

The impact of the QDII reform on the Chinese AH share price premium

Johan Rosberg
20689@student.hhs.se

Jing Yuan
21442@student.hhs.se

ABSTRACT

This paper examines one of the most distinct characteristics of the Chinese stock market, i.e. the persistent share price premium between shares restricted to domestic investors, traded in the two Mainland China stock exchanges, and the equivalent shares restricted to foreign investors, traded on the Hong Kong stock exchange. The purpose of this study is to investigate the impact of a recent reform, namely the QDII investment scheme that allows authorized Chinese institutions to invest in overseas capital markets, on this share price premium. Based on previous research, we develop four different models and apply these in two event studies to measure and analyze the reaction in the share price premium to the initial announcement and the subsequent expansion of the QDII policy. This study shows that the announcements of the QDII policy and the subsequent expansion had negative short-term effects on the share premium, which confirms the effectiveness of the policy. Our results reveal information leakages prior to the initial announcement and certain persistency in the effect afterwards. Most of the convergence in share prices on the Mainland China stock exchanges and the Hong Kong stock exchange seems to have been incorporated around the initial announcement.

Keywords: Chinese stock market, share price premiums, market segmentation, QDII, QFII

Tutor: Professor Magnus Dahlquist, Department of Finance, Stockholm School of Economics
Presentation: 10:15, May 26th, 2009
Venue: Stockholm School of Economics, Room 750
Discussants: Wilhelm Hoffman, Rickard Raudsepp

Acknowledgements: We would like to express our appreciation to our tutor, Professor Magnus Dahlquist, for his support and guidance throughout the process of writing this thesis. We would also like to thank Per-Olov Edlund, Associate Professor at Stockholm School of Economics, for his technical advice.

Table of Contents

1.	Introduction	3
2.	Background	4
2.1.	Characteristics of the Chinese and the Hong Kong stock markets	4
2.2.	Recent market developments	4
2.3.	The QFII and QDII reforms.....	7
2.4.	The role of the state and the NTS reform	8
3.	Previous research.....	9
3.1.	Market segmentation	9
3.2.	Equity market liberalization	14
3.3.	The efficiency market hypothesis (EMH)	14
4.	Hypotheses	15
4.1.	The regression variables	15
4.2.	The event studies	17
5.	Methodology	18
5.1.	Measuring expected premiums	18
5.2.	Measuring abnormal premiums	21
5.3.	Estimating abnormal returns using a market-adjusted return model	23
6.	Data	24
7.	Empirical Results	25
7.1.	The regression models for the first event	25
7.2.	The regression models for the second event.....	28
7.3.	The event study around the initial QDII announcement.....	30
7.4.	The event study around the announcement of the QDII expansion.....	38
8.	Conclusions	44
9.	References	46
9.1.	Academic references.....	46
9.2.	Non-academic references	48
9.3.	Other sources	48
10.	Appendix A – List of companies.....	50
11.	Appendix B – Robustness and specification tests	52
11.1.	Test summary	52
11.2.	Test results.....	56
12.	Appendix C – Regression results	73
13.	Appendix D – Event study results	76

1. Introduction

A privileged group of China's state-owned enterprises (SOEs), representing some of the largest and most strategic of China's entities, share the privilege of being listed in both Mainland China (in the form of A-shares) and Hong Kong (in the form of H-shares). Due to capital control policies in Mainland China, the A-share and H-share markets are still segmented, and these two classes of shares trade at different prices, even though holders of the two share classes are entitled to the same economic rights. Remarkably, the opposite of most emerging markets can be observed. Namely, the A-shares on the Chinese stock markets, restricted to domestic investors, trade at a premium (the AH share price premium) to H-shares on the Hong Kong stock market, restricted to foreign investors.

In the last decade, the Chinese government has launched a series of reforms, such as the Qualified Foreign Institutional Investors (QFII)¹ scheme in 2002 and the more recent Qualified Domestic Institutional Investors (QDII)² scheme in 2006, in order to partly liberalize the Chinese stock market. These reforms should reduce market segmentation, improve market efficiency, and ultimately result in a convergence of A and H-share prices. Apart from an academic importance for studies of market segmentation and its' effects, the liberalization of the Chinese stock markets and the convergence of the AH share price premium are of interest to both foreign and Chinese investors, as an accurate prediction of future market movements opens up for profitable investment opportunities. The impact and effectiveness of the reforms are also of interest to the Chinese government and to regulators of other segmented emerging markets.

Although much previous research has tried to explain the characteristics of the Chinese stock markets by examining factors that affect the premium, few studies have been made to measure the impact of recent reforms of the Chinese stock markets. This paper aims to investigate this Chinese stock market phenomenon by studying the effects of the QDII reform on the AH share price premium. Particularly, we examine if the initial announcement of the implementation and the second announcement of the expansion of the QDII investment scheme had a significant impact on the AH share price premium. To do so, we perform event studies using different models, where we measure and analyze the deviations from the expected premium around the announcement periods. With this study, we hope to be able to draw conclusions about the effectiveness of the QDII reform and give a better understanding of its effects for future references.

¹ The QFII investment scheme gives approved foreign institutional investors access to China's Mainland RMB-denominated stock exchanges (Shanghai and Shenzhen). See section 2.3 for a more elaborate explanation.

² The QDII is an investment scheme, under which domestic institutional investors authorized by the Chinese government are allowed to invest in overseas capital markets under the foreign exchange control system in China. See section 2.3 for a more elaborate explanation.

2. Background

2.1. Characteristics of the Chinese and the Hong Kong stock markets

In 1993, Chinese companies started applying to be listed in Hong Kong as H-shares and were selected for their economic importance, management quality, technology, profitability and international significance (Sun and Tong, 2000). Dually listed Mainland Chinese companies can issue both A-shares on either the Shanghai Stock Exchange (SSE) or the Shenzhen Stock Exchange (SZSE) in Mainland China and H-shares on the Hong Kong Stock Exchange (HKSE). Shares on the SSE and SZSE are denominated and traded in Chinese Renminbi (RMB) whereas shares on the HKSE are denominated in Hong Kong Dollars (HKD). The main difference between the SSE and the SZSE is that state-owned companies dominate the SSE. As a consequence, the SSE is more closely monitored by the central government. The SZSE, on the other hand, has more international exposure and consists of many joint-venture companies with close relations with firms in Hong Kong (Dongwei, 2003).

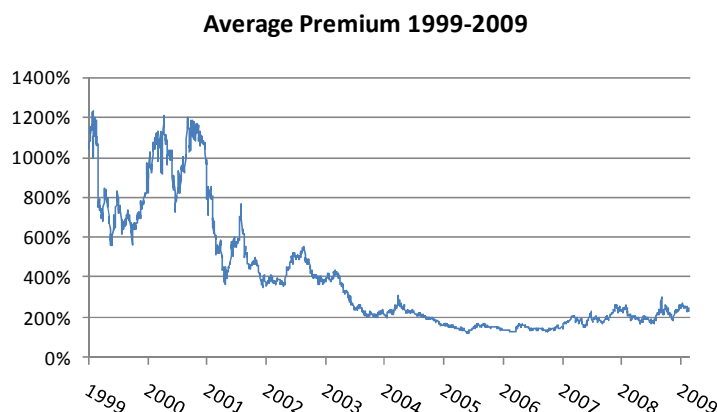
The A-shares and H-shares offer the same voting rights, dividends and other entitlements, but are subject to different trading rights due to China's capital control policies (McGuinness, 2006). Until recently, A-shares were entirely restricted to Mainland resident entities or individuals and H-shares were only available to foreign investors. Historically, A-shares have traded at a premium to the H-shares, even though the share types have had the same shareholder benefits (Birtch and McGuinness, 2008). Although the different pricing of the two share classes due to market segmentation may not be surprising, this is interesting for many reasons, one of them being that in most emerging markets it is the shares available to foreigners that trade at a premium to the shares available to domestic investors (see section 2 for an elaboration). Still today, due to capital control policies in Mainland China, with limitation of currency conversion and short-sales of A-shares not being allowed, full arbitrage between the two segmented markets is not possible (Birch and McGuinness, 2008). There are also B-shares on the Chinese stock markets that were formerly restricted to foreign investors. But since March 2001, B-share market is open to Chinese investors as well.

2.2. Recent market developments

To examine recent developments on the Chinese and Hong Kong stock exchanges, we first look at the development of the premium during the last ten years. The AH share price premium was both extremely high and volatile between 1999 and 2002. Before 2001, the A-shares traded at up to around a 1200% premium (or a 12x multiple) to the H-shares. The premium decreased significantly between 2001 and 2005, and has since then, in historical terms, been rather stable at levels around 200%. These indications from our dataset are in line with Birch and McGuinness (2008) on the historical development of the AH

share price premium.³ The strong decrease starting around 2002 can be explained by the implementation of the QFII since the announcement in November 2002, whereas the NTS reform in 2005 should have had a positive impact on the A-share market (see section 2.3 and 2.4 below).

Chart 1 – The average daily AH share price premium in 1999-2009



The daily premium for each company at each time is calculated as the price of the A-share divided by the price of the H-share. All of the companies among the 53 companies in our original data set (see section 6.1) that were or became dual-listed at some time between 1999 and 2009 were included when calculating the average premium index in Chart 1.

To investigate indications that the differential performance of the SSE and the HKSE could have caused or impacted the premium, we then study the development of the Hang Seng Index (HSI)⁴ in relation to the Shanghai Index (SHI)^{5,6}. The HSI seem to have closely followed the SHI from 1999 to 2004, but has since then been less susceptible to changes in the SHI. Nonetheless, from Chart 2, we see no clear indication in what way that the market trends on the SSE and the HKSE should explain the movements in the AH share price premium.

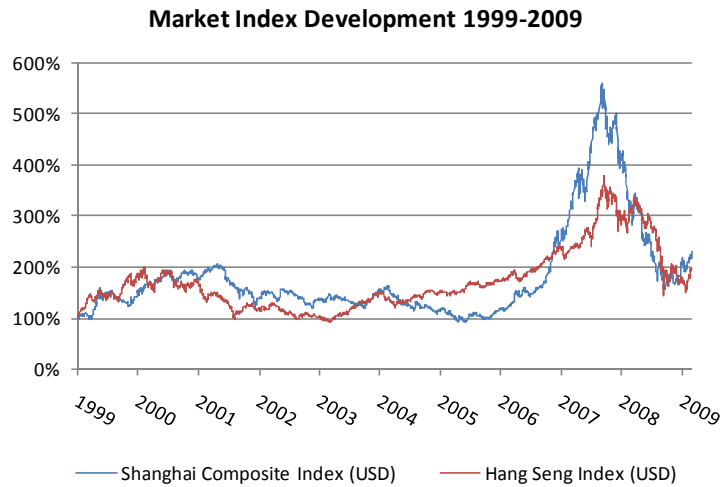
³ For a more detailed elaboration on the share price convergence in 2001 to 2005, we refer the interested reader to Birch and McGuinness (2008).

⁴ The Hang Seng Index measures the performance of largest and most liquid companies listed in Hong Kong and is the most widely quoted indicator of the performance of the Hong Kong stock market.

⁵ The Shanghai Composite Index tracks the daily price performance of all shares listed on the Shanghai Stock Exchange.

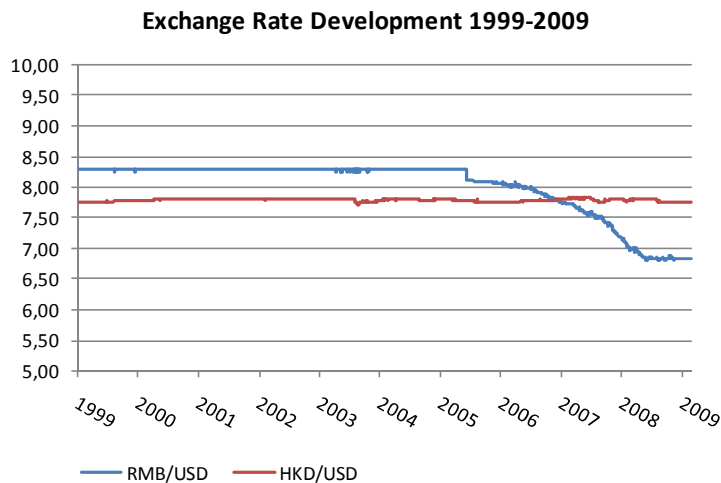
⁶ Most of the investigated companies' A-shares are listed on the SSE. See Appendix A.

Chart 2 – The performance of the Shanghai Composite Index and the Hang Seng Index in 1999-2009



Whereas the exchange rate between the HKD and the USD has been rather constant around 7.75 over the 1999 to 2009 period, the RMB has appreciated tremendously in recent years. During the 1997-1998 Asian financial crisis, China was under tremendous pressure to depreciate the RMB to protect the competitiveness of its exports, as other ASEAN countries had devalued their currencies. Nonetheless, China maintained a stable rate at 8.28 against the USD (Long, 2009). On July 21, 2005, The People's Bank of China announced the adoption of a managed floating exchange rate regime based on market supply and demand with reference to a basket of currencies. After that, the RMB has appreciated and has been stabilized around 6.80 to 6.90 in 2008-2009 (see Chart 3). The appreciation of the RMB should thus have lead to an increase in value of the A-shares compared to the H-shares. To examine whether the exchange rates may have had any obvious effects on the share price developments on the A-share and the H-share market, we explore the exchange rate development of the Renminbi (RMB) and the Hong Kong Dollar (HKD) to the United States Dollar (USD).

Chart 3 – The development of the RMB/USD and the HKD/USD exchange rates in 1999-2009



2.3. The QFII and QDII reforms

Although the A- and H-share markets currently remain largely separate, there has been some relaxation of restrictions by the Chinese government in recent years. Two reforms of great importance, namely the QFII and the QDII, have been implemented.

On November 5, 2002, the China Securities Regulatory Commission (CSRC) and the People's Bank of China (PBOC) announced the QFII program as a provision for foreign capital to access China's financial markets (China Daily, 2006). The QFII reform allows QFII investors approved by the CSRC to invest in RMB-denominated A-shares, treasuries, convertible bonds and enterprise bonds listed on China's stock exchanges and other financial instruments approved by the CSRC. As of March 10, 2009, 79 foreign institutional investors had been approved to buy and sell A-shares since the introduction of the QFII in July 2003 (Bloomberg, 2009). The quota for QFII investments is currently around USD11 billion, but is projected to reach USD30 billion by 2014 (Financial Times, 2009). Apart from the quotas, other restrictions are that shares held by each QFII in one listed company should not exceed 10% of total outstanding shares of the company (a rule also enforced for domestic investors), and that total shares held by all QFIIs in one listed company should not exceed 20% of total outstanding shares of the company (China Daily, 2006).

Following the *People's Bank of China, Announcement No.5* on April 13, 2006, the QDII scheme was introduced. Qualified commercial banks, mutual funds, securities institutions and insurers are now allowed to invest in overseas fixed-income and money market products (Stender et al., 2006). Although the actual introduction of the QDII program by the time of the announcement was not expected to occur until the end of 2006, the market widely viewed the PBOC's initial announcement as the effective start-up.

This implies that an investigation of the actual announcement date would be appropriate. Therefore, the primary event of interest in this paper is this initial announcement of the QDII investment scheme.

Nevertheless, the investment scheme was initially limited to fixed-income and money market products. After granting 15 banks and funds a total quota of USD14.2 billion to invest overseas, the Chinese government announced on May 11, 2007 their intention to widen the scope of the QDII investments (China Daily, 2007). With this expansion of the QDII, approved Chinese institutional investors could offer foreign equity related products to Chinese investors. As this further widens the investment opportunities for Chinese investors, we will also investigate the effect of the second announcement.

The announcement of QDII is one of the most important in a series of steps taken by the People's Republic of China (PRC) regulators toward greater capital account⁷ liberalization. The aims of this policy are the following (Stender et al., 2006):

- To ease upward pressure on domestic inflation and on the RMB exchange rate. This is accomplished since QDII opens up a new channel for capital outflow.
- To increase the competitiveness of domestic financial institutions by allowing them to gain more experience overseas.
- To broaden the investment options of domestic investors.

The QDII scheme opens up a capital outflow channel, which complements the previous capital inflow channel created by the QFII scheme and results in a more balanced overall capital flow. This broadens the investment opportunities of domestic investors considerably and should lead to a decrease in demand for the domestic A-shares. At the same time, the possibility to invest in foreign equity should put upward pressure on the H-shares from Chinese investors attracted by the discounts to the A-shares. These two effects directly affects the AH share price premium negatively. In a longer-term perspective, the QDII scheme could also signal the PRC regulators' incentives of greater capital account liberalization to foreign investors and could therefore with time also strengthen capital inflow. In the long-term, this might affect the premium positively since it should take some time for foreign investors to digest the information and build up confidence, but in connection to the announcement we expect the QDII to have a negative impact on the premium.

2.4. The role of the state and the NTS reform

Another important characteristic of the Chinese stock markets is that a large proportion of the shares outstanding are non-tradable (NTS) shares, i.e. non-listed shares. Such shares are mostly state owned

⁷ The capital account measures the net result of capital in- and outflow resulting from investments, including foreign direct investment, portfolio investments (such as equity and bond holdings) and other investments.

shares and legal entity shares that are not traded in the stock exchanges. Consequently, the effective supply of shares is smaller than the total shares outstanding. According to Beltratti and Bortolotti (2006), a high proportion of NTS constitutes a problem for the market in several ways. First, the owners of tradable shares have limited influence on management decisions. Second, the limited amount of free floated shares makes the market very illiquid and volatile, leading to market manipulation and insider trading. Third, these problems on the domestic market encourages many valuable Chinese companies to list abroad, with listings on the Hong Kong Stock Exchange being one of the most preferred alternatives. These issues have adversely affected domestic investors who, prohibited from investing in the best performing companies, have had to hold less performing local companies in their portfolios.

The non-tradable share (NTS) reform, first announced on April 29, 2005, aimed to improve these difficulties by inviting a first batch of four companies to transform their NTS into tradable shares by compensating existing shareholders through various ways such as bonus shares, cash, and options. This action was supposed to improve both the capital market and the operational efficiency and corporate governance structure in listed Chinese companies. To facilitate the reform, the Chinese government also took other measures to stabilize the stock market, e.g. new laws to facilitate the acquisition of stakes in listed companies by strategic investors and amendments in the Company Law and the Securities Law to strengthen the legal framework for the capital market (Beltratti and Bortolotti, 2006).

Beltratti and Bortolotti (2006) mention several possible implications of the NTS reform for the Chinese publicly listed firms. First, making the NTS tradable would increase corporate governance mechanism, such as monitoring of management, and better protect minority shareholders. Second, the reform could facilitate privatization via secondary equity issuance, which could limit political interference in firms and consequently facilitate operations in these firms. Third, the reform would improve the liquidity of A-shares as the number of free float shares would increase considerably. Hence, improvements of market fundamentals on the Chinese stock market in terms of corporate governance and liquidity could boost the stock prices of companies experiencing the reform.

3. Previous research

3.1. Market segmentation

Many emerging capital markets impose restrictions on foreign equity investments, in order to attract foreign investment without the risk of losing ownership control of domestic firms. On stock markets with foreign ownership restrictions, it is usually foreign investors that pay large price premiums for unrestricted shares relative to matching restricted shares (Bailey, 1994; Bailey et al., 1999). As outlined below, previous research on how market segmentation affects asset pricing points out several reasons for

share price discrepancy on segmented markets. The most frequently suggested factors include information asymmetry and differential demand between domestic and foreign investors, investors' different attitudes towards risk, and differences in liquidity between restricted and unrestricted shares.

3.1.1. Information asymmetry

There are different views on how information asymmetry between foreign and domestic investors affects the share price premium.

Chakravarty et al. (1998) argue that the price premium between Chinese A- and B-shares is related to the difficulty for foreign investors to acquire and analyze reliable information on Chinese firms and the economy in general. Language barriers and different accounting standards contribute to these difficulties. They show that information asymmetry explains a partial, but significant, part of the phenomenon.

In contrast, Chui and Kwok (1998) argue that because of information barriers within China, Chinese investors receive news after foreign investors and find empirical support that returns on shares available to foreigners drive returns available to domestic investors. Moreover, they argue that Chinese retail investors are irrational and poorly informed, which contributes to higher volatility of the A-share market where prices are driven by market sentiment instead of economic fundamentals.

Bailey and Jagtiani's (1994) studies of the stock exchange of Thailand show that cross-sectional differences between local and foreign prices are correlated with proxies for the foreign ownership limits, liquidity, and information availability. They argue that foreign investors, and in particular institutional investors, prefer to invest in larger companies with greater financial disclosure and better information in general, reducing the information asymmetry between domestic and foreign investors. For example, many foreign institutional investors are only mandated to invest in larger companies, which may make them more willing to pay higher prices for available shares. In line with these arguments, Chen et al. (2001) argue that information asymmetry decreases with firm size, since larger firms provide more information to foreign investors. Moreover, more analysts may follow large firms, which also decrease the information asymmetry. Therefore, we should see lower premiums in large market capitalization firms (Chan et al., 2008). Nevertheless, market capitalization may also capture other effects than information asymmetry, such as liquidity, since larger firms may have a more liquid foreign market resulting in higher prices on shares available to foreigners.

Chan et al. (2008) argue that information asymmetry is particularly severe in China. Many Chinese firms do not fully disclose important changes in their business conditions, and published reports are not always prepared in accordance with international accounting standards. Furthermore, share manipulation and insider trading is prevalent, and there is a lack of legal codes to protect investors. Nevertheless, as the Chinese stock markets become more developed with more information available to investors, the price discrepancy due to information asymmetry should decrease over time.

3.1.2. Differential risk

Eun and Janakiramanan (1986) were the first to study the impact of foreign ownership restrictions on share prices. They assume a world with only two countries, one domestic and one foreign, and that domestic investors are only allowed to own a fraction of shares in foreign firms whereas foreign investors have no restrictions to invest in domestic firms. Their major findings are that the higher price for domestic investors relates to differences in aggregate risk aversion between domestic and foreign investors. The more risk averse the domestic investors are, the more they are willing to pay for foreign shares in order to avoid diversification losses. Assuming that Chinese investors are risk averse, this suggests that if the H-share market, or other international markets, were to be made available to Chinese investors, they will pay premiums on foreign shares instead of domestic shares. The more severe the ownership restrictions for domestic investors and the higher the difference in market risk, i.e. covariance with the foreign market portfolio between domestic and foreign portfolios, the higher premium domestic investors will pay for foreign shares.

Hietala (1989) investigates why some unrestricted stocks on the partially segmented Finnish stock market trades at huge premiums relative to the corresponding restricted stocks because foreign investors require a lower rate of return than domestic investors. The international and domestic beta of the stock determines the size of the premium.

Bailey (1994) was the first to acknowledge China as an exception, where B-shares traded at discounts to A-shares, and suggests that the discount could be attributable to lower required returns of Chinese citizens due to the limited investment opportunities, and that foreign investors require discounts due to the non-diversifiable political and macroeconomic risk related to the B-shares. However, investigating 11 stock markets with equity ownership restrictions, Bailey et al. (1999) later find little evidence that price premiums on unrestricted shares relative to the respective restricted shares are related to differences in required rates of return among domestic and foreign investors.

Ma (1996) shows that the price difference between A-shares and B-shares could be related to investors' attitudes toward risks and the diversification value of stocks in emerging markets. Notably, the positive correlation between A-share prices and domestic beta risk, implies risk-seeking behavior of Chinese investors. Moreover, Ma (1996) concludes that overvaluation of stocks in emerging markets is caused by speculative behavior of investors on these markets and that regulatory changes per se can create an extra risk in emerging markets.

3.1.3. Differential demand

According to the differential demand hypothesis, due to differences in demand elasticity for domestic and foreign investors, firms can maximize firm value by price discrimination.

Stulz and Wasserfallen (1995) develop a model showing that the demand function for domestic shares differs between domestic and foreign investors, due to deadweight costs such as political risks, transaction costs, or information acquisition costs. For this reason, domestic firms find it beneficial to price discriminate these two groups of investors by restricting foreign ownership of their shares. Thus, higher price elasticity in domestic demand than in foreign demand results in a price premium on the shares available to foreign investors relative to the shares available to domestic investors. Examining the relationship between stock price premiums and market segmentation induced by ownership restrictions in Mexico, Domowitz et al. (1997) provide support for Stulz and Wasserfallen's (1995) model, as they find that price premiums on unrestricted shares are attributable to the relative scarcity of these shares. In line with the differential demand theories, Bailey et al. (1999) find that proxies for foreign investor demand such as the flows of international mutual funds, the sentiment of foreign investors, the country credit rating, and the firm size tend to increase foreign share price premiums in the 11 studied countries.

However, as noted by Chan and Kwok (2005), the relative scarcity of foreign shares in Mexico causes the premiums because domestic entrepreneurs control the supply of foreign shares for price discrimination. In China, on the contrary, it is the relative scarcity of domestic shares that determines the equity premiums. And even though this restriction lowers the value of domestic firms, the government control makes it hard for individual firms to increase the supply of domestic shares. Consequently, the AH share price premium is negatively related to the supply of A-shares and positively related to the supply of H-shares due to the insufficient supply of stocks.

On the note of higher domestic demand for equity investments, it has also been proposed that the limited investment opportunities available to Chinese domestic investors contributes to the AH share price premium. Fernald and Rogers (2002) argue that due to the limited investment opportunities available in China, equity is one of few opportunities to diversify their investment. As a result, Chinese investors have a lower required rate of return than foreign investors. Along these lines, Chan and Kwok (2005) point out that the unattractive interest rate paid on bank deposits and the low liquidity debt market, concentrated in government securities, shows that China's immature capital markets are still under development.

3.1.4. Liquidity

According to the liquidity hypothesis, illiquidity assets trade at lower prices due to higher trading costs. Amihud and Mendelson (1986) study the effect of the bid-ask spread as a measure of illiquidity on asset pricing and suggest that relative illiquidity of shares result in higher expected returns and lower prices to compensate investors for increased trading costs. Gardiol et al. (1997) investigate the trade-off between liquidity and market for corporate control on the Swiss market and find that relative price premiums between dual class shares are partly explained by the relative degree of liquidity. Silber (2001) examines

stocks with a two-year trading restriction and find that such restricted stocks trade at discounts due to illiquidity. The size of these discounts depends on issue and firm characteristics. Longstaff (2001) develops a valuation model for illiquid securities and shows that when investors face liquidity constraints, the price discount for an illiquid asset can be substantial. Such discounts can therefore be in line with market rationality.

From this point of view, the observed AH share price premium should be due to higher liquidity and lower transaction costs of the A-share markets compared to the H-share market. However, the more developed HKSE should be at least as liquid as the SSE and the SZSE. Nevertheless, a low interest in the H-shares can per se result in relative illiquidity to the A-share counterparts. The limited investment opportunities of Mainland Chinese investors will also support this view.

3.1.5. Other suggested factors

Sun and Tong (2000) find evidence that foreign investors are more sensitive to macroeconomic factors such as currency risk, which imposes larger discounts on the shares restricted to foreign investors when inflation goes up in China. This could be relevant to this paper since the adoption of a floating exchange rate regime in China caused the RMB to appreciate during our studied period (see section 2.1). Along these lines, Fong et al. (2007) argue that the price disparity is caused by both micro factors and macro factors, such as RMB appreciation expectations and monetary expansion. Wang and Jiang (2004) find support for their hypothesis that expected RMB devaluation is positively correlated with the AH share price premium. With their argument, the premium is negatively correlated with expected RMB revaluation (or appreciation), as is the case for the time period to be studied in this paper.

Li et al. (2006), however, report that the exchange rate changes between the HKD the RMB do not have any significant effects on the price discounts. Instead, they find that the AH share price premium relates to the movements of the H-shares' and the A-shares' respective local market indexes, the deviation in the systematic risk premiums of the local markets and highly relates to the spread of the savings rates between Hong Kong and Mainland China.

Lee and Poon (2005) find that the AH share price premium declines dramatically in the period 2000-2004, due to offloading of state shares from the Mainland authorities and relaxing restrictions on overseas investments. Birtch and McGuinness (2008) also note a contraction in the AH share price premium in the period 2001-2005. The authors argue that the major factors for this contraction are both a risk premium related to fears of state share disposals and expectations surrounding the likely implementation of the QDII scheme.

Other possible explanatory factors mentioned in previous research are cost of capital, bond supply, bond yields, dividend yields, foreign reserves and inflation.

3.2. Equity market liberalization

Previous literature on financial globalization and equity market liberalization focuses on the risk-sharing benefit. As countries liberalize their financial markets, foreign investors can acquire stocks in these countries and thus the risks of these stocks are shared among more investors. Ultimately, this leads to lower required premiums among investors and higher stock prices (Martell and Stulz, 2003). As we mentioned before, the uniqueness of the Chinese stock market is that foreign shares trade at a discount to the domestic shares. Thus, equity market liberalization in China should lead to higher required rate of return among domestic investors and ultimately drive down the A-share prices. This phenomenon can be confirmed by the historical performance of the AH-premium as seen in Chart 1, which reveals a significant decrease in the AH share price premium after the announcement of the QFII in 2002.

Stulz (2005) argue that the benefits from the financial globalization process are limited due to twin agency problems, i.e. corporate insider discretion and state ruler discretion. In countries with severe twin agency problems, concentrated ownership is optimal. In this case, insiders must co-invest with outsiders, thus constraining the risk-sharing benefits of financial globalization. According to Stulz (2005), co-investment decreases the degree to which firms raise equity externally, which makes equity markets less active and flexible. Moreover, it forces corporate insiders to overweight their portfolios to their firms' equity, so that fewer risks can be shared across countries through foreign investors.

Martell and Stulz (2003) argue that, in the same way as IPO's, equity market liberalization results in dramatic positive returns in the years following the liberalization, but these returns are followed by poor returns afterwards, which might be an indication of price overreaction in connection to the liberalization with a correction taking place later. Mainly because short selling is difficult for emerging markets due to regulatory restrictions, limited liquidity, and lack of supporting institutions.

3.3. The efficiency market hypothesis (EMH)

The results observed from an event study are highly dependent on the efficiency of the market where the event study is performed. If stock prices do not fully reflect available information on the market, the effects of the studied announcements may be small or delayed. Fama (1970) defines an efficient market as a market that at all times fully reflects all available information. The theory behind the EMH relies on three basic arguments. First, investors are assumed to be rational and take rational decisions. Second, even if some investors are not rational, their trades will randomly be canceled out by each other without affecting prices. Third, to the extent that investors are irrational in similar ways, rational arbitrageurs on the market will eliminate their influence on prices. Even though there is empirical evidence that supports the EMH, its validity has been questioned.

As mentioned, it has been reported that speculative trading and insider trading is prevalent on the Chinese stock markets. We also suspect from Chui and Kwok (1998) that Chinese investors are not always rational and well-informed and therefore do not always trade according to market fundamentals. This suggests that the Chinese stock markets are not fully efficient. For this reason, the reaction to the announcement of the QDII may not induce immediate or clear reactions on the A-share and H-share markets and the reaction could be more prolonged. However, as long as the market rationally incorporates the news relatively quickly, the market can be considered efficient and we will be able to observe effects of the QDII announcement. If the markets are reasonably efficient, it is also possible that information leakages have caused market reactions to the QDII policy even before the announcement date. Nevertheless, due to the technical nature of event studies, the joint-testing problem complicates economic interpretations. This is because event studies simultaneously test whether abnormal returns are zero and whether the model predicting abnormal returns is correct (Kothari and Warner, 2006). For this reason, it may be difficult to discern whether the market is indeed inefficient or if the model predictions are not accurate enough to measure abnormalities on the market. However, as mentioned in Kothari and Warner (2006), the short-horizon (less than one year) methods are quite reliable and give the cleanest evidence on market efficiency, while it is the long-horizon (usually one to five years after the event) methods that are highly sensitive to the joint-test problem.

4. Hypotheses

4.1. The regression variables

To be able to perform the mentioned event studies, we estimate models that are able to predict the premium under normal conditions. In these regression models, we use three of the explanatory variables discussed in the previous section, namely relative market performance, information asymmetry and currency. Below, we develop and explain our hypotheses regarding the explanatory variables.

4.1.1. The relative market performance

It is plausible that parts of the AH share price premium could be explained by the relative market performance of the A-share market compared to the H-share market. Therefore, we expect positive signs on the market variable coefficients since this would indicate that outperformance of the H-share market by the A-share market increases the premium.

Hypothesis 1: Relative market performance relates positively to the AH share price premium.

4.1.2. The information asymmetry

With more information available to foreign investors, large firms attract more foreign investors (Bailey and Jagtiani, 1994; Chen et al., 2001; Chan et al., 2008). When choosing what shares to invest in, foreigners face more restrictions for investing in A-shares than for investing in H-shares, despite the QFII investment scheme. Therefore, the H-shares are more accessible to foreigners than the A-shares, not to mention much cheaper. Thus, assuming that larger firms have more information available to foreigners and that foreign investors would rather invest in the discounted H-shares than in A-shares, we expect the information asymmetry variable to have a negative effect on the AH share price premium.

Hypothesis 2: Information asymmetry relates negatively to the AH share price premium.

There are however other arguments that would suggest an opposite or at least a smaller effect of the information variable. For example, it is not sure that information availability would make investors prone to invest in a company. If the information about a company is negative investors' willingness to invest would decrease. Moreover, even if foreign investors' interest to invest in H-shares of dual-listed companies would push up the price of H-shares, Chinese investors buying A-shares could partly or completely offset this effect. Finally, since all companies in our sample are large corporations, the observed size effect could be limited.

4.1.3. The currency effect

The RMB has appreciated since the floating exchange rate regime was implemented in 2005, whereas the HKD has remained rather stable over the years, and as a consequence, the RMB/HKD exchange rate has decreased. This currency effect should thus have had a direct positive effect on the AH share price premium. Fong et al. (2007), however, argue that due to the undervalued currency and consequent expectations of future revaluation or appreciation, foreign investors' interest in RMB denominated assets has grown. This has motivated foreign investors to acquire H-shares as a proxy for RMB assets, even though H-shares are denominated in HKD. One reason for this could be that dividends from H-shares are paid in RMB before being converted into HKD (Birch and McGuinness, 2008). These arguments suggest that expectations of future RMB appreciation would lead to a contraction in the AH share price premium. Nevertheless, after the QFII reform, these expectations could make foreign investors purchase A-shares instead of H-shares. Even though the QFII quotas are restricted, this would instead lead to an increase in the AH share price premium. However, regardless of whether foreign investors can invest sufficiently in the A-share market through the QFII or not, the appreciation or expected appreciation of the RMB

directly increases the value of RMB denominated assets. Therefore, we expect the RMB/HKD to be negatively related to the AH share price premium.

Hypothesis 3: The RMB/HKD exchange rate relates negatively to the AH share price premium.

4.2. The event studies

4.2.1. Event 1 – The initial announcement of the QDII

One reason for the AH share price premium is the limited investment opportunities available for investors in China (Fernald and Rogers, 2002; Chan and Kwok, 2005). This has forced investors to invest a larger than preferable proportion in the domestic stock market. When allowing Chinese investors to invest in foreign fixed income and money market products for the first time, there should be eagerness among investors to at least partly switch away from domestic equity investments to diversify their portfolios. Thus, the QDII deregulation should have an easing effect on the A-share prices, resulting in a decrease in the AH share price premium. Thus, for the event study of abnormal premiums around the first announcement of the QDII investment scheme, we test the following hypotheses:

Hypothesis 4:

H₀: No abnormal premium due to the initial announcement of the QDII.

H₁: Abnormal premium due to the initial announcement of the QDII.

4.2.2. Event 2 – The expansion of the QDII

Even though allowing investments in foreign financial products was a major step towards a less segmented financial market, the initial investment scheme was limited to fixed income and money market products. The expansion of the investment scheme to include foreign equity related products severely widens the investment and diversification opportunities for Chinese investors, giving them even stronger incentives than before to at least partially substitute their investments in the A-share market to foreign equity products. This would put downward pressures on A-shares. Here, since Chinese investors are now allowed to invest in foreign equity related products, we could also see a boosting effect on H-share prices, as Chinese investors would want to switch their expensive A-shares for cheaper H-shares. Thus, for the event study of abnormal premiums around the announcement of the expansion of the QDII investment scheme, we test the following hypotheses:

Hypothesis 5:

H_0 : No abnormal premium due to the announcement of the QDII expansion.

H_1 : Abnormal premium due to the announcement of the QDII expansion.

5. Methodology

To estimate the normal and abnormal returns for the event studies, we use four different models for measuring normal performance before each event; a one-factor market model (the market model), a two-factor economic model (the information model), a three-factor economic model (the currency model) and a market-adjusted return model. The explanatory variables used in the model are calculated in accordance with Fong et al. (2007).

5.1. Measuring expected premiums

5.1.1. Estimation window

The most common choice of estimation window is the period prior to the event window (MacKinlay, 1997). Since we do not know how long the effect from the event will last, we found it more appropriate to use an estimation window prior to the event window. When choosing event window length, there is a trade-off between windows that reach far back in time, providing a larger data sample, and windows that start soon before the event window, thus less likely to include periods with different characteristics of the market model parameters (Krivin et al., 2003). However, Krivin et al. (2003) argue that the choice of estimation window length is generally unlikely to considerably impact the results in a predictable way or to a large extent. The length of estimation window used in previous research varies from 60-250 days. We use an estimation window of 120 days, as suggested by MacKinlay (1997) when using daily data.

As in most academic event studies, we have not removed days or firms with additional news that could affect the price premium from the estimation windows. Ideally, one would have wanted estimation windows and event windows free of other news than the QDII announcements. In a larger sample, it may have been possible to exclude firms with news announcements around the event window. However, with our limited sample, we considered it better to include all firms in the event studies.

5.1.2. Estimation of expected premiums

To estimate the normal performance of the A-shares in comparison to the H-shares, i.e. without the QDII announcements, we first use a variant of the market model, outlined by MacKinlay (1997). When testing both the linear and the log-linear relationship between our explanatory variables and AH share price

premium, we find that the loglinear model better explains this relationship. Therefore we use loglinear models in our event study. We henceforth define the AH share price premium as;

$$PREM_{it} = \ln\left(\frac{P_{A,it}}{P_{H,it}}\right) = \ln(P_{A,it}) - \ln(P_{H,it})$$

where $P_{A,it}$ is the A-share price for company i at time t and $P_{H,it}$ is the H-share price for company i at time t .

Since we look at the impact of the AH share price premium, which is affected by both the development of the A-share market and the H-share market, our first model relates the AH share price premium of a given security to the relative index of the SHI to the HSI. We use the SHI as proxy for normal performance of the A-share market, as most of the investigated companies' A-shares are listed on the Shanghai Stock Exchange, and the HSI as proxy for normal performance on the H-share market. The index variable, $INDEX_t$, is calculated as the value of the Shanghai Composite Index at time t divided by the value of the Hang Seng Index at time t . Thus, for any company i , our market model is;

$$PREM_{it} = \alpha_i + \beta_i \times INDEX_t + \varepsilon_{it}$$

equivalent to

$$\ln\left(\frac{P_{A,it}}{P_{H,it}}\right) = \alpha_i + \beta_i \ln\left(\frac{SHI_t}{HSI_t}\right) + \varepsilon_{it}$$

where $t = 1, 2, \dots, 120$ days.

For the market model and all other regression models, $E(\varepsilon_{it}) = 0$ and $\text{var}(\varepsilon_{it}) = \sigma_{\varepsilon_i}^2$. We estimate parameters in the model by running time-series regressions for each company's AH share price premium during the estimation period of 120 days prior to the event window for each studied event. In this way, we receive expected levels of the AH share price premium for each company over the event window under normal conditions.

In order to make the model as accurate as possible, we also examined what other factors that affected the price premium during the studied period. For this reason, we followed previous literature and tested the inclusion of other variables, such as liquidity, demand, supply and interest rate. However, these factors either did not show any significance in the regressions or could not be included in the model for

statistical reasons such as small variances of the independent variables and multicollinearity, which motivated our decision of exclusion of these factors in our model. In addition, for some of the factors, such as liquidity, we had too many missing values in our data set to be able to include them in our model.

Nevertheless, two of the factors that we tested, namely information asymmetry and currency, were on average significant and ultimately improved our model. To compare with the results from market model, we first performed the same regressions adding the information asymmetry variable, creating the following extended model that we call the information model;

$$PREM_{it} = \alpha_i + \beta_{1,i} \times INDEX_t + \beta_{2,i} \times INFO_{it} + \varepsilon_{it}$$

in which the information asymmetry variable, $INFO_{it}$, is calculated as the sum of the free float market capitalization of the A-shares for company i at time t , $MCAP_{A,it}$, and the free float market capitalization of the H-shares for company i at time t , $MCAP_{H,it}$.⁸ Hence:

$$\ln\left(\frac{P_{A,it}}{P_{H,it}}\right) = \alpha_i + \beta_{1,i} \ln\left(\frac{SHI_t}{HSI_t}\right) + \beta_{2,i} \ln(MCAP_{A,it} + MCAP_{H,it}) + \varepsilon_{it}$$

According to previous research (Bailey and Jagtiani, 1994; Chen et al., 2001; Chan et al., 2008), larger firms will attract more foreign investments than smaller firms because the availability of information for foreign investors is better in these firms. We believe that the free float market capitalization rather than total market capitalization gives a more representative picture of the information disclosure in the investigated companies. Thus, as a proxy for information asymmetry between the A-share market and the H-share market, we use the total free float market capitalization on both markets for each company i at time t .

To test if the currency effect (described in section 2.1) has had a significant impact on the price premium, we also tested to include a currency variable into the information model, creating the following model that we call the currency model;

$$PREM_{it} = \alpha_i + \beta_{1,i} \times INDEX_t + \beta_{2,i} \times INFO_{it} + \beta_{3,i} \times CUR_t + \varepsilon_{it}$$

where the currency variable, CUR_t , is the $\frac{RMB}{HKD}$ exchange rate at time t . Hence:

⁸ The free float market capitalization is calculated as the total number of free float shares outstanding multiplied by the share price.

$$\ln\left(\frac{P_{A,it}}{P_{H,it}}\right) = \alpha_i + \beta_{1,i} \ln\left(\frac{SHI_t}{HSI_t}\right) + \beta_{2,i} \ln(MCAP_{A,it} + MCAP_{H,it}) + \ln\left(\frac{RMB_t}{HKD_t}\right) + \varepsilon_{it}$$

5.2. Measuring abnormal premiums

5.2.1. Event window

There are several ways to decide on the appropriate event window length, whereas the most common in academic event studies is to use a fixed event window length (NERA Economic Consulting, 2003). According to MacKinlay (1997), the period of interest is often expanded to multiple days to include at least the day of the announcement (the event day) and the day after the announcement, which captures effects on stock prices after market closing on the announcement day. Moreover, to investigate when the effect starts and wears off, the periods prior to and after the event day may also of interest. Therefore, we use a fixed event window length around the event day to measure both the QDII effect per se and its persistency over time on the investigated share price premiums. The event day in both event studies is defined as $t = 0$. We employ a 91 days event window, which consists of 45 pre-event days, the event day, and 45 post-event days. The cumulative effect of the abnormal premiums and returns is measured by adding together the daily abnormal premiums and returns starting from the event day. As mentioned above, in order to avoid considerations of what other type of events that would be considered major and due to the fact that all firms are exposed to different news, we did not limit the event windows according to such news.

5.2.2. Estimation of abnormal premiums

The daily abnormal premiums are calculated over the event window to determine the event's impact each day. Abnormal premiums are calculated as the actual ex post premium levels minus the expected premium levels without the event taking place. For each company i and date t in the event window, the abnormal price premium ($APREM_{it}$) is;

$$APREM_{it} = PREM_{it} - E(PREM_{it}|X_t)$$

where $PREM_{it}$ is the actual premium and $E(PREM_{it}|X_t)$ is the expected premium conditioning on the X_t factors. Since the premium is defined in loglinear terms, the results will be interpreted in relative terms. The logged premium measures the relative premium as a continuously compounded rate. For small values of the difference, this is close to the simple rate. Thus, $\ln(P_{A,it}) - \ln(P_{H,it}) = \ln\left(\frac{P_{A,it}}{P_{H,it}}\right) \approx \frac{P_{A,it} - P_{H,it}}{P_{H,it}}$ for

small values of $\ln\left(\frac{P_{A,it}}{P_{H,it}}\right)$.

The average abnormal premium at time t is then calculated as:

$$\overline{APREM}_t = \frac{1}{N} \sum_{i=1}^N APREM_{it}$$

And for large estimation windows, its variance is:

$$var(\overline{APREM}_t) = \frac{1}{N^2} \sum_{i=1}^N \sigma_{\varepsilon_i}^2$$

As $\sigma_{\varepsilon_i}^2$ is unknown in practice, we use the usual sample variance measure of $\sigma_{\varepsilon_i}^2$ from the respective regression models in the estimation window as an estimator for the variance of the abnormal premiums (MacKinlay, 1997). The average abnormal premium is then aggregated over the event window to calculate the cumulative abnormal premium ($\overline{CAPREM}(\tau_1, \tau_2)$). Thus, for any interval (τ_1, τ_2) in the event window;

$$\overline{CAPREM}(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} \overline{APREM}_\tau$$

where (τ_1, τ_2) delineates the period for which the cumulative abnormal premium is calculated, and;

$$var(\overline{CAPREM}(\tau_1, \tau_2)) = \sum_{\tau=\tau_1}^{\tau_2} var(\overline{APREM}_\tau)$$

The null hypothesis can then be tested using the following t-statistics for the daily average abnormal premium;

$$t_{APREM} = \frac{\overline{APREM}_t}{var(\overline{APREM}_t)^{1/2}} \sim N(0,1)$$

and the following t-statistics for the cumulative abnormal premium;

$$t_{CAPREM} = \frac{\overline{CAPREM}(\tau_1, \tau_2)}{\sqrt{\text{var}(\overline{CAPREM}(\tau_1, \tau_2))^{1/2}}} \sim N(0,1)$$

5.3. Estimating abnormal returns using a market-adjusted return model

When estimating models for the event study, it is crucial that the model is correctly specified. If parameters are incorrectly estimated, this can lead to spurious results in the event study. Due to discovered deviations from the CAPM, questions have been raised regarding the validity of the restrictions imposed by the CAPM on the market model. For this reason, the CAPM is seldom used for event studies these days (MacKinlay, 1997). However, imposing market-adjusted return model restrictions, the model coefficients are pre-specified, and it is not necessary to estimate parameters. To verify whether our obtained results with the regression models are reasonable, we also estimate a market-adjusted return model for the A-share market and the H-share market respectively, where;

$$r_{A,it} - r_{f,t} = \alpha_{A,i} + \beta_{A,i}(r_{m,A,t} - r_{f,t}) + \varepsilon_{A,it}$$

and

$$r_{H,it} - r_{f,t} = \alpha_{H,i} + \beta_{H,i}(r_{m,H,t} - r_{f,t}) + \varepsilon_{H,it}$$

The market-adjusted return model assumes that ex ante returns are equal across securities but not necessarily constant for each security. The ex post abnormal return on any security i is given by the difference between its actual return and that on the market portfolio (Brown and Warner, 1980). Accordingly, α_A and α_H are assumed to be 0 without any abnormal returns. Moreover, as we assume that each firm has same risk characteristics as the market as a whole, β_A and β_H are assumed to be 1, so that:

$$\varepsilon_{A,it} = r_{A,it} - r_{m,A,t}$$

and

$$\varepsilon_{H,it} = r_{H,it} - r_{m,H,t}$$

The ε_A and ε_H are assumed to be the abnormal returns of the respective markets, i.e. the return that cannot be explained by the market return. Thus, the abnormal return between the two markets is estimated as:

$$AR_{ti} = \varepsilon_{A,it} - \varepsilon_{H,it} = (r_{A,it} - r_{m,A,t}) - (r_{H,it} - r_{m,H,t})$$

The average abnormal returns ($\overline{AR}_t$) and the cumulative average abnormal returns ($\overline{CAR}(\tau_1, \tau_2)$) are then calculated in the same way as described in section 4.2.2. The variances of these measures are estimated in the same estimation period as for the regression models as;

$$var(\overline{AR}_t) = \frac{1}{N^2} \sum_{i=1}^N \sigma_{\varepsilon_{A,it} - \varepsilon_{H,it}}^2$$

so that:

$$var(\overline{CAR}(\tau_1, \tau_2)) = \sum_{t=\tau_1}^{\tau_2} var(\overline{AR}_t)$$

Nevertheless, it is important to note that this restricted model may have other biases than the estimated models if the imposed restrictions on the coefficients are wrong.

6. Data

Due to the limited number of companies with both A-share and H-share listings, our sample is naturally narrowed down. Our original sample consists of daily share price data from February 19, 1999 to April 13, 2009, for 53 companies with dual-listings on either the SSE or the SZSE and on the HKSE during the studied event period. However, for the event studies in this paper, we have limited the original sample to include companies that were dual-listed throughout the estimation windows, i.e. from 120 days prior to the two investigated events, and throughout the event windows, i.e. until 45 days after the two events. Hence, for the estimated model in the first event study, we use daily share prices of 26 companies, dually listed on one of the Chinese stock markets and the Hong Kong stock exchange between August 25, 2005 and June 15, 2006. For the model used in the second event study, we use share price data for 29 dual-listed companies during the period September 22, 2006 to July 13, 2007. All company data in our two samples are collected from Thomson Datastream.⁹ For comparability and to isolate the effect of currency fluctuations between the RMB and the HKD to the currency variable, we use share prices in USD that we consider a stable currency over the estimation period. Additionally, number of shares outstanding and percentage of free-float shares outstanding for each stock are collected from Thomson Datastream. The market indexes are also collected from Thomson Datastream. The SHI was only available in RMB and

⁹ See Appendix A for a complete list of these companies.

the HSI was only available in HKD. Therefore, both indexes were manually converted into USD by exchange rates from Thomson Datastream.

Thomson Datastream only provides data on public firms that are currently listed on a stock exchange. Therefore, Chinese firms that have previously been dual-listed are excluded from sample. This could lead to biases in the estimation of the performance and characteristics of dual-listed firms. For this reason, survivorship bias could be a concern in our dataset, which we have not had the possibility to correct for. However, in general, the firms that are allowed the privilege of being dual-listed are large and stable state-backed firms. Moreover, we only include firms that were dual-listed during the whole estimation periods for our regression models. Therefore, we consider the survivorship bias to be a very limited concern in our data. Nevertheless, the number of dual-listed firms has dramatically increased over the last years. For these reasons, a data problem has rather been that we have had to exclude firms that became dual-listed at some point in time during our estimation period or afterwards.

If the statistical assumptions that our made about our data do not hold, regressions could give misleading results (Gujarati, 2003). In order to detect potential problems with our data, we performed robustness and specification tests.¹⁰ In conclusion from the performed robustness tests, there are no major problems with our model in terms of heteroscedasticity, normal distribution of residuals, multicollinearity or outliers. However, our sample shows signs of unit roots and autocorrelation with only few companies as exceptions. The decision of keeping our regression models in their present form is based on the fact that the regression results of the stationary companies generates on average the same results as the total average of all companies. This implies that our results are reasonable and reliable. Thus, in the decision between excluding some of the companies and keeping all of them, we chose the latter. By comparing the obtained event study results using the regression models with those using the market-adjusted return model, we can also get an indication of whether our results are sensible.

7. Empirical Results

7.1. The regression models for the first event

In the event study, we are dependent on our models' ability to predict the AH share price premium in the event window. However, as explained above, we do believe that our models are good enough to predict daily AH share price premiums in the event windows. One shortcoming that stems from the nature of our models is that they may not be able to predict values far into the future as they lose accuracy with time.

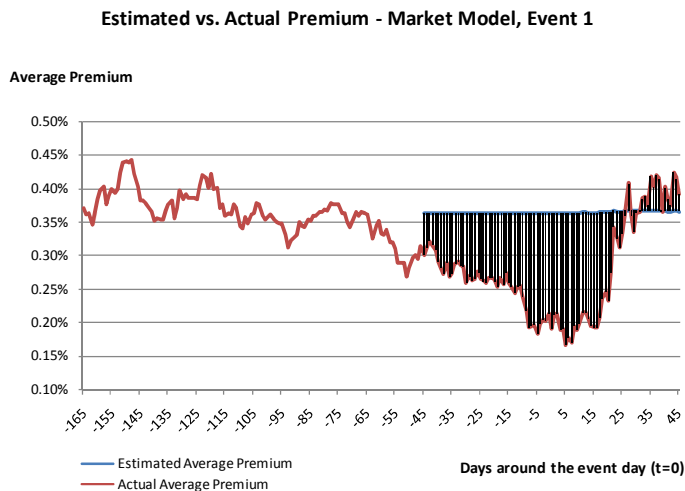
¹⁰ The test results are presented in Appendix B.

Nevertheless, the models are deemed sufficiently precise for the purpose of predicting values throughout our event window. Below we analyze in more detail the characteristics of our models.¹¹

7.1.1. Event 1 – The market model

For the market model, the explanatory variables and the intercepts are significant on a 5% level for a vast majority of the companies, which indicates that they have a considerable impact on the dependent variables, the AH share price premium. Most explanatory variables and intercepts are even significant on a 1% level. In the market model, we get an average R^2 of 10.9% and for only 5 companies the R^2 is higher than 20%. Nevertheless, for 17 companies out of the 26, the coefficients of the index variables have the expected positive sign. The significant p-values and the expected signs of most of the index coefficients lead us to conclude that the market variable is a correct variable to include in our model. However, the relatively low R^2 leads us to suspect that some variable with explanatory power is left out in the model. In Chart 4, we can see the market model predicts a rather constant premium throughout the event window. The rather strong discrepancy from the actual trend, suggesting considerable negative abnormal premiums prior to and around the event day, does not say much about the accuracy of the model per se since we aim to measure deviations from normal behavior. However, due to the low explanatory power of the model, we also tested to include additional explanatory variables from previous research.

Chart 4 – Market model prediction of abnormal premium vs. actual abnormal premium in the event window, Event 1



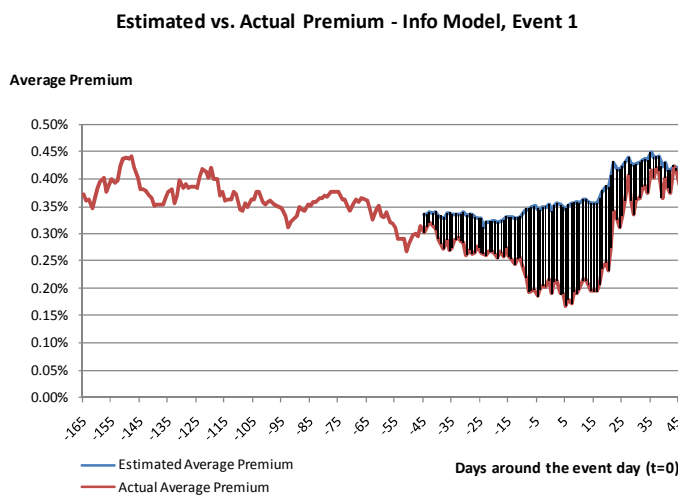
7.1.2. Event 1 – Adding the information variable

Including the information asymmetry variable into the model, the explanatory variables and the intercepts are still significant on a 5% level for the majority of the companies and for most of these are even

¹¹ Appendix C shows detailed regression results for all models.

significant on a 1% level. The average R^2 is now increased to 30.9% and the average adjusted R^2 is 29.7%, which is much higher compared to the average adjusted R^2 for the market model (10.2%). The low p-values for the information asymmetry variable also indicate that this is a better model than the simple market model. Also, more of the index variables have the expected sign. However, only about one third of the information asymmetry variables have the expected sign. Thus, the information model predicts a slight positive trend for the premium, whereas the actual premium decreases during the period until around 20 days after the event where it starts to increase again. This suggests a negative reaction on the premium around the event day. Nevertheless, the predictions seem to follow the trend of the actual premium quite well (see Chart 5).

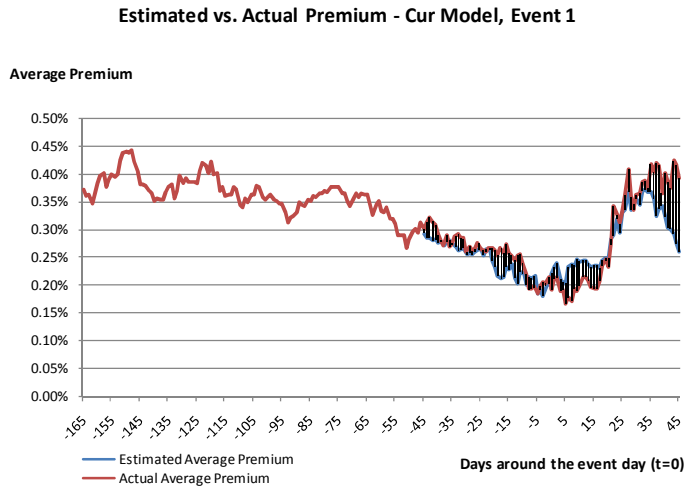
Chart 5 – Information model prediction of abnormal premium vs. actual abnormal premium in the event window, Event 1



7.1.3. Event 1 – Adding the currency variable

Adding the currency variable to the model, the vast majority of the explanatory variables and the intercepts are significant on a 5% level. The average R^2 is now 41.5% and the average adjusted R^2 is 40.0%, with more than half of the adjusted R^2 exceeding 40% and reaching up to 74.3%. Almost all of these are also significant on a 1% level. More of the coefficients for the index and information asymmetry variables now have the expected sign. However, only slightly above one fourth of the coefficients for the currency variable have the expected negative sign, indicating that in most cases, the RMB/HKD exchange rate is positively correlated with the price premium. One reason for this could be that even though the A-shares have increased in value compared to the H-shares because of the RMB appreciation, this effect has partly been offset by foreigners buying the more attractively priced H-shares, as these are also good substitutes for RMB assets. The predictions from the currency model seem to follow the actual premiums very closely, as can be observed in Chart 6. The deviations from the actual premium start to become larger around day 35 after the event.

Chart 6 – Currency model prediction of abnormal premium vs. actual abnormal premium in the event window, Event 1



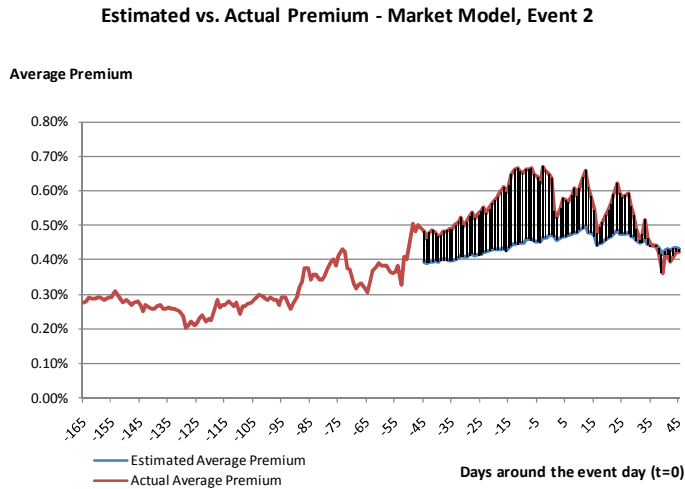
7.2. The regression models for the second event

7.2.1. Event 2 – The market model

Using the market model for the second event, the explanatory variables and the intercepts are significant on a 1% level for 25 and 23 companies respectively out of the 29. Moreover, for 24 companies, the market variable has the expected positive sign. The market model gives an average R^2 of 45.6%, which is much higher than the R^2 we received for the market model in the first event. For the majority of the companies, the R^2 is higher than 50% and for a third of them, R^2 exceeds 70%. This indicates that the relative market indexes better explains the AH share price premium after the announcement of the QDII.

In Chart 7, we note that the actual premiums exceed those predicted by the market model, suggesting positive abnormal premiums. Moreover, the predicted values of the premium seem to follow the trend of the actual values rather accurately. The market model is thus a reasonably good model to explain the AH share price premium during this period. However, we also tested to include the information asymmetry variable as adding this variable considerably improved our market model during the estimation period of the first event.

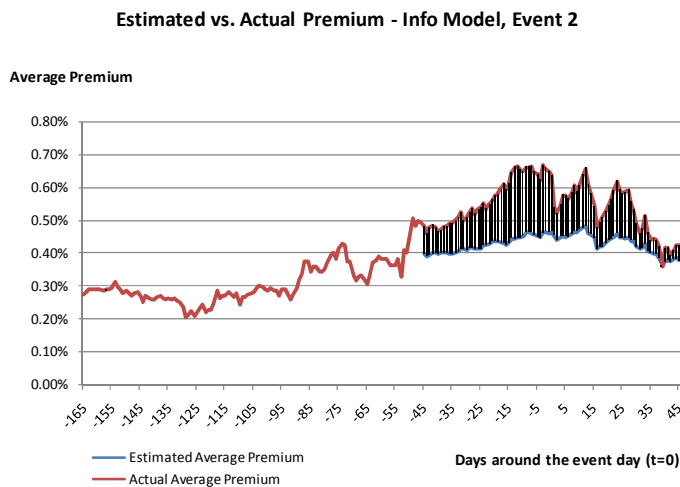
Chart 7 – Market model prediction of abnormal premium vs. actual abnormal premium in the event window, Event 2



7.2.2. Event 2 – Adding the information variable

Adding the information variable to the second event, most of the coefficients for the explanatory variables are significant on a 5% level (26 for the index variable and 15 for the information variable out of the 29 regressions). The average R^2 is slightly improved to 53.5% and the adjusted R^2 is 52.7% (45.1% for the market model). The adjusted R^2 is higher than 50% for the majority of the companies and higher than 70% for a third of the companies. The market variable has the expected positive sign for 26 out of the 29 companies and the information asymmetry variable has the expected negative sign for 17 out of the 29 companies. Thus, the model seems to have been improved when adding the information variable also for the second event. However, from Chart 8, we can draw the conclusion that the predictions of the information model are very similar to the predictions from the market model. Thus, for the second event, the information variable seems to add less explanatory power than it did for the first event.

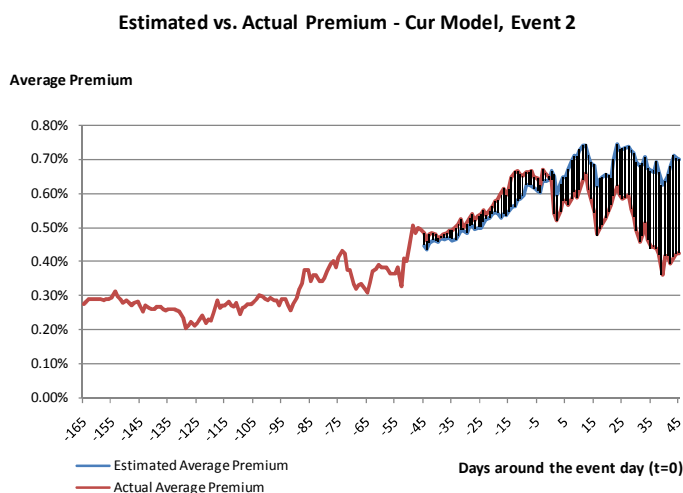
Chart 8 – Information model prediction of abnormal premium vs. actual abnormal premium in the event window, Event 2



7.2.3. Event 2 – Adding the currency variable

Adding the currency variable to the model results in a larger number of significant explanatory variables and intercepts. Almost all of the index variables and the majority of the information asymmetry variables also have the expected sign. Nevertheless, we observe the same unexpected positive sign on most of the currency variable coefficients. The R^2 is on average 63.0% and the average adjusted R^2 is 62.0%. The highest adjusted R^2 reaches up to 91.6% and more than half of the adjusted R^2 exceeds 70%. This indicates that the model has been improved when adding the currency variable. The predicted values of the premium for the currency model, being slightly lower than the actual values before the event day, seem to follow the actual values very closely until the event day. After the event day, the predicted premiums exceed the actual ones, suggesting negative abnormal premiums subsequent to the announcement.

Chart 9 – Currency model prediction of abnormal premium vs. actual abnormal premium in the event window, Event 2



7.3. The event study around the initial QDII announcement

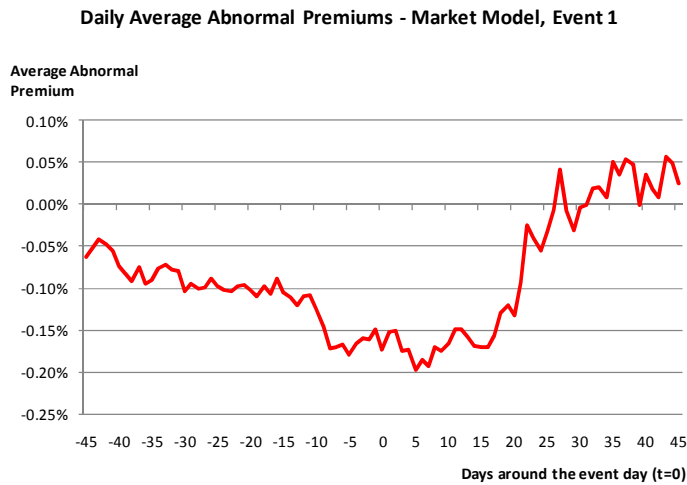
In this section, we analyze abnormal premiums around the first event study, surrounding the initial announcement of the QDII investment scheme. According to Krivin et al. (2003), one way to measure when the effect of the announcement starts and wears off is to examine when the daily average abnormal premiums ($\overline{APREM}_t$) and the daily average abnormal returns ($\overline{AR}_t$) are no longer significant. Therefore, we first look at the average abnormal premiums and returns around the event. In this way, we investigate the persistence of the announcement effect. Using results from our different models, we aim to give more depth to the analysis. To measure and analyze the added effect over more than one day before and after the event, we also analyze the cumulative average abnormal premiums ($\overline{CAPREM}_t$) and the cumulative

average abnormal returns ($\overline{CAR}_t$) around the event, in accordance with MacKinlay (1997). The $\overline{APREM}_t$ and the $\overline{AR}_t$ are the sample average abnormal premiums and returns for the specified day t in event window. The cumulative measures, $\overline{CAPREM}_t$ and the $\overline{CAR}_t$, are sample average cumulative abnormal premiums and returns, calculated by adding together the daily measures from the event day (including the actual event day) backward or forward in the time to the specified day, as explained in section 5. Event time is days relative to the announcement date. We have chosen to limit the analysis to 45 days before the event and 45 days after the event, $t=0$ being the event day, since we believe that this period will be sufficient to capture abnormal premiums and returns due to the QDII announcements.

7.3.1. Event 1 – Using the market model

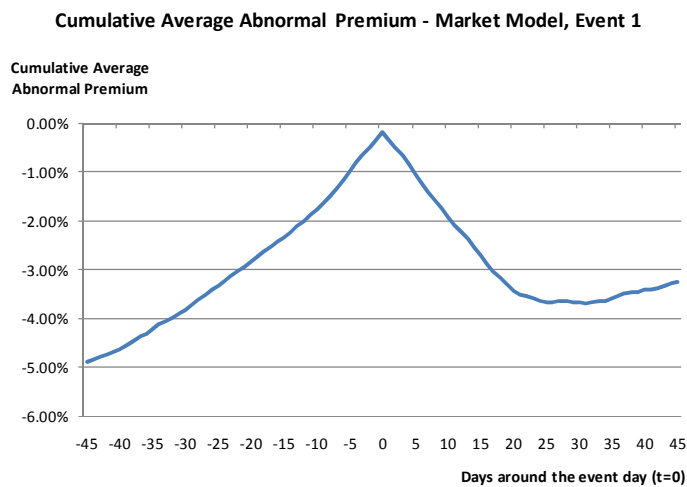
For the first event, the market model indicates negative abnormal premiums from 45 days before and to 22 days after the event. The deviations from the expected premium being at most between -0.15% and -0.20% around the event day are however, in comparison to the actual premium, rather small. We observe negative daily average abnormal premiums of around -0.06% already 45 days prior to the announcement. The negative daily average abnormal premiums persist until the event day and increase steadily to around -0.17% on the event day. After the event, the significant negative abnormal premiums persist until the 21st day after which the premium goes back to normal levels again (see Chart 10 below for a graphical illustration). It seems reasonable that the abnormal returns are largest closer to event day since the news should have reached most investors around this time. After the 22nd day, the daily abnormal premiums start to become insignificant on a 5% level, indicating that the announcement effect is wearing off. Nevertheless, the abnormal premiums around the event day, especially before, have the expected negative signs. The significant abnormal premiums already 45 days prior to the event day indicate that there have been severe information leakages about the announcement, possibly linked to rumors of a likely QDII scheme (Birtch and McGuinness, 2008). This confirms our hypothesis about decreasing premiums due to the announcement. The fact that the premium goes back to normal levels around 20-25 days also indicates that our event window is long enough to cover the effects of the announcement.

Chart 10 – $\overline{APREM}_t$ around the event day ($t=0$) for the market model, Event 1



The average cumulative abnormal premiums (see Chart 11 below) give clearer signs of the negative effects of the announcement. We can see that there are obvious negative cumulative abnormal premiums, both before and after the event. These negative cumulative abnormal premiums are increasing the further back from the event day that we measure, reaching around -5% at 45 days before the event day. In the period after the event, the cumulative abnormal premiums increase steadily until around day 20 where they start to become less negative. The cumulative abnormal premiums are highly significant throughout the event window.

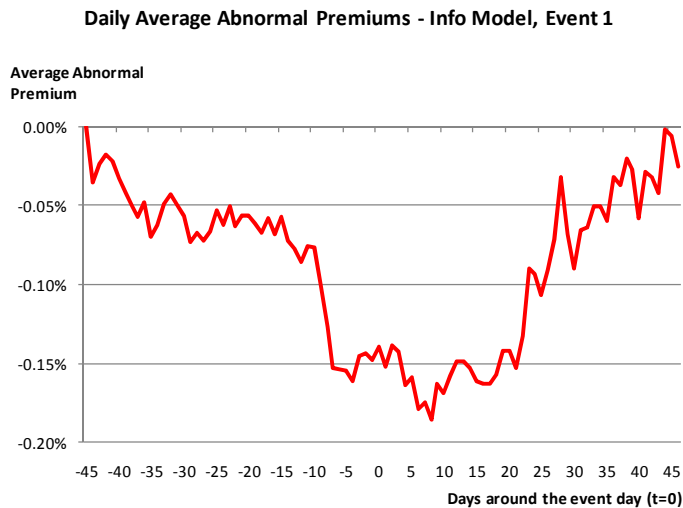
Chart 11 – $\overline{CAPREM}_t$ around the event day ($t=0$) for the market model, Event 1



7.3.2. Event 1 – Adding the information variable

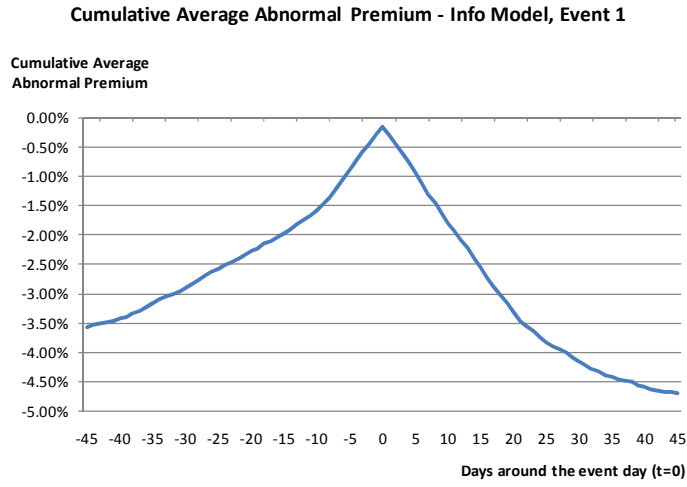
With the information model, we receive a similar but clearer trend in average abnormal premiums. Apparently, most of the negative effect from the initial announcement occurred during the period 10 days before the announcement to 20 days afterwards. The negative abnormal premiums are at most between -0.15% and -0.20% as the market model indicated. The abnormal premiums start to become significant around 40 days before the event at approximately -0.04% and persist and increase until the event day to around -0.15%. The average abnormal premiums continue to persist to around 37 days after the event, but decrease during this period to around 0.02% (see Chart 12). Again, the announcement effect on the average abnormal premiums is strongest on days closer to the event, which is more obvious from the information model than from the market model. Around day -10, there is a sharp drop in the average abnormal premium from around -0.08% to around -0.15%. This effect can be seen in Chart 10, but is much less obvious. This suggests that the main information leakage occurred around this day, around two weeks before the announcement. Around day 20 there is a sharp reduction in the negative abnormal premium back to the levels before the sharp drop. Thus, the information models confirms that negative effect wears off around 20-25 days after the event, but indicates that the information leakages are less severe than the market model suggested.

Chart 12 – $\overline{APREM}_t$ around the event day ($t=0$) for the information model, Event 1



The trend for the average cumulative abnormal premiums around the event day is similar to what the market model showed, although the cumulative abnormal premiums are less negative than what the market model indicated. As for the market model, the steady increase in the negative cumulative abnormal premiums starts to slow down around 20 days after the event day (see Chart 13).

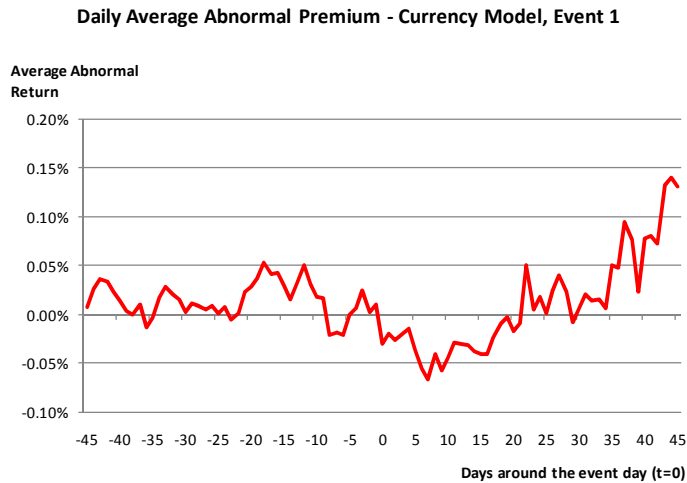
Chart 13 – $\overline{CAPREM}_t$ around the event day ($t=0$) for the information model, Event 1



7.3.3. Event 1 – Adding the currency variable

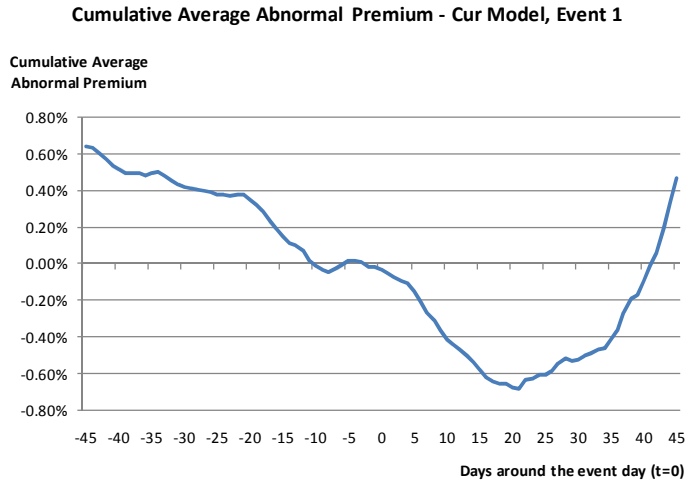
When adding the currency variable to the information model, the negative abnormal returns seem to occur between one to four weeks after the announcement. We observe daily negative abnormal premiums around the event day, from 8 days prior to the event until 21 days after the event day. However, even though the negative abnormal premium on the event day is significant on a 5% level, most of the abnormal premiums between day -8 and day 4 are insignificant. In fact, almost all abnormal returns prior to the event day are insignificant suggesting no effect from the announcement during this period. However, the negative abnormal premiums between day 5 and day 17 after the event are significant at quite modest levels between -0.02% and -0.07% (see Chart 14). This indicates that the market may have needed one trading week after the announcement to adjust for the new information. The many days of insignificant abnormal premiums prior to the event gives no indication of information leakage during this period.

Chart 14 – $\overline{APREM}_\tau$ around the event day ($t=0$) for the currency model, Event 1



The average cumulative abnormal premiums obtained when using the currency model gives a different picture than what previous models indicated. Whereas the previous models indicated highly significant negative cumulative abnormal returns both before and after the event day, the currency model shows negative cumulative abnormal premiums only after the event. Thus, taking the currency effect into account shows that the announcement only affects the premiums after the announcement and gives no signs of information leakage prior to the event. Even though it seems unlikely that no information leakage occurred prior to the event (see Birtch and McGuinness, 2008), a possible explanation for these results is that the rumors may not have caused a significant contraction in the premium prior to the announcement. Although the negative cumulative abnormal premiums are persistent until around day 40, they are much smaller (at most around 0.70%) than the previous models indicated. This could perhaps be explained by the considerable RMB appreciation during the period (see Chart 3 in section 2.1) that should have had a positive effect on the value of the A-shares and consequently the premium.

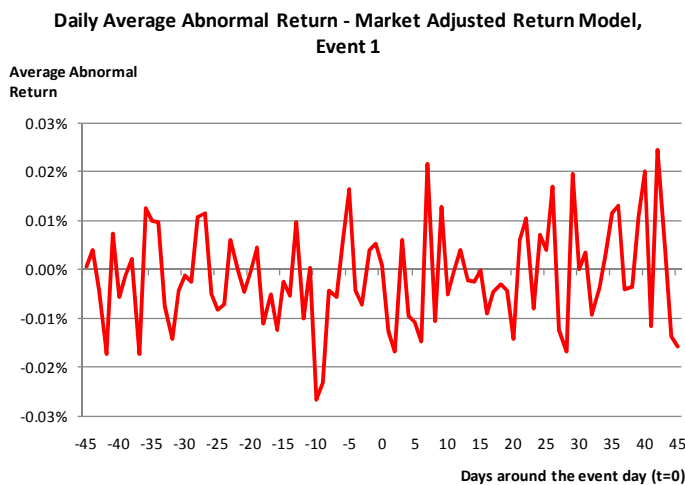
Chart 15 – $\overline{CAPREM}_t$ around the event day ($t=0$) for the currency model, Event 1



7.3.4. Event 1 – The market-adjusted return model

Using the market-adjusted return model to estimate abnormal returns for the first event, we observe seemingly quite random signs on the abnormal return, with the mean abnormal return slightly below zero for the period around event window. Most of the abnormal returns are within the range between -0.02% and 0.02%. (see Chart 16). Moreover, most of these are insignificant, both prior to and after the event day, which makes it hard to draw inferences regarding the impact of the QDII announcement. We do however see significant negative abnormal returns for day 1, 2, 5, 6 and 8 after the event that could be due to the announcement of the QDII.

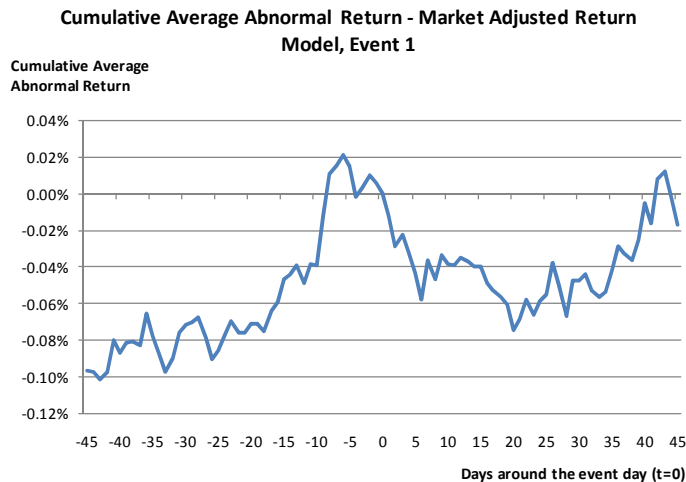
Chart 16 – $\overline{AR}_t$ around the event day ($t=0$) for the market-adjusted return model, Event 1



However, looking at Chart 17, we observe negative cumulative abnormal premiums for the period 45 to 10 days prior to the event day. These values are significant and witness of information leakage prior to the

event. The cumulative abnormal premiums from 10 days before the event day to one day afterwards are insignificant. Nevertheless, most of the values between day 2 and 25 after the event day are significant, whereas values after that period are insignificant. The trend for cumulative abnormal premiums using the market-adjusted return model is very similar to the trend that we observed using the market model and the information model. The development after the event day is similar to what the currency model predicted.

Chart 17 – $\overline{CAR}_t$ around the event day ($t=0$) for the market-adjusted return model, Event 1



7.3.5. Summary of findings for the first event study

The market model and the information model showed negative abnormal premiums of around -0.15% to -0.20% from 10 days before until 20-25 days after the event day. This indicates both severe information leakages before the announcement and persistence in the negative effect on the premium several weeks after the announcement. The currency model did not show any remarkable abnormal premiums prior to the event. The negative effect is delayed until day 5 after the announcement and persists until day 17. Thus, in combination with the results from the other models, we conclude that the initial QDII announcement resulted in negative abnormal premiums after the event day. The market-adjusted return model gave mostly insignificant results for the average abnormal returns. However, when aggregating the return into cumulative average abnormal returns, the market-adjusted return model shows the same trend of negative cumulative average abnormal returns, both prior to and after the event day, as the market model and the information model indicated. It thus seems likely that the results from the market model and the information model are reliable.

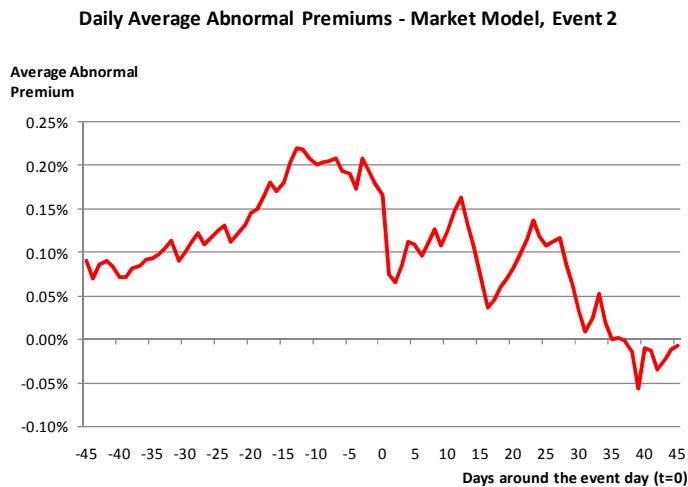
7.4. The event study around the announcement of the QDII expansion

In this section, we analyze the second event study surrounding the announcement of the expansion of the QDII investment scheme to include equity related products. We perform a similar analysis to the one for the first event study in section 7.3, in order to be able to compare the results between the two studies.

7.4.1. Event 2 – Using the market model

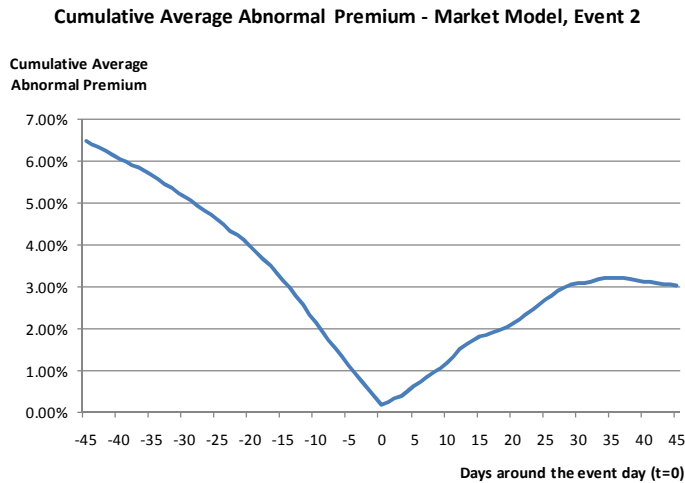
Using the market model for the second event study, surprisingly, we observe significant and slight positive daily average abnormal returns from 45 days before the event day until 30 days after the event day. These abnormal returns reach from 0.03% to 0.22% over the period and have opposite sign to what we expected (see Chart 18). The reason for these positive abnormal returns is hard to explain. Possibly other events, such as a boost in A-share prices due to the NTS reform, have affected the premium during this period. As discussed earlier, this is difficult to correct for since different news can have influenced different companies differently. Nevertheless, even though the abnormal premiums are positive for most of the period, we see a decreasing trend in these, followed by a sharp drop around the event day. This could indicate that even though the actual premiums are larger than the predicted premiums, the actual premiums are affected negatively due to the announcement.

Chart 18 – $\overline{APREM}_t$ around the event day ($t=0$) for the market model, Event 2



As expected from the analysis in the previous paragraph, the cumulative abnormal premiums is increasing as we include more days prior to the event day to around 6.5% at day -45. The cumulative abnormal premiums also increase after the event day but this effect starts to wear off around 30 days after the event day (see Chart 19). The cumulative abnormal premiums for the period are all highly significant.

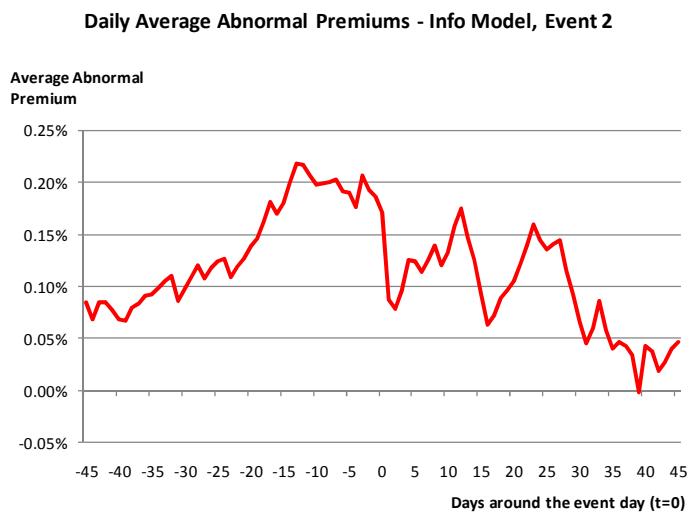
Chart 19 – $\overline{CAPREM}_\tau$ around the event day ($t=0$) for the market model, Event 2



7.4.2. Event 2 – Adding the information variable

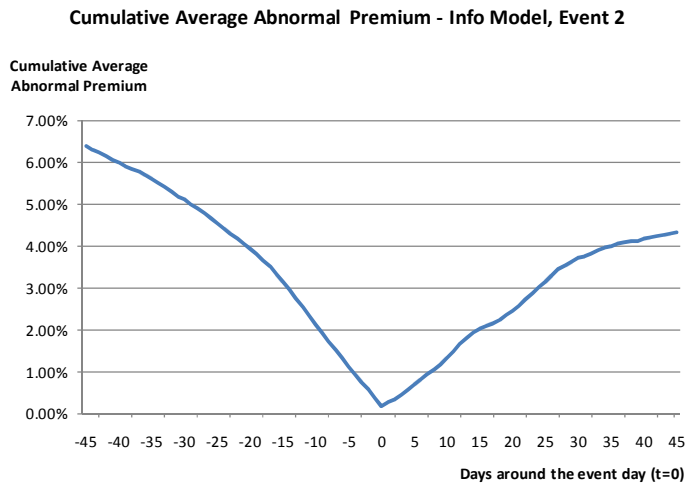
Using the information model, we receive a very similar trend in average abnormal premiums to what we saw when using the market model. The abnormal premiums are significant until 38 days after the event and, compared with the market model, slightly lower before the event day and slightly higher afterwards (see Chart 20). This partly confirms the accuracy of the abnormal premiums observed with the market model. Again, we observe a sharp drop in the abnormal premium on the event day and a negative trend in abnormal premiums after the announcement, confirming the results observed from the market model.

Chart 20 – $\overline{APREM}_\tau$ around the event day ($t=0$) for the information model, Event 2



As expected, the cumulative abnormal premiums for the information model are also very similar to that from the market model, as can be observed in Chart 21 below. The cumulative abnormal premiums for the period are all highly significant.

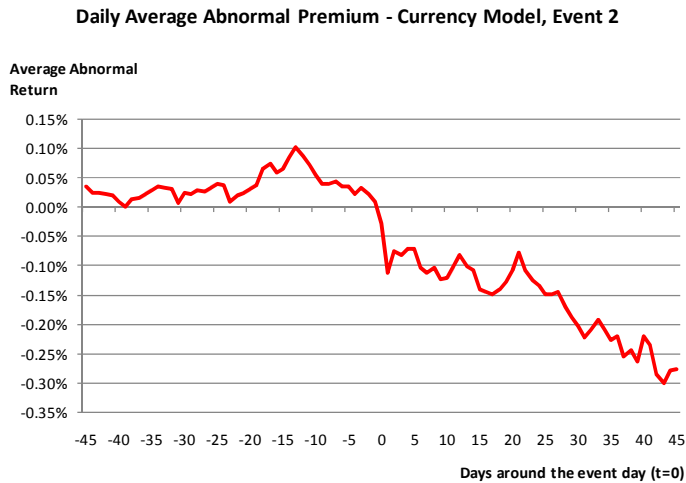
Chart 21 – $\overline{APREM}_t$ around the event day ($t=0$) for the information model, Event 2



7.4.3. Event 2 – Adding the currency variable

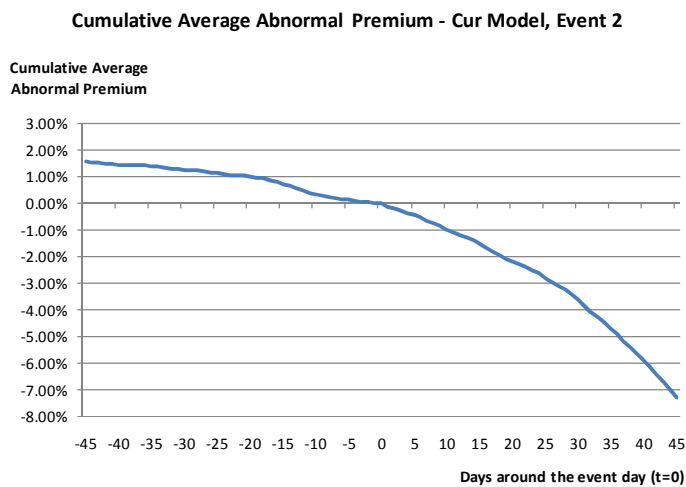
Adding the currency variable to the information model, we obtain significant daily average abnormal premiums for the period 20 days before the event day until 45 days after the event day (except for one day before the event day). Before the event day, the abnormal premiums are slightly positive between 0.01%-0.10%. Interestingly, the average premiums abruptly turn negative exactly on the event day (-0.03% on the event day) and remain increasingly negative until 45 days after the event day, in the range of -0.07% to -0.30% (see Chart 22 below). These results indicate that there has not been any information leakage during the pre-event period and that investors react to the news immediately after announcement. It is also apparent that they keep trading down the premium in the post-event period creating a negative trend during this period. Even though it is apparent that this trend is due to the announcement, it is possible that speculative trading increases this negative effect.

Chart 22 – $\overline{APREM}_\tau$ around the event day ($t=0$) for the currency model, Event 2



For the currency model, the average cumulative abnormal premiums are significant throughout the event window, except for day -1 and -2 before the event day and the event day itself. Nevertheless, the cumulative abnormal premiums being positive before the event day starts to become negative on the event day and the negative cumulative abnormal premiums continues to increase until the end of the event window, as can be seen in Chart 23 below. Thus, the prediction of the currency model for the second event, positive cumulative abnormal premiums prior to the event day and negative cumulative abnormal premiums after the event day, is similar to what the model predicted for the first event.

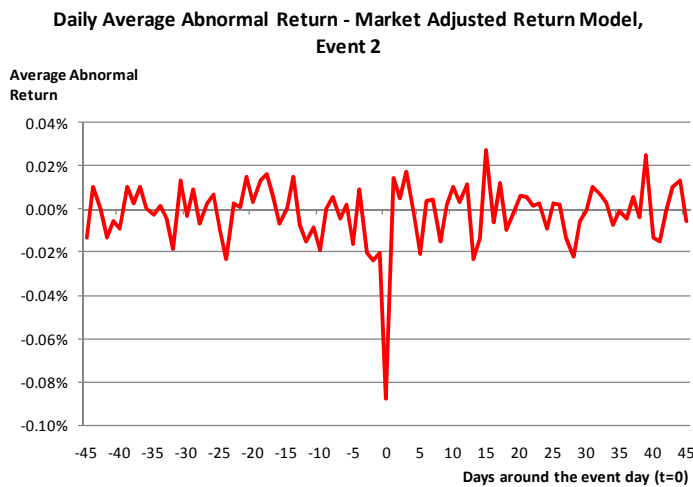
Chart 23 – $\overline{CAPREM}_\tau$ around the event day ($t=0$) for the currency model, Event 2



7.4.4. Event 2 – The market-adjusted return model

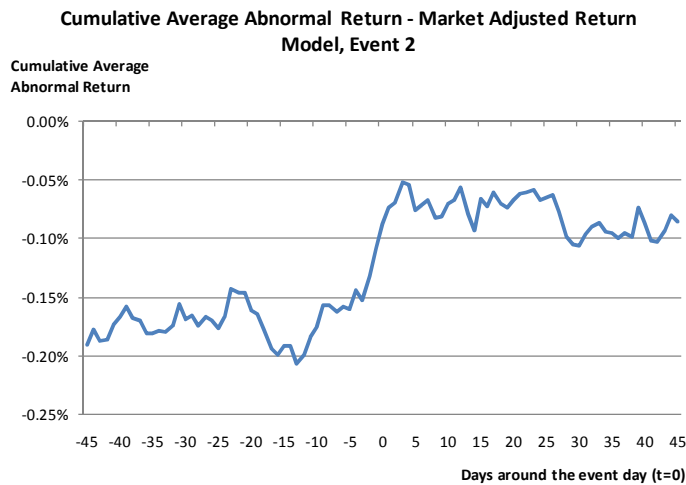
For the second event, most daily average abnormal returns in the event window are insignificant. However, during all three days prior to the event day, we observe significant negative abnormal returns around -0.02% each day (see Chart 24 below). Moreover, we observe a highly significant negative abnormal return on the event day of around -0.09%. Since most of the abnormal returns are within the range between -0.02% and 0.02%, we conclude that the abnormal return on the event day is of such magnitude that it has to be related to the announcement of the expansion of the QDII investment scheme. The significant negative abnormal returns 3 days prior to the event could indicate that there have been slight information leakages prior to the announcement.

Chart 24 – $\overline{AR}_t$ around the event day ($t=0$) for the market-adjusted return model, Event 2



Looking at Chart 25, we observe negative average cumulative abnormal premiums prior to the event day in the range of -0.15% to -0.20%. The cumulative abnormal premiums become less negative shortly after the event day and remain within the range of -0.05% to -0.10% after the announcement. Almost all cumulative abnormal premiums are significant throughout the event window, with highest significance around the event day.

Chart 25 - $\overline{CAR}_t$ around the event day ($t=0$) for the market-adjusted return model, Event 2



7.4.5. Summary of findings for the second event study

As we also observed in the first event study, the market model and the information model give similar results. The two models' predictions indicate positive abnormal premiums almost throughout the event window. It is reasonable to believe that the positive trend during the estimation period and the event window is related to other factors than the announcements of the QDII expansion. One such factor could be a boost in the A-share market due to the NTS reform. Another could be foreign investors' increased appetite for A-shares due to expectations of an appreciating RMB or increased confidence in the Chinese government's intentions to further liberalize the Chinese stock markets. Nevertheless, the sharp drop in abnormal premiums around the event day and the clear decreasing trend afterwards could be an indication of a reaction to the announcement.

The currency model, however, indicate slight positive abnormal premiums prior to the event day. These turn negative on the event day (to around -0.03%) and continue to become more negative each day after the event day to -0.30% on day 45. Possibly the currency variable is able to capture trends that the market variable and the information variable missed out. These results seem more reasonable and in line with our expectations. They suggest that the announcement of the QDII expansion had a more discernible negative impact on the price premiums.

Using the market-adjusted return model, we obtain significant negative abnormal returns during three days prior to the event (around -0.02%), and a highly significant negative abnormal return (around -0.09%) on the event day. This indicates that there were minor information leakages prior to the event and that the announcement of the expansion of the QDII did have an effect on the trading on the event day.

Overall, the indications of negative abnormal premiums are smaller than what was observed for the initial announcement of the QDII. The most plausible reason for this is that most of the negative effect on

the premium occurred already around the initial announcement of the QDII investment scheme. The minor signs of negative abnormal premiums and returns prior to the second event give reasons to believe that there were less information leakages around the second event.

8. Conclusions

The purpose of this thesis has been to examine whether the announcements of the implementation and of the expansion of the QDII scheme had a significant impact on the AH share price premium, to be able to draw conclusion about the effectiveness of the reform.

It appears that the initial announcement of the QDII had the largest impact on the AH share price premium. Our study shows that the announcement affected the premium negatively from 10 days prior to until 20-25 days after the announcement day. The daily effect, in the range of -0.15% to -0.20%, is rather small but significant and the negative effect is in line with our expectations. We also note that the information leakages prior to the event are severe and affect the premium. This is probably due to the mentioned rumors about the QDII scheme prior to the announcement. The relatively swift and rational response to the announcement also witness of certain efficiency on the Chinese markets.

For the subsequent announcement of the expansion of the QDII, all models signify a sharp drop in the premium on the event day and subsequent negative trends. Thus, we conclude, as expected, that the second announcement also affected the abnormal premiums negatively, although this effect is less obvious than what was observed around the initial announcement due to detected positive trend. Moreover, the information leakages before the second announcement seem to have been minor. Overall, the effect of the second announcement proved to be inferior to the initial announcement. This leads us to believe that most of the expected negative effect on the AH share price premiums was incorporated around the initial announcement. It is also plausible that parts of the negative effect from the initial announcement were included in our second estimation window. This would explain the less apparent signs of negative abnormal premiums and returns in the event window for the second event study.

To sum up, this study shows that the QDII announcements had short-term negative effects on the AH share price premium. It is however important to note that as we measure the impact of the announcements and not the successive implementations, the observed short-term negative effects on the premium are mostly due to investors' expectations of and confidence in the long-term effects of the QDII, such as a more liberalized capital market in China. As a result, we believe that the QDII reform has so far been effective. Nevertheless, the premium still persists today. So even though the QDII investment scheme is a step toward a more liberalized market, there is need for more complementary deregulations to entirely extinguish market segmentation between the Chinese and the Hong Kong stock markets.

The QDII allows more balanced inward and outward capital flows, leading to a considerably increased spectrum of investment opportunities for Chinese investors. Being the main target for future investments from Chinese QDIIs, this should in particular benefit the H-share market and drive down the AH share price premium further. Ultimately, we believe that the QDII investment scheme is a very important step toward liberalization of the Chinese capital markets that will benefit both Chinese and foreign investors. After the QFII deregulation in 2002, China's tremendous growth has increased the interest in the country among investors and has attracted more foreign capital to the Chinese market. The QDII has certainly also had an important impact on foreign investors' beliefs and confidence in the intentions of the Chinese government to further liberalize the Chinese capital markets. As the regulatory programs are being developed further, domestic financial institutions will gain international experience, whereas foreign institutional investors will be allowed to learn more about the Chinese markets. Ultimately, this should result in the creation of better and more tailored financial products for Chinese investors, which could serve to further decrease the observed AH share price premium.

To further understand the behavior of domestic and foreign investors around the QDII announcements, it would be interesting to investigate more closely how the A-share market and the H-share market reacted respectively to the QDII announcements. Studies of the long-term effects of the QDII scheme, as more QDIIs are approved, would also shed more light on the effectiveness of the deregulations and their impact on the Chinese capital markets. Moreover, the results from the event study rely very much on the predictability of the regression models used. One improvement that could be made in future research is to improve the regression models by for instance including the expectations of the currency effect rather than just including the static effect of the exchange rate. In the field of investor behavior, one could examine whether the reforms have increased the willingness among foreign investors to invest in China, or whether and how the investment behavior of Chinese investors changes as the markets become more liberalized. Answers to these questions would give more detailed guidance to policy makers for future deregulations of the Chinese stock markets.

9. References

9.1. Academic references

- Amihud, Y., and Mendelson, H., 1986. Asset pricing and the bid-ask spread. *Journal of Financial Economics*, Vol. 17, pp. 223–249.
- Bailey, W., 1994. Risk and return on China's new stock markets: Some preliminary evidence. *Pacific-Basin Finance Journal*, Vol. 2, pp. 243-260.
- Bailey, W., Chung, Y.P., and Kang J-K., 1999. Foreign ownership restrictions and equity price premiums: What drives the demand for cross-border investments? *Journal of Financial and Quantitative Analysis* Vol. 34, pp. 489–511.
- Bailey, W., and Jagtiani, J., 1994. Foreign ownership restrictions and stock prices in the Thai capital market. *Journal of Financial Economics*, Vol. 36, pp. 57–87.
- Beltratti and Bortolotti (2006). *The Nontradable Share Reform in the Chinese Stock Market*, FEEM Working Paper No. 131.06.
- Birtch, T.A., and McGuinness, P.B., 2008. The 2001-2005 price convergence in the A- and H-shares of Chinese state-owned Enterprises. *Journal of Financial Regulation and Compliance*, Vol. 16, No. 3, pp. 239-250.
- Brown, S.J., and Warner, J.B., 1980. Measuring security performance. *Journal of Financial Economics*, Vol. 8, pp. 205–258.
- Chakravarty, S., Sarkar, A., and Wu, L., 1998. Information asymmetry, market segmentation and the pricing of cross-listed shares: Theory and evidence from Chinese A and B shares. *Journal of International Financial Markets, Institutions and Money*, Vol. 8, pp. 325–355.
- Chui, A.C.W. and C.Y. Kwok (1998). Cross-autocorrelation between A-shares and B-shares in the Chinese Stock Market. *Journal of Financial Research*, Vol. 21, pp. 333–53.
- Chan, K., and Kwok, J.K.H., 2005. Market Segmentation and Share Price Premium: Evidence from Chinese Stock Markets. *Journal of Emerging Market Finance*, Vol. 4, No. 1, pp. 43-61.
- Chan, K, Menkveld, A.J., and Yang, Z., 2008. Information Asymmetry and Asset Prices: Evidence from the China Foreign Share Discount. *Journal of Finance*, Vol. 63, No. 1, pp. 159-196.
- Chen, G., Lee, B-S., and Rui, O.M., 2001. Foreign ownership restrictions and market segmentation in China's stock markets. *Journal of Financial Research*, Vol. 24, pp. 133–155.

Domowitz, I., Glen, J., and Madhavan, A., 1997. Market segmentation and stock prices: Evidence from an emerging market, *Journal of Finance*, Vol. 52, pp. 1059–1085.

Dongwei, S.U., 2003. *Chinese stock market-a research handbook*. Singapore: World Scientific Publishing Co. Pte. Ltd.

Eun, C.S., and Janakiraman, S., 1986. A Model of International Asset Pricing with a Constraint on the Foreign Equity Ownership, *Journal of Finance*, Vol. 41, pp. 897–914.

Fama, E.F., 1970. Efficient Capital Markets: A Review of Theory and Empirical Work, *Journal of Finance*, Vol. 25, pp. 383–417.

Fernald, J., and John H.R., 2002. Puzzles in the Chinese stock market. *Review of Economics and Statistics*, Vol. 84, pp. 416–432.

Gardioli, L., Gibson, R., and Tuchschnid, N., 1997. Are Liquidity and Corporate Control Priced by Shareholders? Empirical Evidence from Swiss Dual Class Shares. *Journal of Corporate Finance*, Vol. 3, pp. 299–323.

Gujarati, D.N., 2003. *Basic Econometrics*, 4th Edition. New York: McGraw-Hill.

Hietala, P., 1989. Asset Pricing in Partially Segmented Markets: Evidence from the Finnish Market. *Journal of Finance*, Vol. 44, pp. 697–715.

Kothari, S.P., and Warner, J.B., 2006. Econometrics of event studies. In Eckbo, B.E., (ed.), 2006. *Handbook of Corporate Finance: Empirical Corporate Finance*, Elsevier/North Holland. Ch. 1.

Li, Y., Yan, D., and Greco, J., 2006. Market segmentation and price differentials between A shares and H shares in the Chinese stock markets. *Journal of multinational financial management*, Vol. 16, pp. 232–248.

Long, G., 2009. China's policy of opening up in the decade after the Asian financial crisis. In: Wang, M., (ed.), 2009. *China in the wake of Asia's financial crisis*. New York: Routledge Taylor & Francis Group. Ch. 4.

Longstaff, F.A., 2001. Optimal Portfolio Choice and the Valuation of Illiquid Securities. *The Review of Financial Studies*, Vol. 14, No. 2, pp. 407–431.

Ma, X., 1996. Capital Controls, Market Segmentation and Stock Prices: Evidence from the Chinese Stock Market, *Pacific Basin Finance Journal*, Vol. 4, pp. 219–39.

Martell, R., and Stulz, R.M. 2003. Equity-Market Liberalizations as Country IPO's. *The American Economic Review*, Vol. 93, No. 2, pp. 97–101.

MacKinlay, A.C., 1997. Event Studies in Economics and Finance, *Journal of Economic Literature*, Vol.35, pp. 13-39.

McGuinness, P.B., 2006. The privatisation process and evolving share ownership structure of mainland China's leading state-owned enterprises. *Journal of Financial Regulation and Compliance*, Vol. 14, No. 1, pp. 37-46.

Silber, W., 1991. Discounts on Restricted Stock: The Impact of Illiquidity on Stock Prices. *Financial Analysts Journal*, Vol. 47, pp. 60-64.

Stulz, R.M., 2005. The Limits of Financial Globalization. *The Journal of Finance*, Vol. 60, No. 4, pp. 1595-1638.

Stulz, R.M., and Wasserfallen, W., 1995. Foreign Equity Investment Restrictions, Capital Flight, and Shareholder Wealth Maximization: Theory and Evidence. *Review of Financial Studies*, Vol. 8, pp. 1019-57.

Sun, Q. and Tong, W.H.S., 2000. The Effect of Market Segmentation on Stock Prices: The China Syndrome. *Journal of Banking & Finance*, Vol. 24, pp. 1875-1902.

Wang, S.S., and Jiang, L., 2004. Location of trade, ownership restrictions, and market illiquidity: Examining Chinese A- and H-shares. *Journal of Banking & Finance*, Vol. 28, pp. 1273-1297.

9.2. Non-academic references

Fong, T., Wong, A., and Yong, I., 2007. *Share price disparity in the Chinese stock markets*, Hong Kong Monetary Authority, Working Paper 11/2007.

Kravin, D., Patton, R., Rose, E., and Tabak, D., 2003. *Determination of the appropriate event window length in individual stock event studies*. National Economic Research Associates, Inc., NERA Economic Consulting (4 November 2003).

Lee, J., and Poon, J., 2005, *Convergence of A-share and H-share prices*, Research Paper No. 19, Securities and Futures Commission, Hong Kong, available at: www.hksfc.org.hk/ [Accessed 5 April 2009]

Stender, N.A., Yin, X., and Sheets, N., 2006. China Liberalization of Outbound Portfolio Investment: Precursor to QDII. *China Law & Practice*, Vol. 20, No. 6, pp. 13-16.

9.3. Other sources

Anon., China Daily, 2006. 'QFII'. China Daily, [internet] 26 September. Available at: http://www.chinadaily.cn/china/2006-09/26/content_792579.htm [Accessed 5 April 2009].

Anon., The MathWorks, Inc., 2009. The MathWorks, [internet], 1994-2009. Available at:
<http://www.mathworks.com/> [Accessed 8 May 2009]

Hui, C-H, 2007. 'HK upbeat over QDII quota widening'. China Daily, [internet] 24 May. Available at:
http://www.chinadaily.com.cn/bizchina/2007-05/24/content_879383.htm [Accessed 5 April 2009].

Wan, H., 2009. 'Legg Mason Seeks China License to Trade Yuan-Denominated Stocks'. Bloomberg, [internet] 10 March. Available at:
<http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aM4E27602pNU> [Accessed 5 April 2009].

Wood, A, 2009. 'China's foreign investor scheme on track'. Financial Times, 23 February 2009.

10. Appendix A – List of companies

Event 1

	<u>Company</u>	<u>Listed on</u>	<u>A Shares ticker</u>	<u>Date of A-share Listing</u>	<u>Listed on</u>	<u>H Shares ticker</u>	<u>Date of H-share Listing</u>
1	Angang Steel	SZSE	000898	25 December 1997	HKSE	347	24 July 1997
2	Anhui Conch Cement	SSE	600585	7 February 2002	HKSE	914	21 October 1997
3	Anhui Expressway	SSE	600012	7 January 2003	HKSE	995	13 November 1996
4	Beiren Printing Machinery	SSE	600860	6 May 1994	HKSE	187	6 August 1993
5	China Eastern Airlines	SSE	600115	5 November 1997	HKSE	670	5 February 1997
6	China Petroleum & Chemical	SSE	600028	8 August 2001	HKSE	386	19 October 2000
7	China Shipping Development	SSE	600026	23 May 2002	HKSE	1138	11 November 1994
8	China Southern Airlines	SSE	600029	25 July 2003	HKSE	1055	31 July 1997
9	Dongfang Electric	SSE	600875	10 October 1995	HKSE	1072	6 June 1994
10	Guangzhou Pharmaceutical	SSE	600332	6 February 2001	HKSE	874	30 October 1997
11	Guangzhou Shipyard International	SSE	600685	28 October 1993	HKSE	317	6 August 1993
12	Huadian Power International	SSE	600027	3 February 2005	HKSE	1071	30 June 1999
13	Huaneng Power International	SSE	600011	6 December 2001	HKSE	902	22 January 1998
14	Jiangsu Expressway	SSE	600377	16 January 2001	HKSE	177	27 June 1997
15	Jiangxi Copper	SSE	600362	11 January 2002	HKSE	358	12 June 1997
16	Jingwei Textile Machinery	SZSE	000666	10 December 1996	HKSE	350	02 February 1996
17	Maanshan Iron & Steel	SSE	600808	6 January 1994	HKSE	323	03 December 1993
18	Nanjing Panda Electronics	SSE	600775	18 November 1996	HKSE	553	02 May 1996
19	Shandong Xinhua Pharmaceutical	SZSE	000756	6 August 1997	HKSE	719	31 December 1996
20	Shenzhen Expressway	SSE	600548	25 December 2001	HKSE	548	12 March 1997
21	Sinopec Shanghai Petrochemical	SSE	600688	8 November 1993	HKSE	338	26 July 1993
22	Sinopec Yizheng Chemical Fibre	SSE	600871	11 April 1995	HKSE	1033	29 March 1994
23	Tianjin Capital Environmental Protection	SSE	600874	30 June 1995	HKSE	1065	17 May 1994
24	Tsingtao Brewery	SSE	600600	27 August 1993	HKSE	168	15 July 1993
25	Yanzhou Coal Mining	SSE	600188	1 July 1998	HKSE	1171	01 April 1998
26	ZTE	SZSE	000063	18 November 1997	HKSE	763	09 December 2004

Event 2

	<u>Company</u>	<u>Listed on</u>	<u>A Shares ticker</u>	<u>Date of A-share Listing</u>	<u>Listed on</u>	<u>H Shares ticker</u>	<u>Date of H-share Listing</u>
1	Air China	SSE	601111	18 August 2006	HKSE	753	15 December 2004
2	Angang Steel	SZSE	000898	25 December 1997	HKSE	347	24 July 1997
3	Anhui Conch Cement	SSE	600585	7 February 2002	HKSE	914	21 October 1997
4	Anhui Expressway	SSE	600012	7 January 2003	HKSE	995	13 November 1996
5	Bank of China	SSE	601988	5 July 2006	HKSE	3988	1 June 2006
6	Beiren Printing Machinery	SSE	600860	6 May 1994	HKSE	187	6 August 1993
7	China Eastern Airlines	SSE	600115	5 November 1997	HKSE	670	5 February 1997
8	China Merchants Bank	SSE	600036	1 May 2002	HKSE	3968	22 September 2006
9	China Petroleum & Chemical	SSE	600028	8 August 2001	HKSE	386	19 October 2000
10	China Shipping Development	SSE	600026	23 May 2002	HKSE	1138	11 November 1994
11	China Southern Airlines	SSE	600029	25 July 2003	HKSE	1055	31 July 1997
12	Dongfang Electric	SSE	600875	10 October 1995	HKSE	1072	6 June 1994
13	Guangzhou Pharmaceutical	SSE	600332	6 February 2001	HKSE	874	30 October 1997
14	Guangzhou Shipyard International	SSE	600685	28 October 1993	HKSE	317	6 August 1993
15	Huadian Power International	SSE	600027	3 February 2005	HKSE	1071	30 June 1999
16	Huaneng Power International	SSE	600011	6 December 2001	HKSE	902	22 January 1998
17	Jiangsu Expressway	SSE	600377	16 January 2001	HKSE	177	27 June 1997
18	Jiangxi Copper	SSE	600362	11 January 2002	HKSE	358	12 June 1997
19	Jingwei Textile Machinery	SZSE	000666	10 December 1996	HKSE	350	02 February 1996
20	Maanshan Iron & Steel	SSE	600808	6 January 1994	HKSE	323	03 December 1993
21	Nanjing Panda Electronics	SSE	600775	18 November 1996	HKSE	553	02 May 1996
22	Shandong Xinhua Pharmaceutical	SZSE	000756	6 August 1997	HKSE	719	31 December 1996
23	Shenzhen Expressway	SSE	600548	25 December 2001	HKSE	548	12 March 1997
24	Sinopec Shanghai Petrochemical	SSE	600688	8 November 1993	HKSE	338	26 July 1993
25	Sinopec Yizheng Chemical Fibre	SSE	600871	11 April 1995	HKSE	1033	29 March 1994
26	Tianjin Capital Environmental Protection	SSE	600874	30 June 1995	HKSE	1065	17 May 1994
27	Tsingtao Brewery	SSE	600600	27 August 1993	HKSE	168	15 July 1993
28	Yanzhou Coal Mining	SSE	600188	1 July 1998	HKSE	1171	01 April 1998
29	ZTE	SZSE	000063	18 November 1997	HKSE	763	09 December 2004

11. Appendix B – Robustness and specification tests

11.1. Test summary

11.1.1. Heteroscedasticity

One of the assumptions of the classical linear regression model is homoscedasticity, i.e. that the conditional variances of the residuals are constant (Gujarati, 2003, p. 387). One way to detect heteroscedasticity is to plot the estimated squared residuals against the estimated premiums. As seen in the heteroscedasticity plots, there is no obvious systematic pattern between the two variables in any of our models, suggesting that no heteroscedasticity is present in our data sample.

11.1.2. Normality

Another fundamental assumption of the classical normal linear regressions is normally distributed residuals. The t and F tests used require that the error term follow a normal distribution, otherwise testing results will not be valid in small or finite samples (Gujarati, 2003, p. 108). The Jarque-Bera test is a large-sample test based on the OLS residuals (Gujarati, 2003, p. 148). With the Jarque-Bera test we can investigate whether the residuals follow a normal distribution as assumed. The test examines skewness and kurtosis in the error term and compares these values with those from a normal distribution. The acceptance of the null hypothesis indicates that the residuals are normally distributed, while the rejection of the null hypothesis indicates that the residuals are not normally distributed.

As seen in the normality test results, the majority of the companies have normally distributed residuals. For event 2, the number of residuals that are normally distributed is less both for the market model and the information model compared to event 1, but currency model still has the same number of normally distributed residuals.

Table 1 - Average number of companies with normally distributed residuals

	Event 1	Event 2
Market model	20	9
Information model	14	10
Currency model	17	17

11.1.3. Multicollinearity

Multicollinearity per se does not violate the classical linear regression assumptions and thus the estimates are still unbiased and consistent (Gujarati, 2003, p. 348). The major problem that multicollinearity brings

is difficulties of getting coefficient estimates with small standard errors. The degree of multicollinearity, i.e. how much the regressors correlate with each other, can be assessed through several methods (Gujarati, 2003, p. 359). By examining the R-squared and the t-values for the coefficients, we can draw the conclusion that multicollinearity is not a serious problem in our sample, as we have relatively high R-squared values and highly significant coefficients on average for the regressions.

The results of pair-wise correlations of the regressors confirm that multicollinearity is not a serious problem in our sample. On average, the pair-wise correlations are very low and below 0.8 (which is the threshold for serious multicollinearity). For event 1, all the pair-wise correlations are below 0.8. For event 2, some individual pair-wise correlations do exceed 0.8, but on average they are below the critical value.

Table 2 - Average pair-wise correlation of regressors

	Market/Info	Market/Currency	Currency/Info
Event 1	-0.1619	-0.4666	-0.1619
Event 2	0.6369	-0.7814	-0.4462

11.1.4. Outliers

11.1.4.1. Residual case order plot

The residual case order plot shows all residuals outside a specified number of standard deviations from 0. If one observes too many large residuals, it might be an indication of a bad model. With a sample of 120 observations, as in our case, it is normal to have 5-7 large residuals. In the residual case plots, large residuals are shown in red. As one can observe, our sample in general provides a reasonably low number of large residuals.

11.1.4.2. Cook's distance

Cook's distance measures an observation's influence on all the predicted values and is calculated as the normalized change in coefficients due to the deletion of an observation. A standardized squared residual for each observation when it is excluded from the estimation is used as the distance measure. Cook's distance is F-distributed, $F(2, n - 2)$, where n is the number of observations. As a heuristic rule of thumb, the Cook's distance should not be substantially larger than 1. A large distance value indicates that excluding the observation has a large impact on the estimated coefficients. None of the observation's Cook's distance exceeds 1. In fact, they are very small, on average 0.008 – 0.009 for all the companies in all the models.

11.1.4.3. Leverage

The leverage identifies those observations which have a large effect on the outcome of the fitted regression model. If a data point has high leverage, it can pull the regression line toward itself and alter the slope of the regression line. If this is the case, the leveraged data point is called an influential point. One rule of thumb is to compare the leverage to $2p/n$, where n is the number of observations and p is the number of parameters in the model.¹²

Table 3 - Average number of observations exceeding the critical leverage value

	Event 1	Event 2
Market model	15	2
Info model	13	1
Currency model	13	8

As seen in the summary in Table 3 above, there are a number of observations that exceed the limit, especially for event 1. However, if we had to adjust the sample for outliers, we would have lost a significant number of observations since the outlier observations are not the same for each model and company. One should bear in mind that the numbers in the summary table above are calculated based on an average of all the companies. In fact, many of these outliers exceed the limit only by a small margin, which is also why we do not consider these to disturb our results in a significant way. Also, as mentioned by Gujarati (2003), these outliers might be data points that provide vital information that other data points cannot and should not be excluded unless they arise directly from errors in the sampling process. In general, based on the two tests, we can conclude that outliers are not a serious problem in our sample.

11.1.5. Autocorrelation

Autocorrelation is defined as correlation between members of series of observations ordered in time or in space. The classical linear regression model assumes that such autocorrelation does not exist (Gujarati, 2003, p.442). Matlab has a function that computes the sample autocorrelation function. These values indicate that the residuals exhibit somewhat strong positive autocorrelation. The results from the Durbin-Watson test confirm that the residuals are positively autocorrelated. An inclusion of a trend variable in our regression models did not result in any significant improvement of the Durbin-Watson statistics and therefore we could conclude that the autocorrelation in our time-series arises from pure autocorrelation as opposed to model misspecification (Gujarati, 2003, p. 475).

¹² The MathWorks, 2009.

11.1.6. Stationarity

Due to the high autocorrelations, a unit root test to control for the stationarity of the series is appropriate. The method used is the Augmented Dickey-Fuller unit root test, which tests the null hypothesis of a unit root against the alternative hypothesis of stationarity. A majority of the companies proved to have a unit root. Similarly, we performed unit root tests for the explanatory variables and also found non-stationarity. When both the dependent variable and the explanatory variables are non-stationary the error term will also be non-stationary and thus exhibit autocorrelation (Gujarati, 2003, p.448).

To remedy the autocorrelation and unit root problems, we tested a first difference model according to Gujarati (2003). However, this model resulted in insignificant coefficients. By keeping the original model, the OLS estimators are still linear, unbiased, consistent and asymptotically normally distributed despite the presence of autocorrelation. However, they are no longer efficient, i.e. unbiased estimators with the least variance. The estimated residual variance might underestimate the true variance, which could result in an overestimation of R-squared. Furthermore, the variance of the estimated coefficients might be underestimated and the regular t and F tests could therefore give misleading conclusions about the significance of the estimated coefficients.

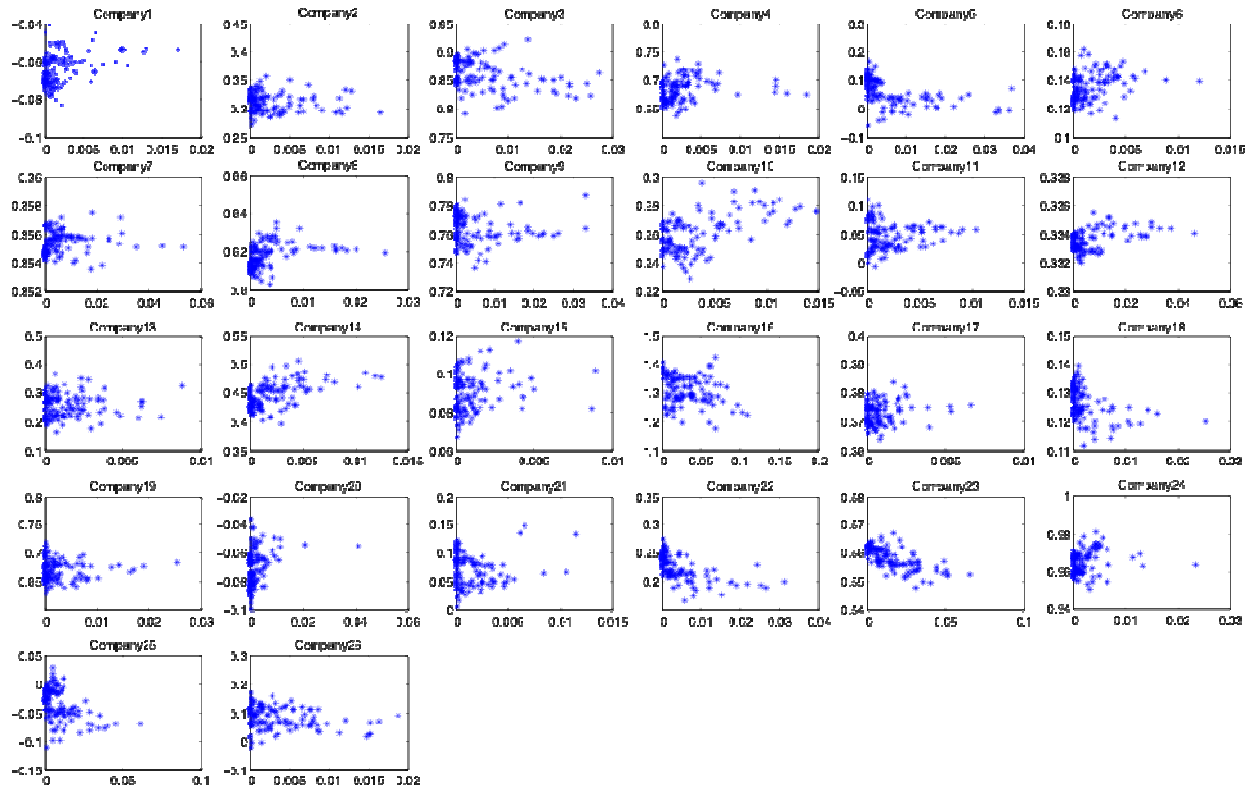
11.2. Test results

Heteroscedasticity

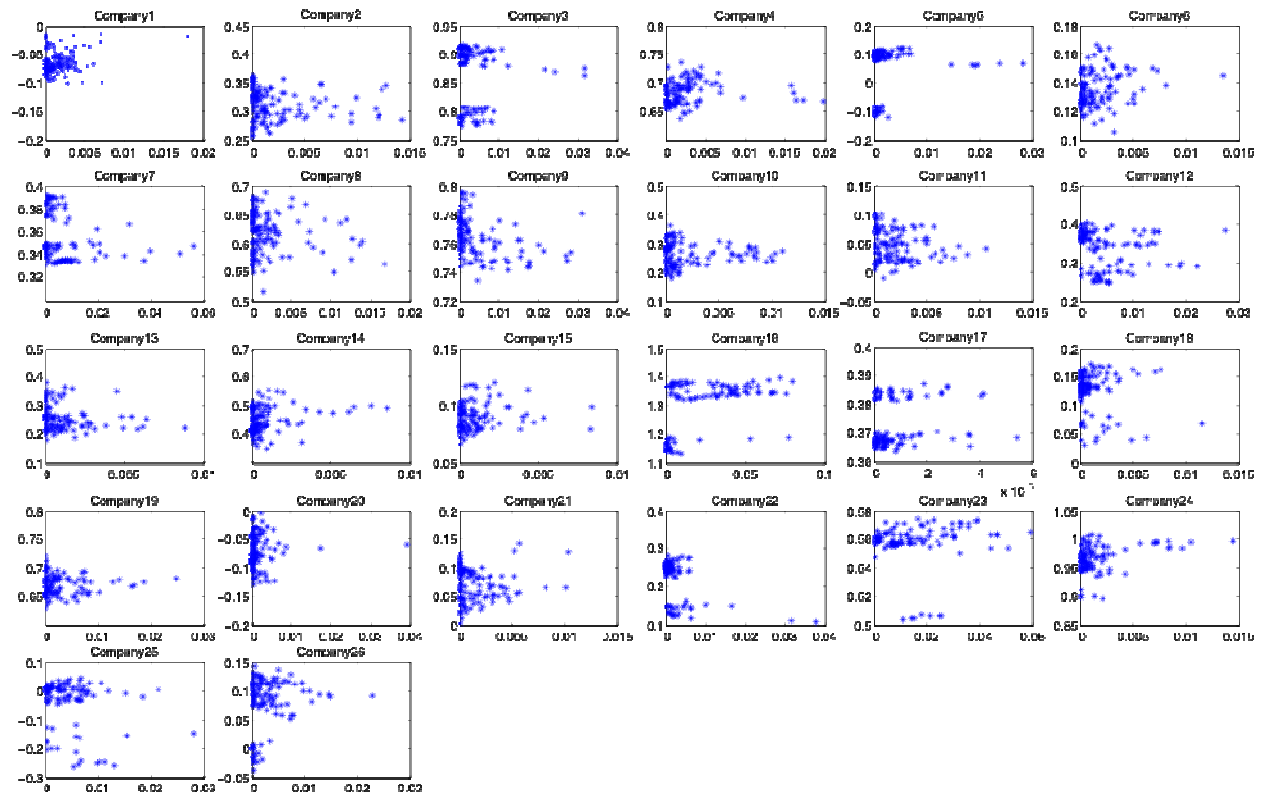
Plots of estimated squared residual against estimated premium for each company.

Event 1

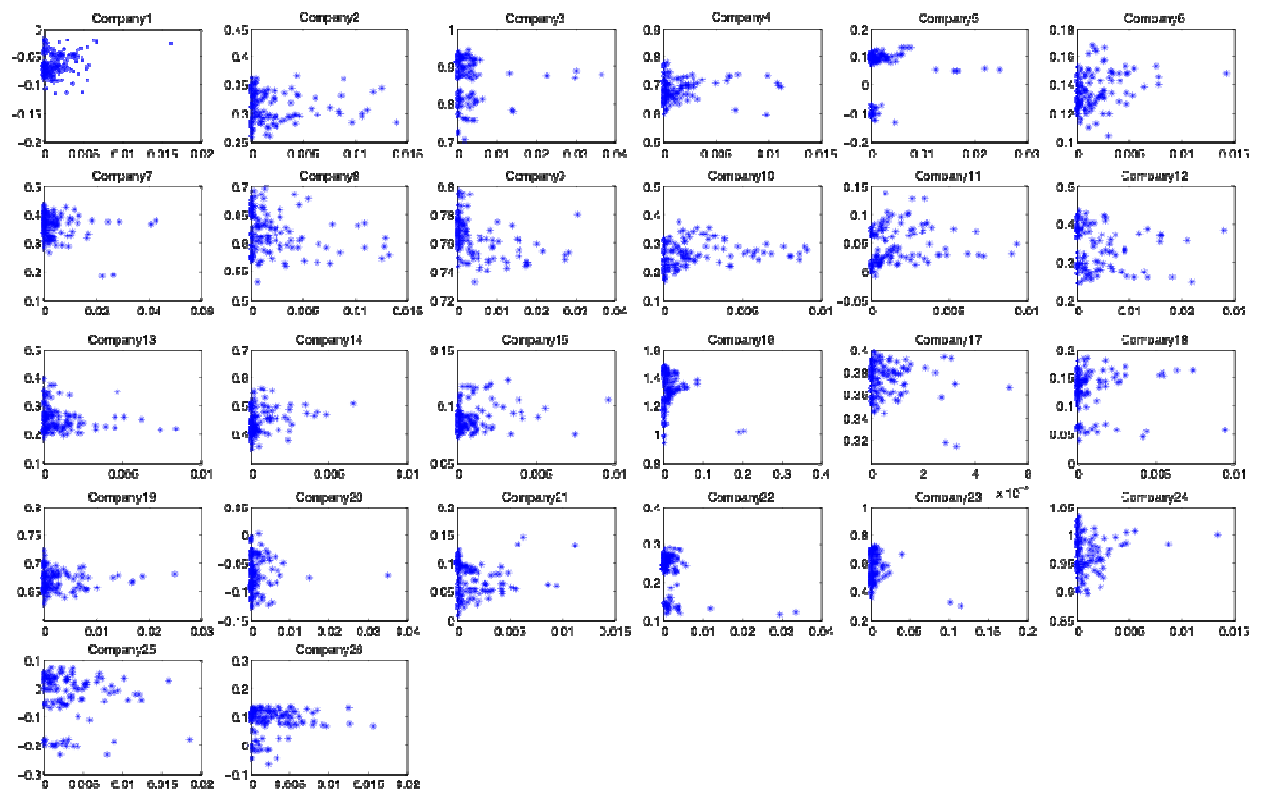
Market Model



Info Model

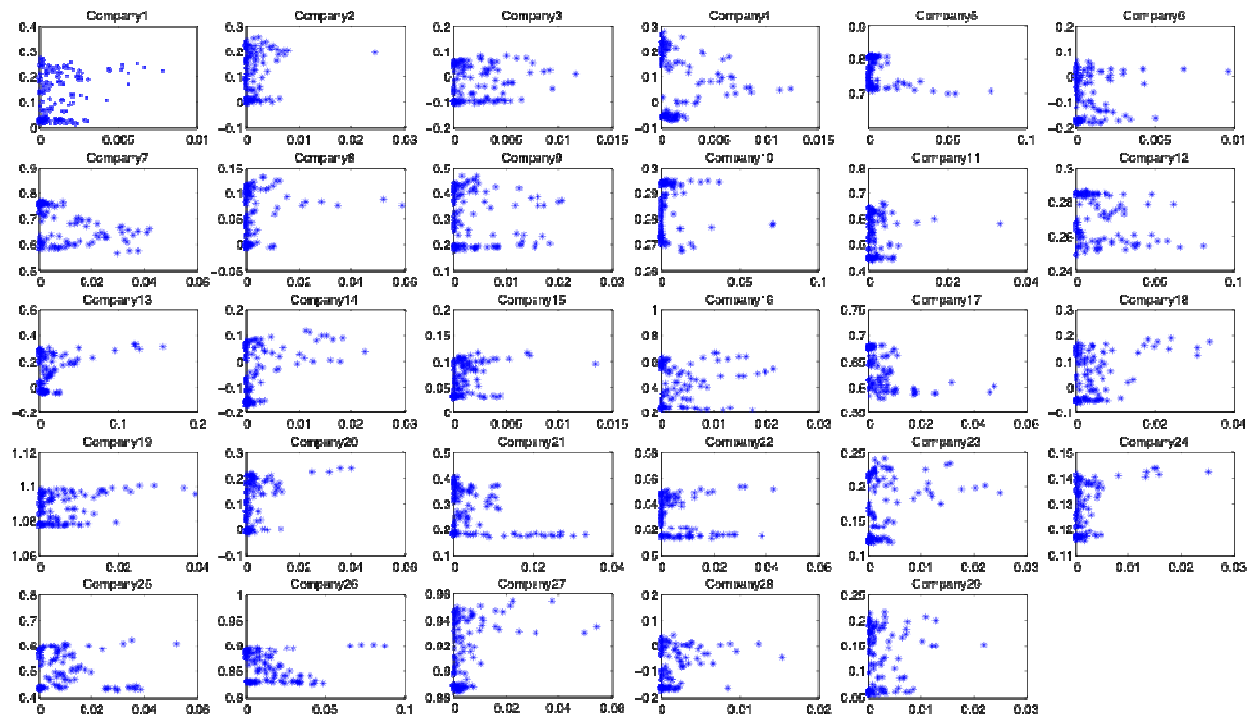


Currency Model

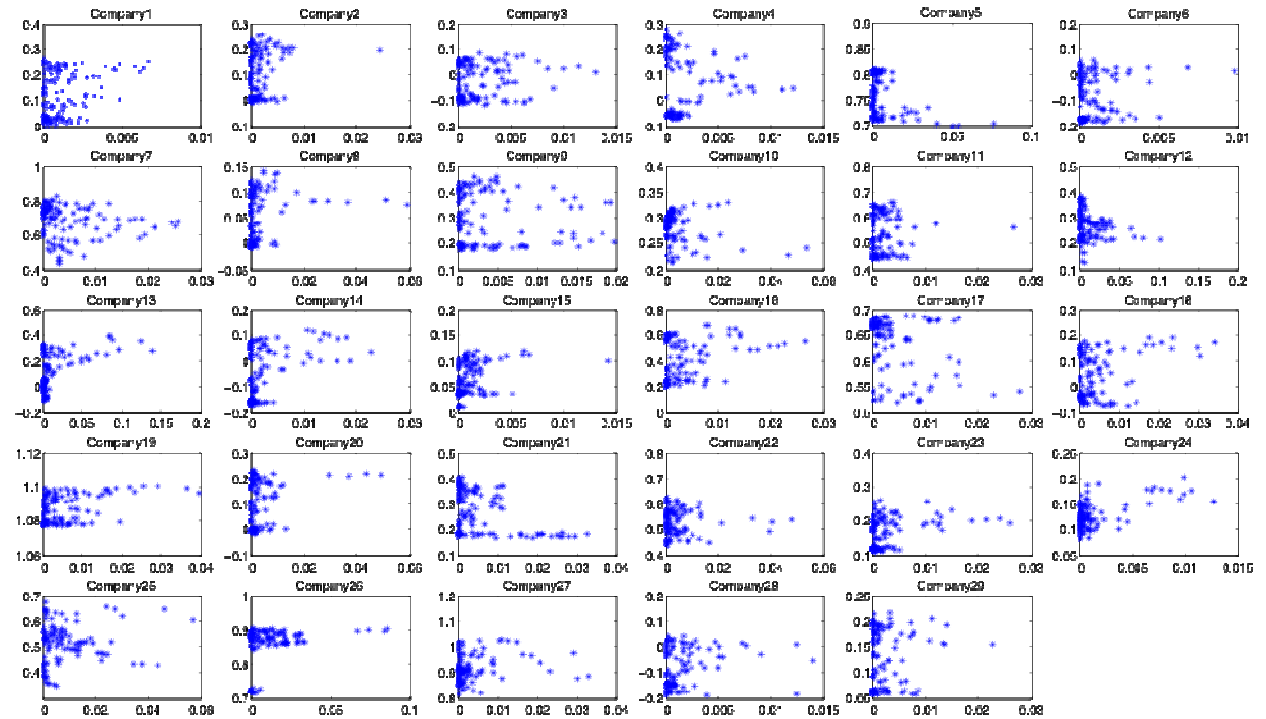


Event 2

Market Model



Info Model



Normality Test

Jarque-Bera test - Event 1

Company	Market-model			Info-Model			Currency-model			Critical value
	<i>JB-statistic</i>	<i>p-value</i>	<i>H0 rejection</i>	<i>JB-statistic</i>	<i>p-value</i>	<i>H0 rejection</i>	<i>JB-statistic</i>	<i>p-value</i>	<i>H0 rejection</i>	
Anhui Conch Cement	0,13	0,50	No	1,98	0,29	No	1,06	0,50	No	5,51
Anhui Expressway	1,49	0,41	No	1,16	0,50	No	0,50	0,50	No	5,51
Beiren Printing Machinery	1,81	0,33	No	9,73	0,02	Yes	31,22	0,00	Yes	5,51
China Eastern Airlines	10,84	0,01	Yes	12,16	0,01	Yes	8,66	0,02	Yes	5,51
China Shipping Development	0,08	0,50	No	64,86	0,00	Yes	38,93	0,00	Yes	5,51
China Southern Airlines	3,14	0,14	No	2,58	0,20	No	2,22	0,25	No	5,51
Dongfang Electric	0,63	0,50	No	6,03	0,04	Yes	7,69	0,03	Yes	5,51
Guangzhou Pharmaceutical	3,77	0,10	No	5,25	0,05	No	3,10	0,14	No	5,51
Guangzhou Shipyard International	0,37	0,50	No	0,78	0,50	No	0,86	0,50	No	5,51
Huadian Power International	5,15	0,06	No	6,50	0,04	Yes	3,61	0,11	No	5,51
Huaneng Power International	4,40	0,08	No	6,00	0,04	Yes	4,85	0,06	No	5,51
Jiangsu Expressway	0,33	0,50	No	4,18	0,08	No	2,92	0,16	No	5,51
Jiangxi Copper	2,07	0,28	No	0,21	0,50	No	0,21	0,50	No	5,51
Jingwei Textile Machinery	6,65	0,04	Yes	12,21	0,01	Yes	4,67	0,07	No	5,51
Maanshan Iron & Steel	1,07	0,50	No	0,74	0,50	No	2,60	0,20	No	5,51
Nanjing Panda Electronics	10,08	0,02	Yes	9,49	0,02	Yes	9,21	0,02	Yes	5,51
Shenzhen Expressway	0,29	0,50	No	0,46	0,50	No	0,30	0,50	No	5,51
China Petroleum & Chemical	4,54	0,07	No	2,33	0,23	No	3,57	0,11	No	5,51
Tianjin Capital Environmental Protection	17,78	0,00	Yes	16,95	0,00	Yes	17,03	0,00	Yes	5,51
Tsingtao Brewery	19,64	0,00	Yes	67,97	0,00	Yes	45,27	0,00	Yes	5,51
Yanzhou Coal Mining	1,19	0,50	No	1,22	0,49	No	1,37	0,44	No	5,51
Sinopec Shanghai Petrochemical	0,28	0,50	No	84,68	0,00	Yes	97,04	0,00	Yes	5,51
Sinopec Yizheng Chemical Fibre	7,90	0,03	Yes	8,43	0,02	Yes	94,55	0,00	Yes	5,51
Shandong Xinhua Pharmaceutical	3,54	0,11	No	3,23	0,13	No	4,48	0,07	No	5,51
Angang Steel	2,31	0,24	No	5,07	0,06	No	4,57	0,07	No	5,51
ZTE	2,69	0,18	No	3,06	0,15	No	4,15	0,08	No	5,51
Number of normally distributed residuals	20			14			17			

Jarque-Bera test - Event 2

Company	Market-model			Info-Model			Currency-model			Critical value
	<i>JB-statistic</i>	<i>p-value</i>	<i>H0 rejection</i>	<i>JB-statistic</i>	<i>p-value</i>	<i>H0 rejection</i>	<i>JB-statistic</i>	<i>p-value</i>	<i>H0 rejection</i>	
Air China	2,13	0,27	No	2,31	0,24	No	2,58	0,20	No	5,51
Angang Steel	12,17	0,01	Yes	12,21	0,01	Yes	3,72	0,10	No	5,51
Anhui Conch Cement	4,68	0,07	No	2,92	0,16	No	1,89	0,31	No	5,51
Anhui Expressway	12,57	0,01	Yes	9,38	0,02	Yes	0,64	0,50	No	5,51
Bank of China	21,13	0,00	Yes	19,57	0,00	Yes	1,86	0,32	No	5,51
Beiren Printing Machinery	5,67	0,05	Yes	5,95	0,04	Yes	11,82	0,01	Yes	5,51
China Eastern Airlines	4,38	0,08	No	0,98	0,50	No	4,15	0,08	No	5,51
China Merchants Bank	100,82	0,00	Yes	111,22	0,00	Yes	114,65	0,00	Yes	5,51
China Petroleum & Chemical	6,68	0,04	Yes	6,28	0,04	Yes	2,56	0,20	No	5,51
China Shipping Development	31,21	0,00	Yes	6,66	0,04	Yes	40,32	0,00	Yes	5,51
China Southern Airlines	13,35	0,01	Yes	2,70	0,18	No	2,53	0,21	No	5,51
Dongfang Electric	2,55	0,20	No	5,69	0,05	Yes	5,56	0,05	Yes	5,51
Guangzhou Pharmaceutical	16,95	0,00	Yes	21,05	0,00	Yes	0,34	0,50	No	5,51
Guangzhou Shipyard International	3,83	0,10	No	4,37	0,08	No	0,22	0,50	No	5,51
Huadian Power International	0,02	0,50	No	1,07	0,50	No	2,62	0,19	No	5,51
Huaneng Power International	0,92	0,50	No	5,25	0,05	No	4,68	0,07	No	5,51
Jiangsu Expressway	12,59	0,01	Yes	2,09	0,27	No	1,16	0,50	No	5,51
Jiangxi Copper	12,34	0,01	Yes	17,04	0,00	Yes	24,37	0,00	Yes	5,51
Jingwei Textile Machinery	0,69	0,50	No	0,65	0,50	No	1,08	0,50	No	5,51
Maanshan Iron & Steel	11,38	0,01	Yes	43,68	0,00	Yes	2,59	0,20	No	5,51
Nanjing Panda Electronics	7,07	0,03	Yes	6,55	0,04	Yes	6,30	0,04	Yes	5,51
Shandong Xinhua Pharmaceutical	2,16	0,26	No	18,14	0,00	Yes	1,29	0,47	No	5,51
Shenzhen Expressway	11,72	0,01	Yes	18,17	0,00	Yes	9,67	0,02	Yes	5,51
Sinopec Shanghai Petrochemical	47,28	0,00	Yes	19,86	0,00	Yes	5,48	0,05	No	5,51
Sinopec Yizheng Chemical Fibre	10,86	0,01	Yes	3,52	0,11	No	6,37	0,04	Yes	5,51
Tianjin Capital Environmental Protection	7,34	0,03	Yes	6,15	0,04	Yes	4,13	0,08	No	5,51
Tsingtao Brewery	5,54	0,05	Yes	11,02	0,01	Yes	17,36	0,00	Yes	5,51
Yanzhou Coal Mining	0,78	0,50	No	1,21	0,49	No	1,33	0,45	No	5,51
ZTE	0,72	0,50	No	0,93	0,50	No	0,02	0,50	No	5,51
Number of normally distributed residuals	11			12			20			

Multicollinearity Test

Pair-wise correlation - Event 1			
Company	Market/Info	Market/Currency	Currency/Info
Anhui Conch Cement	-0,27	-0,47	-0,06
Anhui Expressway	-0,26	-0,47	0,51
Beiren Printing Machinery	0,44	-0,47	-0,77
China Eastern Airlines	0,44	-0,47	-0,28
China Shipping Development	-0,45	-0,47	0,70
China Southern Airlines	-0,59	-0,47	0,74
Dongfang Electric	-0,20	-0,47	0,66
Guangzhou Pharmaceutical	0,72	-0,47	-0,33
Guangzhou Shipyard International	0,36	-0,47	-0,15
Huadian Power International	0,46	-0,47	-0,45
Huaneng Power International	0,32	-0,47	0,07
Jiangsu Expressway	-0,30	-0,47	0,71
Jiangxi Copper	-0,41	-0,47	0,62
Jingwei Textile Machinery	-0,40	-0,47	0,65
Maanshan Iron & Steel	0,09	-0,47	0,10
Nanjing Panda Electronics	-0,59	-0,47	0,65
Shenzhen Expressway	-0,25	-0,47	0,68
China Petroleum & Chemical	-0,54	-0,47	0,62
Tianjin Capital Environmental Protection	-0,48	-0,47	0,72
Tsingtao Brewery	-0,36	-0,47	0,61
Yanzhou Coal Mining	-0,11	-0,47	0,56
Sinopec Shanghai Petrochemical	-0,54	-0,47	0,66
Sinopec Yizheng Chemical Fibre	-0,28	-0,47	0,30
Shandong Xinhua Pharmaceutical	0,02	-0,47	0,46
Angang Steel	-0,49	-0,47	0,65
ZTE	-0,56	-0,47	0,61
Average	-0,16	-0,47	-0,16

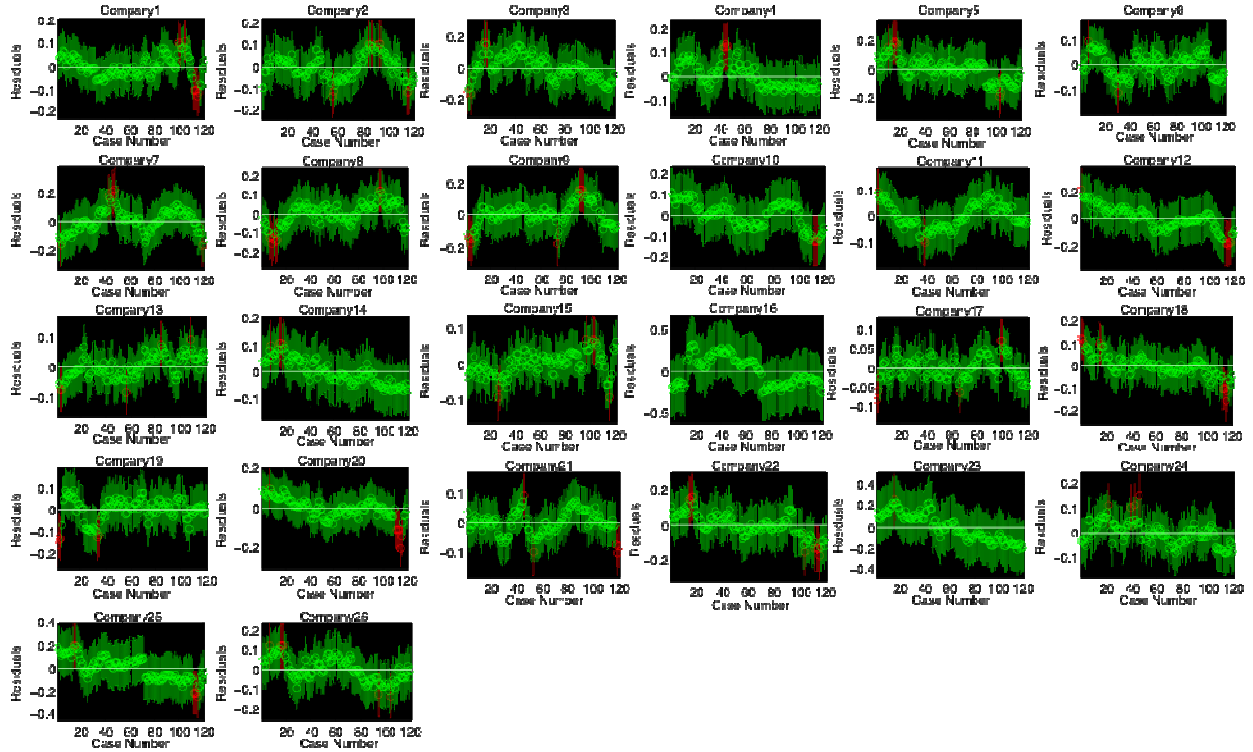
Pair-wise correlation - Event 2			
Company	Market/Info	Market/Currency	Currency/Info
Air China	0,89	-0,78	-0,75
Angang Steel	0,94	-0,78	-0,87
Anhui Conch Cement	0,95	-0,78	-0,80
Anhui Expressway	-0,40	-0,78	-0,14
Bank of China	0,76	-0,78	-0,27
Beiren Printing Machinery	0,96	-0,78	-0,79
China Eastern Airlines	0,95	-0,78	-0,66
China Merchants Bank	0,93	-0,78	-0,75
China Petroleum & Chemical	0,91	-0,78	-0,73
China Shipping Development	0,87	-0,78	-0,58
China Southern Airlines	0,31	-0,78	0,03
Dongfang Electric	0,91	-0,78	-0,72
Guangzhou Pharmaceutical	0,94	-0,78	-0,86
Guangzhou Shipyard International	0,96	-0,78	-0,83
Huadian Power International	-0,42	-0,78	0,45
Huaneng Power International	0,75	-0,78	-0,59
Jiangsu Expressway	0,75	-0,78	-0,29
Jiangxi Copper	-0,08	-0,78	0,37
Jingwei Textile Machinery	0,64	-0,78	-0,24
Maanshan Iron & Steel	0,94	-0,78	-0,66
Nanjing Panda Electronics	-0,47	-0,78	0,58
Shandong Xinhua Pharmaceutical	0,82	-0,78	-0,57
Shenzhen Expressway	0,91	-0,78	-0,73
Sinopec Shanghai Petrochemical	0,90	-0,78	-0,80
Sinopec Yizheng Chemical Fibre	0,86	-0,78	-0,52
Tianjin Capital Environmental Protection	0,10	-0,78	-0,16
Tsingtao Brewery	0,89	-0,78	-0,50
Yanzhou Coal Mining	0,16	-0,78	0,20
ZTE	0,88	-0,78	-0,75
Average	0,64	-0,78	-0,45

Outliers

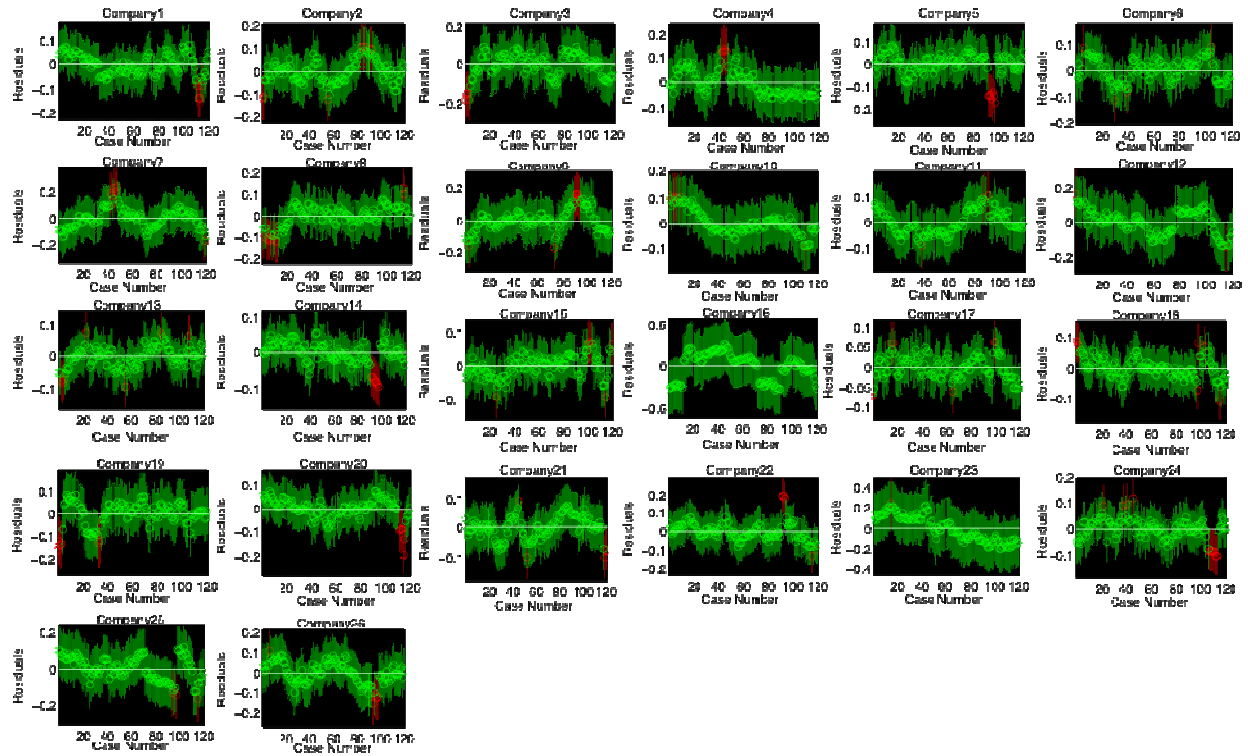
Residual case order plots.

Event 1

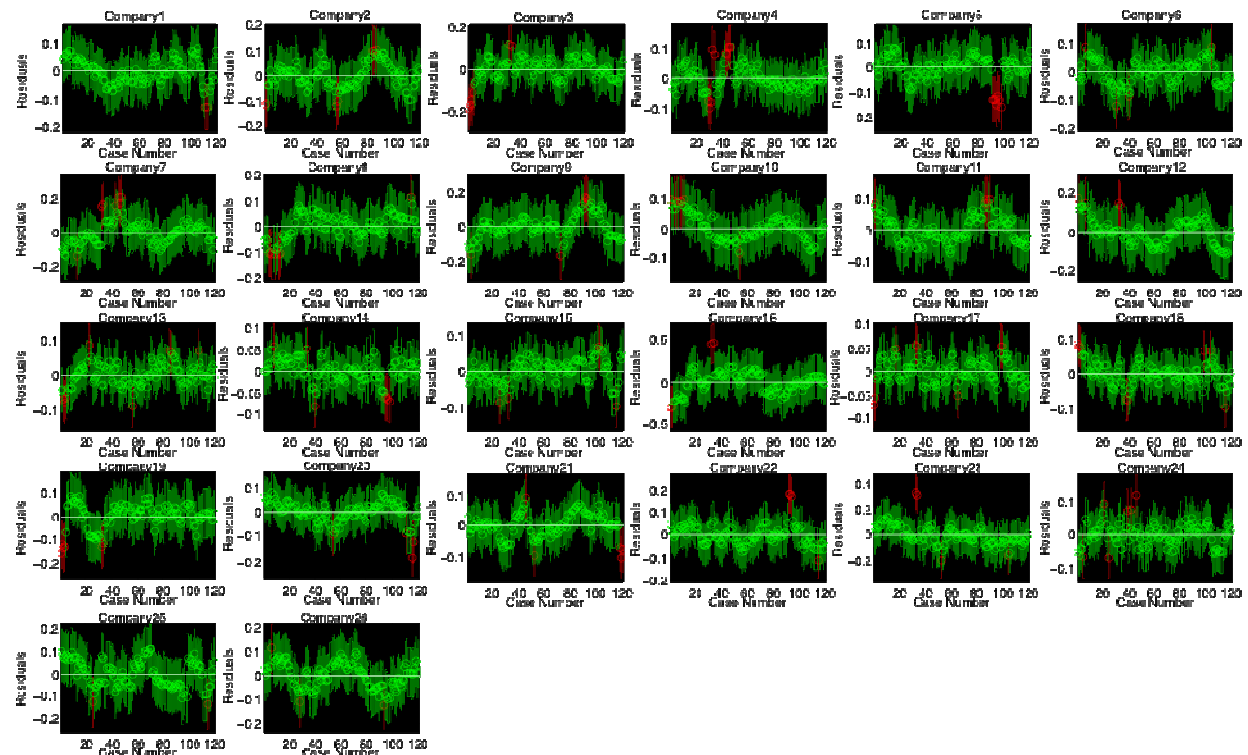
Market Model



Information Model

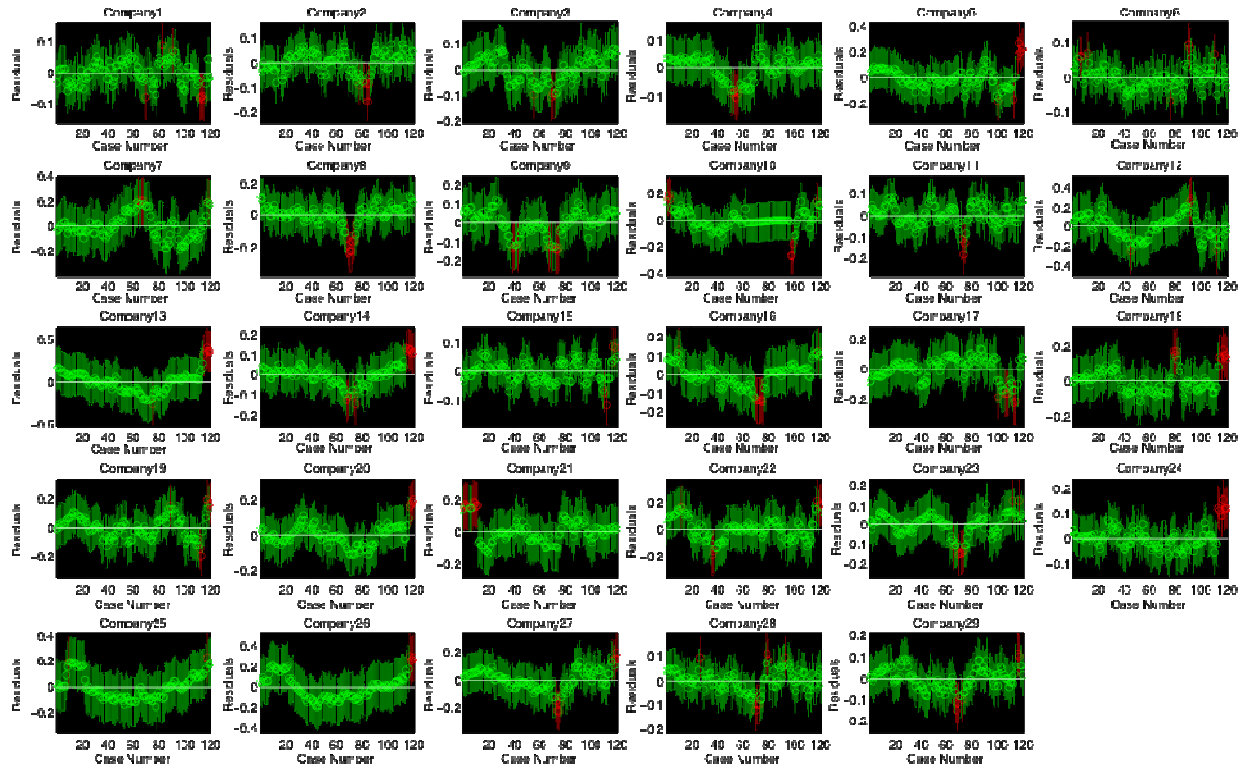


Currency Model

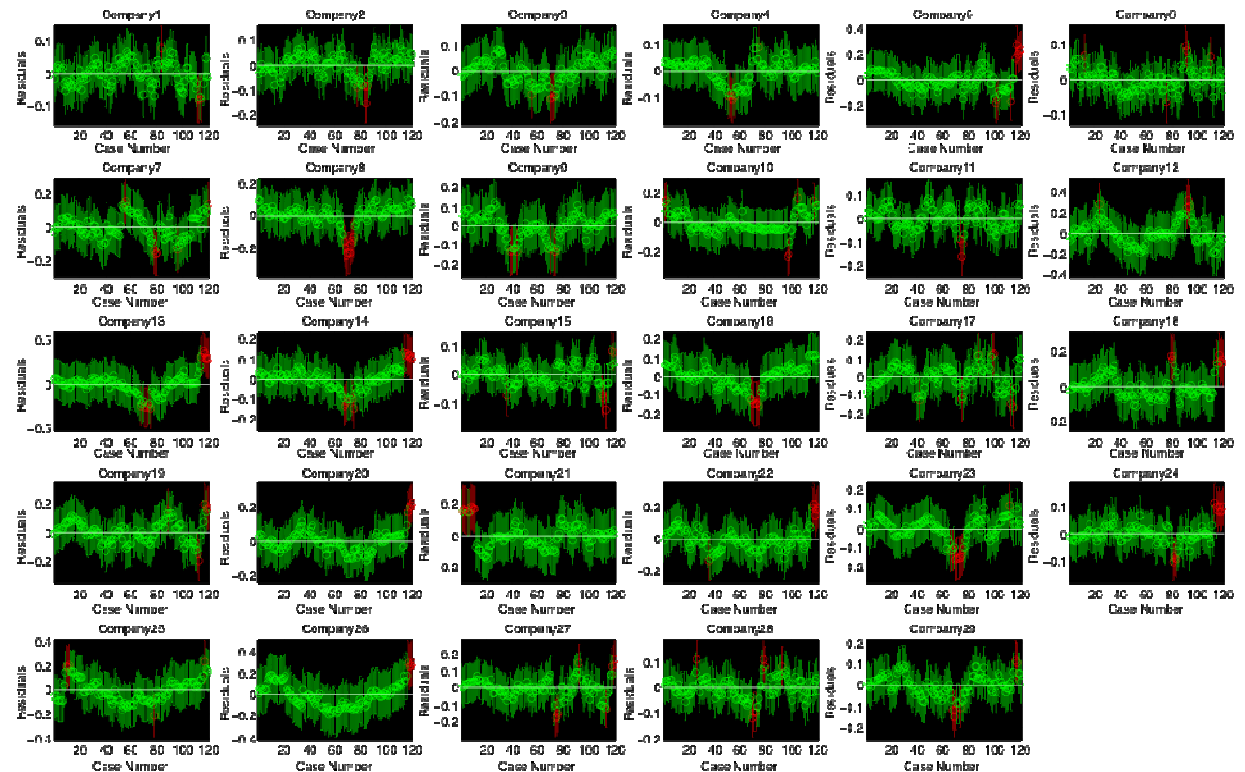


Event 2

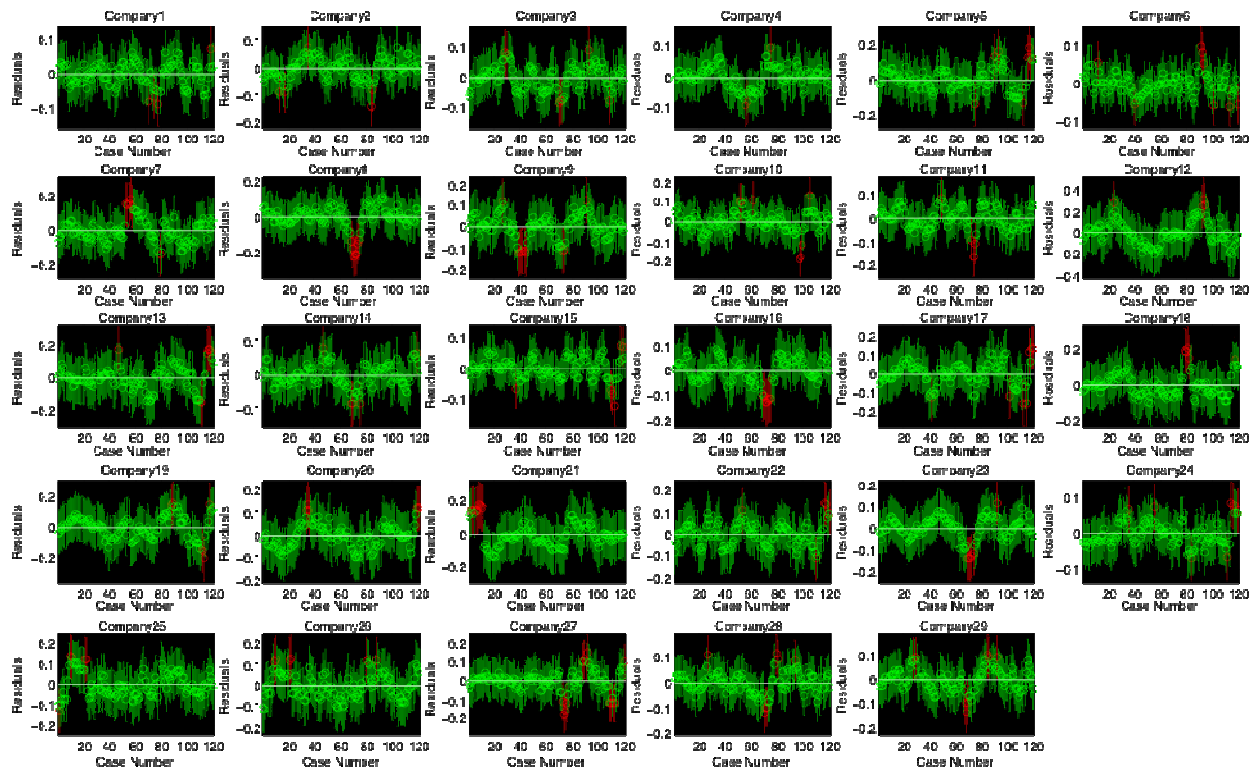
Market Model



Information Model



Currency Model

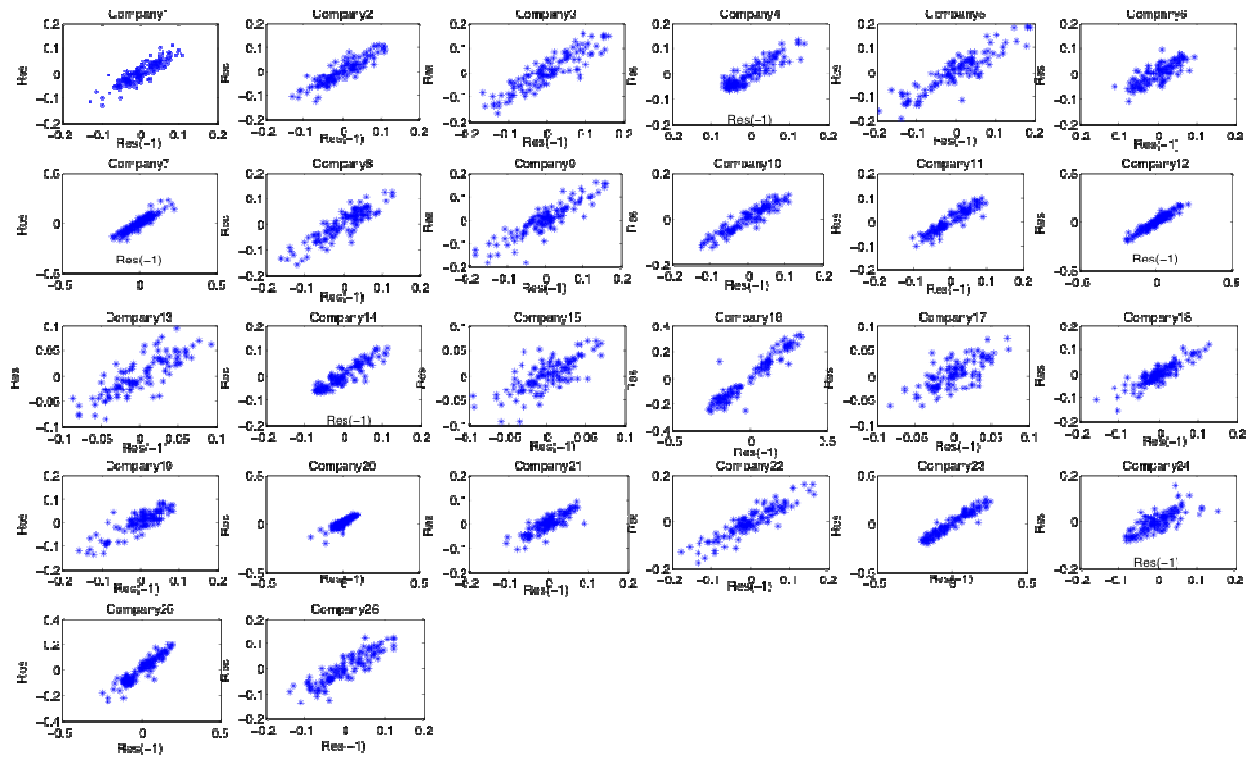


Autocorrelation

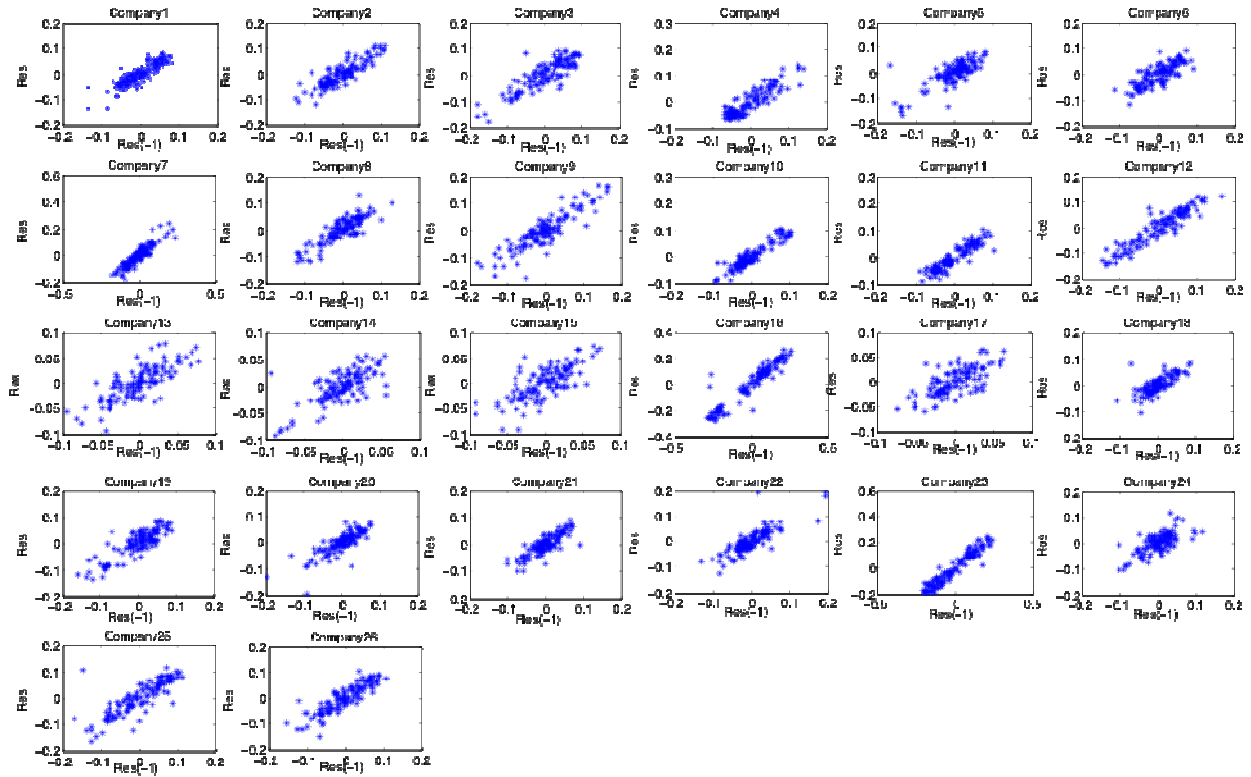
Plot for each company of residuals versus lagged residuals.

Event 1

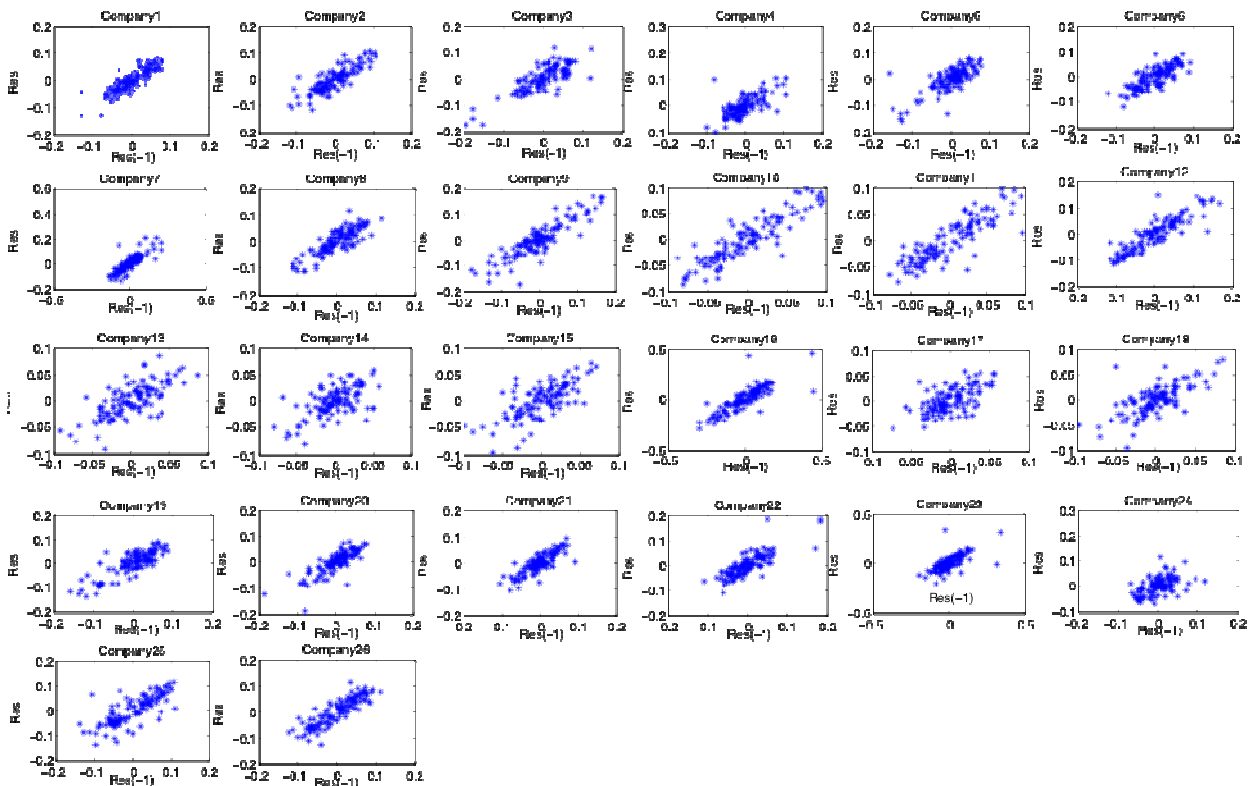
Market Model



Information Model

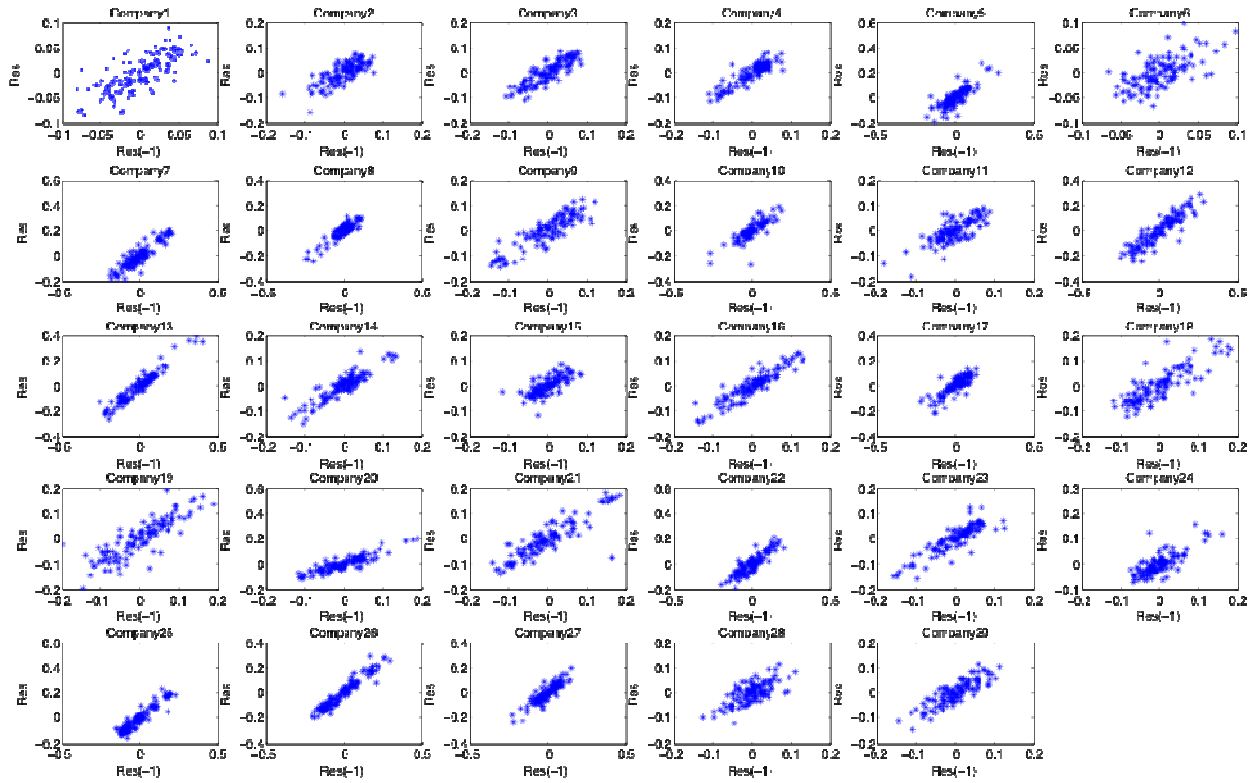


Currency Model

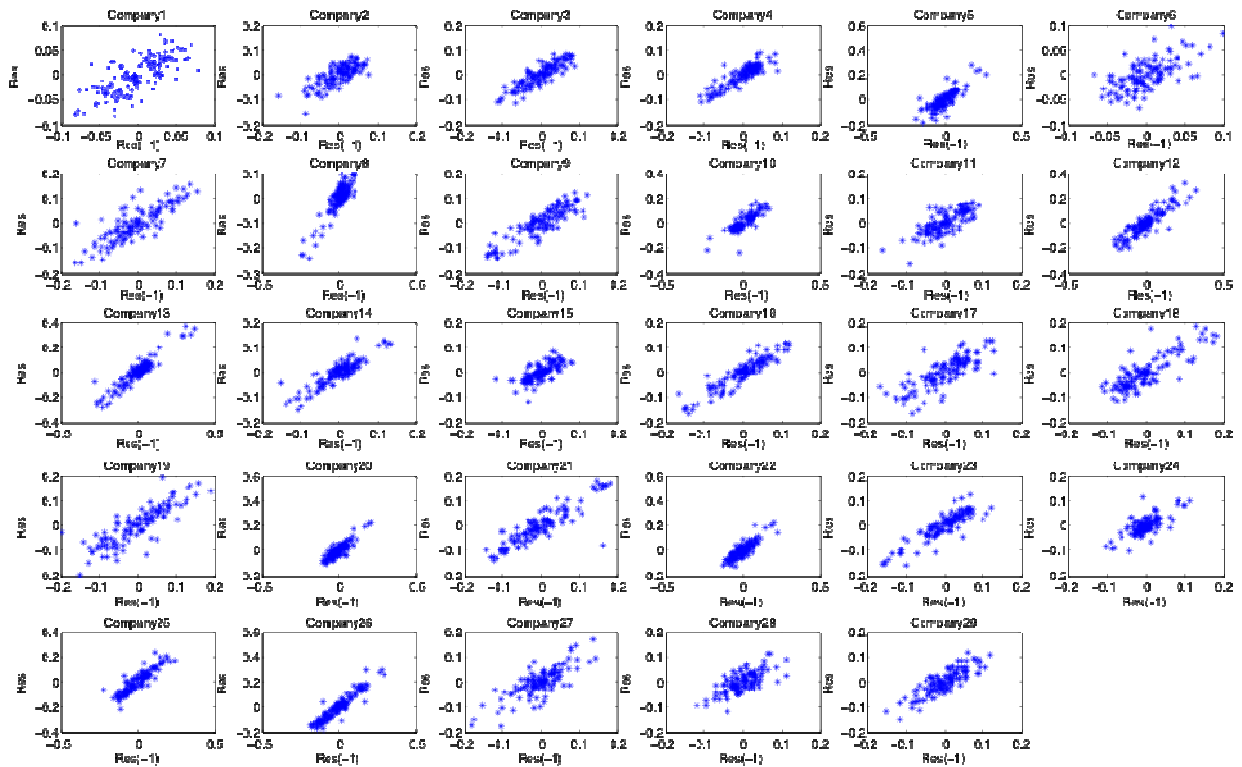


Event 2

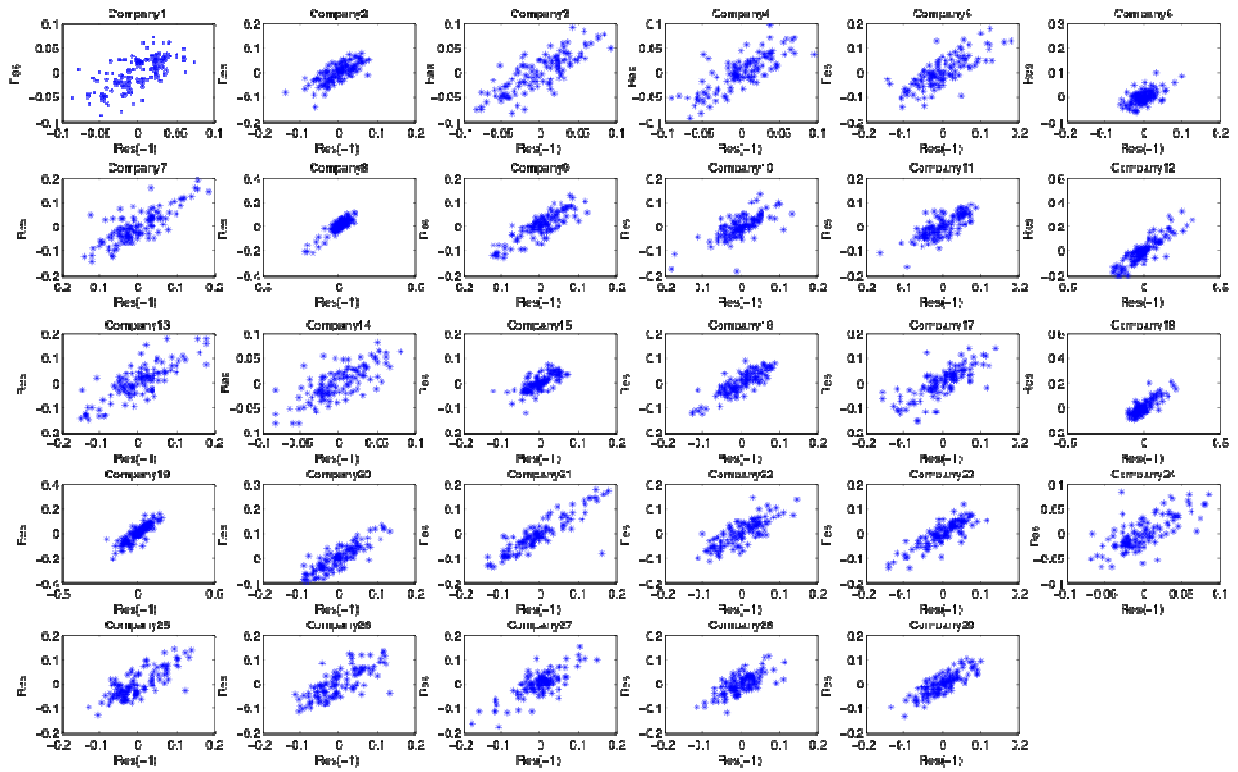
Market Model



Information Model



Currency Model



Durbin Watson - Event 1

Company	Market model		Info model		Currency model	
	<i>DW</i>	<i>p-value</i>	<i>DW</i>	<i>p-value</i>	<i>DW</i>	<i>p-value</i>
Anhui Conch Cement	0,2173	0,0000	0,2788	0,0000	0,2821	0,0000
Anhui Expressway	0,2013	0,0000	0,2562	0,0000	0,2842	0,0000
Beiren Printing Machinery	0,2078	0,0000	0,2762	0,0000	0,3601	0,0000
China Eastern Airlines	0,2067	0,0000	0,1955	0,0000	0,6078	0,0000
China Shipping Development	0,1980	0,0000	0,4679	0,0000	0,4374	0,0000
China Southern Airlines	0,4208	0,0000	0,4276	0,0000	0,4353	0,0000
Dongfang Electric	0,1434	0,0000	0,1563	0,0000	0,3237	0,0000
Guangzhou Pharmaceutical	0,2180	0,0000	0,2797	0,0000	0,3064	0,0000
Guangzhou Shipyard International	0,2044	0,0000	0,2004	0,0000	0,1993	0,0000
Huadian Power International	0,1091	0,0000	0,1207	0,0000	0,2006	0,0000
Huaneng Power International	0,1430	0,0000	0,1639	0,0000	0,2731	0,0000
Jiangsu Expressway	0,0826	0,0000	0,1239	0,0000	0,2140	0,0000
Jiangxi Copper	0,3365	0,0000	0,4293	0,0000	0,5333	0,0000
Jingwei Textile Machinery	0,1817	0,0000	0,5487	0,0000	0,7788	0,0000
Maanshan Iron & Steel	0,4837	0,0000	0,5074	0,0000	0,5448	0,0000
Nanjing Panda Electronics	0,0886	0,0000	0,1110	0,0000	0,3144	0,0000
Shenzhen Expressway	0,5357	0,0000	0,5840	0,0000	0,7333	0,0000
China Petroleum & Chemical	0,2150	0,0000	0,4985	0,0000	0,5537	0,0000
Tianjin Capital Environmental Protection	0,2899	0,0000	0,2913	0,0000	0,2919	0,0000
Tsingtao Brewery	0,2279	0,0000	0,3588	0,0000	0,3639	0,0000
Yanzhou Coal Mining	0,3122	0,0000	0,3108	0,0000	0,3204	0,0000
Sinopec Shanghai Petrochemical	0,1752	0,0000	0,3186	0,0000	0,3555	0,0000
Sinopec Yizheng Chemical Fibre	0,0796	0,0000	0,0789	0,0000	0,6242	0,0000
Shandong Xinhua Pharmaceutical	0,4687	0,0000	0,5619	0,0000	0,9597	0,0000
Angang Steel	0,1208	0,0000	0,3208	0,0000	0,4044	0,0000
ZTE	0,2116	0,0000	0,2380	0,0000	0,2434	0,0000

Durbin Watson - Event 2

<u>Company</u>	<u>Market model</u>		<u>Info model</u>		<u>Currency model</u>	
	<u>DW</u>	<u>p-value</u>	<u>DW</u>	<u>p-value</u>	<u>DW</u>	<u>p-value</u>
Air China	0,5262	0,0000	0,5500	0,0000	0,6794	0,0000
Angang Steel	0,4658	0,0000	0,4658	0,0000	0,5077	0,0000
Anhui Conch Cement	0,2528	0,0000	0,2488	0,0000	0,3808	0,0000
Anhui Expressway	0,2262	0,0000	0,2352	0,0000	0,4068	0,0000
Bank of China	0,3299	0,0000	0,3316	0,0000	0,4277	0,0000
Beiren Printing Machinery	0,7085	0,0000	0,7092	0,0000	0,8448	0,0000
China Eastern Airlines	0,1726	0,0000	0,3171	0,0000	0,4143	0,0000
China Merchants Bank	0,2176	0,0000	0,1995	0,0000	0,2510	0,0000
China Petroleum & Chemical	0,2169	0,0000	0,2148	0,0000	0,2950	0,0000
China Shipping Development	0,3048	0,0000	0,2959	0,0000	0,5944	0,0000
China Southern Airlines	0,4949	0,0000	0,5056	0,0000	0,5057	0,0000
Dongfang Electric	0,1831	0,0000	0,2108	0,0000	0,2122	0,0000
Guangzhou Pharmaceutical	0,0689	0,0000	0,1190	0,0000	0,3691	0,0000
Guangzhou Shipyard International	0,2010	0,0000	0,2040	0,0000	0,5306	0,0000
Huadian Power International	0,5532	0,0000	0,5755	0,0000	0,5739	0,0000
Huaneng Power International	0,1407	0,0000	0,1489	0,0000	0,3037	0,0000
Jiangsu Expressway	0,3073	0,0000	0,4092	0,0000	0,4719	0,0000
Jiangxi Copper	0,3172	0,0000	0,3205	0,0000	0,3403	0,0000
Jingwei Textile Machinery	0,2966	0,0000	0,2971	0,0000	0,2894	0,0000
Maanshan Iron & Steel	0,1885	0,0000	0,2198	0,0000	0,2621	0,0000
Nanjing Panda Electronics	0,2186	0,0000	0,2179	0,0000	0,2187	0,0000
Shandong Xinhua Pharmaceutical	0,2228	0,0000	0,2608	0,0000	0,4111	0,0000
Shenzhen Expressway	0,2266	0,0000	0,2257	0,0000	0,2944	0,0000
Sinopec Shanghai Petrochemical	0,4444	0,0000	0,5104	0,0000	0,5700	0,0000
Sinopec Yizheng Chemical Fibre	0,0941	0,0000	0,1841	0,0000	0,4363	0,0000
Tianjin Capital Environmental Protection	0,0733	0,0000	0,1056	0,0000	0,4939	0,0000
Tsingtao Brewery	0,2214	0,0000	0,4011	0,0000	0,4311	0,0000
Yanzhou Coal Mining	0,5539	0,0000	0,5998	0,0000	0,5966	0,0000
ZTE	0,3012	0,0000	0,3147	0,0000	0,3568	0,0000

Autocorrelation coefficients

Autocorrelation - Event 1			
Company	Market-model	Info-Model	Currency-model
Anhui Conch Cement	0,8885	0,8492	0,8425
Anhui Expressway	0,8845	0,8494	0,8357
Beiren Printing Machinery	0,8767	0,8250	0,7648
China Eastern Airlines	0,8935	0,8992	0,6918
China Shipping Development	0,8951	0,7602	0,7721
China Southern Airlines	0,7871	0,7838	0,7806
Dongfang Electric	0,9099	0,9038	0,8305
Guangzhou Pharmaceutical	0,8839	0,8539	0,8410
Guangzhou Shipyard International	0,8804	0,8855	0,8861
Huadian Power International	0,9272	0,9187	0,8800
Huaneng Power International	0,9144	0,9085	0,8478
Jiangsu Expressway	0,9282	0,9123	0,8651
Jiangxi Copper	0,8201	0,7760	0,7250
Jingwei Textile Machinery	0,8981	0,7210	0,6104
Maanshan Iron & Steel	0,7389	0,7252	0,7112
Nanjing Panda Electronics	0,9402	0,9194	0,8200
Shenzhen Expressway	0,6908	0,6688	0,5962
China Petroleum & Chemical	0,8595	0,7202	0,6908
Tianjin Capital Environmental Protection	0,8165	0,8163	0,8160
Tsingtao Brewery	0,8717	0,8122	0,8083
Yanzhou Coal Mining	0,8223	0,8263	0,8193
Sinopec Shanghai Petrochemical	0,8969	0,8288	0,8167
Sinopec Yizheng Chemical Fibre	0,9475	0,9514	0,6847
Shandong Xinhua Pharmaceutical	0,7559	0,7136	0,5089
Angang Steel	0,9242	0,8289	0,7823
ZTE	0,8912	0,8789	0,8737

Autocorrelation - Event 2			
Company	Market-model	Info-Model	Currency-model
Air China	0,7334	0,7239	0,6578
Angang Steel	0,7626	0,7626	0,7424
Anhui Conch Cement	0,8641	0,8663	0,8004
Anhui Expressway	0,8839	0,8796	0,789
Bank of China	0,7956	0,7954	0,7712
Beiren Printing Machinery	0,6349	0,6345	0,5579
China Eastern Airlines	0,8998	0,8235	0,7833
China Merchants Bank	0,8750	0,8859	0,8707
China Petroleum & Chemical	0,8855	0,8858	0,8524
China Shipping Development	0,8218	0,8274	0,7025
China Southern Airlines	0,7437	0,7389	0,7405
Dongfang Electric	0,9082	0,8921	0,8919
Guangzhou Pharmaceutical	0,9278	0,9123	0,8083
Guangzhou Shipyard International	0,8811	0,8803	0,734
Huadian Power International	0,7149	0,7056	0,709
Huaneng Power International	0,9091	0,9105	0,8476
Jiangsu Expressway	0,8378	0,7760	0,7387
Jiangxi Copper	0,8245	0,8228	0,8204
Jingwei Textile Machinery	0,8302	0,8299	0,8419
Maanshan Iron & Steel	0,8596	0,8323	0,8458
Nanjing Panda Electronics	0,8765	0,8766	0,8802
Shandong Xinhua Pharmaceutical	0,8678	0,8319	0,7686
Shenzhen Expressway	0,8848	0,8860	0,8505
Sinopec Shanghai Petrochemical	0,7413	0,7136	0,6965
Sinopec Yizheng Chemical Fibre	0,9377	0,8944	0,7681
Tianjin Capital Environmental Protection	0,9383	0,9172	0,7349
Tsingtao Brewery	0,8585	0,7620	0,7685
Yanzhou Coal Mining	0,7191	0,6984	0,6998
ZTE	0,8489	0,8422	0,8179

Unit Root Tests

Unit root test - event 1				
Company	test-stat	p-value	critical value	H0 Rejection
Anhui Conch Cement	4,1388	0,2604	6,4443	No
Anhui Expressway	4,2306	0,2394	6,4443	No
Beiren Printing Machinery	7,7420	0,0198	6,4443	Yes
China Eastern Airlines	3,9651	0,3002	6,4443	No
China Shipping Development	2,1910	0,7063	6,4443	No
China Southern Airlines	3,8039	0,3371	6,4443	No
Dongfang Electric	2,4551	0,6458	6,4443	No
Guangzhou Pharmaceutical	3,5083	0,4047	6,4443	No
Guangzhou Shipyard International	3,4121	0,4267	6,4443	No
Huadian Power International	2,9751	0,5268	6,4443	No
Huaneng Power International	4,5822	0,1783	6,4443	No
Jiangsu Expressway	4,2300	0,2395	6,4443	No
Jiangxi Copper	4,1073	0,2676	6,4443	No
Jingwei Textile Machinery	3,7059	0,3595	6,4443	No
Maanshan Iron & Steel	8,2702	0,0137	6,4443	Yes
Nanjing Panda Electronics	4,8399	0,1505	6,4443	No
Shenzhen Expressway	9,7962	0,0047	6,4443	Yes
China Petroleum & Chemical	8,7700	0,0096	6,4443	Yes
Tianjin Capital Environmental Protection	6,4713	0,0491	6,4443	Yes
Tsingtao Brewery	4,6393	0,1718	6,4443	No
Yanzhou Coal Mining	2,7872	0,5698	6,4443	No
Sinopec Shanghai Petrochemical	3,2932	0,4540	6,4443	No
Sinopec Yizheng Chemical Fibre	7,7542	0,0197	6,4443	Yes
Shandong Xinhua Pharmaceutical	9,4573	0,0059	6,4443	Yes
Angang Steel	3,4004	0,4294	6,4443	No
ZTE	2,2047	0,7032	6,4443	No
Number of unit roots				19

Unit root test - event 2				
Company	test-stat	p-value	critical value	H0 Rejection
Air China	5,6086	0,0895	6,4443	No
Angang Steel	10,7754	0,0029	6,4443	Yes
Anhui Conch Cement	3,4245	0,4239	6,4443	No
Anhui Expressway	3,4664	0,4143	6,4443	No
Bank of China	2,8213	0,5620	6,4443	No
Beiren Printing Machinery	7,6260	0,0217	6,4443	Yes
China Eastern Airlines	2,1504	0,7156	6,4443	No
China Merchants Bank	4,5874	0,1777	6,4443	No
China Petroleum & Chemical	2,9030	0,5433	6,4443	No
China Shipping Development	6,9559	0,0348	6,4443	Yes
China Southern Airlines	6,7500	0,0403	6,4443	Yes
Dongfang Electric	3,7465	0,3502	6,4443	No
Guangzhou Pharmaceutical	3,4183	0,4253	6,4443	No
Guangzhou Shipyard International	3,7036	0,3600	6,4443	No
Huadian Power International	6,1399	0,0620	6,4443	No
Huaneng Power International	3,8596	0,3243	6,4443	No
Jiangsu Expressway	4,9048	0,1445	6,4443	No
Jiangxi Copper	3,4525	0,4175	6,4443	No
Jingwei Textile Machinery	2,7428	0,5800	6,4443	No
Maanshan Iron & Steel	3,8551	0,3253	6,4443	No
Nanjing Panda Electronics	4,3065	0,2220	6,4443	No
Shandong Xinhua Pharmaceutical	2,8746	0,5498	6,4443	No
Shenzhen Expressway	3,3181	0,4483	6,4443	No
Sinopec Shanghai Petrochemical	3,6505	0,3722	6,4443	No
Sinopec Yizheng Chemical Fibre	1,2178	0,9334	6,4443	No
Tianjin Capital Environmental Protection	1,6851	0,8261	6,4443	No
Tsingtao Brewery	2,5252	0,6298	6,4443	No
Yanzhou Coal Mining	6,2820	0,0561	6,4443	No
ZTE	5,0055	0,1352	6,4443	No
Number of unit roots				25

12. Appendix C – Regression results

Main Regression Results - Market Model, Event 1

Company	Coefficients		p-value		t-value		R-squared	Adj. R-squared
	<i>a</i>	<i>INDEX</i>	<i>a</i>	<i>INDEX</i>	<i>a</i>	<i>INDEX</i>		
Angang Steel	-2,1765	-0,8212	0,0026	0,0031	-3,0721	-3,0197	0,0717	0,0639
Anhui Conch Cement	0,5806	0,2472	0,0847	0,0562	1,7385	1,9283	0,0305	0,0223
Anhui Expressway	1,6083	0,4979	0,0000	0,0009	4,2205	3,4039	0,0894	0,0817
Beiren Printing Machinery	-1,1438	-0,7696	0,0366	0,0003	-2,1147	-3,7065	0,1043	0,0967
China Eastern Airlines	2,2282	0,5928	0,0000	0,0000	6,1335	4,2513	0,1328	0,1255
China Petroleum & Chemical	-0,3108	-0,1679	0,3640	0,2023	-0,9113	-1,2822	0,0137	0,0054
China Shipping Development	-3,4590	-1,3509	0,0000	0,0000	-6,1850	-6,2930	0,2513	0,2449
China Southern Airlines	0,8952	0,2915	0,0038	0,0136	2,9545	2,5063	0,0505	0,0425
Dongfang Electric	0,4165	0,0235	0,4681	0,9151	0,7279	0,1068	0,0001	-0,0084
Guangzhou Pharmaceutical	1,1200	0,1926	0,0089	0,2361	2,6587	1,1909	0,0119	0,0035
Guangzhou Shipyard International	-0,0219	-0,3015	0,9654	0,1214	-0,0435	-1,5601	0,0202	0,0119
Huadian Power International	1,2886	0,3949	0,0034	0,0188	2,9851	2,3830	0,0459	0,0378
Huaneng Power International	1,8516	0,6929	0,0000	0,0000	5,6078	5,4670	0,2021	0,1953
Jiangsu Expressway	0,3876	0,0208	0,5273	0,9297	0,6340	0,0884	0,0001	-0,0084
Jiangxi Copper	3,4058	1,2089	0,0000	0,0000	12,6385	11,6867	0,5365	0,5326
Jingwei Textile Machinery	2,1884	0,6683	0,0000	0,0000	6,3067	5,0174	0,1758	0,1688
Maanshan Iron & Steel	0,8638	0,2970	0,0004	0,0013	3,6688	3,2857	0,0838	0,0761
Nanjing Panda Electronics	-2,6336	-1,5133	0,0360	0,0019	-2,1217	-3,1760	0,0787	0,0709
Shandong Xinhua Pharmaceutical	1,4273	0,1774	0,0000	0,1617	4,3493	1,4082	0,0165	0,0082
Shenzhen Expressway	0,6871	0,1206	0,0011	0,1290	3,3436	1,5288	0,0194	0,0111
Sinopec Shanghai Petrochemical	-1,4422	-0,6396	0,0034	0,0008	-2,9897	-3,4544	0,0918	0,0841
Sinopec Yizheng Chemical Fibre	0,2641	-0,1129	0,7683	0,7429	0,2953	-0,3288	0,0009	-0,0076
Tianjin Capital Environmental Protection	2,0880	0,5440	0,0000	0,0002	5,5878	3,7928	0,1087	0,1011
Tsingtao Brewery	0,9059	0,3747	0,0140	0,0082	2,4944	2,6879	0,0577	0,0497
Yanzhou Coal Mining	2,2616	0,8407	0,0000	0,0000	8,2167	7,9574	0,3492	0,3437
ZTE	-2,8686	-1,1315	0,0000	0,0000	-6,7640	-6,9506	0,2905	0,2845

Main Regression Results - Information Model, Event 1

Company	Coefficients			p-value		t-value			R-squared	Adj. R-squared
	<i>a</i>	<i>INDEX</i>	<i>INFO</i>	<i>a</i>	<i>INDEX</i>	<i>a</i>	<i>INDEX</i>	<i>INFO</i>		
Angang Steel	-7,9935	0,4189	0,4315	0,0000	0,0449	0,0000	-11,9874	2,0269	0,5950	0,5881
Anhui Conch Cement	-1,2134	0,3963	0,1049	0,0168	0,0017	0,0000	-2,4249	3,2200	0,4591	0,1627
Anhui Expressway	0,1522	0,6559	0,0902	0,7568	0,0000	0,0000	0,3104	4,6423	0,4316	0,2144
Beiren Printing Machinery	2,3941	-0,0894	-0,1030	0,0001	0,6288	0,0000	3,9546	-0,4847	-8,3148	0,4370
China Eastern Airlines	0,6170	0,5529	0,0720	0,8257	0,0006	0,5620	0,2208	3,5487	0,5815	0,1353
China Petroleum & Chemical	-0,7643	0,4852	0,0887	0,0020	0,0000	0,0000	-3,1636	4,4724	11,1796	0,5231
China Shipping Development	-5,8222	-0,4202	0,2225	0,0000	0,0056	0,0000	-15,0885	-2,8227	13,8316	0,7159
China Southern Airlines	0,7557	0,4474	0,0269	0,0160	0,0021	0,0649	2,4450	3,1442	1,8637	0,0779
Dongfang Electric	1,0651	-0,1012	-0,0491	0,0792	0,6431	0,0055	1,7711	-0,4646	-2,8273	0,0640
Guangzhou Pharmaceutical	17,1532	1,2382	-0,7050	0,0000	0,0000	0,0000	8,1201	6,5270	-7,6931	0,3438
Guangzhou Shipyard International	-3,8076	-0,5470	0,1650	0,1820	0,0407	0,1776	-1,3428	-2,0698	1,3564	0,0354
Huadian Power International	16,8341	0,9890	-0,7223	0,0000	0,0000	0,0000	9,3380	6,7802	-8,7776	0,4247
Huaneng Power International	-0,1485	0,5748	0,0796	0,8500	0,0000	0,0060	-0,1895	4,4125	2,7974	0,2521
Jiangsu Expressway	-0,0079	0,4604	0,0717	0,9877	0,0265	0,0000	-0,0155	2,2475	7,2600	0,3106
Jiangxi Copper	4,8023	0,9614	-0,0968	0,0000	0,0000	0,0000	14,5218	9,6585	-6,0368	0,6466
Jingwei Textile Machinery	-0,3881	1,1572	0,2028	0,1775	0,0000	0,0000	-1,3567	12,8351	13,7193	0,6841
Maanshan Iron & Steel	1,3887	0,3119	-0,0226	0,0002	0,0007	0,0608	3,8353	3,4746	-1,8932	0,1111
Nanjing Panda Electronics	-2,4306	-0,0077	0,1947	0,0356	0,9887	0,0000	-2,1259	-0,0142	4,7211	0,2262
Shandong Xinhua Pharmaceutical	-4,0547	0,1619	0,2993	0,0000	0,1429	0,0000	-4,3622	1,4748	6,1984	0,2596
Shenzhen Expressway	0,8608	0,0658	-0,0156	0,0001	0,4086	0,0072	4,1005	0,8293	-2,7349	0,0783
Sinopec Shanghai Petrochemical	-3,0933	0,2306	0,1811	0,0000	0,1571	0,0000	-7,8882	1,4241	10,0015	0,5104
Sinopec Yizheng Chemical Fibre	-0,5923	0,0075	0,0564	0,6070	0,9833	0,2384	-0,5157	0,0210	1,1851	0,0128
Tianjin Capital Environmental Protection	2,0883	0,5319	-0,0016	0,0000	0,0016	0,8791	5,5655	3,2318	-0,1524	0,1088
Tsingtao Brewery	-2,3900	0,6730	0,1957	0,0001	0,0000	0,0000	-3,9712	5,2140	6,4169	0,3030
Yanzhou Coal Mining	1,5867	0,8573	0,0328	0,0038	0,0000	0,1472	2,9515	8,1058	1,4591	0,3608
ZTE	-4,6690	-0,6389	0,1440	0,0000	0,0005	0,0000	-8,7824	-3,5694	4,9445	0,4131

Main Regression Results - Currency Model, Event 1

Company	Coefficients			p-value			t-value			R-squared	Adj. R-squared		
	a	INDEX	INFO	a	INDEX	INFO	a	INDEX	INFO				
Angang Steel	-6,5403	0,6592	0,3191	37,6683	0,0000	0,0007	0,0000	-10,0770	3,4835	8,5748	5,5835	0,6808	0,6726
Anhui Conch Cement	-1,3835	0,5240	0,1141	7,6671	0,0071	0,0003	0,0000	-2,7424	3,7177	4,8860	1,8050	0,1993	0,1786
Anhui Expressway	-0,0760	0,5687	0,1051	-7,5756	0,8828	0,0003	0,0000	-0,1615	-0,1478	3,6998	4,5000	-1,4091	0,2276
Beiren Printing Machinery	0,3100	0,1094	-0,0442	39,2429	0,6457	0,5221	0,0058	0,0000	0,4609	0,6420	-2,8090	5,2958	0,5466
China Eastern Airlines	-1,1984	1,0254	0,1505	34,5063	0,5795	0,0000	0,1177	0,0000	-0,5557	7,8550	1,5762	9,0684	0,4809
China Petroleum & Chemical	-0,6964	0,5768	0,0705	15,0698	0,0025	0,0000	0,0000	-3,0907	5,5952	8,3265	4,3778	0,5908	0,5802
China Shipping Development	-5,6104	-0,3602	0,2010	10,0327	0,0000	0,0194	0,0000	-13,9229	-2,3702	9,8357	1,6860	0,7227	0,7155
China Southern Airlines	0,7954	0,4533	0,0180	3,8369	0,0128	0,0019	0,3470	2,5279	3,1735	0,9443	0,7152	0,0820	0,0582
Dongfang Electric	2,0211	0,4858	-0,1282	52,6558	0,0004	0,0248	0,0000	3,6811	2,2734	-6,4071	6,0774	0,2901	0,2717
Guangzhou Pharmaceutical	17,1195	1,0791	-0,7028	-10,4160	0,0000	0,0000	0,0000	8,2466	5,4182	-7,8031	-2,2706	0,3717	0,3555
Guangzhou Shipyard International	-3,7152	-0,5280	0,1609	0,8631	0,2099	0,0888	0,2065	-1,2609	-1,7162	1,2703	0,1220	0,0355	0,0106
Huadian Power International	14,7682	1,1734	-0,6277	17,5289	0,0000	0,0000	0,0000	8,2772	8,0507	-7,7044	3,8848	0,4910	0,4778
Huaneng Power International	-1,0074	0,2146	0,1152	-20,5542	0,1726	0,1245	0,0000	-1,3724	1,5472	4,2855	-5,0082	0,3851	0,3692
Jiangsu Expressway	0,1469	0,8353	0,0311	41,7130	0,7556	0,0001	0,0132	0,0000	0,3120	4,1132	2,5184	4,8339	0,4262
Jiangxi Copper	4,3851	0,8702	-0,0666	-11,2668	0,0000	0,0000	0,0004	0,0026	12,6428	8,6515	-3,6329	-3,0808	0,6733
Jingwei Textile Machinery	0,2361	1,2971	0,1514	17,6392	0,4000	0,0000	0,0000	0,0000	0,8447	15,3570	9,3648	5,5222	0,7498
Maanshan Iron & Steel	1,3331	0,2441	-0,0199	-4,4075	0,0004	0,0182	0,1015	0,1689	3,6736	2,3959	-1,6509	-1,3845	0,1255
Nanjing Panda Electronics	-2,8063	0,4796	0,0254	120,0901	0,0026	0,2734	0,5122	0,0000	-3,0781	1,1004	0,6575	8,2741	0,5134
Shandong Xinhua Pharmaceutical	-0,7393	0,5830	0,1158	27,5211	0,4146	0,0000	0,0168	0,0000	-0,8188	5,3590	2,4266	7,1924	0,4880
Shenzhen Expressway	1,1043	0,2441	-0,0401	17,6705	0,0000	0,0023	0,0000	0,0000	5,7202	3,1245	-5,9114	5,4841	0,2681
Sinopec Shanghai Petrochemical	-2,6990	0,3430	0,1337	22,7423	0,0000	0,0277	0,0000	0,0001	-7,1268	2,2300	6,5701	4,2014	0,5751
Sinopec Yizheng Chemical Fibre	0,4437	1,3910	-0,0232	103,8530	0,5429	0,0000	0,4495	0,0000	6,1012	5,6180	-0,7587	13,3876	0,6121
Tianjin Capital Environmental Protection	2,0888	0,5302	-0,0012	-0,3295	0,0000	0,0021	0,9319	0,9603	5,5413	3,1457	-0,0856	-0,0499	0,1089
Tsingtao Brewery	-1,8402	0,7511	0,1622	8,6344	0,0075	0,0000	0,0000	0,0871	-2,7200	5,5322	4,5135	1,7252	0,3204
Yanzhou Coal Mining	1,3430	0,8113	0,0449	-3,4832	0,0338	0,0000	0,1051	0,4444	2,1483	6,6660	1,6332	-0,7675	0,3641
ZTE	-4,1126	-0,5333	0,0972	17,7794	0,0000	0,0030	0,0029	0,0025	-7,5618	-3,0278	3,0411	3,0909	0,4578

Main Regression Results - Market Model, Event 2

Company	Coefficients		p-value		t-value		R-squared	Adj. R-squared
	<i>a</i>	<i>INDEX</i>	<i>a</i>	<i>INDEX</i>	<i>a</i>	<i>INDEX</i>		
Air China	1,2523	0,5272	0,0000	0,0000	28,5549	25,7220	0,8486	0,8474
Angang Steel	1,2626	0,5410	0,0000	0,0000	25,2397	23,1395	0,8194	0,8179
Anhui Conch Cement	0,8125	0,3923	0,0000	0,0000	14,0886	14,5561	0,6423	0,6393
Anhui Expressway	1,6202	0,7220	0,0000	0,0000	31,5857	30,1171	0,8849	0,8839
Bank of China	0,2651	-0,2324	0,0057	0,0000	2,8171	-5,2827	0,1913	0,1844
Beiren Printing Machinery	1,0003	0,5053	0,0000	0,0000	27,4001	29,6134	0,8814	0,8804
China Eastern Airlines	-0,2307	-0,4250	0,0516	0,0000	-1,9663	-7,7512	0,3374	0,3318
China Merchants Bank	0,6710	0,2897	0,0000	0,0000	8,5792	7,9247	0,3474	0,3418
China Petroleum & Chemical	1,5897	0,6023	0,0000	0,0000	20,7188	16,7962	0,7051	0,7026
China Shipping Development	0,1603	-0,0574	0,0686	0,1618	1,8376	-1,4080	0,0165	0,0082
China Southern Airlines	1,5223	0,4628	0,0000	0,0000	27,4765	17,8712	0,7302	0,7279
Dongfang Electric	0,1023	-0,0783	0,4779	0,2464	0,7119	-1,1649	0,0114	0,0030
Guangzhou Pharmaceutical	1,8345	0,8050	0,0000	0,0000	12,1151	11,3752	0,5230	0,5190
Guangzhou Shipyard International	1,2308	0,5982	0,0000	0,0000	19,3597	20,1320	0,7745	0,7726
Huadian Power International	0,4557	0,1825	0,0000	0,0000	10,8467	9,2963	0,4228	0,4179
Huaneng Power International	2,4077	0,9361	0,0000	0,0000	31,9014	26,5387	0,8565	0,8553
Jiangsu Expressway	0,1670	-0,2193	0,0649	0,0000	1,8632	-5,2373	0,1886	0,1817
Jiangxi Copper	1,1677	0,5253	0,0000	0,0000	14,4063	13,8672	0,6197	0,6165
Jingwei Textile Machinery	1,1919	0,0489	0,0000	0,2496	13,1851	1,1569	0,0112	0,0028
Maanshan Iron & Steel	1,2228	0,5281	0,0000	0,0000	16,6234	15,3604	0,6666	0,6638
Nanjing Panda Electronics	1,3292	0,4949	0,0000	0,0000	14,8691	11,8460	0,5432	0,5393
Shandong Xinhua Pharmaceutical	0,7135	0,0857	0,0000	0,0638	7,2847	1,8712	0,0288	0,0206
Shenzhen Expressway	0,7223	0,2584	0,0000	0,0000	10,5363	8,0658	0,3554	0,3499
Sinopec Shanghai Petrochemical	0,2539	0,0590	0,0000	0,0167	4,8873	2,4284	0,0476	0,0395
Sinopec Yizheng Chemical Fibre	1,3833	0,4075	0,0000	0,0000	11,6001	7,3122	0,3118	0,3060
Tianjin Capital Environmental Protection	1,2052	0,1618	0,0000	0,0162	8,4928	2,4389	0,0480	0,0399
Tsingtao Brewery	1,2302	0,1474	0,0000	0,0005	13,9699	3,5810	0,0980	0,0904
Yanzhou Coal Mining	0,8758	0,4475	0,0000	0,0000	17,3154	18,9315	0,7523	0,7502
ZTE	0,8422	0,3358	0,0000	0,0000	14,1212	12,0467	0,5515	0,5477

Main Regression Results - Information Model, Event 2

Company	Coefficients			p-value			t-value			R-squared	Adj. R-squared
	<i>a</i>	INDEX	INFO	<i>a</i>	INDEX	INFO	<i>a</i>	INDEX	INFO		
Air China	-0,5339	0,4368	0,0743	0,5057	0,0000	0,0272	-0,6676	9,6759	2,2365	0,8548	0,8524
Angang Steel	1,3251	0,5449	-0,0026	0,1972	0,0000	0,9513	1,2970	8,0184	-0,0613	0,8194	0,8163
Anhui Conch Cement	3,8062	0,5221	-0,1358	0,0397	0,0000	0,1043	2,0800	6,2380	-1,6368	0,6503	0,6443
Anhui Expressway	1,7849	0,7090	-0,0077	0,0000	0,0000	0,2101	12,7181	27,2311	-1,2603	0,8864	0,8845
Bank of China	0,0180	-0,2442	0,0123	0,9866	0,0004	0,8164	0,0169	-3,6191	0,2327	0,1916	0,1778
Beiren Printing Machinery	1,1015	0,5120	-0,0037	0,1981	0,0000	0,9055	1,2944	8,5884	-0,1190	0,8814	0,8794
China Eastern Airlines	23,0816	0,8684	-1,0288	0,0000	0,0000	0,0000	10,8264	6,9823	-10,9428	0,6725	0,6669
China Merchants Bank	3,0431	0,3781	-0,1023	0,2111	0,0002	0,3288	1,2574	3,8869	-0,9807	0,3527	0,3416
China Petroleum & Chemical	0,8196	0,5607	0,0340	0,5697	0,0000	0,5926	0,5702	6,5586	0,5365	0,7058	0,7008
China Shipping Development	4,6022	0,2418	-0,1886	0,0000	0,0019	0,0000	4,6790	3,1789	-4,5313	0,1633	0,1490
China Southern Airlines	0,1382	0,4416	0,0712	0,7999	0,0000	0,0118	0,2541	16,5881	2,5575	0,7445	0,7401
Dongfang Electric	8,6517	0,6260	-0,3504	0,0000	0,0000	0,0000	5,4094	4,3303	-5,3629	0,2064	0,1929
Guangzhou Pharmaceutical	18,3612	1,6370	-0,7261	0,0000	0,0000	0,0000	5,2749	8,7638	-4,7517	0,6002	0,5934
Guangzhou Shipyard International	2,4271	0,6415	-0,0502	0,3615	0,0000	0,6524	0,9161	6,3846	-0,4517	0,7749	0,7711
Huadian Power International	-0,4690	0,2038	0,0467	0,2330	0,0000	0,0191	-1,1988	9,5978	2,3769	0,4494	0,4399
Huaneng Power International	7,4365	1,0179	-0,2282	0,0024	0,0000	0,0376	3,1087	19,5148	-2,1032	0,8617	0,8594
Jiangsu Expressway	4,4806	0,0578	-0,1967	0,0000	0,2844	0,0000	7,0825	1,0754	-6,8683	0,4218	0,4119
Jiangxi Copper	0,2858	0,5308	0,0424	0,5744	0,0000	0,0810	0,5632	14,0875	1,7604	0,6295	0,6232
Jingwei Textile Machinery	1,1230	0,0462	0,0034	0,2079	0,4029	0,9379	1,2664	0,8395	0,0781	0,0113	-0,0056
Maanshan Iron & Steel	-2,6884	0,3774	0,1781	0,2546	0,0002	0,0983	-1,1449	3,9054	1,6665	0,6743	0,6688
Nanjing Panda Electronics	1,2785	0,4980	0,0024	0,0012	0,0000	0,8920	3,3306	10,4616	0,1360	0,5433	0,5355
Shandong Xinhua Pharmaceutical	11,1902	0,4991	-0,5018	0,0000	0,0000	0,0000	8,0287	7,4914	-7,5294	0,3458	0,3346
Shenzhen Expressway	3,1021	0,3786	-0,1030	0,0275	0,0000	0,0891	2,2320	4,9183	-1,7143	0,3712	0,3604
Sinopec Shanghai Petrochemical	12,1701	0,3445	-0,5325	0,0000	0,0000	0,0000	7,0744	7,4824	-6,9290	0,3247	0,3132
Sinopec Yizheng Chemical Fibre	-20,1782	-0,0079	0,9720	0,0000	0,9366	0,0000	-4,5567	-0,0797	4,8706	0,4278	0,4181
Tianjin Capital Environmental Protection	5,6441	0,1903	-0,2216	0,0000	0,0026	0,0000	5,6705	3,0776	-4,4991	0,1884	0,1745
Tsingtao Brewery	-5,7707	-0,3837	0,3232	0,0000	0,0000	0,0000	-6,8801	-5,3789	8,3760	0,4361	0,4265
Yanzhou Coal Mining	-0,2089	0,4363	0,0491	0,5528	0,0000	0,0023	-0,5952	18,8982	3,1211	0,7713	0,7674
ZTE	2,0709	0,3764	-0,0535	0,1937	0,0000	0,4393	1,3071	6,3495	-0,7761	0,5538	0,5462

Main Regression Results - Currency Model, Event 2

Company	Coefficients				p-value				t-value				R-squared	Adj. R-squared
	<i>a</i>	INDEX	INFO	CUR	<i>a</i>	INDEX	INFO	CUR	<i>a</i>	INDEX	INFO	CUR		
Air China	-0,1260	0,3580	0,0495	-5,0898	0,8658	0,0000	0,1144	0,0000	-0,1693	7,9433	1,5908	-4,6033	0,8773	0,8741
Angang Steel	-1,1565	0,4970	0,1085	5,6114	0,3547	0,0000	0,0431	0,0015	-0,9292	7,4198	2,0451	3,2475	0,8345	0,8302
Anhui Conch Cement	0,5681	0,5846	0,0282	10,2434	0,7165	0,0000	0,6941	0,0000	0,3640	8,4512	0,3943	7,6001	0,7665	0,7605
Anhui Expressway	1,3150	1,0587	0,0363	12,8690	0,0000	0,0000	0,0000	0,0000	9,4696	18,6295	4,3281	6,6853	0,9180	0,9159
Bank of China	9,4226	0,7187	-0,4097	26,0317	0,0000	0,0000	0,0000	0,0000	6,1572	5,1400	-5,7520	7,5060	0,4559	0,4418
Beiren Printing Machinery	0,3114	0,5468	0,0312	4,6371	0,6957	0,0000	0,2857	0,0000	0,3921	9,9515	1,0725	4,9087	0,9018	0,8993
China Eastern Airlines	27,1882	1,2747	-1,1951	9,2203	0,0000	0,0000	0,0000	0,0002	11,9494	8,0999	-12,1183	3,8815	0,7102	0,7027
China Merchants Bank	1,9994	0,5528	-0,0404	10,6670	0,3585	0,0000	0,6676	0,0000	0,9218	5,9836	-0,4305	5,5454	0,4883	0,4751
China Petroleum & Chemical	0,5640	0,7716	0,0640	11,5742	0,6515	0,0000	0,2472	0,0000	0,4529	9,5046	1,1631	6,3284	0,7813	0,7757
China Shipping Development	7,8191	0,7959	-0,2974	17,8331	0,0000	0,0000	0,0000	0,0000	10,2760	10,6476	-9,5054	10,7400	0,5805	0,5696
China Southern Airlines	0,3543	0,4669	0,0620	1,0544	0,5833	0,0000	0,0507	0,5295	0,5502	9,6964	1,9745	0,6306	0,7454	0,7388
Dongfang Electric	8,6317	0,6009	-0,3515	-1,2770	0,0000	0,0003	0,0000	0,7200	5,3735	3,7311	-5,3539	-0,3594	0,2073	0,1868
Guangzhou Pharmaceutical	-2,1037	1,3924	0,2379	40,1881	0,4289	0,0000	0,0482	0,0000	-0,7938	11,7812	1,9964	13,5361	0,8450	0,8410
Guangzhou Shipyard International	-8,3933	0,5790	0,4296	16,4156	0,0000	0,0000	0,0000	0,0000	-4,4706	9,0242	5,3896	13,1363	0,9095	0,9072
Huadian Power International	-0,2982	0,2341	0,0409	1,5375	0,4689	0,0000	0,0435	0,1839	-0,7267	7,5516	2,0410	1,3369	0,4577	0,4437
Huaneng Power International	7,6737	1,3043	-0,2164	13,5835	0,0001	0,0000	0,0130	0,0000	4,0591	24,4401	-2,5226	8,4486	0,9144	0,9122
Jiangsu Expressway	2,6055	-0,2033	-0,1236	-7,3883	0,0080	0,0816	0,0026	0,0127	2,7006	-1,7569	-3,0725	-2,5324	0,4520	0,4379
Jiangxi Copper	1,2512	0,6643	0,0074	6,4519	0,0451	0,0000	0,7854	0,0101	2,0256	10,5556	0,2729	2,6147	0,6502	0,6411
Jingwei Textile Machinery	2,5916	0,2349	-0,0574	6,5465	0,0184	0,0191	0,2584	0,0244	2,3917	2,3762	-1,1359	2,2798	0,0537	0,0292
Maanshan Iron & Steel	1,8078	0,7762	-0,0077	11,2895	0,4068	0,0000	0,9370	0,0000	0,8326	7,3158	-0,0792	6,1764	0,7549	0,7486
Nanjing Panda Electronics	1,6626	0,5702	-0,0088	4,0378	0,0004	0,0000	0,6462	0,1293	3,6374	8,5240	-0,4602	1,5275	0,5523	0,5407
Shandong Xinhua Pharmaceutical	13,6773	0,8950	-0,5946	14,9254	0,0000	0,0000	0,0000	0,0000	11,9254	12,5801	-10,9897	8,3282	0,5906	0,5800
Shenzhen Expressway	2,9292	0,5358	-0,0820	8,4884	0,0225	0,0000	0,1379	0,0000	2,3125	6,9703	-1,4940	4,9964	0,4825	0,4692
Sinopec Shanghai Petrochemical	9,4969	0,3987	-0,4036	5,7640	0,0000	0,0000	0,0000	0,0000	5,7118	9,1710	-5,3860	4,9210	0,4413	0,4269
Sinopec Yizheng Chemical Fibre	-0,1130	0,9620	0,1142	28,1914	0,9717	0,0000	0,4220	0,0000	-0,0355	9,9950	0,8059	13,3012	0,7734	0,7676
Tianjin Capital Environmental Protection	5,6520	0,8902	-0,1613	33,0717	0,0000	0,0000	0,0000	0,0000	10,4866	16,6702	-5,9946	16,8233	0,7641	0,7580
Tsingtao Brewery	-1,7482	0,1446	0,1578	11,9886	0,1165	0,2440	0,0014	0,0000	-1,5815	1,1711	3,2816	5,0302	0,5371	0,5251
Yanzhou Coal Mining	-0,0989	0,4507	0,0452	0,6323	0,8250	0,0000	0,0165	0,6889	-0,2216	10,5399	2,4320	0,4013	0,7717	0,7658
ZTE	0,8974	0,4890	0,0096	7,5014	0,5418	0,0000	0,8814	0,0000	0,6120	8,3217	0,1495	4,9271	0,6311	0,6215

13. Appendix D – Event study results

Event 1

t	Market Model				Info Model				Cur Model				CAPM			
	ARbar	t stat	CARbar	t stat	ARbar	t stat	CARbar	t stat	ARbar	t stat	CARbar	t stat	ARbar	t stat	CARbar	t stat
-45	-0.0623	-4.4458	-4.8834	-51.3814	-0.0349	-2.8246	-3.5589	-42.4692	0.0081	0.7614	0.6402	8.8732	0.0006	0.1174	-0.0964	-2.7813
-44	-0.0522	-3.7251	-4.8211	-51.2864	-0.0239	-1.9344	-3.5240	-42.5174	0.0259	2.4347	0.6321	8.8577	0.0040	0.7827	-0.0970	-2.8295
-43	-0.0425	-3.0329	-4.7689	-51.3044	-0.0176	-1.4245	-3.5001	-42.7063	0.0359	3.3747	0.6062	8.5908	-0.0042	-0.8219	-0.1010	-2.9795
-42	-0.0485	-3.4610	-4.7264	-51.4350	-0.0220	-1.7806	-3.4825	-42.9828	0.0339	3.1867	0.5703	8.1755	-0.0173	-3.3853	-0.0968	-2.8886
-41	-0.0561	-4.0034	-4.6779	-51.5097	-0.0326	-2.6385	-3.4605	-43.2167	0.0239	2.2467	0.5364	7.7805	0.0073	1.4285	-0.0795	-2.4004
-40	-0.0729	-5.2022	-4.6218	-51.5088	-0.0417	-3.3750	-3.4279	-43.3285	0.0141	1.3254	0.5125	7.5239	-0.0057	-1.1154	-0.0868	-2.6526
-39	-0.0825	-5.8873	-4.5489	-51.3262	-0.0504	-4.0791	-3.3862	-43.3331	0.0036	0.3384	0.4984	7.4078	-0.0012	-0.2348	-0.0811	-2.5092
-38	-0.0912	-6.5081	-4.4664	-51.0373	-0.0573	-4.6376	-3.3358	-43.2320	0.0002	0.0188	0.4948	7.4480	0.0022	0.4305	-0.0799	-2.5036
-37	-0.0747	-5.3307	-4.3752	-50.6487	-0.0476	-3.8525	-3.2785	-43.0448	0.0105	0.9870	0.4946	7.5423	-0.0172	-3.3657	-0.0821	-2.6061
-36	-0.0951	-6.7865	-4.3005	-50.4522	-0.0698	-5.6493	-3.2309	-42.9893	-0.0125	-1.1750	0.4841	7.4813	0.0125	2.4460	-0.0649	-2.0878
-35	-0.0904	-6.4511	-4.2054	-50.0171	-0.0619	-5.0099	-3.1611	-42.6407	-0.0033	-0.3102	0.4966	7.7803	0.0099	1.9372	-0.0774	-2.5243
-34	-0.0763	-5.4449	-4.1150	-49.6362	-0.0488	-3.9496	-3.0992	-42.3987	0.0174	1.6357	0.4999	7.9431	0.0097	1.8981	-0.0873	-2.8875
-33	-0.0718	-5.1237	-4.0387	-49.4270	-0.0426	-3.4478	-3.0504	-42.3404	0.0282	2.6509	0.4825	7.7786	-0.0075	-1.4676	-0.0970	-3.2552
-32	-0.0776	-5.5376	-3.9669	-49.2784	-0.0497	-4.0225	-3.0078	-42.3769	0.0205	1.9271	0.4543	7.4341	-0.0142	-2.7787	-0.0895	-3.0487
-31	-0.0799	-5.7018	-3.8893	-49.0635	-0.0566	-4.5809	-2.9581	-42.3229	0.0161	1.5135	0.4338	7.2087	-0.0043	-0.8414	-0.0753	-2.6048
-30	-0.1042	-7.4358	-3.8094	-48.8245	-0.0728	-5.8921	-2.9015	-42.1773	0.0029	0.2726	0.4177	7.0522	-0.0011	-0.2152	-0.0710	-2.4953
-29	-0.0941	-6.7151	-3.7052	-48.2740	-0.0671	-5.4308	-2.8287	-41.7988	0.0110	1.0340	0.4148	7.1190	-0.0026	-0.5088	-0.0699	-2.4973
-28	-0.1005	-7.1718	-3.6111	-47.8523	-0.0726	-5.8759	-2.7616	-41.5049	0.0085	0.7990	0.4038	7.0487	0.0109	2.1329	-0.0673	-2.4455
-27	-0.0990	-7.0648	-3.5106	-47.3440	-0.0667	-5.3984	-2.6890	-41.1291	0.0051	0.4794	0.3953	7.0225	0.0116	2.2699	-0.0782	-2.8918
-26	-0.0883	-6.3012	-3.4116	-46.8531	-0.0532	-4.3058	-2.6223	-40.8449	0.0095	0.8930	0.3902	7.0591	-0.0050	-0.9784	-0.0898	-3.3817
-25	-0.0981	-7.0005	-3.3233	-46.5099	-0.0624	-5.0504	-2.5691	-40.7785	0.0014	0.1316	0.3807	7.0184	-0.0082	-1.6046	-0.0848	-3.2543
-24	-0.1017	-7.2574	-3.2252	-46.0309	-0.0505	-4.0872	-2.5067	-40.5760	0.0083	0.7802	0.3793	7.1311	-0.0072	-1.4089	-0.0766	-2.9978
-23	-0.1043	-7.4430	-3.1235	-45.4986	-0.0629	-5.0908	-2.4562	-40.5785	-0.0049	-0.4606	0.3710	7.1189	0.0061	1.1936	-0.0694	-2.7720
-22	-0.0971	-6.9292	-3.0192	-44.9252	-0.0561	-4.5405	-2.3933	-40.3897	0.0017	0.1598	0.3759	7.3680	-0.0001	-0.0196	-0.0755	-3.0806
-21	-0.0965	-6.8864	-2.9221	-44.4576	-0.0567	-4.5890	-2.3372	-40.3294	0.0227	2.1339	0.3742	7.4995	-0.0046	-0.9001	-0.0754	-3.1456
-20	-0.1016	-7.2503	-2.8256	-44.0011	-0.0614	-4.9694	-2.2805	-40.2771	0.0287	2.6979	0.3515	7.2104	-0.0004	-0.0783	-0.0708	-3.0232
-19	-0.1093	-7.7998	-2.7240	-43.4665	-0.0669	-5.4146	-2.2191	-40.1605	0.0378	3.5533	0.3228	6.7852	0.0045	0.8806	-0.0704	-3.0804
-18	-0.0975	-6.9577	-2.6147	-42.8063	-0.0583	-4.7185	-2.1522	-39.9616	0.0537	5.0480	0.2850	6.1463	-0.0111	-2.1720	-0.0749	-3.3624
-17	-0.1065	-7.6000	-2.5172	-42.3393	-0.0685	-5.5441	-2.0939	-39.9445	0.0416	3.9105	0.2313	5.1249	-0.0050	-0.9784	-0.0638	-2.9426
-16	-0.0893	-6.3726	-2.4107	-41.7235	-0.0572	-4.6295	-2.0254	-39.7579	0.0422	3.9669	0.1897	4.3250	-0.0124	-2.4264	-0.0588	-2.7906
-15	-0.1052	-7.5072	-2.3214	-41.4145	-0.0724	-5.8597	-1.9682	-39.8242	0.0301	2.8295	0.1475	3.4664	-0.0026	-0.5088	-0.0464	-2.2699
-14	-0.1108	-7.9068	-2.2162	-40.8344	-0.0772	-6.2482	-1.8958	-39.6172	0.0152	1.4288	0.1174	2.8495	-0.0054	-1.0567	-0.0438	-2.2130
-13	-0.1202	-8.5776	-2.1054	-40.1544	-0.0857	-6.9361	-1.8186	-39.3378	0.0312	2.9329	0.1022	2.5676	0.0098	1.9177	-0.0384	-2.0082
-12	-0.1102	-7.8640	-1.9852	-39.2912	-0.0754	-6.1025	-1.7329	-38.8991	0.0499	4.6908	0.0710	1.8511	-0.0100	-1.9568	-0.0482	-2.6159
-11	-0.1087	-7.7570	-1.8750	-38.6254	-0.0764	-6.1834	-1.6575	-38.7258	0.0316	2.9705	0.0211	0.5726	0.0004	0.0783	-0.0382	-2.1578
-10	-0.1247	-8.8987	-1.7663	-38.0041	-0.1013	-8.1987	-1.5811	-38.5834	0.0181	1.7015	-0.0105	-0.2976	-0.0267	-5.2247	-0.0386	-2.2774
-9	-0.1459	-10.4116	-1.6416	-37.0450	-0.1272	-10.2950	-1.4798	-37.8739	0.0169	1.5887	-0.0286	-0.8502	-0.0233	-4.5593	-0.0119	-0.7364
-8	-0.1710	-12.2028	-1.4957	-35.5783	-0.1530	-12.3831	-1.3526	-36.4910	-0.0210	-1.9741	-0.0455	-1.4257	-0.0044	-0.8610	0.0114	0.7436
-7	-0.1696	-12.1029	-1.3247	-33.4222	-0.1542	-12.4802	-1.1996	-34.3264	-0.0186	-1.7485	-0.0245	-0.8143	-0.0057	-1.1154	0.0158	1.0931
-6	-0.1668	-11.9031	-1.1551	-31.1554	-0.1545	-12.5045	-1.0454	-31.9794	-0.0204	-1.9177	-0.0059	-0.2096	0.0060	1.1741	0.0215	1.5901
-5	-0.1795	-12.8093	-0.9883	-28.7922	-0.1616	-13.0791	-0.8909	-29.4368	-0.0006	-0.0564	0.0145	0.5565	0.0166	3.2483	0.0155	1.2382
-4	-0.1653	-11.7960	-0.8088	-25.8118	-0.1458	-11.8004	-0.7293	-26.3972	0.0068	0.6392	0.0151	0.6348	-0.0043	-0.8414	-0.0011	-0.0963
-3	-0.1592	-11.3607	-0.6435	-22.9605	-0.1441	-11.6628	-0.5835	-23.6128	0.0245	2.3031	0.0083	0.3901	-0.0071	-1.3893	0.0032	0.3131
-2	-0.1617	-11.5391	-0.4843	-19.9534	-0.1480	-11.9784	-0.4394	-20.5323	0.0030	0.2820	-0.0162	-0.8792	0.0040	0.7827	0.0103	1.1637
-1	-0.1497	-10.6828	-0.3226	-16.2784	-0.1392	-11.2662	-0.2914	-16.6768	0.0105	0.9870	-0.0192	-1.2762	0.0053	1.0371	0.0063	0.8717
0	-0.1729	-12.3384	-0.1729	-12.3384	-0.1522	-12.3183	-0.1522	-12.3183	-0.0297	-2.7919	-0.0297	-2.7919	0.0010	0.1957	0.0010	0.1957
1	-0.1515	-10.8112	-0.3244	-16.3692	-0.1389	-11.2419	-0.2911	-16.6596	-0.0197	-1.8519	-0.0494	-3.2836	-0.0126	-2.4656	-0.0116	-1.6051
2	-0.1506	-10.7470	-0.4750	-19.5702	-0.1429	-11.5656	-0.4340	-20.2799	-0.0262	-2.4629	-0.0756	-4.1030	-0.0169	-3.3070	-0.0285	-3.2198
3	-0.1750	-12.4882	-0.6500	-23.1924	-0.1640	-13.2734	-0.5980	-24.1996	-0.0201	-1.8895	-0.0957	-4.4981	0.0062	1.2132	-0.0223	-2.1818
4	-0.1731	-12.3526	-0.8231	-26.2682	-0.1587	-12.8444	-0.7567	-27.3890	-0.0144	-1.3536	-0.1101	-4.6285	-0.0096	-1.8785	-0.0319	-2.7916
5	-0.1974	-14.0867	-1.0205	-29.7303	-0.1793	-14.5117	-0.9360	-30.9270	-0.0366	-3.4405	-0.1467	-5.6299	-0.0109	-2.1329	-0.0428	-3.4191
6	-0.1856	-13.2446	-1.2061	-32.5309	-0.1745	-14.1232	-1.1105	-33.9709	-0.0550	-5.1702	-0.2017	-7.1664	-0.0146	-2.8569	-0.0574	-4.2453
7	-0.1933	-13.7941	-1.3994	-35.3069	-0.1858	-15.0378	-1.2963	-37.0935	-0.0664	-6.2418	-0.2681	-8.9103	-0.0218	-4.2658	-0.0356	-2.4629
8	-0.1704	-12.1600	-1.5698	-37.3410	-0.1634	-13.2248	-1.4597	-39.3804	-0.0402	-3.7789	-0.3083	-9.6604	-0.0106	-2.0742	-0.0462	-3.0135
9	-0.1746	-12.4597	-1.7444	-39.3648	-0.1687	-13.6538	-1.6284	-41.6772	-0.0570	-5.3582	-0.3653	-10.8591	0.0129	2.5243	-0.0333	-2.0606
10	-0.1662	-11.8602	-1.9106	-41.1089	-0.1584	-12.8201	-1.7868	-43.6031	-0.0439	-4.1267	-0.4092	-11.5980	-0.0050	-0.9784	-0.0383	-2.2597
11	-0.1498	-10.6899	-2.0604	-42.4444	-0.1488	-12.0432	-1.9356	-45.2233	-0.0293	-2.7543	-0.4385	-11.8993	-0.0001	-0.0196	-0.0384	-2.1691
12	-0.1498	-10.6899	-2.2102	-43.7447	-0.1489	-12.0512	-2.0845	-46.7916	-0.0294	-2.7637	-0.4679	-12.1990	0.0041	0.8023	-0.0343	-1.8615
13	-0.1576	-11.2465	-2.3678	-45.1589	-0.1531	-12.3912	-2.2376	-48.4012	-0.0318	-2.9893	-0.4997	-12.5542	-0.0023	-0.4501	-0.0366	-1.9141
14	-0.1690	-12.0601	-2.5368	-46.7415	-0.1613	-13.0548	-2.3989	-50.1307	-0.0383	-3.6003	-0.5380	-13.0581	-0.0026	-0.5088	-0.0392	-1.9806
15	-0.1706	-12.1742	-2.7074	-48.3009	-0.1630	-13.1924	-2.5619	-51.8370	-0.0404	-3.7977	-0.5784	-13.5929	-0.0001	-0.0196	-0.0393	-1.9226
16	-0.1707	-12.1814	-2.8781	-49.8131	-0.1631	-13.2005	-2.7250	-53.4908	-0.0405	-3.8071	-0.6189	-14.1104	-0.0089	-1.7416	-0.0482	-2.2875
17	-0.1567	-11.1823	-3.0348	-51.0454	-0.1575	-12.7473	-2.8825	-54.9883	-0.0237	-2.2279	-0.6426	-14.2				

Event 2

	Market Model				Info Model				Cur Model				CAPM			
t	ARbar	t stat	CARbar	t stat	ARbar	t stat	CARbar	t stat	ARbar	t stat	CARbar	t stat	ARbar	t stat	CARbar	t stat
-45	0,0902	6,7615	6,4691	71,4996	0,0847	6,8518	6,3843	76,1480	0,0341	3,2963	1,5696	22,3711	-0,0133	-2,1923	-0,1906	-4,6323
-44	0,0702	5,2623	6,3789	71,2817	0,0690	5,5818	6,2996	75,9680	0,0232	2,2427	1,5355	22,1269	0,0099	1,6319	-0,1773	-4,3567
-43	0,0867	6,4992	6,3087	71,2939	0,0849	6,8680	6,2306	75,9850	0,0243	2,3490	1,5123	22,0388	-0,0003	-0,0495	-0,1872	-4,6519
-42	0,0907	6,7990	6,2220	71,1270	0,0854	6,9085	6,1457	75,8161	0,0220	2,1267	1,4880	21,9354	-0,0135	-2,2253	-0,1869	-4,6982
-41	0,0826	6,1918	6,1313	70,9197	0,0772	6,2451	6,0603	75,6473	0,0186	1,7980	1,4660	21,8668	-0,0060	-0,9890	-0,1734	-4,4104
-40	0,0723	5,4197	6,0487	70,8123	0,0687	5,5575	5,9831	75,5890	0,0093	0,8990	1,4474	21,8511	-0,0094	-1,5495	-0,1674	-4,3094
-39	0,0716	5,3672	5,9764	70,8351	0,0676	5,4685	5,9144	75,6493	-0,0008	-0,0773	1,4381	21,9804	0,0099	1,6319	-0,1580	-4,1179
-38	0,0822	6,1618	5,9048	70,8780	0,0796	6,4393	5,8468	75,7373	0,0139	1,3437	1,4389	22,2728	0,0027	0,4451	-0,1679	-4,4317
-37	0,0853	6,3942	5,8226	70,8050	0,0838	6,7790	5,7672	75,6828	0,0148	1,4307	1,4250	22,3460	0,0101	1,6648	-0,1706	-4,5618
-36	0,0924	6,9265	5,7373	70,7042	0,0917	7,4181	5,6834	75,5843	0,0208	2,0107	1,4102	22,4108	0,0003	0,0495	-0,1807	-4,8968
-35	0,0930	6,9714	5,6449	70,5251	0,0924	7,4747	5,5917	75,3905	0,0275	2,6583	1,3894	22,3848	-0,0027	-0,4451	-0,1810	-4,9726
-34	0,0984	7,3762	5,5519	70,3471	0,0990	8,0086	5,4993	75,1965	0,0351	3,3930	1,3619	22,2530	0,0012	0,1978	-0,1783	-4,9679
-33	0,1057	7,9234	5,4535	70,1091	0,1053	8,5183	5,4003	74,9208	0,0323	3,1223	1,3268	21,9960	-0,0048	-0,7912	-0,1795	-5,0743
-32	0,1140	8,5456	5,3478	69,7842	0,1104	8,9309	5,2950	74,5647	0,0313	3,0257	1,2945	21,7832	-0,0189	-3,1154	-0,1747	-5,0129
-31	0,0905	6,7840	5,2338	69,3555	0,0867	7,0136	5,1846	74,1420	0,0057	0,5510	1,2632	21,5861	0,0132	2,1758	-0,1558	-4,5399
-30	0,1011	7,5786	5,1433	69,2468	0,0980	7,9278	5,0979	74,0687	0,0233	2,2523	1,2575	21,8325	-0,0036	-0,5934	-0,1690	-5,0033
-29	0,1127	8,4482	5,0422	69,0078	0,1096	8,8661	4,9999	73,8456	0,0208	2,0107	1,2342	21,7822	0,0087	1,4341	-0,1654	-4,9777
-28	0,1228	9,2053	4,9295	68,6187	0,1206	9,7560	4,8903	73,4616	0,0287	2,7743	1,2134	21,7812	-0,0069	-1,1374	-0,1741	-5,3291
-27	0,1087	8,1483	4,8067	68,0937	0,1080	8,7367	4,7697	72,9182	0,0252	2,4360	1,1847	21,6424	0,0027	0,4451	-0,1672	-5,2085
-26	0,1177	8,8230	4,6980	67,7751	0,1174	9,4971	4,6617	72,5749	0,0317	3,0643	1,1595	21,5708	0,0067	1,1044	-0,1699	-5,3897
-25	0,1251	9,3777	4,5803	67,3358	0,1248	10,0958	4,5443	72,0949	0,0386	3,7313	1,1278	21,3807	-0,0096	-1,5824	-0,1766	-5,7090
-24	0,1306	9,7900	4,4552	66,7938	0,1275	10,3142	4,4195	71,5035	0,0371	3,5863	1,0892	21,0579	-0,0234	-3,8572	-0,1670	-5,5055
-23	0,1120	8,3957	4,3246	66,1727	0,1090	8,8176	4,2920	70,8726	0,0098	0,9473	1,0521	20,7600	0,0023	0,3791	-0,1436	-4,8317
-22	0,1212	9,0853	4,2126	65,8453	0,1189	9,6185	4,1830	70,5583	0,0198	1,9140	1,0423	21,0090	0,0006	0,0989	-0,1459	-5,0147
-21	0,1313	9,8425	4,0914	65,3882	0,1270	10,2737	4,0641	70,0934	0,0235	2,2717	1,0225	21,0731	0,0151	2,4890	-0,1465	-5,1485
-20	0,1451	10,8769	3,9601	64,7792	0,1380	11,1636	3,9371	69,5010	0,0301	2,9097	0,9990	21,0733	0,0033	0,5440	-0,1616	-5,8128
-19	0,1501	11,2517	3,8150	63,9467	0,1454	11,7622	3,7991	68,7211	0,0374	3,6153	0,9689	20,9431	0,0129	2,1264	-0,1649	-6,0780
-18	0,1638	12,2787	3,6649	63,0266	0,1629	13,1779	3,6537	67,8079	0,0655	6,3317	0,9315	20,6577	0,0161	2,6539	-0,1778	-6,7237
-17	0,1805	13,5306	3,5011	61,8596	0,1813	14,6663	3,4908	66,5599	0,0731	7,0663	0,8660	19,7314	0,0053	0,8736	-0,1939	-7,5335
-16	0,1702	12,7585	3,3206	60,3714	0,1696	13,7199	3,3095	64,9325	0,0582	5,6260	0,7929	18,5896	-0,0071	-1,1703	-0,1992	-7,9637
-15	0,1805	13,5306	3,1504	59,0397	0,1800	14,5612	3,1399	63,5009	0,0652	6,3027	0,7347	17,7553	-0,0001	-0,0165	-0,1921	-7,9163
-14	0,2036	15,2622	2,9699	57,4824	0,2005	16,2195	2,9599	61,8238	0,0844	8,1587	0,6695	16,7102	0,0150	2,4725	-0,1920	-8,1716
-13	0,2196	16,4616	2,7663	55,4210	0,2184	17,6676	2,7594	59,6588	0,1016	9,8213	0,5851	15,1162	-0,0073	-1,2033	-0,2070	-9,1192
-12	0,2188	16,4016	2,5467	52,9474	0,2170	17,5543	2,5410	57,0108	0,0857	8,2843	0,4835	12,9629	-0,0150	-2,4725	-0,1997	-9,1297
-11	0,2076	15,5620	2,3279	50,3477	0,2068	16,7292	2,3240	54,2712	0,0719	6,9503	0,3978	11,1007	-0,0087	-1,4341	-0,1847	-8,7888
-10	0,2006	15,0373	2,1203	47,9225	0,1976	15,9849	2,1172	51,6404	0,0532	5,1427	0,3259	9,4987	-0,0190	-3,1319	-0,1760	-8,7472
-9	0,2043	15,3147	1,9197	45,5064	0,1999	16,1710	1,9196	49,1060	0,0385	3,7217	0,2727	8,3361	0,0000	0,0000	-0,1570	-8,1837
-8	0,2044	15,3221	1,7154	42,8630	0,2000	16,1791	1,7197	46,3720	0,0385	3,7217	0,2342	7,5464	0,0055	0,9066	-0,1570	-8,6264
-7	0,2077	15,5695	1,5110	40,0459	0,2035	16,4622	1,5197	43,4647	0,0429	4,1470	0,1957	6,6884	-0,0045	-0,7418	-0,1625	-9,4702
-6	0,1936	14,5126	1,3033	36,9262	0,1911	15,4591	1,3162	40,2436	0,0336	3,2480	0,1528	5,5828	0,0020	0,3297	-0,1580	-9,8437
-5	0,1905	14,2802	1,1097	33,9601	0,1905	15,4106	1,1251	37,1569	0,0347	3,3543	0,1192	4,7041	-0,0163	-2,6868	-0,1600	-10,7671
-4	0,1733	12,9908	0,9192	30,8151	0,1765	14,2780	0,9346	33,8115	0,0214	2,0687	0,0845	3,6530	0,0091	1,5000	-0,1437	-10,5931
-3	0,2074	15,5470	0,7459	27,9569	0,2070	16,7454	0,7581	30,6634	0,0328	3,1707	0,0631	3,0498	-0,0202	-3,3297	-0,1528	-12,5935
-2	0,1933	14,4901	0,5385	23,3058	0,1929	15,6047	0,5511	25,7391	0,0215	2,0783	0,0303	1,6911	-0,0241	-3,9726	-0,1326	-12,6193
-1	0,1796	13,4631	0,3452	18,2976	0,1869	15,1194	0,3582	20,4897	0,0088	0,8507	0,0088	0,6015	-0,0204	-3,3627	-0,1085	-12,6464
0	0,1656	12,4136	0,1656	12,4136	0,1713	13,8574	0,1713	13,8574	-0,0290	-2,8033	-0,0202	-1,9527	-0,0881	-14,5221	-0,0881	-14,5221
1	0,0745	5,5846	0,2401	12,7267	0,0869	7,0298	0,2582	14,7695	-0,1128	-10,9040	-0,1330	-9,0910	0,0140	2,3077	-0,0741	-8,6369
2	0,0653	4,8950	0,3054	13,2174	0,0789	6,3827	0,3371	15,7443	-0,0757	-7,3177	-0,2087	-11,6477	0,0050	0,8242	-0,0691	-6,5761
3	0,0851	6,3792	0,3905	14,6363	0,0965	7,8064	0,4336	17,5381	-0,0827	-7,9943	-0,2914	-14,0843	0,0170	2,8022	-0,0521	-4,2940
4	0,1120	8,3957	0,5025	16,8457	0,1251	10,1200	0,5587	20,2124	-0,0701	-6,7763	-0,3615	-15,6279	-0,0025	-0,4121	-0,0546	-4,0249
5	0,1092	8,1858	0,6117	18,7198	0,1247	10,0877	0,6834	22,5696	-0,0721	-6,9697	-0,4336	-17,1116	-0,0209	-3,4451	-0,0755	-5,0807
6	0,0965	7,2338	0,7082	20,0953	0,1145	9,2625	0,7979	24,3963	-0,1030	-9,9567	-0,5366	-19,6055	0,0038	0,6264	-0,0717	-4,4671
7	0,1106	8,2908	0,8188	21,7006	0,1262	10,2090	0,9241	26,4301	-0,1121	-10,8363	-0,6487	-22,1705	0,0042	0,6923	-0,0675	-3,9338
8	0,1267	9,4976	0,9455	23,6254	0,1401	11,3335	1,0642	28,6963	-0,1045	-10,1017	-0,7532	-24,2698	-0,0152	-2,5055	-0,0827	-4,5440
9	0,1076	8,0659	1,0531	24,9637	0,1200	9,7075	1,1842	30,2935	-0,1231	-11,8997	-0,8763	-26,7873	0,0018	0,2967	-0,0809	-4,2170
10	0,1234	9,2503	1,1765	26,5910	0,1336	10,8076	1,3178	32,1423	-0,1206	-11,6580	-0,9969	-29,0557	0,0101	1,6648	-0,0708	-3,5188
11	0,1479	11,0868	1,3244	28,6594	0,1585	12,8219	1,4763	34,4753	-0,1015	-9,8117	-1,0984	-30,6511	0,0032	0,5275	-0,0676	-3,2167
12	0,1626	12,1888	1,4870	30,9156	0,1749	14,1486	1,6512	37,0469	-0,0826	-7,9847	-1,1810	-31,6632	0,0115	1,8956	-0,0561	-2,5647
13	0,1320	9,8949	1,6190	32,4356	0,1477	11,9483	1,7989	38,8926	-0,1019	-9,8503	-1,2829	-33,1440	-0,0232	-3,8242	-0,0793	-3,4935
14	0,1064	7,9759	1,7254	33,3951	0,1254	10,1443	1,9243	40,1931	-0,1071	-10,3530	-1,3900	-34,6933	-0,0140	-2,3077	-0,0933	-3,9709
15	0,0740	5,5472	1,7994	33,7215	0,0942	7,6204	2,0185	40,8219	-0,1397	-13,5043	-1,5297	-36,9678	0,0272	4,4835	-0,0661	-2,7239
16	0,0373	2,7961	1,8367	33,2928	0,0638	5,1611	2,0823	40,8548	-0,1451	-14,0263	-1,6748	-39,2659	-0,0061	-1,0055	-0,0722	-2,8865
17	0,0458	3,4332	1,8825	33,2612	0,0728	5,8892	2,1551	41,0918	-0,1493	-14,4323	-1,8241	-41,5613				