Market Segmentation, Information Asymmetry and Investor Responses in the Chinese A- and B-Markets

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Abstract

This paper examines changes in returns and trading volumes around earnings announcements for firms which have both A-shares (traditionally for local investors only) and B-shares (traditionally for foreign investors only) in China. It considers the impact of regulatory changes which reduced the segmentation of local and foreign investors across the two classes of shares. We find that both the A- and B-markets experience significant price changes around earning announcements. When the two markets are fully segmented, the magnitude of price changes in the A-share market are significantly smaller than the B-market which lends empirical support to the previous claim that the B-market is less informed. The changes in trading volume indicate that the B-market investors have less divergent expectations and interpretations of the pre-disclosure information compared to the A-market investors. However, when regulatory changes reduced the level of segmentation, the price and volume reactions in the two markets became more consistent. The results suggest that the A- and B-markets are more integrated as a result of the regulatory changes.

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1. Introduction

One of the prominent characteristics of the Chinese stock market is the segmentation between the domestic investors and foreign investors. Prior to 2001, China was the only country with total restrictions on foreign participation in the domestic equity market. A-shares listed on the Shanghai and the Shenzhen Stock Exchanges could only be traded by domestic investors. The only opportunity for foreign participation in the Chinese equity markets was through companies that issued a separate, restricted class of shares for foreigners. In Shanghai or Shenzhen foreign investors could trade and own B-shares. These separate classes of shares are legally identical, with the same voting rights and dividends. The only difference between these classes was the investors who could own them. (For historical development of the Chinese stock markets, see Ma (2004)).

In February 2001, as the first step toward opening the domestic market to foreigners, the Chinese authorities announced that the domestic investors would be allowed to invest in the B-market using foreign currency accounts. In November 2002, the Chinese authorities made a further step to open the domestic market to foreign investors. Some selected foreign institutions were allowed to invest in A-shares through the so-called QFII (Qualified Foreign Institutional Investors) provision by the Chinese securities regulatory authority. Hence, overtime there has been a significant reduction in the degree of segmentation across these two markets.

One of the recent interests in finance literature is the information asymmetry between local and distant investors. Brennan and Cao (1997), Choe et al. (2005), and Grinblatt and Keloharju (2000) argue that domestic investors are usually better informed because they have a linguistic and cultural advantage over the foreign investors regarding their local market. A well-known phenomenon of "home bias" can be explained by the information asymmetry across local and foreign investors in international equity markets. The segmentation of local and foreign investors in the Chinese market therefore provides an opportunity to examine differences in the behaviour of these two investor groups. The impact of reductions in the level of segmentation between these investor groups are also used to understand how they interact.

A number of studies argue that there are significant differences in the ease of access to the fundamental information between foreign and domestic investors and between retail and institutional investors in the Chinese market. Chakravarty et al. (1998) argue that due to language barriers, different accounting standards, and lack of reliable information about the local economy and firms, it is more difficult for foreign investors to acquire and assess information about local Chinese firms. Chan et al. (2008) analyse trade and quote data of the Shanghai Stock Exchange (SHSE) and the Shenzhen Stock Exchange (SZSE) from January 2000 to November 2001. Using several measures of information asymmetry including the price impact coefficient, the adverse selection component of the bid-ask spread, and the probability of informed trading (PIN), they find that information asymmetry explains the cross-sectional variation in foreign share discounts. The fact that the information asymmetry measurements are larger in the A-share market suggests that the domestic investors have an informational advantage relative to foreign investors. Further, the trades and quote revisions in the A-share market contain more information than those in the B-market. Thus, the discount of B-shares is largely due to the information asymmetry, as foreign investors are not as well informed as domestic investors.

Brennan and Cao (1997) imply that the investors make their investment based on their private pre-disclosure information as well as historical public information. When a public announcement conveys good or bad news about the firm's fundamentals, investors revise their prior beliefs and predicted payoff. The earnings announcements convey the most important fundamental news about the company. When new information about the earnings is

announced, the revision of investors to their prior beliefs and expected payoff causes a change in market price. The investors with more pre-disclosure information revise their belief less than the investors who have less pre-disclosure information. To examine this, we place our focus on market reactions in both A- and B-shares of China around earnings announcements. If A-share investors have an information advantage over their B-market counterparts as the previous studies suggest, the price revision upon earnings announcements would be lower. When the market became less segmented after 2002 however, as the level of information asymmetry was reduced between the A- and the B-market, the differences in the price revision to the news should be reduced too.

While the announcement of news will cause a change in prices it also causes a change in the trading volume. Beaver (1968) argues that price changes upon the earnings announcement reflects an average change in investors' beliefs, and trading volume arises because of differential belief revisions. In particular, trading volume reactions reflect a lack of consensus regarding the appropriate price of the firm's share and it captures changes in the expectation of individual investors while price reactions reflect changes in the expectations of the market as a whole.

In this study we hypothesise that both price adjustments and volume reactions around earnings announcements will differ across the A- and B-markets. Both the domestic investors in A-markets and the foreign investors in B-markets revise their expectations and interpretation about the earnings of the company based on their own pre-disclosure belief. In particular, the market with more pre-disclosure information, the A-market, should experience a lower adjustment in prices compared to the B-market. This difference is expected to get smaller as the two markets become integrated. Additionally, the A-market was initially dominated by individual investors and the B-market was traditionally dominated by foreign institutional investors. Chakravarty et al. (1998) argue that apart from the official resources for information which are available to both local and foreign investors, the local investors may also take advantage of other informal local information sources that are unavailable to foreigners. Thus the local investors are exposed to a more diverse pre-disclosure information pool and thus have more diverse expectations and interpretations of the upcoming news. If this is the case, we expect to see more reaction in trading volume associated with a price change in A-market. In comparison, foreign institutional investors in the B-market have less divergent expectations and interpretations about the upcoming news, and therefore it should not take much trading activity to induce a price change in the B-market.

We use stocks with both A- and B-shares to examine changes in returns and trading volumes around earnings announcements. We examine the differences in the magnitude of the changes in returns and volumes of A- and B-shares to assess which market reacts more. We consider the period before February 2001 when the markets were completely segmented as well as the period after 2002 when the trading restrictions of the two markets were reduced. This allows us to investigate whether local and foreign investors react differently to the same earnings announcements during a period of complete segmentation and after the regulatory change when the markets are more integrated.

Our findings suggest that there are significant price changes in both of the markets following the announcements. When the two markets were segmented the price reaction in the A-market was significantly smaller than the B-market. However, when trade restrictions across the two markets were reduced in 2002, the differences in price reactions declined and became insignificant. We also find that there was a significant increase in trading volume around or on the announcement day in A-markets prior to 2001 and in B-markets after 2002. The results indicate that local A-market investors possess more diverse expectations and interpretations about the announcements while foreign B-market investors possess less divergent expectations and interpretations when the two markets are segmented. However,

the investor disagreement has increased in B-markets and decreased in A-markets when the two markets are integrated.

The rest of the paper is organised as follows. Section 2 presents previous literature, and section 3 details institutional features of the Chinese market. Section 4 introduces the data and section 5 presents the method employed. The results are reported in section 6 and section 7 concludes.

2. Previous literature

A large number of previous studies have examined differences in the pricing of A- and B-shares in China. Many of these studies examine periods during which the A- and B- share markets were segmented into local and foreign investors, respectively.[2] These studies have consistently shown that when the markets were segmented the B-shares traded at a significant discount to the A shares.[3] The differences in pricing in the A- and B- markets have been explained by a range of factors including information asymmetry, liquidity effects, diversification effects and differential risk premiums.

The existing literature reveals that the earnings information is value relevant in the Chinese market. Su (2003) is one of a few studies to examine the Chinese stock price reactions to changes in earnings per share (EPS). Using a small sample of stocks from 1997 to 1998, he finds that domestic A-share investors do not anticipate the EPS changes and slowly adjust to the new earnings information. However, the international investors in the B-share market predict changes in EPS better and there is little or no abnormal announcement-day effects. Thus, he claims that Chinese A-share markets are speculative while B-share markets are relatively more efficient. Huang (2004) investigates the Chinese stock price reactions to financial announcements in 2002. Contrary to Su's findings, Huang reports that both A-share and B-share stocks respond to the financial announcements. Moreover, B-share prices react more strongly to negative financial announcements than A-shares.

Both of these studies have found that earnings announcements are informationally valuable to investors. However, their findings on the information efficiency of the A- versus the B-market are contradictory. Neither of these studies examined the changes in trading volume. Some accounting literature has suggested that trading volume and returns capture fundamentally different aspects of the market's assimilation of information (Bamber 1986, 1987). Beaver (1968) argues that abnormal trading volume reflects the degree to which individual investors revise their expectations in response to earnings announcements while abnormal returns reflect the aggregate or average revision in expectations. Thus volume reaction may be a more sensitive test of the usefulness of a public disclosure than price reactions. Kim and Verrecchia (1991) agree that price changes reflect the change in the market's average belief, while trading volume preserves differences among individual investors' beliefs that are "cancelled out" in the averaging process that determines the price. Thus price changes and volume changes reveal different perspectives on the "market reaction". To better understand the market responses to earnings announcements in the Chinese market, it is important to examine both the change in trading volume of stocks and the price adjustments.

Gao and Tse (2004) examined about 112 annual earnings announcements on sixty stocks covered by IBES prior to 2000. They argue that the investors in the B-share market react to both the IAS (International Accounting Standards) and PRC GAAP (People's Republic of

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[2] Chan et al. (2007) provides a review of recent studies of the Chinese financial markets.
[3] See for example Chakravarty et al. (1998), Sun and Tong (2000). Bergstrom and Tang (2001), Fung et al. (2000), Fung and Leung (2002), Xu and Fung (2002), Yang (2003), Mei et al. (2004) and Wang et al. (2005).

China Generally Accepted Accounting Principles) earnings announcements, while the A-share investors react only to PRC GAAP earnings reports. They also find that the abnormal trading volumes in the A-share market persist for a longer period than those in the B-share market.

The eventual goal for the Chinese government is to establish an integrated market. A series of regulatory changes since 2001 have reduced the trading restrictions between the A and B-markets. More recently, a number of studies have considered changes in the pricing differentials between the markets following the regulatory change in 2001 and 2002. These studies indicate that the price differentials between A and B shares were reduced following the reduction in market segmentation (Karolyi & Li 2003). If the regulatory change has achieved its goal as other studies suggest, the integration of the markets would have reduced or eliminated the information asymmetry across A- and B-markets. Thus by examining investors' responses in both markets before and after the regulatory change, our study is able to reveal whether the policy change has improved the assimilation of pre-disclosure information in both A and B-markets.

3. Institutional features of Chinese stock market

The Chinese market consists of two stock exchanges: the SHSE and the SZSE. Both exchanges were established in the early 1990s. By the end of 2004, SHSE had 837 listed companies with total market capitalisation of 2,601.43 billion Yuan, and SZSE had 536 listed companies with total market capitalisation of 1,104.12 billion Yuan (SHSE, SZSE Fact Books 2004). Both exchanges utilize a fully electronic order driven trading system and trading rules are essentially the same across the two markets. Most companies listed on the SHSE are large and mainly state-owned, while the companies on SZSE are relatively smaller, with most of these being joint ventures and export companies (Xu 2000). Cross-listing between these two stock exchanges is not allowed.

A Chinese company can issue five types of shares in the domestic markets. These are state shares, legal person shares, employee shares, A-shares, and B-shares. Only A- and B-shares are tradable shares.[4] A-shares are issued to domestic investors while B-shares are issued to foreign investors. B-shares are special Renminbi-denominated ordinary shares but are traded in foreign currency. B-shares are quoted in US dollars on SHSE, and HK dollars on SZSE.

Chinese listed companies announce their earnings and other financial information through four periodic reports. The annual report must be released within four months of the end of each financial year, the half-year report must be published within two months of the end of half-year, and the quarterly reports must be published within one month of the end of each quarter.[5] Listed companies are required to publish their periodic reports on the nominated websites by the China Securities Regulatory Commission (CSRC), and the extract or the full reports must be published in at least one nominated newspaper.[6]

Companies with both A- and B-shares need to prepare two sets of financial statements: one is based on the International Accounting Standard (IAS) for the B-share holders and the other is based on the domestic accounting standard, PRC GAAP, for the A-share holders. Both sets of financial statements are released on the same day. Both A- and B-share holders

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[4] From April 2005, the Chinese government and SFC (Securities and Futures Commission) officially started the reform on the untradeable shares. To be able to gain trading rights, the shareholders of untradeable shares would compensate the shareholders of tradable shares for the negative market impact.

[5] The annual report is to be released no later than 30 April, the half-year report is to be released no later than 31 August and the quarterly reports are to be released within one month after each end of quarter.

[6] The report can also be published in other sources, but no earlier than the time of the release by CSRC.

can access two sets of financial statements. B-shares are usually owned by institutional investors and they also receive half-yearly earnings and dividend reports and an annual report. A-shares are usually owned by domestic individual investors, who are informed about company reports in the newspaper or via other media. Theoretically both domestic and foreign investors are able to access the same information at the same time. However, Chakarvarty, et al. (1998) argue that foreign investors have difficulty acquiring and accessing information about local Chinese firms due to language barriers as well as differences in accounting standards and unreliable information.

4. Data

We selected all Chinese companies with both A- and B-shares listed over the period from August 1995 to March 2005. There are 90 companies with both A- and B-shares: 45 companies listed in SZSE and 45 in SHSE. These companies made a total of 2,422 announcements over the sample period. Any pair of announcements within twenty days of each other were removed from the sample to ensure that we have independent announcements in the sample.[7] This reduced the number of announcements in the sample to 2,115.

Daily stock prices, trading volumes, market value and book to market ratios and interest rates data are obtained from DataStream. The earnings announcement data are obtained from the CSMAR (Chinese Stock Market and Accounting Research) database. Market indices used are the SHSE A- and B-share indices as well as SZSE A- and B-share indices, which are also obtained from DataStream.

Figure 1 and 2 illustrate the market movements of two stock exchange indices from August 1994 to August 2005. For the period prior to mid-2000, the A- and B- markets experienced different dynamics with considerable price differences between the two markets. In particular, B-shares were heavily discounted compared to the A-shares on both exchanges. However, subsequent to the regulatory change in 2001 and 2002 the two markets have become more correlated with each other and there is a convergence in A and B-market price movements starting in mid-2001.

To incorporate the structural breaks of two markets due to the regulatory change, we split our sample into two sub-periods: the period before this change, from 1 August 1995 to 20 February 2001, and the period after this change, from 1 February 2003 to 1 August 2005. We discard the transitional period between 20 February 2001 and 1 February 2003 to be able to better detect the effect of regulatory change.

Table 1 reports summary statistics of the sample from each of the exchanges as at 1 August 2005. There are 45 companies with both A- and B-shares in SHSE and SZSE respectively. These results show that the market value of A-shares in our sample is larger than B-shares for both exchanges.[8] In SHSE, the P/E ratios and trading volumes of A-shares are also larger than the B-shares, which indicates that there is a price premium for A-shares or a price discount for B-shares. There is more trading activity in A-shares than B-shares. The level of trading in A-shares is more volatile than the B-market as shown by the difference in the standard deviation of trading volume in the two markets. However, in SZSE, there is no significant difference in P/E ratio and trading volume between A-shares and B-shares. Since stocks listed on two stock exchanges are subject to same trading rules and reporting requirements, we combined them for our analysis.

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[7] As we are only interested in the reactions from the earnings announcement, we exclude the observation if there are multiple announcements during the twenty-day window.
[8] This might be explained by the restrictions of foreign ownership.

5. Research design

We adopted an event study approach to investigate how A- and B-share investors behave before and after the earnings announcements. Unlike previous studies, we controlled for firm-specific characteristics by considering only those firms with both A- and B-shares. Therefore, the sample of firms included in each category is identical. The difference in behaviour across the A- and B- samples are not driven by firm-specific characteristics. It is well recognised in the finance literature that the stock market dynamics in positive and negative states are asymmetric. In particular, negative shocks to stock returns generate more volatility than a positive shock of equal magnitude (see Nelson 1991; Pagan & Schwert 1990; Campbell & Hentschel 1992; Engle & Ng 1993). We therefore separately analysed the market reactions to good and bad news.

Ideally the earnings announcement study should be conducted using a measurement of earnings surprises. However, as the professional analyst market in China is in its infancy, there are no complete analyst forecast data available to enable us to calculate an earnings surprise.[9] Therefore, we estimated the earnings surprise by examining the return from the previous day's closing price. For both A and B markets, the sample was partitioned into two groups, positive and negative announcements. A positive earnings announcement is defined as an announcement that is associated with an increase in the stock price on the announcement day. A negative earnings announcement is associated with a decrease in the stock price on the announcement day.

We used a 5-day window to measure returns and changes in trading volume before and after earnings announcements. The abnormal return over the event window was calculated as the difference of compound return and the expected return. The return was calculated as:

$$R_{it} = \ln P_{it} - \ln P_{i,t-1}$$

where P_{it} is the closing price of stock i on day t and R_{it} is the actual compound return of stock i on day t.
The abnormal return is calculated as:

$$AR_{it} = R_{it} - E(\tilde{R}_{it})$$

where $E(\tilde{R}_{it})$ is the expected return for stock i on day t.

While all previous studies in the Chinese market have adopted a single index model to compute the expected returns during the event window, we estimated a Fama-French three factor model to adjust for the additional risk relating to the size, and the book-to-market ratio (Fama and French 1993). We adopted this approach because the work of Eun and Huang (2007) and Wang and Di Iorio (2007) shows that both size and book-to-market effects are priced in the Chinese market while beta alone cannot fully measure the systematic risk. That is:

$$E(\tilde{R}_{it}) - R_{ft} = \hat{\beta}_i (R_{mt} - R_{ft}) + \hat{s}_i SMB_t + \hat{h}_i HML_t$$

where SMB_t is the return difference of the portfolio of small stocks and a portfolio of large stocks and HML_t is the return difference of the portfolio of high-book-to-market stocks and portfolio of low-book-to-market stocks. R_{mt} is the return of market index. R_{ft} is the risk-free rate of return.[10] $\hat{\beta}_i, \hat{s}_i, \hat{h}_i$ are estimated from time series regression of each stock.

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[9] IBES has limited earnings forecast data on the Chinese stock market, however, as the forecast data are offered by the foreign institutional brokers, it is not clear how they are relevant to local investors.
[10] The risk-free rate for the A-share market is the China deposit rate and for the B-market is the US three-month Treasury bill rate.

Average abnormal returns AAR_t are calculated as the mean of the difference between the actual return and the expected returns across all announcements during the event window:

$$AAR_t = \frac{1}{N} \sum_{i=1}^{N} AR_{i,t}$$

where N is the number of stocks on day t.

Though the traditional *t-test* is only optimal when the abnormal returns are normally distributed, Brown and Warner (1980, 1985) point out that it generally performs reasonably well with the daily return data. We adopted the cross-sectional test proposed by Pilotte (1992) to account for an increase in return variance during the announcement period.[11] The traditional two sample *t-statistics* are employed to test the differences in returns and across A and B-markets.

In addition to examining the reactions of price changes, we also investigated the market reactions in terms of changes in the trading volume. Previous research examined the level of trading volume during the event window. However, the normal t-statistics are not appropriate as the level of trading volume does not have a standard normal distribution: in fact it is highly skewed and leptokurtic. To avoid this problem, we employed the nonparametric median tests to examine the change in trading volume around the announcements.

We computed the abnormal change in trading volume (AV) for each trading day within the event window where the abnormal change is calculated as follows:

$$AV_{it} = Vol_{it} - \overline{Vol}_i$$

where Vol_{it} is the percentage change of trading volume of stock i on day t. $\overline{Vol}_i$ is the median percentage change of daily trading volume of stock i between -31 day to -11 day prior to the event window. The nonparametric median test for location was adopted to test the significance of the AV_{it}.

Average abnormal change in trading volumes for each trading day within the event window are:

$$AAV_t = \frac{1}{N} \sum_{i=1}^{N} AV_{it} .$$

In addition to comparing the return and volume reactions of both A and B-markets we also adopted a regression to examine whether the reactions from good or bad news on the event day across two markets and different periods of time differ. The cross-sectional regression we run is:

$$AR_i = a + bD_m + cD_p + dD_n + \varepsilon_i ,$$

where AR_i is the abnormal return on the event day for announcement i, and dummy D_m takes 1 for A-market and 0 for B-market. D_p takes 1 for the period before 2001 when the two markets are completely segmented, and 0 for the period after 2002 when the two markets are integrated, dummy D_n takes 1 for negative news and 0 for positive news.

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[11] The t-statistic is calculated as follows:

$$t = (\sqrt{N})AAR_t / SD, \text{ and } SD = \left\{ \sum_{i=1}^{N} (AR_t - AAR_t)^2 / (N-1) \right\}^{1/2} , \text{ where } AR_t \text{ is the abnormal return and}$$

AAR_t is the mean cross-sectional abnormal return on day t of the event window.

5. Results

5.1. Period with complete segmentation

Table 2 depicts the return and volume reactions for negative announcements prior to 2001. There is a significant abnormal return (AR) of -3.1% in the A-market on the event day and -5.1% in the B-market. There is a significant difference of 2% in ARs between the two markets. This result suggests that the A-market was on average more informed or less surprised by the announcements.

When the trading volumes around the announcements were investigated, we found different levels of trading activity in the A- and B-markets. In the A-market, there was no abnormal activity on the day of the announcement, but there was a significant increase in activity on the day prior to and subsequent to the announcement day. Trading activity declined substantially two days after the announcement. It took three days for the trading to digest the news. However, in the B-market, there was no significant change in trading around the announcement. The significant price adjustment occurred in the absence of abnormal volume. A test of the difference in trading volume confirmed that the differences in trading around the announcement across the two markets were significant.

These results indicated that the A-market experienced a significant increase in trading accompanied by a relative small price change, while the B-market experienced a larger price change without significant change in volume. Kim and Verrecchia (1991) claim that it is possible that earnings announcements generate different magnitudes of changes in trading volume and prices. When an earnings announcement generates differential belief revisions among investors, the trading volume is likely to be high relative to the price reaction. Bamber and Cheon (1995) further argue that there are significant conceptual differences between price and volume reactions to informative disclosures. If the investors have identical pre-disclosure expectations and interpretations of the announcement, even if the announcement causes a change in average beliefs which induces a price change, the trading volume may be low. On the contrary, when an announcement generates differential belief revision, trading volume is likely to be high.

The results of Table 2 suggest that in the case of negative announcements, the expectation and interpretation of A-market investors were more diverse and caused the volume to increase prior to the event. However, the diversity of investors' expectations was not sufficient to move price significantly prior to the event, while on the event day the price adjusted significantly when investors became informed. In the B-market the investors had more similar expectations regarding the upcoming announcements, thus, there was no abnormal change in volume prior to the announcement. On the event day the price changed more dramatically when investors became informed. The price adjustment was larger in the B-market because the aggregate market was less informed and the adjustment needed to be bigger.

Table 3 reports the result for positive announcements during this fully segmented period. On the event day, the significant abnormal return in the A-market was 2.5% while in the B-market it was 3.5%. The difference in returns was about -1% across the two markets. Consistent with the results for negative news announcements, the results show that around positive announcements, the A-market was also less responsive than the B-market on the event day. Additionally, there was some information leakage in the B-market as the abnormal returns appeared to be significant five days before the announcement and one day before the announcement. The results here appear to show that it took longer for the B-market to adjust its price compared to the A-market, and that the adjustment was also larger in magnitude.

The tests on trading volume show similar results to negative announcements. In the A-market, there was a significant increase in trading on the event day and the day after the

announcement. There was a drop off in trading in the following days. Hence trading volume increased prior to negative news, but did not adjust ahead of positive news. Similar to the case of negative news, it also took longer in the A-market for the market to adjust to the positive news. This suggests that A-market investors anticipated the negative news earlier than the positive ones. Thus in the positive case, the abnormal trades occurred immediately upon the announcements when everyone was informed. In the B-market however, the reaction in volume is similar to the negative announcements, in which there generally was no significant increase or decrease in volume around the announcement. The results suggest that the B-market investors probably also had more similar expectations about positive news during the event window. On the event day, the price adjustment in the B-market was also larger as the overall market was less informed.

Overall the results during this period indicate that the price adjustment in the A-market was less than the B-market for both positive and negative news. This is consistent with previous findings about information asymmetry across the two markets, which indicate that the B-market is less informed (Chan et al. 2008). However, our volume results also suggest that during this fully segmented period, the trading activity across the event window also differed in the two markets. In particular, it took longer in the A-market for the trading to be adjusted to a small price reaction, while in the B-market there was no significant change in trading, just a big price reaction instead.

In the Chinese market, A-shares are mainly owned by individual investors while there are more institutional investors in the B-share market.[12] The results in this period of time may have been due to the fact that domestic individual investors source and interpret the information more diversely, and thus it takes more trading to induce a relatively small price reaction compared to their B-counterparts. The main investors in the B-marketare foreign institutional investors who seem to predict and digest the upcoming news in a more unanimous way, and thus it does not take any trading to induce a larger price reaction. Additionally, there was no apparent difference in trading activity of the B-market regardless of the news type, whereas the A-market investors anticipated and traded more on negative news than positive news. Given the fact that short selling is not allowed in China, it appears local investors sell out of their positions when companies announce bad news.

5.2. Period with reduced market segmentation

Table 4 and Table 5 provide results for the period with reduced market segmentation.

Table 4 summarizes the results for negative announcements. The abnormal return was -1.8% in the A-market on the event day. For the B-market, the abnormal return on the event day was -1.9%. Compared to the pre 2001 period the price adjustments in both of the markets was smaller in magnitude, which suggests that the information content of the news was smaller. Contrary to the results prior to 2001, there is no significant difference in abnormal returns across the two markets on the event day. The results here suggest that although the price reactions in the A-market were still smaller than the B-market, the difference between the two markets declined and was no longer statistically significant. Additionally, there was a significant positive return one day before the bad news in the B-market. Over this sample period, B-market investors did not anticipate the news correctly.

For the trading volume results, the A-market did not have a significant change on the event day while the B-market had some significant volume reactions. The test of difference in volume confirms that. The trading volume increased significantly on the announcement day

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[12] For example, in 1995, the proportion of institutional investors in the SHSE A-market was 0.57% compared to 16.47% in the B-market[12] (Huang, 2004; Gao and Tse, 2004).

after a decrease one day before the announcement. This suggests that the B-market investors were more confused about their expectation of the upcoming news.

The trading pattern in the B-market post 2002 was quite different from the pre-2001 period. In the early period there was a large price change on small volumes while in the later period there was a significant increase in trading accompanied by a smaller price change. According to the arguments of Kim and Verrecchia (1991) and Bamber and Cheon (1995), the significant increase in trading volume in the B-market suggests that the expectations of investors are more diverse now than the period before 2001. The qualified institutional investors could trade in the domestic markets while the domestic investors could invest in the B-shares during this period, thus we believe the mixture of both local and foreign investors in the B-market has increased the diversity in investors' expectations about the news.

For positive announcements, Table 5 indicates that the abnormal return was 2% in the A-market and 2.4% in the B-market on the event day. The difference between returns across the two markets is also not significant, which is consistent with the results from the negative announcements that the information asymmetry across two markets has been reduced. Interestingly there is significant negative price adjustment in both of the markets prior to the good news. We suspect that the incorrect predictions of upcoming news in both markets were a result of some regulatory reform which initiated in late 2004. As shown in figure 1 and 2, from 2004 the Chinese stock market experienced a tremendous round of price decline. This bear market was triggered by the effort of Chinese government and the SFC (Securities and Futures Commission) to further reform the untradeable shares in the market. Releasing the untradeable shares held by states into the market increased the supply of new shares and thus was widely taken as negative news to investors who owned tradable shares at the time (Kwan 2005a, 2005b; Bortolotti & Beltratti 2006). Starting from 2004 the Chinese market was overwhelmed by negative sentiment due to this reform which officially launched in April 2005. Under such a gloomy and uncertain environment, it is not surprising that the investors had a negative outlook in general despite a positive earnings shock.

Again there was no change in trading volume on the A-market. In the B-market however, there was a significant increase in trading on event day, and the trading were reversed on day 1 and 2. Similar to the case for negative announcements, the B-market experienced significantly more trading compared to the A-market. The changes in the B-market suggest that with a mixture of both domestic and foreign investors over this period of time, not only was the information asymmetry reduced as reflected by the disappearance of return differences, but there were more diverse opinions about the upcoming news.

In general, the results after 2002 show that with reduced segmentation the difference in price adjustments across the two markets prior to 2001 became smaller and not significant upon the announcement days. The results support the improvement in information dissemination after the regulatory change in the B-market. Interestingly, during this period of time, we saw significant increases in trading for both negative and positive announcements in the B-market contrary to the pre-2001 period. This suggests that the B-investors seemed more confused. It took more trading in the B-market to induce the price change. As both domestic and foreign investors now trade together, the interactions of both informed and uninformed investors may have caused the prediction and pre-disclosure information to be more diverse.

Table 6 provides the results of the cross-sectional regression of price reactions of all announcements on the event day. Both the coefficient for market dummy and period dummy are significant at 95% confidence level which is consistent with our previous results that the price reactions between A- and B-market as well as across different time horizons were different. However, the coefficient for dummy measuring the news type is not significant, which suggests that the reactions to negative versus positive news are consistent.

6. Conclusion

The results of our study show that the earnings announcements were informationally valuable to both the A- and B-market over the whole sample period. There were significant price reactions in both of the markets on the announcement day. However, the price reaction in the A-market was significantly smaller than the B-market when the two markets were segmented. The larger price adjustment in the B-market offers empirical support to the previous claim that the A-market investors had an informational advantage over B-market investors (Chakravarty et al. 1998; Chan et al. 2008). However, when trade restrictions across the two markets were reduced in 2002, the differences in price reactions declined and became insignificant. This suggests that the regulatory changes improved the informational dissemination process in the B-market.

The trading activity of the A- and B- investors around announcements was also different when the two markets were segmented. To be associated with the price reaction, there were only increases in trading volumes in the A-market around the announcements and this result indicates that prior to 2001 the domestic investors appeared to have more diverse expectations and interpretations about the announcements compared to their B-market counterparts who were essential institutional investors. After 2002, when the local investors were allowed to trade in the B-market, the B-market started to experience significant increases in trading volume upon the news. The mixture of domestic and foreign investors after 2002 caused more diverse opinion about the upcoming news in the B-market and more consistent expectations about the upcoming news in the A-market compared to the pre-2001 period.

Our results clearly indicate that the information assimilation upon the earnings announcements to the local investors and foreign investors were different in the Chinese case. The results of this study have pointed out some interesting issues for future research. As the stock markets were only established in China three decades ago, the general perception is that the domestic investors are less educated about the functioning of the stock market and relatively less sophisticated than investors in other developed markets.[13] However our results suggest that the A-market is actually more informed. Thus whether/how the different behavioural biases among local and foreign investors as suggested by Odean (1998, 1999) contribute to the information assimilation process in the market is an interesting issue which is a subject for future research.

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Figure 1. Shanghai Stock Exchange A-share Index and B-share Index (01/08/1994 – 01/08/2005)
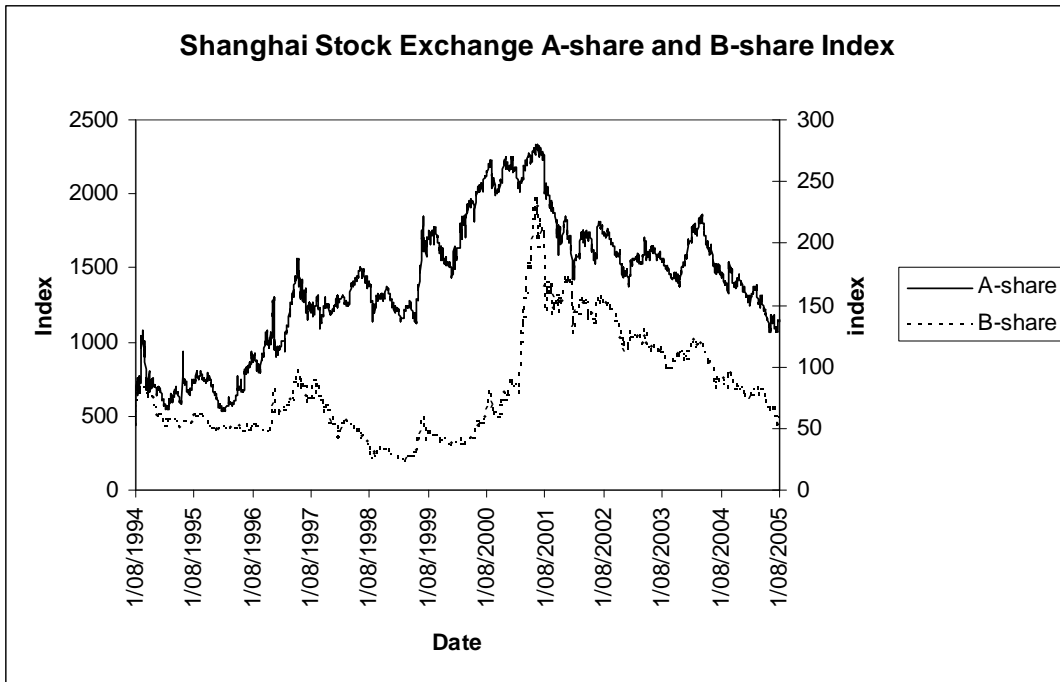
Figure 2. Shenzhen Stock Exchange A-share Index and B-share Index
(01/08/1994 – 01/08/2005)
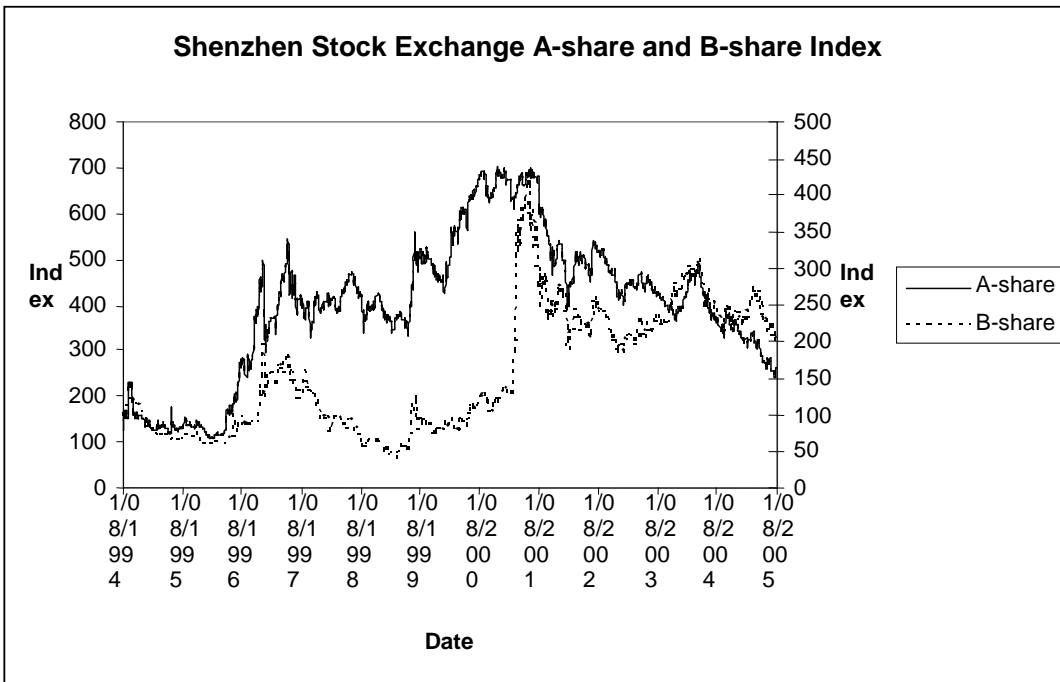
Table 1. Summary Statistics

	Shanghai Stock Exchange			Shenzhen Stock Exchange		
	A	B	T-statistics	A	B	T-statistics
Market Value	72915.03	18904.39	7.968**	105157.9	34768.15	3.3313**
Std.	(1317.23)	(494.52)		(2732.96)	(1324.23)	
P/E ratio	77.9	68.34	2.346**	125.18	98.75	0.2998
Std.	(110.054)	(251.56)		(363.02)	(358.59)	
Trading volume	1504.9	748.50	2.530**	4550.67	927.14	1.2593
Std.	(2364.42)	(1272.32)		(18115.81)	(1729.85)	

Table 1 reports summary statistics for the sample stocks. There are 45 companies with both A and B-shares in each market. Market value is the total market value in millions of Chinese Yuan. P/E ratio is the average price earnings ratio. Trading volume is the average daily trading volume in terms of number of shares traded in units of 1000. The SHSE B-shares are denominated in US dollars. The market value has been converted to Chinese Yuan at exchange rate 1USD=7.8Yuan. The SZSE B-shares are denominated in Hong Kong dollars. The market value has been converted to Chinese Yuan at an exchange rate 1HKD=0.95 Yuan. The T-statistics are from a two sample t-test. Standard deviations are reported in italics. **indicates the significance at 5% level.

Table 2. Price and Volume Reactions to Negative News Pre-2001

Window	A-Market (observation 369)					B-Market (observation 224)					Diff in return		Diff in vol	
	Return	t-test	Vol	Sign-M	Sign-P	Return	t-test	Vol	Sign-M	Sign-P		t-test	Z	P
-5	0.002	1.468	0.052	14.5	0.145	-0.001	-0.459	0.044	2	0.842	0.003	1.225	-0.307	0.380
-4	-0.001	-0.429	-0.008	-2.5	0.835	-0.002	-0.862	-0.112	-9	0.256	0.001	0.500	-1.153	0.125
-3	0.000	0.086	0.052	18.5	0.061	-0.001	-0.372	-0.104	-10	0.204	0.001	0.354	**-2.168**	**0.015**
-2	-0.001	-0.659	0.004	1.5	0.917	-0.001	-0.629	0.027	2.5	0.789	0.001	0.228	0.254	0.340
-1	0.002	1.701	**0.075**	**28.5**	**0.004**	0.002	0.849	-0.044	-4.5	0.592	0.000	0.073	**-2.119**	**0.017**
0	**-0.031**	**-22.190**	-0.037	-8.5	0.405	**-0.051**	**-19.512**	0.028	1.5	0.894	**0.020**	**6.791**	0.424	0.336
1	-0.003	-1.946	**0.077**	**24.5**	**0.012**	0.003	1.019	-0.137	-11.5	0.140	-0.005	-1.802	**-2.288**	**0.011**
2	-0.001	-0.553	**-0.169**	**-48.5**	**<.0001**	0.002	0.955	0.054	8.5	0.284	-0.003	-1.103	**3.305**	**0.001**
3	0.000	0.268	-0.017	-8.5	0.405	-0.002	-0.882	-0.007	-2.5	0.789	0.002	0.893	0.254	0.340
4	0.000	0.173	-0.016	-1.5	0.917	0.003	1.452	-0.052	-2.5	0.789	-0.002	-1.122	-0.254	0.340
5	0.000	-0.230	-0.048	-16.5	0.095	-0.003	-1.488	-0.156	-9.5	0.228	0.003	1.206	-0.932	0.176

This table reports returns and changes in volumes around negative earnings announcements for the period 01/08/1995 to 20/02/2001. 'Return' is the abnormal return calculated using a Fama-French three factor model. The test for abnormal return and difference in returns is the t-test. 'Vol' is the change in volume calculated as the difference between the median change during the event window and the median of same variable over previous 20 days. Sign-M and Sign-P are from the nonparametric sign test for location. The 'Diff in vol' reports the Z value of a median two-sample test on volume differences and its P value. The significant values at 5% level are in bold.

Table 3. Price, Volume Reaction to Positive News Pre 2001

Window	A-Market (observation 336)					B-Market (observation 186)					Diff in Return		Diff in vol	
	Return	t-test	Vol	Sign-M	Sign-P	Return	t-test	Vol	Sign-M	Sign-P		t-test	Z	P
-5	-0.001	-0.456	0.001	1	0.957	0.000	0.049	0.096	7	0.341	-0.001	-0.441	1.278	0.101
-4	0.002	0.761	-0.019	-8	0.413	0.004	1.731	-0.140	-8	0.271	-0.002	-0.937	-0.730	0.233
-3	0.001	0.335	0.025	7	0.478	0.002	1.049	-0.134	-13	0.067	-0.002	-0.647	**-2.192**	**0.014**
-2	-0.003	-1.412	0.001	0	1	-0.001	-0.628	-0.106	-6	0.420	-0.002	-0.832	-0.913	0.181
-1	0.000	-0.028	0.024	9	0.354	**0.005**	**2.292**	-0.147	-6	0.420	**-0.005**	**-2.053**	-1.096	0.137
0	**0.025**	**8.583**	**0.420**	**70**	**<.0001**	**0.035**	**14.994**	-0.062	-4.5	0.557	**-0.010**	**-3.691**	**-3.834**	**<.0001**
1	0.001	0.484	**0.115**	**29**	**0.002**	-0.004	-1.640	-0.074	-9	0.213	0.005	1.887	**-2.739**	**0.003**
2	-0.002	-0.967	**-0.119**	**-36**	**0.0001**	0.002	0.875	-0.066	-6	0.420	-0.004	-1.670	0.913	0.181
3	0.000	-0.062	**-0.065**	**-24**	**0.010**	0.000	0.155	-0.076	-6	0.420	0.000	-0.195	-0.183	0.428
4	0.000	-0.010	**-0.051**	**-21**	**0.025**	-0.001	-0.575	0.046	3	0.714	0.001	0.483	0.730	0.233
5	-0.001	-0.400	**-0.088**	**-23**	**0.014**	0.000	-0.048	-0.071	-8.5	0.239	-0.001	-0.384	0.307	0.380

This table reports returns and changes in volumes around positive earnings announcements for the period 01/08/1995 to 20/02/2001. 'Return' is the abnormal return calculated using a Fama-French three factor model. The test for abnormal return and difference in returns is the t-test. 'Vol' is the median change in volume calculated as the difference between the median change during the event window and the median of same variable over previous 20 days. Sign-M and Sign-P are from the nonparametric sign test for location. The 'Diff in vol' reports the Z value of a median two-sample test on volume differences and its P value. The significant values at 5% level are in bold.

Table 4. Price, Volume Reaction to Negative News Post 2002

Window	A-Market (observation 240)					B-Market (observation 140)					Diff in return		Diff in vol	
	Return	t-test	Vol	Sign-M	Sign-P	Return	t-test	Vol	Sign-M	Sign-P		t-test	Z	P
-5	0.001	0.965	0.015	1.5	0.898	0.000	0.035	0.065	2	0.800	0.001	0.586	0.251	0.401
-4	0.001	0.502	0.001	0.5	1.000	-0.002	-1.608	-0.071	-8	0.205	0.003	1.534	-1.022	0.153
-3	0.001	0.780	-0.029	-5.5	0.520	-0.002	-1.073	-0.086	-6	0.353	0.002	1.325	-0.386	0.350
-2	0.001	1.030	**0.083**	**15.5**	**0.052**	0.001	0.961	0.120	5	0.447	0.000	0.032	0.212	0.416
-1	0.000	0.271	0.007	0	1.000	**0.005**	**3.316**	**-0.133**	**-12**	**0.052**	**-0.004**	**-2.281**	**-1.699**	**0.045**
0	**-0.018**	**-15.530**	-0.030	-5	0.561	**-0.019**	**-12.542**	0.233	12	**0.052**	0.001	0.311	**2.337**	**0.010**
1	-0.002	-1.285	0.007	2.5	0.796	0.002	0.990	-0.105	-9	0.150	-0.003	-1.584	-1.497	0.069
2	-0.001	-1.007	-0.024	-9	0.273	0.000	-0.048	-0.012	-3	0.673	-0.001	-0.508	0.425	0.336
3	-0.001	-0.773	0.004	1	0.949	-0.001	-0.579	-0.029	-3	0.673	0.000	-0.088	-0.425	0.336
4	-0.001	-1.042	-0.022	-5	0.561	-0.001	-0.533	-0.119	-12	0.052	-0.001	-0.286	-1.487	0.069
5	-0.001	-0.475	0.032	7	0.401	-0.002	-1.327	-0.068	-3	0.673	0.001	0.732	-0.637	0.262

This table reports returns and changes in volumes around negative earnings announcements for the period 01/02/2003 to 01/08/2005. 'Return' is the abnormal return calculated using a Fama-French three factor model. The test for abnormal return and difference in returns is the t-test. 'Vol' is the median change in volume calculated as the difference between the median change during the event window and the median of same variable over previous 20 days. Sign-M and Sign-P are from the nonparametric sign test for location. The 'Diff in vol' reports the Z value of a median two-sample test on volume differences and its P value. The significant values at 5% significance level are in bold.

Table 5. Price, Volume Reaction to Positive News Post 2002

Window	A-Market (observation 203)					B-Market (observation 106)					Diff in return		Diff in vol	
	Return	t-test	Vol	Sign-M	Sign-P	Return	t-test	Vol	Sign-M	Sign-P		t-test	Z	P
-5	**-0.005**	**-3.830**	-0.036	-7.5	0.326	**-0.003**	**-2.136**	**-0.181**	**-12**	**0.025**	-0.002	-1.117	-1.395	0.082
-4	-0.001	-0.363	0.043	9	0.232	**-0.003**	**-1.968**	0.040	2	0.771	0.003	1.281	0.000	0.500
-3	**-0.003**	**-2.384**	0.054	6	0.439	-0.003	-1.767	0.071	5	0.382	0.000	0.078	0.240	0.405
-2	**-0.004**	**-2.675**	-0.018	-2	0.833	0.000	0.061	0.119	7	0.207	-0.004	-1.651	**1.676**	**0.047**
-1	**-0.003**	**-2.234**	-0.082	-8	0.291	-0.001	-0.541	0.029	2	0.771	-0.002	-0.827	1.197	0.116
0	**0.020**	**14.211**	0.035	5	0.527	**0.024**	**12.142**	0.538	27	**<.0001**	-0.004	-1.627	**4.071**	**<0.0001**
1	0.002	1.091	-0.058	-13	0.078	0.001	0.692	**-0.260**	**-16**	**0.002**	0.000	0.180	**-2.395**	**0.008**
2	-0.001	-1.206	-0.009	-2	0.833	0.000	-0.236	**-0.247**	**-14**	**0.008**	-0.001	-0.631	**-2.395**	**0.008**
3	0.001	0.938	0.008	0	1.000	0.002	1.441	-0.035	-3	0.627	-0.001	-0.274	-0.718	0.236
4	-0.002	-1.490	0.002	0	1.000	0.002	1.125	0.095	6	0.285	-0.003	-1.804	0.958	0.169
5	0.000	0.423	-0.031	-6	0.439	0.000	-0.149	0.025	3	0.627	0.001	0.396	0.718	0.236

This table reports returns and changes in volumes around positive earnings announcements for the period 01/02/2003 to 01/08/2005. 'Return' is the abnormal return calculated using a Fama-French three factor model. The test for abnormal return and difference in returns is the t-test. 'Vol' is the median change in volume calculated as the difference between the median change during the event window and the median of same variable over previous 20 days. Sign-M and Sign-P are from the nonparametric sign test for location. The 'Diff in vol' reports the Z value of a median two-sample test on volume differences and its P value. The significant values at 95% significance level are in bold.

Table 6. Cross-section Regression of Price Reactions on announcement day

	Constant	Market	Period	News type
Coefficients	0.079	-0.012	-0.025	0.004
t-statistics	(26.639**)	(-4.279**)	(-8.651**)	(1.528)
R-square	0.042			
Adjusted R-square	0.041			

This table present regression results for

$$AR_i = a + bD_m + cD_p + dD_n + \varepsilon_i$$

Where AR_i is the abnormal return on the event day for announcement i, and dummy D_m takes 1 for A-market and 0 for B-market, D_p takes 1 for period before 2001 when two markets are completely segmented and 0 for period after 2002 when two markets are integrated, dummy D_n takes 1 for negative news and 0 for positive news.
** indicates 5% significance level.