have led to a recovery of the Chinese stock markets in 2006. The Shanghai Composite Index has tripled in value in about two years since the recovery in 2006.

In addition to the above changes in regulations, there have also been changes to the restrictions related to the types of shares domestic and international investors can trade. Since December 1, 2002, foreign investors can purchase A-shares through a program called Qualified Foreign Institutional Investors (QFII). On April 14, 2006, the China Banking Regulatory Commission announced that domestic Chinese investors are allowed to trade in foreign stock exchanges through Qualified Domestic Institutional Investors (QDII). This program was also

being extended to Hong Kong Stock Exchange on May 11, 2007. Since then, domestic Chinese investors are allowed to trade stocks listed in Hong Kong through such a program, while the initial amount of money that can be flowed into the Hong Kong Stock Exchange is estimated to be HK\$56.7 billion.

The ownership restrictions in China were believed to have created the price discrepancy between the stock prices in Hong Kong and China for the same company. Before the implementation of the QDII, the domestic Chinese investors were only allowed to trade A-shares. Moreover, the supply of A-shares was not enough to meet the demand of the local investors, resulting in a premium of the A-shares. However, as the QDII came along, it is believed that some of the demand will move into the Hong Kong Stock Exchange, resulting in a decrease of the stock price of the A-shares and an increase of the stock price of H-shares.

Having discussed all of the above events, this paper is going to focus on three events. These three events are going to be investigated to see if each of them affected the correlations between the Hong Kong stock prices and the Chinese stock prices. The three events are as follows:

- i. April 14, 2006 – Official implementation date of QDII
- ii. May 23, 2006 – Lift of the ban of new IPOs in the Chinese stock market
- iii. May 11, 2007 – Extension of QDII to Hong Kong Stock Exchange

4 – Data and Model

Daily closing stock prices of the 45 companies dual-listed in Shanghai or Shenzhen Stock Exchange and Hong Kong Stock Exchange as A-shares and H-shares (denoted as A+H shares), with the time span from January 4, 2000 or the initial listed date of the stocks, whichever is later, to June 29, 2007, are used in this paper. The list of the 45 A+H shares is shown in Table 1, but

stock 24 and 45, namely, Hisense Kelon Electrical Holdings Co Ltd and China COSCO Holdings Co Ltd are excluded for regression and calculation purposes. Hisense Kelon Electrical is excluded because the trading of its H shares has been suspended since June 16, 2005. The exclusion of China COSCO is due to the fact that its A shares only started trading since June 26, 2007, which means that there are only four days of data available. The daily closing values, with the same time span, of the Hong Kong Hang Seng Index and Shanghai Composite Index are also being used in the analysis. Moreover, the daily foreign exchange rate between Hong Kong dollars and Chinese Renminbi is used to ensure the stock prices are in the same currency.

Several calculations and regressions are done for the purpose of this paper. First of all, the daily percentage price difference between the A and H shares is calculated to investigate whether there exhibit a trend that is related to the events mentioned in the previous section. The percentage price difference for each stock is calculated as below:

$$\text{Percentage difference} = (P_{A_t} - P_{H_t}) / P_{A_t}$$

while P_A refers to the price of the A-shares and P_H refers to the price of the H-shares.

Second, two regression tests are run to determine whether the prices of A shares and H shares are co-moving. In addition, the regressions are to investigate whether the H share returns affect the A share returns, and vice versa. The regressions are as follows:

$$\text{i). } \Delta P_{H_t} = \alpha + \beta \Delta P_{A_t} + \varepsilon_t \quad (\text{denoted as HKCN test})$$

$$\text{ii). } \Delta P_{A_t} = \alpha + \beta \Delta P_{H_t} + \varepsilon_t \quad (\text{denoted as CNHK test})$$

while $\Delta P_H = (P_{H_t} - P_{H_{t-1}}) / P_{H_{t-1}}$ and $\Delta P_A = (P_{A_t} - P_{A_{t-1}}) / P_{A_{t-1}}$.

The above two tests only indicate whether there is a relationship between the A share returns and H share returns. As a result, in addition to the above, regression tests are being performed to determine whether the returns of Hang Seng Index and Shanghai Composite Index

have an impact on the A and H share returns. The following two regression tests are also being run:

$$\text{iii). } \Delta P_{Ht} = \alpha + \beta_1 \Delta P_{At} + \beta_2 \Delta P_{HSIt} + \beta_3 \Delta P_{SHIt} + \varepsilon_t \quad (\text{denoted as HKCNindex test})$$

$$\text{iv). } \Delta P_{At} = \alpha + \beta \Delta P_{Ht} + \beta_2 \Delta P_{HSIt} + \beta_3 \Delta P_{SHIt} + \varepsilon_t \quad (\text{denoted as CNHKindex test})$$

where $\Delta P_{HSI} = (P_{HSIt} - P_{HSIt-1}) / P_{HSIt-1}$ and $\Delta P_{SHI} = (P_{SHIt} - P_{SHIt-1}) / P_{SHIt-1}$. P_{HSI} and P_{SHI} refer to the value of the Hang Seng Index and Shanghai Composite Index, respectively.

Third, the 100-day rolling average correlations between five different pairs of variables are calculated: i). ΔP_H and ΔP_A , ii). ΔP_H and ΔP_{HSI} , iii). ΔP_H and ΔP_{SHI} , iv). ΔP_A and ΔP_{HSI} and v). ΔP_A and ΔP_{SHI} . By average, it refers to the mean of the value for all 43 companies. The correlation between any two variables is calculated based on the following formula:

$$\gamma = (\sigma_{X_1 X_2}) / (\sigma_{X_1}^2 \sigma_{X_2}^2)^{0.5}$$

The rolling correlations suffer from a main drawback in the sense that the number of days in the moving window, namely 100 days in this case, is arbitrarily chosen.

Finally, to overcome the drawback of the 100-day rolling average correlations, a model called dynamic conditional correlation general autoregressive conditional heteroskedasticity (DCC GARCH), as proposed by Engle (2002) and by Engle and Sheppard (2001), is used. Again, similar to the 100-day rolling average correlations, the average correlations between the same five pairs of variables are being calculated: i). ΔP_H and ΔP_A , ii). ΔP_H and ΔP_{HSI} , iii). ΔP_H and ΔP_{SHI} , iv). ΔP_A and ΔP_{HSI} and v). ΔP_A and ΔP_{SHI} .

5 – Empirical Results and Analysis

Figure 1 shows the average percentage difference between the A shares and the H shares for the 43 cross-listed companies from January 4, 2000 to June 29, 2007. The graph shows a clear trend in terms of the percentage price difference between the A and H share prices, and this

trend is consistent with the events being mentioned in the section 3 of this paper. The percentage price difference peaked in 2000 and 2001 when the market value of the Shanghai Composite Index hit its highest value since 1990, resulting in a huge premium of the A shares relative to the H shares. The percentage price difference decreased from around 90% in 2001 to below 10% in 2005, which was also the period in which the Chinese stock market went into the deep recession.

With the recovery of the Chinese stock markets and the lift of the ban on the new IPOs in the first half of 2006, the percentage price difference began to increase again. However, there was also a huge drop for the percentage price difference from 30% to around 15% in the second half of 2006, which can be seen more clearly from Figure 2. This was mainly due to the implementation of the QDII, allowing domestic Chinese investors to invest in foreign stock exchanges, and thus reducing the demand for the A shares. However, the percentage price difference began to rise again and reached a peak of around 45% in May 2007 because it was believed that the amount allowed to invest in foreign stock exchanges through the QDII was minimal. Nevertheless, the China Banking Regulatory Commission announced in May 2007 of the expansion of the QDII in terms of the amount and that domestic Chinese investors can now invest in Hong Kong stock market through this program. Such an announcement caused a sharp decrease from 45% in May 2007 to 35% by the end of June 2007 in terms of the percentage price difference.

Given the above trend, it is quite obvious that the A and H share returns are not co-moving. In order to officially confirm this result and to determine whether the A share returns affect the H share returns and vice versa, two regression tests are being performed. Table 2 and 3 present the results of the two regression tests, $\Delta P_{A_t} = \alpha + \beta \Delta P_{H_t} + \varepsilon_t$ (denoted as CNHK test) and $\Delta P_{H_t} = \alpha + \beta \Delta P_{A_t} + \varepsilon_t$ (denoted as HKCN test). As can be seen from the regression result

for the CNHK test, α for almost every single stock is not significantly different from 0 at the 5% level. This is quite consistent with the hypothesis that the stock price changes in Hong Kong and China are co-moving. Nevertheless, the results for β 's of most of the 45 stocks are significantly different from 0, and not anywhere close to 1, with the t-stat way above the critical value of 5% level. For the HKCN test, the t-stat of α 's shows a mixed result, with around half of the stocks with α significantly different from 0, and the other half with α not significantly different from 0 at the 5% level. However, the results for β 's again show that it is significantly different from 0 but not close to 1 for most of the stocks. In order for the hypothesis that the stock prices changes in Hong Kong and China are co-moving to be true, the value of β for each stock should be close to 1, while the value of α is close to 0. As a result, these regression tests suggest that the stock prices are not co-moving for Hong Kong and China. Nevertheless, since the β 's are significantly different from 0, it can be implied that the A and H share returns are correlated.

Further to the above regressions, table 4 and 5 illustrate the relationship between H share returns, A share returns, Hong Kong Hang Seng Index returns and Shanghai Composite Index returns. The results of two regressions are presented: $\Delta P_{A_t} = \alpha + \beta_1 \Delta P_{H_t} + \beta_2 \Delta P_{HSI_t} + \beta_3 \Delta P_{SHI_t} + \varepsilon_t$ (denoted as CNHKindex test) and $\Delta P_{H_t} = \alpha + \beta_1 \Delta P_{A_t} + \beta_2 \Delta P_{HSI_t} + \beta_3 \Delta P_{SHI_t} + \varepsilon_t$ (denoted as HKCNindex test). These two regression tests show similar results as the CNHK and HKCN tests. For the CNHKindex test, α 's are again not significantly different from 0 but not close to 1 while β_1 's are significantly different from 0 for most of the 43 stocks. The results for β_2 's are not as strong as β_1 's; however, β_2 's for most of the stocks are still significantly different from 0 but not close to 1. Both the results for β_1 's and β_2 's indicate that the A share returns are not co-moving with the H share or Hong Kong Hang Seng Index returns. On the other hand, β_3 's are significantly different from 0 but very close to 1. This result is expected because A share returns

should be co-moving with the Shanghai Composite Index. The HKCNindex test demonstrates similar results, in which the H share returns are not co-moving with the A share and Shanghai Composite Index returns, but are co-moving with the Hong Kong Hang Seng Index returns.

Given that the stock prices in Hong Kong and China are not co-moving, it is interesting to investigate how correlated they are. As a result, the average correlations between the five pairs of variables i). ΔP_H and ΔP_A , ii). ΔP_H and ΔP_{HSI} , iii). ΔP_H and ΔP_{SHI} , iv). ΔP_A and ΔP_{HSI} and v). ΔP_A and ΔP_{SHI} are calculated using the moving window of a period of 100 days and the DCC GARCH model. It is also important, by using the correlations being calculated, to determine whether the events mentioned in section 3 affect the correlations.

Figure 3 shows the time varying correlations between the average A and H share returns calculated by both the moving window and DCC GARCH. Although the range of the correlations is slightly different for the moving window and DCC GARCH methods, the graph actually illustrates that the pattern for the correlations calculated by the moving window and DCC GARCH is very similar, in the sense that they tend to move in the same directions. Given the drawback of the rolling correlations mentioned in the previous section, the time varying correlations calculated using the moving window method tends to be more volatile relative to the ones calculated using the DCC GARCH model.

Figures 4 to 8 demonstrate the time varying correlations over time for the five pairs of variables. Each of Figures 4 to 8 shows the time varying correlations from January 2, 2006 to June 29, 2007 since the main focus of this paper is on the three events mentioned in section 3, and that those events all happened after January 1, 2006. Figure 4 shows the average time varying correlations between the A and H share returns. Figures 5 and 6 demonstrate the average time varying correlations between the H share returns and the Hang Seng Index returns, and the

H share returns and the Shanghai Composite Index, respectively. Finally, the average time varying correlations between the A share returns and the Hang Seng Index returns, and the A share returns and the Shanghai Composite Index, respectively, are illustrated in Figures 7 and 8.

Overall, figures 4, 6, and 7 demonstrate that the cross-market correlations are relatively insignificant, and are in fact very close to 0 for some periods of time. This is consistent with the regression results that the H and A share returns are not co-moving. Figure 5 shows that the correlations between H share returns and the Hang Seng Index returns are relatively higher since the variables are within the same market. This also implies that, even though the A+H shares are issued by Chinese companies headquartered in China, the prices of these shares are still being affected by the Hong Kong stock market. Figure 8 illustrates that the correlations between A share returns and the Shanghai Composite Index returns are the highest. This means that the Chinese stock market is more influential on the stock returns relatively to the Hong Kong stock market.

April 14, 2006 – Official implementation date of QDII

On April 14, 2006, the China Banking Regulatory Commission officially announced the implementation of the QDII, meaning that Chinese domestic investors can invest in foreign stock markets through this program. The implication here is that the demand for the local A shares would be decreased, resulting in a potential decrease in value of the A shares. Nevertheless, figures 4, 6 and 7 show only a gradual decrease from April 2006 to May 2006 in terms of the correlations due to this particular event. The decrease in the correlation was not very significant, only ranging from 5% to 8% because investors believe that the effect of QDII is not going to be very significant as the amount that is allowed to be invested in foreign markets at the beginning is not enormous. On the other hand, figures 5 shows that the correlations between H share returns

and the Hang Seng Index returns are not severely affected. Nevertheless, figure 8 shows that the correlations between A share returns and the Shanghai Composite Index returns experience a dramatic drop from more than 50% in January 2006 to around 35% in April 2006. This decrease is mainly due to the fact that the A share prices of the 43 companies experienced a decline as early as January 2006 when the investors expect the implementation of QDII was going to take place very soon. At the same time, however, the Shanghai Composite Index was continuing its own raising trend. Nevertheless, the changes in correlations overall brought by this event are within expectation.

May 23, 2006 – Lift of the ban of new IPOs in the Chinese stock market

As one of the tools to bring the Chinese stock market back to life, the Shanghai Stock Exchange announced the lifting of the ban of new IPOs on May 23, 2006. The ban of new IPOs was placed in April 2005. Since then, a large number of companies issued new shares through IPOs in the Shanghai and Shenzhen stock exchanges, with the largest IPO in the world in October 2006 by Industrial and Commercial Bank of China Ltd. The lift of the ban of new IPOs, along with the strong economic growth in China, resulted in the recovery of the Chinese stock markets in mid-2006. At the same time, the stock market in Hong Kong continued its upward trend since 2003. Nevertheless, the increase in A share prices was much more significant and faster relative to the increase in H share prices. One of the main reasons is that investors believed that the QDII being implemented in April 2006 was not significant enough to reduce the demand of the A shares. It was believed that QDII could reduce the discrepancy between the stock prices of A and H shares in the long run, but not until the amount of money that could be invested in foreign stock exchanges is increased by a significant amount. As a result, one would expect that the correlation between A and H share returns to increase during this period. Figures 4, 6 and 7

show that the changes in correlation are what being expected. The correlations increased by around 10% to 15% from May 2006 to May 2007. Again, figure 5 does not exhibit a huge change in correlations because the correlations are between stock and index returns within the same stock market. Figure 8, on the other hand, shows a significant increase in terms of the correlations, mainly because the A share prices of those 43 companies increased back up along with the Shanghai Composite Index.

May 11, 2007 – Extension of QDII to Hong Kong Stock Exchange

QDII once again became an important event on May 11, 2007, when the China Banking Regulatory Commission announced that the amount of money that could be invested in foreign stock exchanges through QDII got increased. More importantly, QDII had been extended to Hong Kong stock exchange, meaning that the Chinese domestic investors are allowed to invest in Hong Kong stocks through QDII, and that the total amount of money that could be invested in Hong Kong stock totalled HK\$56.7 billion. Even though the amount was still very minimal, it was believed that the Chinese government would continue to expand the QDII program. Such an announcement by the Chinese government caused the H shares, and even the Hong Kong stock market in general, to increase significantly on the next trading day, May 14, 2007. For the month followed, the price discrepancy between the A and H shares began to get smaller and smaller because there seemed to be cash outflow from Chinese stock markets to Hong Kong stock market. Such a change is also being reflected in figures 4, 6 and 7. The cross-region correlations got reduced by around 10% to 15% in one month followed by the event.

6 – Conclusion

Overall, there are several findings that are worth mentioning in this paper. To start with, even though the A+H shares are issued by the same company, the stock prices of the shares are

not the same. In addition, although there are correlations between the A and H shares, the correlations tend not to be high, resulting in a lack of co-movement between the A and H shares, as indicated by the regression tests. This paper then goes on to investigate the correlations between the A and H shares. The 100-day rolling correlations and the correlations from DCC GARCH model are being calculated, indicating that the correlations are time-varying. In addition, three different events are being investigated to determine whether they have impact on the time-varying correlations. The results show that the events do have an impact on the time varying correlations between cross-region stocks and indices. More importantly, the effect of the events on the time varying correlations is what we have expected. Although there may be other factors affecting the time varying correlations at the same time in addition to the events, the magnitude of the increase or decrease of the time varying correlations in such a short period of time does strongly imply that the events played a very important role in the changes of the time varying correlations.

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Table 1 – 45 A+H shares as of June 29, 2007

Number	Company Name	China Code	Hong Kong Code
1	Northeast Electric Development Co Ltd	000585	0042
2	Tsingtao Brewery Co Ltd	600600	0168
3	Jiangsu Expressway Co Ltd	600377	0177
4	Beiren Printing Machinery Holdings Ltd	600860	0187
5	Jiaoda Kunji High-Tech Co Ltd	600806	0300
6	Guangzhou Shipyard International Co Ltd	600685	0317
7	Maanshan Iron and Steel Co Ltd	600808	0323
8	Sinopec Shanghai Petrochemical Co Ltd	600688	0338
9	Angang Steel Co Ltd	000898	0347
10	Jingwei Textile Machinery Co Ltd	000666	0350
11	Jiangxi Copper Co Ltd	600362	0358
12	China Petroleum and Chemical Corp (Sinopec)	600028	0386
13	Guangshen Railway Co Ltd	601333	0525
14	Shenzhen Expressway Co Ltd	600548	0548
15	Nanjing Panda Electronics Co Ltd	600775	0553
16	Beijing North Star Co Ltd	601588	0588
17	China Eastern Airlines Corp Ltd	600115	0670
18	Shandong Xinhua Pharmaceutical Co Ltd	000756	0719
19	Air China Ltd	601111	0753
20	ZTE Corporation	000063	0763
21	Guangzhou Pharmaceutical Co Ltd	600332	0874
22	Huaneng Power International Inc	600011	0902
23	Anhui Conch Cement Co Ltd	600585	0914
24	Hisense Kelon Electrical Holdings Co Ltd	000921	0921
25	Datang International Power Generation Co Ltd	601991	0991
26	Anhui Expressway Co Ltd	600012	0995
27	China CITIC Bank Corporation Ltd	601998	0998
28	Sinopec Yizheng Chemical Fibre Co Ltd	600871	1033
29	Chongqing Iron & Steel Co Ltd	601005	1053

30	China Southern Airlines Co Ltd	600029	1055
31	Tianjin Capital Environmental Protection Co Ltd	600874	1065
32	Huadian Power International Corp Ltd	600027	1071
33	Dongfang Electrical Machinery Co Ltd	600875	1072
34	Luoyang Glass Co Ltd	600876	1108
35	China Shipping Development Co Ltd	600026	1138
36	Yanzhou Coal Mining Co Ltd	600188	1171
37	Industrial and Commercial Bank of China Ltd	601398	1398
38	Ping An Insurance (Group) Co of China Ltd	601318	2318
39	Weichai Power Co Ltd	000338	2338
40	Aluminum Corporation of China Ltd	601600	2600
41	China Life Insurance Co Ltd	601628	2628
42	Bank of Communications Co Ltd	601328	3328
43	China Merchants Bank Co Ltd	600036	3968
44	Bank of China Ltd	601988	3988
45	China COSCO Holdings Co Ltd	601919	1919

Table 2 – CNHK regression test results

Number	Company Name	α	α t-stat	β	β t-stat
1	Northeast Electric Development Co Ltd	0.0001	0.1110	0.1097	9.9354*
2	Tsingtao Brewery Co Ltd	0.0006	1.3674	0.1001	6.6537*
3	Jiangsu Expressway Co Ltd	0.0001	0.2406	0.0711	3.5125*
4	Beiren Printing Machinery Holdings Ltd	0.0003	0.4127	0.1121	6.7042*
5	Jiaoda Kunji High-Tech Co Ltd	0.0005	0.7491	0.1545	9.9909*
6	Guangzhou Shipyard International Co Ltd	0.0012	1.8565	0.1187	7.8545*
7	Maanshan Iron and Steel Co Ltd	0.0006	1.1117	0.1077	6.9873*
8	Sinopec Shanghai Petrochemical Co Ltd	0.0007	1.3653	0.1081	7.0315*
9	Angang Steel Co Ltd	0.0009	1.7256	0.1333	9.1648*
10	Jingwei Textile Machinery Co Ltd	0.0001	0.2354	0.1056	6.0931*
11	Jiangxi Copper Co Ltd	0.0010	1.3469	0.2478	11.2740*
12	China Petroleum and Chemical Corp (Sinopec)	0.0006	1.1198	0.2247	9.5853*
13	Guangshen Railway Co Ltd	0.0016	0.5107	0.2084	1.7977
14	Shenzhen Expressway Co Ltd	0.0003	0.4411	0.1591	5.3690*
15	Nanjing Panda Electronics Co Ltd	0.0000	0.0568	0.0856	5.8610*
16	Beijing North Star Co Ltd	0.0032	0.9981	0.6432	7.9608*
17	China Eastern Airlines Corp Ltd	0.0005	1.0308	0.1218	7.7046*
18	Shandong Xinhua Pharmaceutical Co Ltd	-0.0003	-0.5982	0.1292	7.3508*
19	Air China Ltd	0.0040	1.8018	0.6382	7.6725*
20	ZTE Corporation	0.0008	0.9573	0.4258	12.0040*
21	Guangzhou Pharmaceutical Co Ltd	-0.0002	-0.3174	0.1815	9.4077*
22	Huaneng Power International Inc	0.0005	0.8003	0.1314	4.8246*
23	Anhui Conch Cement Co Ltd	0.0013	1.9794	0.2453	11.6490*
25	Datang International Power Generation Co Ltd	0.0093	2.1383*	0.6178	4.5160*
26	Anhui Expressway Co Ltd	0.0006	0.8783	0.0700	2.4433*
27	China CITIC Bank Corporation Ltd	-0.0029	-0.4488	0.8450	1.7396
28	Sinopec Yizheng Chemical Fibre Co Ltd	0.0006	0.9938	0.1606	9.5820*
29	Chongqing Iron & Steel Co Ltd	0.0013	0.2706	0.1548	1.4331
30	China Southern Airlines Co Ltd	0.0007	0.9608	0.2392	8.8774*

31	Tianjin Capital Environmental Protection Co Ltd	0.0003	0.5801	0.1389	8.0119*
32	Huadian Power International Corp Ltd	0.0008	0.6163	0.2429	4.3974*
33	Dongfang Electrical Machinery Co Ltd	0.0011	1.7176	0.1340	9.2313*
34	Luoyang Glass Co Ltd	0.0003	0.4103	0.1277	7.5018*
35	China Shipping Development Co Ltd	0.0012	1.7979	0.1584	6.4693*
36	Yanzhou Coal Mining Co Ltd	0.0006	1.0053	0.0663	4.1126*
37	Industrial and Commercial Bank of China Ltd	0.0018	0.8109	0.7755	6.6384*
38	Ping An Insurance (Group) Co of China Ltd	0.0036	0.9448	0.3511	2.3071*
39	Weichai Power Co Ltd	0.0076	0.9931	0.0338	0.1343
40	Aluminum Corporation of China Ltd	0.0006	0.9340	0.1069	4.7352*
41	China Life Insurance Co Ltd	0.0001	0.0433	0.6329	5.0356*
42	Bank of Communications Co Ltd	-0.0058	-1.1099	1.1500	1.8818
43	China Merchants Bank Co Ltd	0.0024	1.0597	0.6998	6.8926*
44	Bank of China Ltd	0.0009	0.6001	0.7990	6.4681*

*Significant at the 5% level

Table 3 – HKCN regression test results

Number	Company Name	α	α t-stat	β	β t-stat
1	Northeast Electric Development Co Ltd	0.0021	1.8356	0.4451	9.9354*
2	Tsingtao Brewery Co Ltd	0.0015	2.1742*	0.2248	6.6537*
3	Jiangsu Expressway Co Ltd	0.0015	2.6336*	0.1042	3.5125*
4	Beiren Printing Machinery Holdings Ltd	0.0015	1.8645	0.2037	6.7042*
5	Jiaoda Kunji High-Tech Co Ltd	0.0025	2.6635*	0.3195	9.9909*
6	Guangzhou Shipyard International Co Ltd	0.0028	2.8249*	0.2619	7.8545*
7	Maanshan Iron and Steel Co Ltd	0.0020	2.4317*	0.2299	6.9873*
8	Sinopec Shanghai Petrochemical Co Ltd	0.0012	1.6225	0.2320	7.0315*
9	Angang Steel Co Ltd	0.0021	2.6836*	0.3139	9.1648*
10	Jingwei Textile Machinery Co Ltd	0.0016	2.1613*	0.1793	6.0931*
11	Jiangxi Copper Co Ltd	0.0019	2.3592*	0.3371	11.2740*
12	China Petroleum and Chemical Corp (Sinopec)	0.0015	2.6779*	0.2559	9.5853*
13	Guangshen Railway Co Ltd	0.0024	0.9254	0.1357	1.7977
14	Shenzhen Expressway Co Ltd	0.0013	2.4463*	0.1262	5.3690*
15	Nanjing Panda Electronics Co Ltd	0.0013	1.2626	0.2050	5.8610*
16	Beijing North Star Co Ltd	0.0031	1.1625	0.4431	7.9608*
17	China Eastern Airlines Corp Ltd	0.0010	1.4813	0.2458	7.7046*
18	Shandong Xinhua Pharmaceutical Co Ltd	0.0014	1.9511	0.2115	7.3508*
19	Air China Ltd	0.0018	1.0716	0.3634	7.6725*
20	ZTE Corporation	0.0004	0.5118	0.4338	12.0040*
21	Guangzhou Pharmaceutical Co Ltd	0.0018	2.5132*	0.2827	9.4077*
22	Huaneng Power International Inc	0.0013	2.3365*	0.1228	4.8246*
23	Anhui Conch Cement Co Ltd	0.0021	2.6936*	0.3662	11.6490*
25	Datang International Power Generation Co Ltd	0.0013	0.4370	0.2571	4.5160*
26	Anhui Expressway Co Ltd	0.0014	2.1632*	0.0746	2.4433*
27	China CITIC Bank Corporation Ltd	-0.0024	-1.1398	0.0942	1.7396
28	Sinopec Yizheng Chemical Fibre Co Ltd	0.0007	0.9487	0.2837	9.5820*
29	Chongqing Iron & Steel Co Ltd	0.0045	0.8575	0.1768	1.4331
30	China Southern Airlines Co Ltd	0.0009	1.0788	0.3069	8.8774*

31	Tianjin Capital Environmental Protection Co Ltd	0.0017	2.3643*	0.2326	8.0119*
32	Huadian Power International Corp Ltd	0.0011	1.1930	0.1294	4.3974*
33	Dongfang Electrical Machinery Co Ltd	0.0027	2.8705*	0.3167	9.2313*
34	Luoyang Glass Co Ltd	0.0010	1.1487	0.2227	7.5018*
35	China Shipping Development Co Ltd	0.0021	2.6655*	0.1969	6.4693*
36	Yanzhou Coal Mining Co Ltd	0.0015	1.9393	0.1316	4.1126*
37	Industrial and Commercial Bank of China Ltd	0.0007	0.4918	0.2928	6.6384*
38	Ping An Insurance (Group) Co of China Ltd	0.0057	2.0290*	0.1961	2.3071*
39	Weichai Power Co Ltd	0.0021	1.9837*	0.0006	0.1343
40	Aluminum Corporation of China Ltd	0.0020	2.5358*	0.1458	4.7352*
41	China Life Insurance Co Ltd	0.0009	0.4054	0.3097	5.0356*
42	Bank of Communications Co Ltd	-0.0002	-0.1070	0.0976	1.8818
43	China Merchants Bank Co Ltd	0.0031	2.1234*	0.3121	6.8926*
44	Bank of China Ltd	0.0002	0.2751	0.1948	6.4681*

*Significant at the 5% level

Table 4 – HKCN Index regression test results

Company Name	α	α t-stat	β_1	β_1 t-stat	β_2	β_2 t-stat	β_3	β_3 t-stat
Northeast Electric Development Co Ltd	-0.0004	-0.6888	0.0864	8.4557	-0.0933	-2.2502	0.7806	21.6070
Tsingtao Brewery Co Ltd	0.0002	0.4601	0.0647	5.0769	-0.0251	-0.7910	0.8655	32.0530
Jiangsu Expressway Co Ltd	-0.0002	-0.4638	0.0390	2.1645	-0.0692	-1.8342	0.7565	27.3130
Beiren Printing Machinery Holdings Ltd	-0.0004	-0.7511	0.0719	5.2169	-0.0873	-2.1786	1.1396	32.6210
Jiaoda Kunji High-Tech Co Ltd	-0.0001	-0.0958	0.1043	7.9142	-0.0583	-1.2929	1.1450	28.9720
Guangzhou Shipyard International Co Ltd	0.0007	1.1986	0.0777	5.9576	-0.0067	-0.1503	1.1142	28.6680
Maanshan Iron and Steel Co Ltd	0.0001	0.3027	0.0458	3.2921	-0.0185	-0.4707	0.9939	30.7430
Sinopec Shanghai Petrochemical Co Ltd	0.0002	0.4649	0.0614	4.6061	-0.0753	-2.1375	0.9549	32.4270
Angang Steel Co Ltd	0.0004	1.0590	0.0713	5.6843	0.0112	0.3203	0.9901	34.1900
Jingwei Textile Machinery Co Ltd	-0.0004	-0.9956	0.0391	2.7595	-0.0444	-1.2149	1.1158	35.5440
Jiangxi Copper Co Ltd	0.0004	0.6307	0.2033	9.9716	-0.2726	-4.1442	1.0803	27.0420
China Petroleum and Chemical Corp (Sinopec)	0.0003	0.6994	0.1205	6.2237	-0.0946	-2.4133	0.9733	37.3660
Guangshen Railway Co Ltd	-0.0026	-1.2673	0.0313	0.3382	-0.0257	-0.1119	1.0054	12.5440
Shenzhen Expressway Co Ltd	-0.0003	-0.5955	0.1176	4.5547	-0.0865	-1.6324	0.9274	27.5930
Nanjing Panda Electronics Co Ltd	-0.0006	-1.1179	0.0560	4.3204	-0.0489	-1.0704	1.1132	29.0400
Beijing North Star Co Ltd	0.0000	-0.0019	0.5422	7.4658	-0.9782	-3.5935	1.0033	8.0289
China Eastern Airlines Corp Ltd	0.0000	0.1047	0.0917	6.3636	-0.0783	-2.1813	0.8402	28.3870
Shandong Xinhua Pharmaceutical Co Ltd	-0.0009	-1.9325	0.0598	4.0505	-0.1146	-3.1289	1.0428	32.7270
Air China Ltd	0.0010	0.5323	0.4923	6.6121	-0.4286	-2.1952	0.8905	9.8240
ZTE Corporation	0.0000	-0.0049	0.3571	10.0860	-0.1319	-1.3364	0.5560	11.1070
Guangzhou Pharmaceutical Co Ltd	-0.0005	-1.1082	0.0979	6.0133	-0.0558	-1.3351	0.9633	30.1830
Huaneng Power International Inc	-0.0001	-0.1187	0.0794	3.3502	-0.0422	-0.8452	0.9154	29.3740
Anhui Conch Cement Co Ltd	0.0008	1.3936	0.1982	9.8215	-0.0420	-0.6661	0.8487	21.0920
Datang International Power Generation Co Ltd	0.0058	1.6389	0.7300	5.8004	-1.1101	-3.0417	1.1234	7.9056
Anhui Expressway Co Ltd	-0.0002	-0.3538	0.0590	2.3662	-0.1664	-2.7502	0.8955	24.4580
China CITIC Bank Corporation Ltd	-0.0038	-0.7857	0.7141	1.8864	-0.1301	-0.2592	0.9041	5.5764
Sinopec Yizheng Chemical Fibre Co Ltd	0.0000	-0.0028	0.1113	7.5776	-0.1117	-2.7783	1.0465	30.8710
Chongqing Iron & Steel Co Ltd	-0.0032	-0.9048	0.0991	1.1330	-0.5459	-1.4410	1.3672	8.9325
China Southern Airlines Co Ltd	0.0002	0.2712	0.2074	7.9138	-0.2320	-2.9835	0.7162	15.7540
Tianjin Capital Environmental Protection Co Ltd	-0.0002	-0.4137	0.0986	6.5418	-0.1226	-3.1427	1.0063	30.3140
Huadian Power International Corp Ltd	-0.0010	-0.9259	0.1358	2.7448	-0.4919	-3.7433	1.1444	17.3750
Dongfang Electrical Machinery Co Ltd	0.0005	1.0482	0.0874	7.0897	-0.0358	-0.8670	1.1068	31.0180
Luoyang Glass Co Ltd	-0.0003	-0.4843	0.0902	5.8095	-0.1315	-2.8183	0.9788	24.2940
China Shipping Development Co Ltd	0.0006	1.0625	0.0893	4.0544	-0.0914	-1.4451	1.1161	29.3090
Yanzhou Coal Mining Co Ltd	0.0000	0.0303	0.0363	2.5676	-0.0840	-2.1839	0.9806	30.4060
Industrial and Commercial Bank of China Ltd	-0.0023	-1.6041	0.5855	6.2059	-0.4445	-2.7109	0.9342	15.0900
Ping An Insurance (Group) Co of China Ltd	0.0002	0.0692	0.2917	1.8224	-0.0568	-0.1531	0.8663	6.7137
Weichai Power Co Ltd	0.0067	0.8767	0.0754	0.2870	-1.4394	-1.6104	1.6047	3.2357
Aluminum Corporation of China Ltd	0.0002	0.2885	0.0774	3.4493	-0.1124	-1.6398	0.8760	21.0210

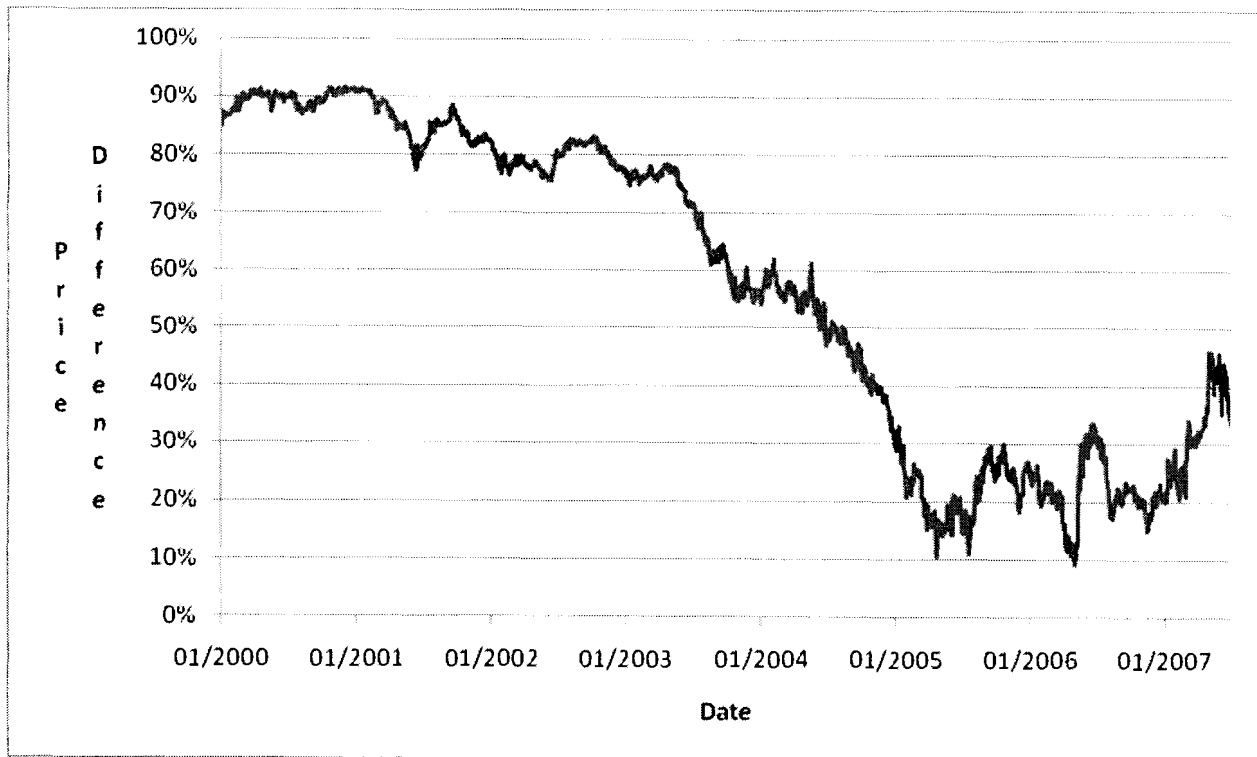
China Life Insurance Co Ltd	-0.0024	-1.0967	0.3482	2.6438	0.0250	0.0901	0.8722	9.6091
Bank of Communications Co Ltd	-0.0055	-2.1305	0.6399	1.5244	-0.4065	-1.0051	0.8334	9.9513
China Merchants Bank Co Ltd	-0.0006	-0.3369	0.5163	5.4655	-0.1919	-0.9722	0.8387	10.6040
Bank of China Ltd	-0.0019	-1.8022	0.5169	5.0137	-0.3145	-2.3742	0.9116	17.2360

Table 5 – CNHK Index regression test results

Company Name	α	α t-stat	β_1	β_1 t-stat	β_2	β_2 t-stat	β_3	β_3 t-stat
Northeast Electric Development Co Ltd	0.0019	1.7064	0.4155	8.4557	0.8419	9.4853	0.0399	0.4520
Tsingtao Brewery Co Ltd	0.0014	2.1152	0.2048	5.0769	0.7113	13.1670	-0.0430	-0.7222
Jiangsu Expressway Co Ltd	0.0013	2.4303	0.0726	2.1645	0.7357	15.2490	0.0178	0.3919
Beiren Printing Machinery Holdings Ltd	0.0014	1.7700	0.1943	5.2169	0.5984	9.2763	-0.0185	-0.2583
Jiaoda Kunji High-Tech Co Ltd	0.0024	2.5723	0.3029	7.9142	0.5162	6.7974	0.0058	0.0724
Guangzhou Shipyard International Co Ltd	0.0026	2.7829	0.2335	5.9576	0.7479	9.8879	-0.0053	-0.0662
Maanshan Iron and Steel Co Ltd	0.0017	2.3293	0.1224	3.2921	1.1114	18.8190	0.1657	2.5729
Sinopec Shanghai Petrochemical Co Ltd	0.0010	1.4811	0.1779	4.6061	0.9306	16.5700	0.0544	0.8735
Angang Steel Co Ltd	0.0020	2.7180	0.2320	5.6843	1.0460	17.8620	0.0263	0.3977
Jingwei Textile Machinery Co Ltd	0.0014	1.9515	0.1011	2.7595	0.7116	12.6000	0.1456	2.2435
Jiangxi Copper Co Ltd	0.0013	1.7598	0.3280	9.9716	1.4865	20.0800	-0.1276	-2.0397
China Petroleum and Chemical Corp (Sinopec)	0.0011	2.2471	0.2084	6.2237	0.9202	20.0620	-0.0129	-0.2703
Guangshen Railway Co Ltd	0.0012	0.5471	0.0335	0.3382	1.4699	7.6502	-0.0460	-0.3547
Shenzhen Expressway Co Ltd	0.0010	1.9267	0.1237	4.5547	0.7636	15.1290	-0.0643	-1.5029
Nanjing Panda Electronics Co Ltd	0.0010	1.1033	0.1720	4.3204	1.1568	15.3080	-0.0219	-0.2713
Beijing North Star Co Ltd	0.0026	0.9855	0.4833	7.4658	1.0203	4.0067	-0.1988	-1.4280
China Eastern Airlines Corp Ltd	0.0009	1.3737	0.2250	6.3636	0.9327	17.9040	-0.0513	-0.9286
Shandong Xinhua Pharmaceutical Co Ltd	0.0011	1.6665	0.1417	4.0505	0.6188	11.3070	0.1665	2.7253
Air China Ltd	0.0014	0.8791	0.3752	6.6121	0.7864	4.8247	-0.1383	-1.4346
ZTE Corporation	-0.0001	-0.1101	0.3872	10.0860	0.8505	8.7503	-0.0156	-0.2742
Guangzhou Pharmaceutical Co Ltd	0.0016	2.3098	0.2211	6.0133	0.6527	10.7490	0.0873	1.4588
Huaneng Power International Inc	0.0009	1.8064	0.0989	3.3502	0.8731	17.2550	-0.0338	-0.7665
Anhui Conch Cement Co Ltd	0.0016	2.2162	0.3312	9.8215	1.1906	15.8940	-0.1251	-2.0931
Datang International Power Generation Co Ltd	0.0007	0.2846	0.3301	5.8004	1.4413	6.7293	-0.4282	-3.7869
Anhui Expressway Co Ltd	0.0008	1.3394	0.0832	2.3662	0.8853	13.1890	-0.0649	-1.2077
China CITIC Bank Corporation Ltd	-0.0027	-1.3040	0.1363	1.8864	0.3952	1.8965	-0.1118	-1.1553
Sinopec Yizheng Chemical Fibre Co Ltd	0.0006	0.7906	0.2607	7.5776	0.9101	15.6770	-0.0218	-0.3440
Chongqing Iron & Steel Co Ltd	0.0024	0.5126	0.1791	1.1330	2.2150	4.9797	-0.2566	-0.8602
China Southern Airlines Co Ltd	0.0001	0.1082	0.2861	7.9138	1.0773	12.6550	-0.0495	-0.8288
Tianjin Capital Environmental Protection Co Ltd	0.0016	2.2805	0.2211	6.5418	0.7853	14.0760	-0.0240	-0.3969
Huadian Power International Corp Ltd	0.0002	0.1835	0.0922	2.7448	0.9876	9.7028	0.0837	1.2571
Dongfang Electrical Machinery Co Ltd	0.0026	2.8366	0.2916	7.0897	0.8138	11.1440	-0.0282	-0.3535
Luoyang Glass Co Ltd	0.0008	0.9510	0.1913	5.8095	0.7718	11.7380	0.0807	1.2035
China Shipping Development Co Ltd	0.0014	2.0928	0.1400	4.0544	1.3984	20.2310	-0.0004	-0.0060
Yanzhou Coal Mining Co Ltd	0.0013	1.7969	0.0943	2.5676	0.9168	15.6770	0.0466	0.7364
Industrial and Commercial Bank of China Ltd	0.0007	0.6392	0.3527	6.2059	0.9489	9.0823	-0.2610	-3.5521
Ping An Insurance (Group) Co of China Ltd	0.0047	2.1974	0.1553	1.8224	1.5059	7.4481	-0.2743	-2.3618
Weichai Power Co Ltd	0.0013	1.3321	0.0013	0.2870	0.9729	8.5806	0.0878	1.3330
Aluminum Corporation of China Ltd	0.0014	1.9438	0.1078	3.4493	1.4259	19.9240	0.0100	0.1777

China Life Insurance Co Ltd	0.0001	0.0344	0.1842	2.6438	1.3532	8.9782	-0.1047	-1.1562
Bank of Communications Co Ltd	-0.0010	-0.7729	0.1282	1.5244	0.6806	5.3411	-0.0582	-0.7152
China Merchants Bank Co Ltd	0.0028	2.1700	0.2924	5.4655	0.9467	7.2951	-0.1638	-2.1593
Bank of China Ltd	-0.0003	-0.4946	0.1944	5.0137	0.7139	10.6390	-0.1105	-2.2613

**Figure 1 – Price difference in percentage between H shares and A shares
from January 4, 2000 to June 29, 2007**



**Figure 2 – Price difference in percentage between H shares and A shares
from January 2, 2006 to June 29, 2007**

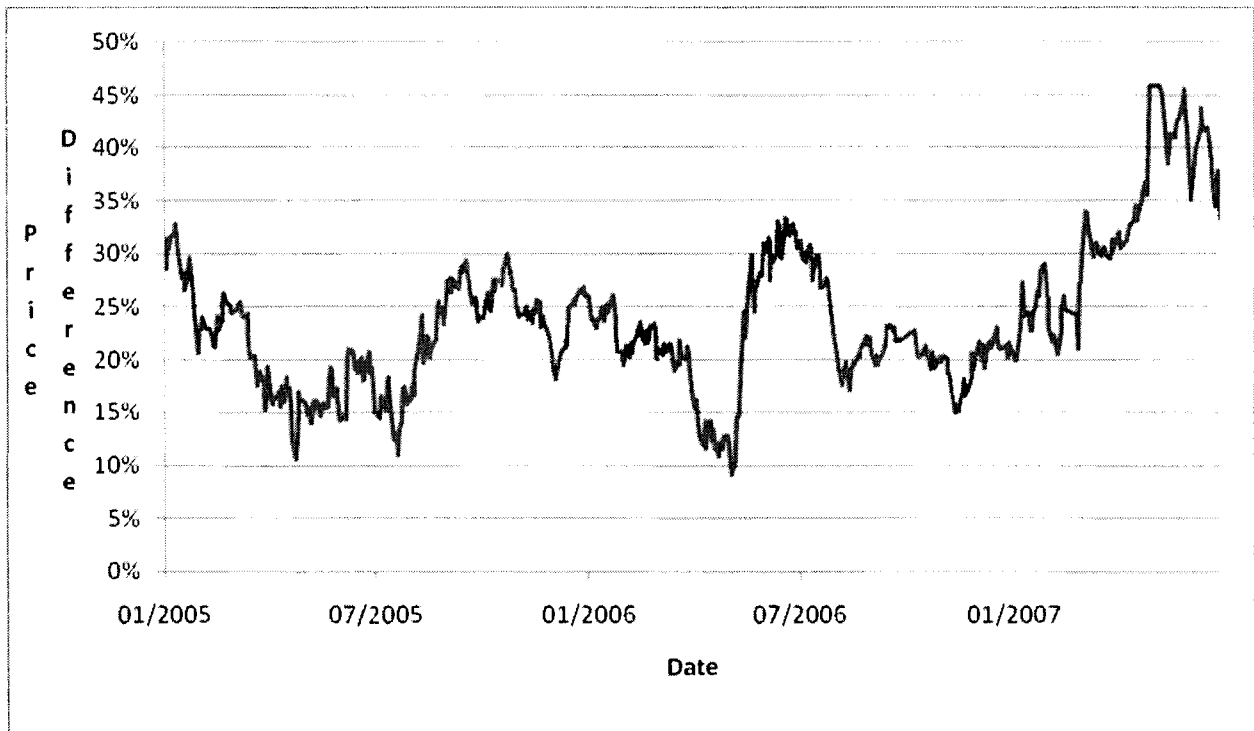
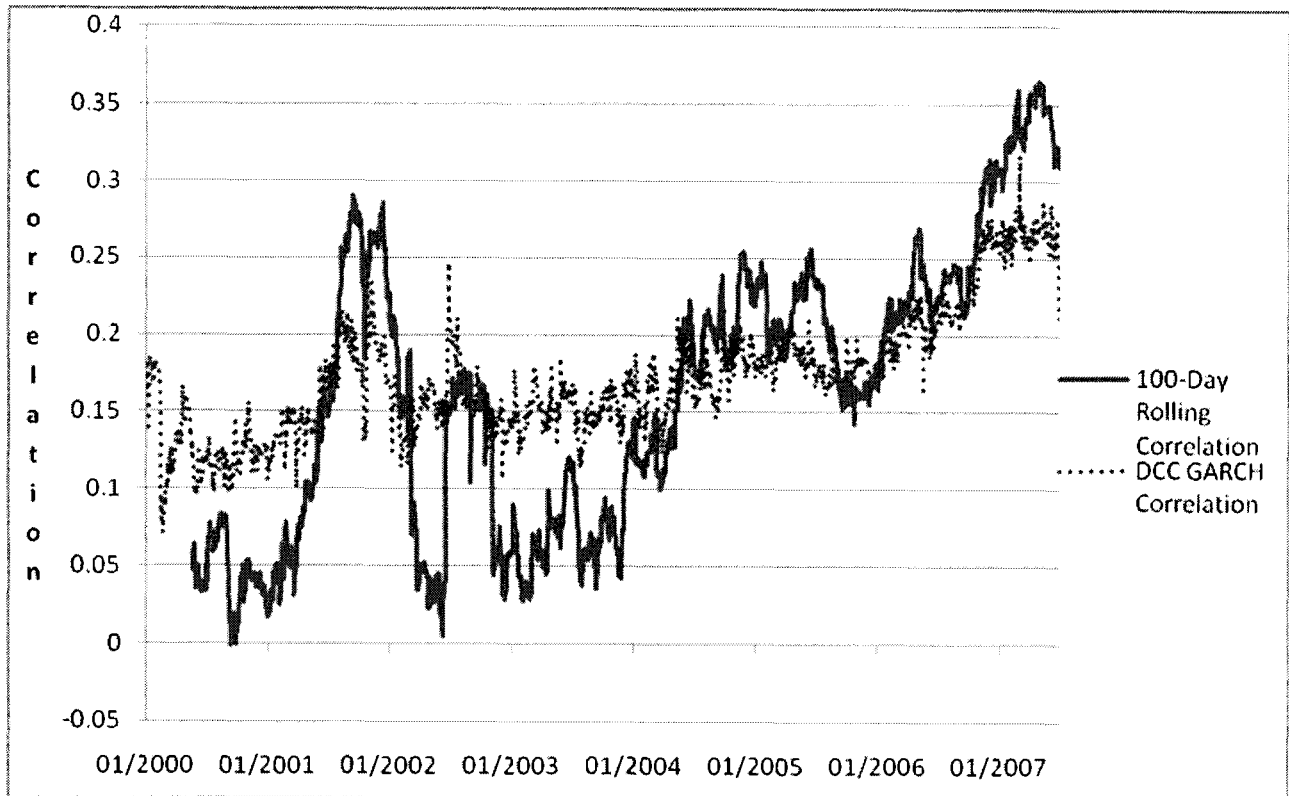


Figure 3 – Average correlation between H share returns and A share returns from January 4, 2000 to June 29, 2007 using 100-day rolling method and DCC GARCH



**Figure 4 – Average correlation between H share returns and A share returns
from January 2, 2006 to June 29, 2007**

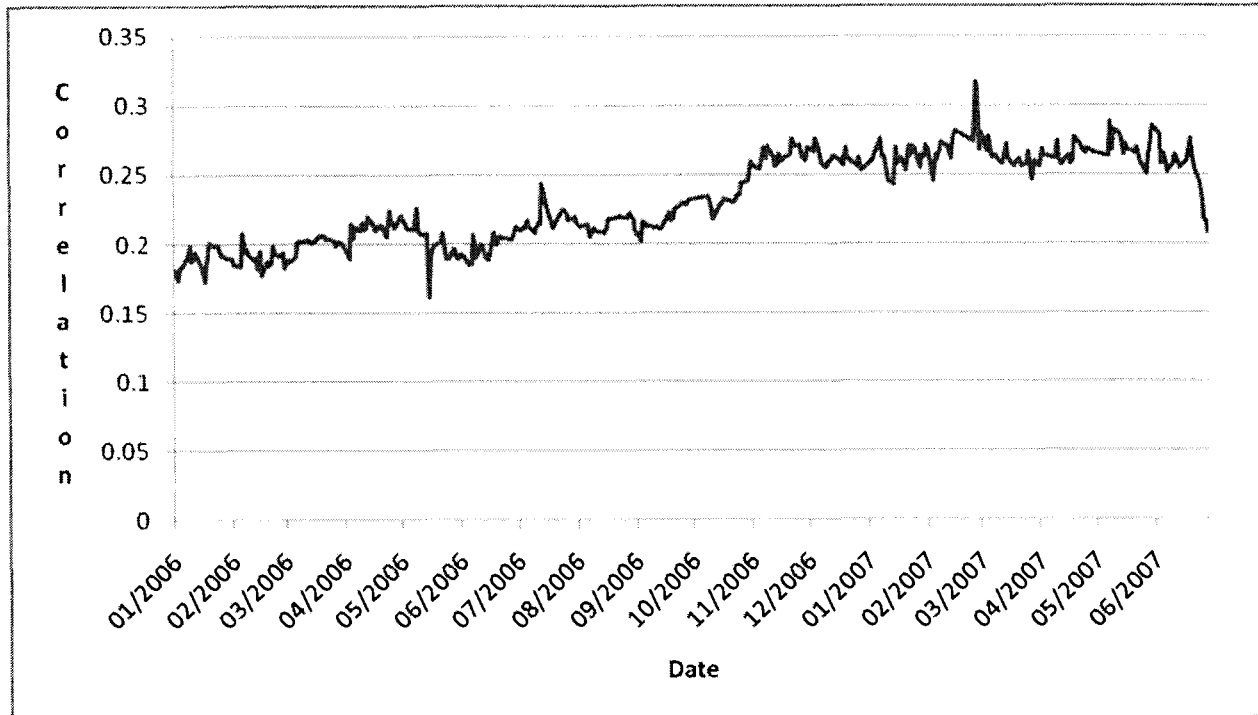


Figure 5 – Average correlation between H share returns and Hang Seng Index returns from January 2, 2006 to June 29, 2007

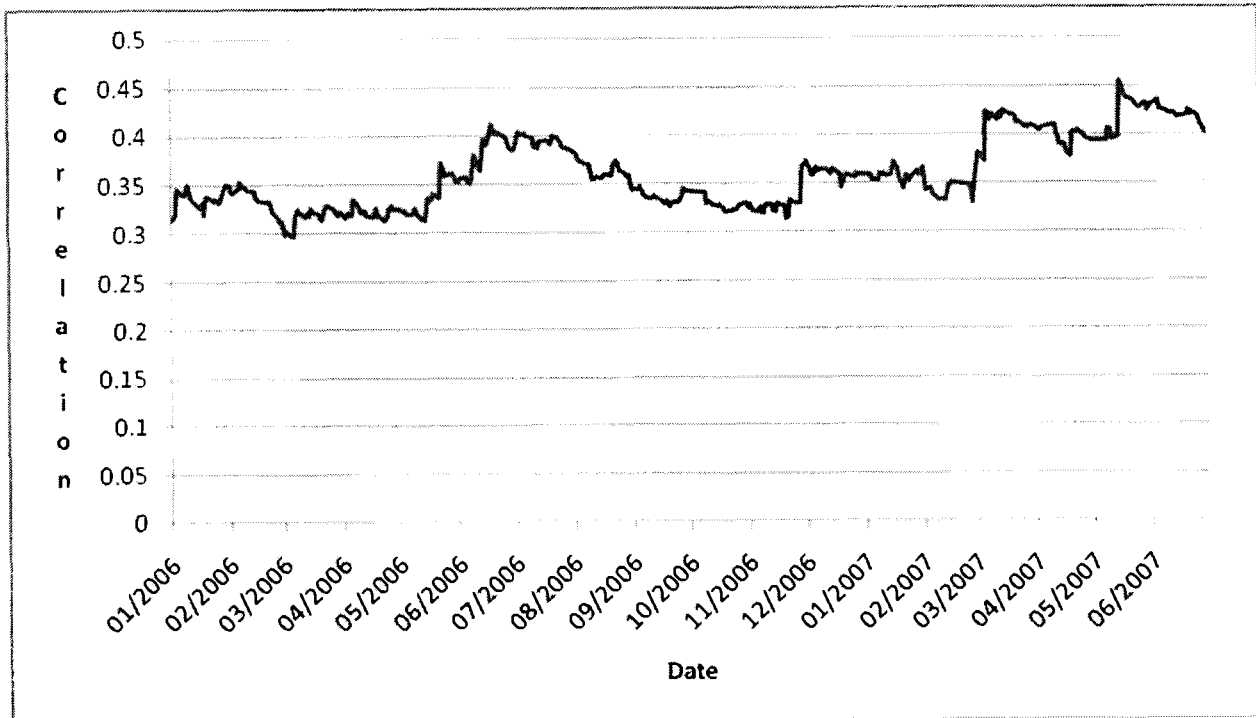


Figure 6 – Average correlation between H share returns and Shanghai Composite Index returns from January 2, 2006 to June 29, 2007

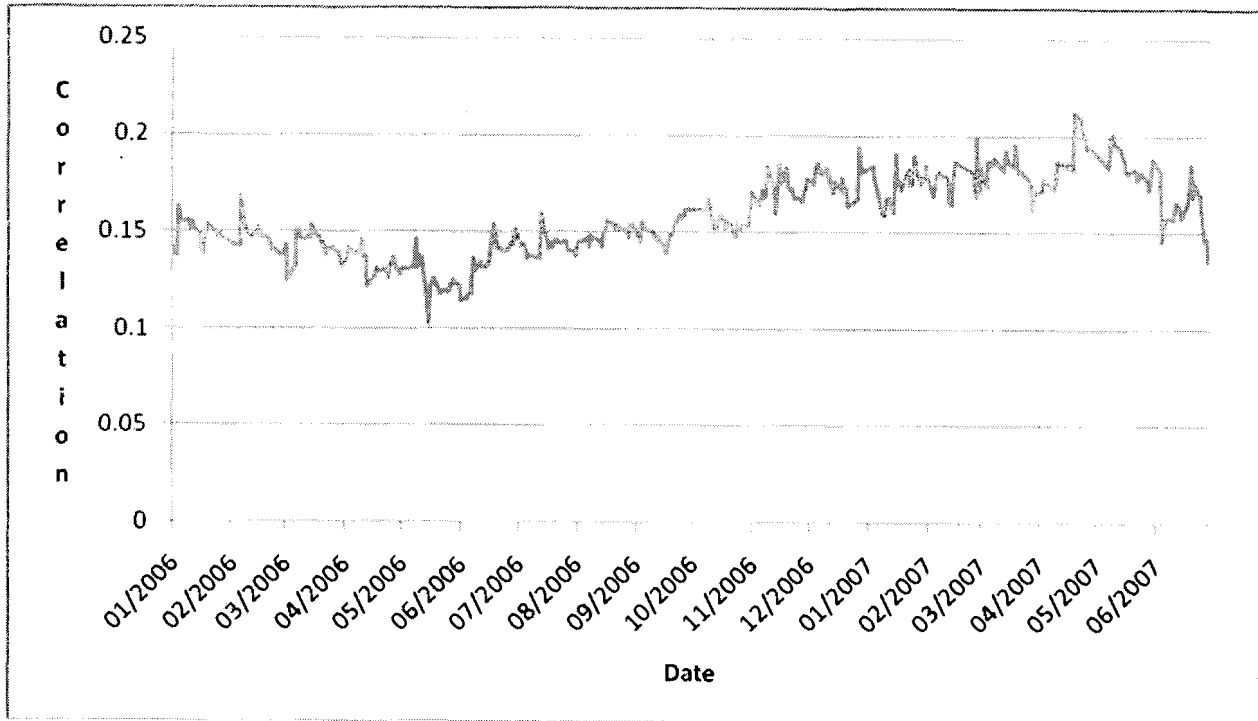


Figure 7 – Average correlation between A share returns and Hang Seng Index returns from January 2, 2006 to June 29, 2007

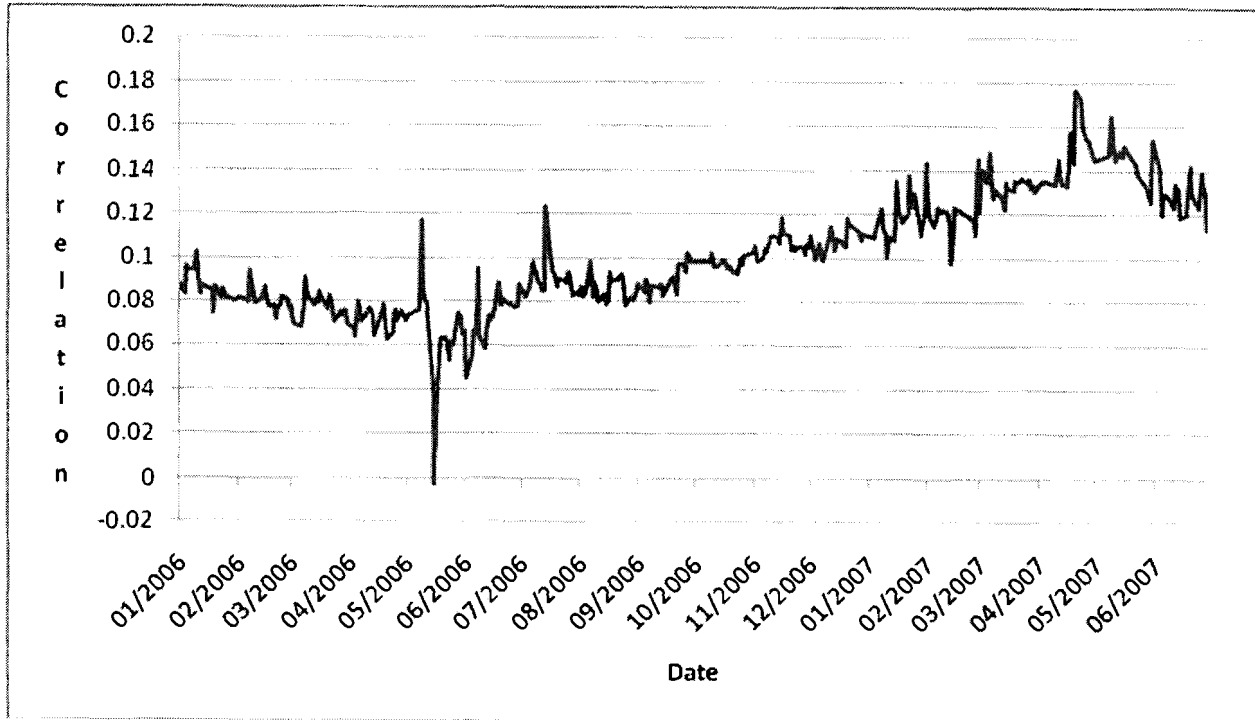


Figure 8 – Average correlation between A share returns and Shanghai Composite Index returns from January 2, 2006 to June 29, 2007

