Understanding the Variation of Foreign Share Price Discounts – A Study of Dual-listed Chinese Firms

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Abstract

This paper investigates the drivers of the price discount between Chinese cross-listed shares (A shares traded mainly by domestic investors; B- and H- shares traded mainly by foreign investors). Extending the variance decomposition framework of Vuolteenaho (2002), we decompose the unexpected price discount into two terms: the difference in expected return news and the difference in cash flow news between the foreign and domestic equity markets. Our results show that differences in expected return news overwhelmingly dominate differences in cash flow news in driving the variation of the price discount. This suggests that to a large extent, market or macro shocks, rather than firm-specific shocks drive the price discount of the cross-listed shares.

1. Introduction

Since the establishment of the Shanghai and Shenzhen stock exchanges in the early 1990's, a number of Chinese firms have issued identical shares to different investor groups, specifically, A-class shares to domestic investors and B-class (and H-class) shares to foreign investors.[1] Although voting and cash flow rights are the same for both A- and B-shares, they often trade at different prices ostensibly because of market segmentation that limits arbitrage. Moreover, in contrast to other segmented markets, such as Indonesia, Korea, Malaysia, Mexico, Norway, Philippines, Singapore, Switzerland, Taiwan, and Thailand (Bailey, Chung and Kang, 1999), where foreign designated shares trade largely at a premium relative to local shares, foreign-held B-shares often trade at a discount relative to the corresponding domestic A-shares.

Subsequent regulatory developments in these markets served to reduce market segmentation and the size of the average discount but, nevertheless, the phenomenon persists. The Chinese Securities Regulatory Commission opened the B-share market to local retail punters in February 2001 in an attempt to increase trading volume. Domestic investors were permitted to trade in the B-share market, using US dollars in Shanghai and Hong Kong dollars in Shenzhen. Yet, except for the initial months after the partial liberalization of the B-share market, only minor improvements occurred in terms of increased liquidity in the B-share market and reduction in the average discount. Changes to the A-share market due to increased access by foreign institutions under the Qualified Foreign Institutional Investor (QFII) rules, announced in November 2002, were relatively ineffective. By contrast, the announcement of the Qualified Domestic Institutional Investor Program (QDII) in April 2006 and the burgeoning new share listings in late

[1] For simplicity, in what follows, we refer mainly to A- and B-shares (with A- and H-shares understood) until the empirical section of this paper.

2006 and 2007 were more effective in reducing the price gap between A- and H- shares.[2] Despite these liberalizations, by mid-2007, listed B-shares sold at an average discount of 35% relative to A-shares.

The anomalous differential pricing of identical shares in terms of voting and cash flow rights, not to mention the relative discounting of foreign to domestic shares, has generated extensive research by finance scholars to explain these phenomena. A number of potential explanations of the discount have been offered by the literature, most prominently, differences in risk attitudes between foreign and domestic investors (Ma, 1996 and Eun, Janakiramanan and Lee, 2001) coupled with concerns over corporate governance (Tong and Yu, 2007) and information asymmetry by foreign investors relative to domestic investors (Chan, Menkveld and Yang, 2006). The latter is also presumed to be the cause of illiquidity in the B-share market relative to the A-share market because informed trading increases adverse selection costs which, in turn, deters trading activity.

This paper provides a new perspective on this literature by examining the drivers of the price discount variation over time. Since share price is the sum of the discounted expected future cash flows over the lifetime of the firm, revisions to share price are necessarily driven by shocks (revisions) to future expected cash flows, called cash flow news, and/or shocks to future expected returns, called expected return news, over the lifetime of the firm. We extend the variance decomposition methodologies of Campbell and Shiller (1998 a,b), Campbell (1991), Vuolteenaho (2002), and Callen and Segal (2004) to evaluate the contribution of cash flow news and expected return news in driving the variability of the price discount between B-shares and A-shares.

[2] China's securities regulators allowed companies to convert non-tradable shares held primarily by government companies into tradable shares.

Prior to evaluating the discount, we focus our analysis on each of the A-share and B-share markets separately. While prior studies using U.S. data find that the firm-level stock returns are mainly driven by cash-flow news, emerging stock markets may be driven (at least partially) by other factors. The finance literature has shown that emerging stock markets are different from the developed stock markets. For example, Morck, Yeung and Yu (2000) find that stock prices are less synchronous the more developed is the economy. Indeed, in contrast to US studies, we find that expected return news significantly dominates earnings news in driving the variability of A-share returns. Conversely, and consistent with US studies, we find that cash flow news significantly dominates expected return news in explaining the variability of B-share returns. Since this study measures cash flow news using accounting earnings and book values (see below), these results suggest that investors in the foreign B-share market behave more like U.S. investors, who rely primarily on corporate financial reports in forming valuation expectations. Hence, for these foreign investors, cash flow news tends to dominate expected return news in determining stock return variation. In contrast, these results also suggest that domestic Chinese investors in the A-share market do not overly rely on corporate financial reports in determining A-share prices, but focus instead on macro-level news such as interest rate changes, currency exchange rate changes, regulatory shocks, and government interventions. It appears that accounting information captured by cash flow news is less relevant in the domestic China stock market by comparison to the foreign B-share market.

We further extend the variance decomposition framework to show that the variation in the price discount is determined by the relative impact of earnings news and expected return news in both the domestic A-market and the foreign B-market. Specifically, we decompose the unexpected price discount into two terms: the *difference* in expected return news between the A-share and B-share markets and the *difference* in cash flow news between the A-share and

B-share market. Thus, the revision to the foreign share price discount increases (decreases) either because expected return news for domestic A-shares is greater (smaller) than expected return news for foreign B-shares, or because cash flow news for A-shares is smaller (greater) than cash flow news for B-shares, or both.

Our findings document a large variation in the foreign share price discounts between 1995 and 2006. Most crucially, we find that the difference in expected return news between domestic and foreign markets has a much greater economic effect on driving the price discount than cash flow news differences. Indeed, while the difference in cash flow news between domestic and foreign investors is *relatively* small, the difference in expected return news between foreign and domestic investors accounts for about 74% of the total variation of the price discount, suggesting that it is primarily macro-economic news that drives the price discount rather than idiosyncratic cash flow news.

The paper is organized as follows. Section 2 briefly reviews the literature. Section 3 extends the variance decomposition framework to encompass the price discount. Section 4 discusses the data and the methodology employed. Section 5 presents the empirical results. Section 6 tests the robustness of the results. Section 7 concludes.

2. Literature Review

With the introduction of B-shares in 1992, Chinese domestic and foreign markets were segmented. Domestic investors were initially restricted to trading only in A-shares while foreign investors traded only in B-shares. Typically when there is segmentation between domestic and foreign investors, foreign shares trade at a premium over domestic shares and the premium is stationary (Ahlgren, Sjoo and Zhang, 2003). Stationary likely occurs because domestic and foreign investors have the same information sets in the long run. In contrast, China’s foreign

B-class shares trade at a significant discount over domestic A-class shares. Moreover, since direct arbitrage is infeasible and information sets potentially different, the two investor groups appear to determine equity prices independently of each other.

Beginning with Bailey (1994), price discovery and information diffusion between domestic and foreign investors in Chinese markets have been the subject of many papers. Research regarding the relationship between A-share and B-share pricing behavior has been conducted along several dimensions.

2.1 The pricing behavior and efficiency of the Chinese stock markets

The early strand of the literature uses A- and B- individual shares and market indices to examine pricing behavior and market efficiency in Chinese equity markets. Bailey (1994) examines early 1990's share prices of eight companies listed on the Shanghai and Shenzhen stock exchanges and finds little evidence of association between China's B-share returns and international stock returns. Laurence, Cai and Qian (1997) provide early evidence regarding the weak-form efficiency of Chinese stock market. Using serial correlation tests, they conclude that the domestic A-share market is weak-form efficient, while the B-share market is not. Chui and Kwok (1998) investigate cross-autocorrelations of A- and B- share returns. They find that returns on B-shares lead returns on A-shares, which, they argue, may reflect the informational advantage of foreign investors. Long, Payne and Feng (1999) analyze the impact of information transmission on market efficiency and on the price-volume relation in A- and B- shares listed on the Shanghai stock exchange. They argue that information disseminates more smoothly in the presence of institutional investors, and this might explain why B-shareholders are better informed than A-shareholders. Mookerjee and Yu (1999) report evidence against the efficient market hypothesis. They find both autocorrelation and seasonality in returns.

2.2 Asymmetric Information and price differentials

The second strand of the literature uses asymmetric information models and time series empirical tools to demonstrate that Chinese markets are not efficient. Findings of a unit root in the A-share price premium and no co-integration between A- and B- share prices suggest that domestic and foreign investors have different information sets and do not share information in the long run. Sjöö and Zhang (2000) find that the direction of information diffusion is determined by the choice of stock exchange (Shanghai or Shenzhen). They also find that there is no co-integration between A- and B-share prices and domestic investors have an informational advantage relative to foreign investors. Chakravarty, Sarkar and Wu (1998) and Bergström and Tang (2001) argue that the A-share price premium is due to market segmentation arising out of information asymmetry due to differences in accounting standards and disclosure requirements. A-shares trade at a higher premium if domestic investors have better information, thereby increasing the degree of information asymmetry. Chan, Menkveld and Yang (2006) examine the effect of information asymmetry on equity prices in the domestic A- and foreign B-share markets based on micro-structure models. They find that their measures of information asymmetry explain a significant portion of cross-sectional variation in B-share discounts, even after controlling for other factors. Moreover, foreign investors are more sensitive to macro-economic factors like currency risk as explained by Sun and Tong (2000). B-share prices experience deeper discounts when China's inflation goes up and its official reserve deteriorates.

In addition to segmentation theory, other models have been proposed to explain the discount phenomenon. They include the liquidity differential model and the risk differential model.

2.3 Risk differentials

The third strand of literature argues that domestic and foreign investors differ in their risk aversion. Specifically, Chinese markets are highly speculative and attract highly risk tolerant investors who tend to push up domestic share prices (Mei, Sheinkman, and Xiong (2003)). Another reason may be due to differences in risk exposures between domestic and foreign investors arising out of capital controls that restrict the domestic investors from diversifying overseas. As a consequence, the risk of A- and B- shares is evaluated based on different investment benchmarks.

The empirical findings are mixed. Ma (1996) shows that cross-sectional differences between prices of A-shares and B-shares are correlated with investors' attitudes towards risk. Extending the equilibrium international asset pricing model of Eun and Janakiramanan (1986), Eun, Janakiramanan and Lee (2001) find that the B-share discount is positively related to the covariance risk of B-shares with the Morgan Stanley world market index; yet, they fail to find a negative relation with the covariance risk of A-shares and the Chinese market index. While Sun and Tong (2000) also find a positive relationship between B-share discount and risk levels, Chen, Lee and Rui (2001) apply the same proxy to the ratio of A to B-share return variances but find no significant results.

2.4 Liquidity differentials

The fourth strand of the literature uses the trading activity framework of Amihud and Mendelson (1986) to explain the price discount. Because A-share markets have been consistently and predominately more liquid than B-share markets, B-shares should have a higher expected return and be priced lower to compensate investors for increased trading costs. Chen, Lee and Rui (2001) find supportive evidence for this conjecture based on the relative trading volume and relative turnover of B- and A-shares. They find that both proxies are strongly negatively related to the discount. Chen and Xiong (2001) find similar results by comparing restricted institutional shares with their unrestricted counterparts. Jiang and Wang (2004) also find support for the liquidity hypothesis by confirming that the share discount is highly correlated with relative market illiquidity proxies.

Unlike the prior literature which focuses primarily on analyzing mean effects, the purpose of this study is to determine the major factors that drive the *variability* of the discount, using the variance decomposition methodology. The next section describes the variance decomposition methodology as it applies to the price discount.

3. The Variance Decomposition of the Foreign Share Price Discount

Campbell and Shiller (1988a,b), Campbell (1991) and Campbell and Ammer (1993) develop a return decomposition based on a log-linear dividend growth model. The well-known stickiness of dividends for dividend paying firms and the fact that many firms do not currently pay dividends limit the potential empirical usefulness of the log-linear dividend growth model. To attenuate these problems, Vuolteenaho (2002) further developed a return decomposition that uses the accounting Clean Surplus identity—the change in book value equity equals earnings less dividends--to replace dividends with return on book value equity (ROE). In addition to the clean surplus identify, two additional assumptions are required for this transformation. First, book value equity and net dividends have to be strictly positive. Second, the difference between log book equity and log market equity has to be stationary.

In what follows, we apply the Vuolteenaho (2002) model to decompose returns to A-shares, to B-shares and to the price discount. The basic Vuolteenaho (2002) model can be written in the form:[3]

[3] In contrast to Vuolteenaho (2002) who decomposes unexpected returns, our focus is on the price discount.

$$b_t - p_t = k_t + E_t\left[\sum_{j=0}^{\infty}\rho^j r_{t+1+j} - \sum_{j=0}^{\infty}\rho^j e_{t+1+j}\right] \quad (1)$$

where E_t is the expectation operator based on all information available at time t, and where the log cum dividend stock return (gross of the risk-free rate) is denoted by r_t, the log return on book value equity by e_t, and an approximation error (which ensures the equality of the relation) by k_t.[4] Following Vuolteenaho (2002), we also assume that the discount rate ρ--which is estimated as one less the aggregate dividend-price ratio--is a constant close to (but below) one.

Equation (1) permits the decomposition of the log book-to-market ratio for each share type into an expected return news component and a cash flow news component based on accounting numbers underlying the specific share. However, in order to obtain a similar decomposition for the price discount, we need to assume further that the book values of A-shares and B-shares are identical. As we show further below, this assumption is often satisfied empirically, at least to a close approximation.[5] Appendix A formally derives the decomposition for the price discount, which takes the form:

$$\begin{aligned}\left(p_t^B - p_t^A\right) - E_{t-1}\left(p_t^B - p_t^A\right) &= \left[\Delta E_t^B\left(\sum_{j=0}^{\infty}\rho_B^j(e_{t+1+j})\right) - \Delta E_t^A\left(\sum_{j=0}^{\infty}\rho_A^j(e_{t+1+j})\right)\right] \\ &\quad - \left[\Delta E_t^B\left(\sum_{j=0}^{\infty}\rho_B^j(r_{t+1+j}^B)\right) - \Delta E_t^A\left(\sum_{j=0}^{\infty}\rho_A^j(r_{t+1+j}^A)\right)\right] + k_t\end{aligned} \quad (2)$$

where ΔE_t^B and ΔE_t^A denote the revision in expectations from time t-1 to t for B-shares and A-shares, respectively. We define $E_{t-1}\left(p_t^B - p_t^A\right) \equiv E_{t-1}^B\left(p_t^B\right) - E_{t-1}^A\left(p_t^A\right)$ and we add subscripts to ρ to distinguish the A-share market from the B-share market. The left-hand side of equation (2) represents the revision to the foreign share price discount. The first square-bracketed term on the

[4] Since Vuolteenaho (2002) elects to subtract the risk-free rate from market returns, he is forced to subtract the risk-free rate from either earnings news or expected return news on the right-hand side of the equation. To avoid complexity of notation and without loss of generality, we define returns gross of the risk-free rate.

[5] We make this assumption at the end of the derivation of equation (2) in order to minimize its impact on the theoretical relation.

right-hand side of Equation (2) is the difference in cash flow news between B-shares and A-shares. The second square-bracketed term on the right-hand side of Equation (2) is the difference in expected return news between the two share types. Thus, an unexpected upward revision in the foreign price discount is due either to an increase of expected return news for A-shares relative to B-shares, or a decrease in cash flow news of A-shares relative to B-shares, or both.

To further analyze which of the two effects dominates, it is convenient to define the two components of the price discount as the difference in cash flow news (η_t^{CN}) and the difference in discount rate news (η_t^{DN}) where:

$$\eta_t^{CN} \equiv \Delta E_t^B \left(\sum_{j=0}^{\infty} \rho_B^j (e_{t+1+j}^B) \right) - \Delta E_t^A \left(\sum_{j=0}^{\infty} \rho_A^j (e_{t+1+j}^A) \right) \tag{3a}$$

$$\eta_t^{DN} = \Delta E_t^B \left(\sum_{j=0}^{\infty} \rho_B^j (r_{t+1+j}^B) \right) - \Delta E_t^A \left(\sum_{j=0}^{\infty} \rho_A^j (r_{t+1+j}^A) \right). \tag{3b}$$

Substituting (3a) and (3b) into (2) and taking variances yields the three component variance decomposition:

$$Var\left[Disc_t - E_{t-1}\left(Disc_t \right) \right] \approx Var\left(\eta_t^{CN} \right) + \mathrm{var}(\eta_t^{DN}) - 2Cov\left(\eta_t^{CN}, \eta_t^{DN} \right) \tag{4}$$

where the discount is denoted $Disc_t = p_t^B - p_t^A$

4. Data

4.1 Data Selection

The sample consists of the entire population of firms listed on the A-share, B-share and H-share markets. All accounting data and stock information (monthly stock returns, shares outstanding, annual earnings, dividends, and book values) are obtained from the Taiwan

Economic Journal (*TEJ*) for the period 1995 to 2006. No financial firms (banks and insurance companies) are listed during this period.

Firms that are missing annual data on one of the three variables, stock price, earnings or book value are deleted from the sample for that year. Each of the monthly stock returns, earnings and book value must have at least one observation during each preceding year. We also require two lags of annual returns. Accounting data are as of the December 31st year-end. Annual returns are measured from April of year t to March of year $t+1$. Imposing these restrictions yields a sample of 56 firms (335 firm-year observations) with A- and B-shares, and an additional 30 firms (165 firm-year observations) with A- and H-shares. Because aggregate dividend-price ratios differ across markets, we set ρ = 0.9809 for A-shares, ρ = 0.9207 for B-shares and ρ = 0.9660 for H-shares based on the discussion in Campbell, Lo and MacKinlay (1997).

4.2 Variable Definitions

Annual stock returns are computed using the geometric mean of the monthly returns. Missing book values are estimated via the Clean Surplus identity by adding current net income less current dividends to last year's book value of equity. Market values are measured three months after the fiscal year end. Consistent with Vuolteenaho (2002), ROE is computed as (the log of one plus) earnings divided by last period's book value.

4.3 Descriptive Statistics

Tables 1a and 1b provide descriptive statistics. The descriptive statistics in Table 1a are computed for the entire population of A- and B-shares listed on the Shanghai Stock Exchange (SHSE) and the Shenzhen Stock Exchange (SZSE); the two national exchanges of China during the period 1995 to 2006. The descriptive statistics shown in Table 1b are computed for the entire population of A- and H-shares listed on the SHSE, SZSE and the Hong Kong Stock Exchanges. The results for each panel are reported for three periods: the total sample period (1995-2006), the sub-sample period from 1995 to 2000 and the sub-sample period from 2001 to 2006. We break down the data into two subsample periods (1996 – 2001 and 2001 – 2006) for three reasons. First, the breakpoint is roughly the middle point of our sample, which offers two balanced subsamples for a robustness check. Second, before 2001, the price discount phenomenon was more significant in both B- and H-share markets absent the implementation of substantive market regulations and also because the H-share market was gravely affected by the Asian Financial crisis (in 1997 and 1998). Third, the relaxation of restrictions on local investment in 2001, the increased access to the A- market by foreign institutions under the Qualified Foreign Institutional Investor (QFII) program and the increased access to the H-market by domestic institutions under the Qualified Domestic Institutional Investor (QFII) program (as well as the prior expectation of their enactments) caused the price discount between domestic and foreign shares to narrow.

The data presented in Tables 1a and 1b are comparable to those of the extant studies on China's stock market for the period under consideration (Wang and Li, 2004; Jia, Sun and Tong, 2005 and Lin and Chen, 2005). Panel A of Table 1a (Table 1b) reports the distribution of the price discount and the log book value differences between A-shares and B-shares (H-shares). The price discount is the log transformed price difference between A-shares and B-shares (H-shares). Thus, a -1.0 in these tables signifies that the price of the B- or H-share is about 37% of the price of the A-share of the inter-listed firm.

These tables reveal that the price discount decreased in the more recent period. As already noted, the partial price convergence of the A- and B-shares can be explained partly by regulatory changes such as the market liberalization in 2001 and the QFII program of 2002.[6] The new administrative rule on the investment of QFIIs induced foreign institutional investors (including fund management companies and insurance companies managing long-term fund assets) to invest in the A-share market. Although this should have increased the discount, in fact, the discount narrowed since foreign and domestic investors expected the Chinese government to gradually merge the two share types. Although the impact was limited, the price differential in fact narrowed. For example, the average price discount of Eastern Communications (A-share code: 600776; B-share code: 900941) dropped from -1.85 in earlier sub-sample period to -1.02 in the more recent sub-sample period.

The A- and H-share prices further converged because of expectations regarding the imminent implementation of the QDII proposal, designed to allow controlled and limited capital outflows from China to Hong Kong between 2003 and 2005. The PRC state authorities eventually launched the QDII program only in April 2006, allowing domestic financial institutions to invest in overseas fixed income, equities and derivatives in foreign currencies. However, three months after implementation in July 2006, China's foreign exchange authority granted only limited overseas investment of 10.3 billion U.S. dollars to eight qualified domestic institutional investors. In 2007, the scheme was expanded to further include trust companies and brokerage houses.

One notable feature of the summary statistics in Panel A of Tables 1(a) and 1(b) is that differences in (log) book value per share of A- and B- shares appear to be quite small. This result facilitates simplification of the variance decomposition for the price discount (See Appendix A).

[6] On November 5, 2002 the China Securities Regulatory Commission (CSRC) and the People's Bank of China (PBOC) introduced the Qualified Foreign Institutional Investor program as a provision for foreign capital to access China's financial market.

Panels B of Tables (1a) and (1b) show the distribution of the log return on equity, the log market return, and the log book-to-market ratio for A-shares. Panel C of Table 1a (Table 1b) lists the distribution of the log return on equity, the log market return, and the log book-to-market ratio for B-shares (H-shares). These panels illustrate that the earlier subsample period exhibits a higher return on book value equity and a higher market return on average than the later subsample period in the case of A-shares and B-shares. Conversely, in the case of H-shares, the later sub-sample period has a higher return on book value equity and a higher market return on average as compared to the earlier sub-sample period. This is a consequence of the resurgent H-share market between 2001 and 2006 which was positively affected by expectations of the QDII program and with the move to allow China's National Social Security Fund to invest in Hong Kong during the upward stock movement period after the recovery from the SARS outbreak. In addition, since H-shares are listed on the Hong Kong stock exchange, geographical trading proximity and the well-known home bias effect may have lead to the co-movement of H-shares with the increasing Hong Kong share prices.[7]

Finally, there are large differences between the log book-to-market ratios of A-shares and B-shares (and H-shares) arising out of price discounts in the foreign share markets. With the exception of the later sub-sample period in the case of H-shares, average and median ratios are positive indicating that book values are greater than market values. Indeed, the mean log book-to-market ratio of 1.29 for B-shares in the earlier sub-sample period, translates into a book value per share 3.6 times greater than the market value per share.

[Table 1: here]

5. Main Empirical Results

[7] These reforms may help to partially explain why unexpected price discounts are largely driven by the difference in discount rate news rather than cash flow news.

5.1 VAR Estimation

To implement the variance decomposition of equation (4), we follow Campbell (1991), Campbell and Ammer (1993), Vuolteenaho (2002) and Callen and Segal (2004) and use a log-linear vector autoregressive (VAR) model. Formally, let z^M_t be a vector of state variables describing market *M* at time *t*, where M = A, B, H. The elements of z^M_t are the inter-listed firm's log book to market ratio, log (one plus) cum dividend market return and the log (one plus) return on equity. A dual-listed firm state vector is assumed to follow the log-linear dynamic:

$$z_t^M = C^M + \Gamma^M z_{t-1}^M + \varepsilon_t^M \tag{5}$$

where

$$z_t^M = \begin{pmatrix} b_t^M - p_t^M \\ r_t^M \\ e_t^M \end{pmatrix}, \quad C^M = \begin{pmatrix} c_1^M \\ c_2^M \\ c_3^M \end{pmatrix} \text{ and } \varepsilon_t^M = \begin{pmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{pmatrix}.$$

The error term ε^M_t is assumed to have a covariance matrix $\Sigma^M = E(\varepsilon^M_t \varepsilon^{M/}_t)$ and to be independent of everything known at *t-1*.

The parsimonious short VAR specification is limited to one lag of log return on equity, log market return, and log book-to-market ratio. Taking expectations on both sides of equation (5), yields:

$$E_{t-1}^M\left(z_{t+1+j}^M\right) = \left[I + \Gamma^M + \left(\Gamma^M\right)^2 + \ldots + \left(\Gamma^M\right)^j\right]C^M + \left(\Gamma^M\right)^{j+1} E_{t-1}^M\left(z_t^M\right). \tag{6}$$

Substituting equation (6) into equations (3a) and (3b) yields the difference in expected return news and the difference in cash flow news between the A-market and the B-market (or H-market). In particular, Appendix B shows that:

$$\eta_t^{CN} = e_2^/ \Gamma^B (I - \rho_B \Gamma^B)^{-1} \varepsilon_t^B - e_2^/ \Gamma^A (I - \rho_A \Gamma^A)^{-1} \varepsilon_t^A \tag{7}$$

$$\eta_t^{DN} = e_3^/ \Gamma^B (I - \rho_B \Gamma^B)^{-1} \varepsilon_t^B - e_3^/ \Gamma^A (I - \rho_A \Gamma^A)^{-1} \varepsilon_t^A \tag{8}$$

where $e_3 = (0,0,1)$ and $e_2 = (0,1,0)$. Taking variances of equations (7) and (8), respectively, gives the expressions:

$$\begin{aligned} Var(\eta_t^{CN}) = {} & e_2'\Gamma^B(I-\rho_B\Gamma^B)^{-1}\Sigma^B\left[e_2'\Gamma^B(I-\rho_B\Gamma^B)^{-1}\right]' \\ & + e_2'\Gamma^A(I-\rho_A\Gamma^A)^{-1}\Sigma^A\left[e_2'\Gamma^A(I-\rho_A\Gamma^A)^{-1}\right]' \\ & + 2e_2'\Gamma^B(I-\rho_B\Gamma^B)^{-1}\Sigma^{AB}\left[e_2'\Gamma^A(I-\rho_A\Gamma^A)^{-1}\right]' \end{aligned} \tag{9}$$

$$\begin{aligned} Var(\eta_t^{DN}) = {} & e_3'\Gamma^B(I-\rho_B\Gamma^B)^{-1}\Sigma^B\left[e_3'\Gamma^B(I-\rho_B\Gamma^B)^{-1}\right]' \\ & + e_3'\Gamma^A(I-\rho_A\Gamma^A)^{-1}\Sigma^A\left[e_3'\Gamma^A(I-\rho_A\Gamma^A)^{-1}\right]' \\ & + 2e_3'\Gamma^B(I-\rho_B\Gamma^B)^{-1}\Sigma^{AB}\left[e_3'\Gamma^A(I-\rho_A\Gamma^A)^{-1}\right]'. \end{aligned} \tag{10}$$

Proofs of these variance formulations are found in Appendix B.

The long VAR specification allows for richer lag structure of two lags for each of the three state variables. The details of the derivation of the long-VAR are presented in Appendix C.

We follow Vuolteenaho's (2002) approach for estimating the VAR coefficient matrix by trading off efficiency for robustness and simplicity. The VAR is estimated using weighted least squares on the panel data, with one pooled prediction regression per state variable. Each annual cross-section is weighted equally by deflating the data for each firm-year by the number of firms in the cross-section of that year.

5.2 Variance Decomposition Results in the Separate Markets

Panel A of Table 2a (Table 2b) show the estimated parameters of the short VAR for the A-shares and B-shares (H-shares) and the associated robust standard errors derived from the Sha-Rao (1993) jackknife procedure. Based on the significant (two-tailed) parameter estimates, Table 2a indicates that the book-to-market ratio is positively affected by its own lag in the A-market and also by the return on equity in the B-market. Return on equity is positively affected by its own lag in both markets and also by past market returns in the A market. Market returns are related positively to the past book-to-market ratio in both markets. The results for Table 2b indicate that the book-to-market ratio is positively affected by its own lag in the

H-market and also by the return on equity in the A-market. Returns are positively affected by past book to market ratios and past returns. Return on equity is negatively related to the past book-to-market ratio in the H-market and market returns are positively affected by the past book-to-market ratio in both markets.

Panel B of Table 2a (Table 2b) shows the short and long VAR variance decompositions for A- and B-shares (A- and H-shares). Variance terms are almost always statistically significant but some covariance terms are not. Also, covariance terms tend to be smaller in absolute value than the corresponding variance terms. Overall, we find that the A-shares show highly significant (1% level) expected return news variances and cash flow news variances (5% level) for both the short and long VAR estimates. Covariances are small and insignificant. Importantly, expected return news variances are significantly greater than cash flow news variances for three of the four VAR decompositions [Tables 2a and 2b]. B-shares also show (highly) significant expected return news and cash flow news variances (1% level) for both the short and long VAR. Covariances are significant as well. H-shares show insignificant expected return news variances and significant cash flow news variances (5% level) for both short and long-VAR estimates. Importantly, expected return news variances are not significantly different from cash flow news variances both in the case of B-shares and H-shares for both short and long-VARS. Overall these results suggest that expected return news is the dominant driver of returns in the domestic A-market but not in the foreign B- or H-markets.

These results are accentuated by the analyses in Panel C of Tables 2a and 2b. This Panel shows that expected return news explains from 67% to 85% of the return variation in the domestic A-market by comparison to cash flow news which explains only from 34% to 47% of the return variation.[8] In contradistinction, expected return news explains only from 16% to 23%

[8] These percentages do not add to 100% because of the covariances.

of the return variation in the foreign B- and H-markets by comparison to cash flow news that explains from 36% to 56% of the return variation in these markets. The remaining percentage is explained by the covariance between cash flow news and expected return news.

[Table 2: here]

5.3 Variance Decomposition Results for the Price Discount

Tables 3a and 3b provide the variance decomposition results for the price discount, the primary focus of this study. Panel A of Table 3a shows that the variances of the expected return news differences between A-shares and B-shares are significant (5% level) both for the short-and long-VARs, whereas the variances of the cash flow news differences are not significant. Moreover, the variances of these expected return differences are significantly greater than the variances of the cash flow differences for both the short- and long-VAR estimates. Panel B of Table 3a shows that the variances of the expected return news differences between A-shares and B-shares explain from 40% to 74% of the variability of the price discount. Table 3b shows similar results for differences between A-shares and H-shares.

Overall, Tables 3a and 3b indicate that expected return news is far more crucial than cash flow news in driving the variation of the price discount. This appears to come about because investors in these segmented markets react *relatively* similarly to cash flow news but react very differently to expected return news. These results are consistent with the hypothesis that corporate financial reports are less important for driving the price discount than are systemic macroeconomic factors such as exchange rate changes, regulatory changes, and governmental large-scale interventions.

[Table 3: here]

6. Robustness Analysis

6.1 Further Evidence on Cash Flow News

Chen and Zhao (2008) argue that the approach of directly estimating discount rate news but backing out cash flow news residually from unexpected returns has potentially serious limitations. They find that minor changes in model specification can lead to opposite conclusions. In contrast to the findings of previous studies (Campbell and Ammer (1993) and Campbell and Voulteenaho (2004)), they find that the estimated variance of the cash flow news at the aggregate level is at least equal to or larger than the discount rate news. To mitigate the concern that our findings may change with different specifications, we model cash flow news directly rather than residually as suggested by Chen and Zhao (2008). The (untabulated) results are qualitatively unaffected by this specification.

6.2 Violation of Clean Surplus

Most listed firms are carves-out of State Owned Enterprises (SOE) with the parent SOE controlling ownership using non-tradable shares. Since non-tradable shares do not have an estimable market value, we do the analysis on a per share basis rather than on a total share basis. However, per share valuation violates the Clean Surplus Identity if the number of shares increases or decreases. We perform a robustness check by re-estimating the model for a sub-sample of A- and B-share firms (298 observations) that had no change in shares outstanding during the period between 1996 and 2006. The results are consistent with our main findings. We did not perform a similar analysis for A- and H-shares because of the limited number of H-share observations that had no change in shares outstanding.

6.3 ERC Analysis

The results of the variance decomposition analyses suggest that investors in Chinese A-shares are relatively unconcerned with accounting information by comparison to investors in B- and H-shares. To bolster this claim, we further undertake an Earnings Response Coefficient (ERC) analysis, which focuses on conditional mean drivers of returns as opposed to volatility drivers.[9] Specifically, we regress the change in the price discount on the standardized change in firm earnings:

$$(p_{it}^{B} - p_{it}^{A}) - (p_{it-1}^{B} - p_{it-1}^{A}) = \alpha + \beta^{B} SU_{it}^{B} + \beta^{A} SU_{it}^{A} + \varepsilon_{it} \tag{11}$$

where $(p_{it}^{B} - p_{it}^{A}) - (p_{it-1}^{B} - p_{it-1}^{A})$ denotes the change in (the logarithms of the) price discount between the cross-listed A- and B-shares of firm i. The standardized unexpected earnings are measured as:

$SU_{it}^{B} = \frac{E_{it}^{B} - E_{it}^{B}}{P_{it-1}^{B}}$ and $SU_{it}^{A} = \frac{E_{it}^{A} - E_{it}^{A}}{P_{it-1}^{A}}$ where $E_{it}^{B} - E_{it-1}^{B}$ and $E_{it}^{A} - E_{it-1}^{A}$ denote the changes in earnings of B- and A-shares, respectively. The latter terms are normalized by prior period prices, P_{t-1}^{B} and P_{t-1}^{A}, respectively, in order to standardize unexpected earnings. In an alternative approach, we replace earnings by operating cash flows (CF_{it}) and define SU_{it} as standardized unexpected cash flows.

The estimated regression of equation (11) for A- and B-shares, as reported in Table 4a, yields an adjusted R^2 of less than 1%. The estimated coefficients are also insignificant at conventional levels, suggesting that unexpected earnings fail to explain the change in the price discount between A- and B-shares. The mean of the standardized unexpected earnings of A- and B-shares are 0.000 and -0.004. Substituting the means back into the equation shows that the effect on unexpected returns is trivial. Table 4a also regresses the change in the price discount on the individual standardized unexpected earnings with similar results. Qualitatively similar results

[9] See Callen (2009) for the conceptual differences between the mean (ERC) approach and the Variance Decomposition approach.

obtain if we replace earnings by operating cash flows. Table 4b shows similar results for A- and H-shares, which is consistent with our contention that corporate financial reports are less important for driving the price discount in Chinese equity markets.

[Table 4: here]

6.4 The Parameter ρ

Campbell et al. (1997) and Vuolteenaho (2002) choose ρ in the range [0.96, .97] for annual US data. As ρ is the reciprocal of one plus the aggregate log dividend-price ratio (see Ch. 7 of Campbell et al. (1997)), we employ other values of ρ for the A- and B-share market comparison and for the A- and H-share market comparison given that aggregate dividend-price ratios vary across markets. To ensure that our results are robust, we re-estimate our results for a range of ρ values. Foreign B- and H- shares have lower share prices compared to A-shares so the former should also have higher average log dividend-price ratios. Therefore, we let ρ take values between 0.95 and 0.99 for domestic shares and between 0.90 and 0.95 for foreign shares. The results prove to be consistent with our previous findings.

7. Conclusion

Vuolteenaho (2002) argues that cash flow news is more likely to reflect firm-specific idiosyncratic news, whereas expected return news is more likely to reflect systematic macro-economic news. We extend his framework to investigate the drivers of the price discount in Chinese equity markets.

We find that expected return news is a much more important driver of the price discount than cash flow news. Further, we find that the unexpected variability of the return of A-shares is driven primarily by expected return news, whereas the unexpected variability of the return of B-and H-shares is driven primarily by cash flow news. A possible reason for this finding is that the price discount of domestic A-shares is affected more by the perceptions of market regulatory reforms and macro-economic policy shifts, quite typical in the Chinese context, than idiosyncratic factors. Since B- and H-shareholders are typically foreign institutional investors, their investment behavior maybe more akin to US investors for whom the information contained in corporate reports is of central importance.[10]

[10] These results are consistent with the earlier study by Sami and Zhou (2004) who find that accounting information in the B- and H-share markets is more relevant than in A-share market. This is a relative statement. Accounting information is likely to be important to Chinese investors as well but not as important as macroeconomic factors. For example, Lin and Chen (2005) show that accounting numbers based on domestic accounting standards are more relevant in the Chinese stock market by comparison to accounting numbers based on International Accounting Standards.

APPENDIX A

From Equation (2) of Vuolteenaho (2002), the log book to market ratio can be written as:

$$b_t - p_t = k_t + \sum_{j=0}^{\infty} \rho^j r_{t+1+j} - \sum_{j=0}^{\infty} \rho^j e_{t+1+j} \qquad \text{(A1)}$$

where b_t is the log book value per share, p_t is the log market value per share, r_t is the log (one plus) cum dividend stock return, e_t is the log (one plus) return on book-value equity, and k_t is the approximation error.

Let E^A and E^B denote the expectation operator for the A-share market and B-share market, respectively. The expectation operators are different in the two markets because the markets are segmented. Let M denote an A- or B- share market. The expectation of equation (A1) can be written as:

$$b_t^M - p_t^M = k_t + \sum_{j=0}^{\infty} \rho_M^j E_t^M (r_{t+1+j}^M) - \sum_{j=0}^{\infty} \rho_M^j E_t^M (e_{t+1+j}^M) \bullet \qquad \text{(A2)}$$

where, with some abuse of notation, k_t will continue to denote the approximation error even when the equations are transformed by expectations and differencing.

Subtracting the book-to-market ratio of the A-market from the B-market and assuming subsequently that book values are identical in both markets yields:

$$p_t^B - p_t^A = k_t + \left[E_t^B \left(\sum_{j=0}^{\infty} \rho_B^j (e_{t+1+j}^B) \right) - E_t^A \left(\sum_{j=0}^{\infty} \rho_A^j (e_{t+1+j}^A) \right) \right]$$
$$- \left[E_t^B \left(\sum_{j=0}^{\infty} \rho_B^j (r_{t+1+j}^B) \right) - E_t^A \left(\sum_{j=0}^{\infty} \rho_A^j (r_{t+1+j}^A) \right) \right] . \qquad \text{(A3)}$$

Further taking the expectation of equation (A3) at period *t -1*, we obtain:

$$E_{t-1}\left(p_t^B - p_t^A\right) = k_t + \left[E_{t-1}^B\left(\sum_{j=0}^{\infty}\rho_B^j(e_{t+1+j}^B)\right) - E_{t-1}^A\left(\sum_{j=0}^{\infty}\rho_A^j(e_{t+1+j}^A)\right)\right]$$
$$-\left[E_{t-1}^B\left(\sum_{j=0}^{\infty}\rho_B^j(r_{t+1+j}^B)\right) - E_{t-1}^A\left(\sum_{j=0}^{\infty}\rho_A^j(r_{t+1+j}^A)\right)\right] \quad \text{(A4)}$$
.

where $E_{t-1}\left(p_t^B - p_t^A\right) \equiv E_{t-1}^B\left(p_t^B\right) - E_{t-1}^A\left(p_t^A\right)$. Subtracting Equation (A4) from Equation (A3) gives the revision to the discount:

$$\left(p_t^B - p_t^A\right) - E_{t-1}\left(p_t^B - p_t^A\right) = k_t$$
$$+\left\{\left[E_t^B\left(\sum_{j=0}^{\infty}\rho_B^j(e_{t+1+j}^B)\right) - E_{t-1}^B\left(\sum_{j=0}^{\infty}\rho_B^j(e_{t+1+j}^B)\right)\right] - \left[E_t^A\left(\sum_{j=0}^{\infty}\rho_A^j(e_{t+1+j}^A)\right) - E_{t-1}^A\left(\sum_{j=0}^{\infty}\rho_A^j(e_{t+1+j}^A)\right)\right]\right\}$$
$$-\left\{\left[E_t^B\left(\sum_{j=0}^{\infty}\rho_B^j(r_{t+1+j}^B)\right) - E_{t-1}^B\left(\sum_{j=0}^{\infty}\rho_B^j(r_{t+1+j}^B)\right)\right] - \left[E_t^A\left(\sum_{j=0}^{\infty}\rho_A^j(r_{t+1+j}^A)\right) - E_{t-1}^A\left(\sum_{j=0}^{\infty}\rho_A^j(r_{t+1+j}^A)\right)\right]\right\}$$

$$= k_t + \left[\Delta E_t^B\left(\sum_{j=0}^{\infty}\rho_B^j(e_{t+1+j}^B)\right) - \Delta E_t^A\left(\sum_{j=0}^{\infty}\rho_A^j(e_{t+1+j}^A)\right)\right] - \left[\Delta E_t^B\left(\sum_{j=0}^{\infty}\rho_B^j(r_{t+1+j}^B)\right) - \Delta E_t^A\left(\sum_{j=0}^{\infty}\rho_A^j(r_{t+1+j}^A)\right)\right]$$

where $\Delta E_t^M = E_t^M - E_{t-1}^M$, $\mathrm{M} = \mathrm{B,H,A}$. The first and second square brackets of the final equation show the difference-in-difference form of the revision to the discount.

APPENDIX B

Based on equation (3), the difference in expected return news can be expressed as:

$$\begin{aligned}
\eta_t^{DN} &= \Delta E_t^B\left(\sum_{j=0}^{\infty}\rho_B^j(r_{t+1+j}^B)\right) - \Delta E_t^A\left(\sum_{j=0}^{\infty}\rho_A^j(r_{t+1+j}^A)\right) \\
&= \Delta E_t^B\left(\sum_{j=0}^{\infty}\rho_B^j(e_3^{/}z_{t+1+j}^B)\right) - \Delta E_t^A\left(\sum_{j=0}^{\infty}\rho_A^j(e_3^{/}z_{t+1+j}^A)\right) \\
&= \sum_{j=0}^{\infty}\rho_B^j e_3^{/}\Delta E_t^B\left(z_{t+1+j}^B\right) - \sum_{j=0}^{\infty}\rho_A^j e_3^{/}\Delta E_t^A\left(z_{t+1+j}^A\right) \qquad \text{(B1)} \\
&= e_3^{/}\sum_{j=0}^{\infty}\rho_B^j(\Gamma^B)^{j+1}\left[z_t^B - E(z_t^B)\right] - e_3^{/}\sum_{j=0}^{\infty}\rho_A^j(\Gamma^A)^{j+1}\left[z_t^A - E(z_t^A)\right] \\
&= e_3^{/}\Gamma^B(I-\rho_B\Gamma^B)^{-1}\left[z_t^B - E(z_t^B)\right] - e_3^{/}\Gamma^A(I-\rho_A\Gamma^A)^{-1}\left[z_t^A - E(z_t^A)\right] \\
&= e_3^{/}\Gamma^B(I-\rho_B\Gamma^B)^{-1}\varepsilon_t^B - e_3^{/}\Gamma^A(I-\rho_A\Gamma^A)^{-1}\varepsilon_t^A
\end{aligned}$$

where $e_3^{/} = (0,0,1)$. Taking the variance of Equation (B1) yields:

$$\begin{aligned}
Var(\eta_t^{DN}) &= Var\left[e_3^{/}B(I-\rho_B B)^{-1}\varepsilon_t^B - e_3^{/}\Gamma^A(I-\rho_A\Gamma^A)^{-1}\varepsilon_t^A\right] \\
&= e_3^{/}\Gamma^B(I-\rho_B\Gamma^B)^{-1}\Sigma^B\left[e_3^{/}\Gamma^B(I-\rho_B\Gamma^B)^{-1}\right]^{/} \\
&\quad + e_3^{/}\Gamma^A(I-\rho_A\Gamma^A)^{-1}\Sigma^A\left[e_3^{/}\Gamma^A(I-\rho_A\Gamma^A)^{-1}\right]^{/} \qquad \text{(B2)} \\
&\quad + 2e_3^{/}\Gamma^B(I-\rho_B\Gamma^B)^{-1}\Sigma^{AB}\left[e_3^{/}\Gamma^A(I-\rho_A\Gamma^A)^{-1}\right]^{/}
\end{aligned}$$

where $\Sigma^A = \text{cov}(\varepsilon_t^A)$, $\Sigma^B = \text{cov}(\varepsilon_t^B)$ and Σ^{AB} is the covariance matrix between ε_t^A and ε_t^B.

To illustrate how Σ^{AB} is constructed and estimated, suppose that $\varepsilon_t^A = \left(\varepsilon_{1,t}^A \quad \varepsilon_{2,t}^A \quad \varepsilon_{3,t}^A\right)^{/}$ and $\varepsilon_t^B = \left(\varepsilon_{1,t}^B \quad \varepsilon_{2,t}^B \quad \varepsilon_{3,t}^B\right)^{/}$. Thus, we have

$$\Sigma^{AB} = \begin{bmatrix} \text{cov}(\varepsilon_{1,t}^A,\varepsilon_{1,t}^B) & \text{cov}(\varepsilon_{1,t}^A,\varepsilon_{2,t}^B) & \text{cov}(\varepsilon_{1,t}^A,\varepsilon_{3,t}^B) \\ \text{cov}(\varepsilon_{2,t}^A,\varepsilon_{1,t}^B) & \text{cov}(\varepsilon_{2,t}^A,\varepsilon_{2,t}^B) & \text{cov}(\varepsilon_{2,t}^A,\varepsilon_{3,t}^B) \\ \text{cov}(\varepsilon_{3,t}^A,\varepsilon_{1,t}^B) & \text{cov}(\varepsilon_{3,t}^A,\varepsilon_{2,t}^B) & \text{cov}(\varepsilon_{3,t}^A,\varepsilon_{3,t}^B) \end{bmatrix}. \qquad \text{(B3)}$$

To estimate Σ^{AB}, we retrieve the two estimated errors from the two VAR systems and then calculate the covariance matrix of the two estimated errors. Similarly, the second term on the right hand of Eq. (3b) can be written as:

$$\begin{aligned}\eta_t^{CN} &= \Delta E_t^B\left(\sum_{j=0}^{\infty}\rho_B^j(e_{t+1+j})\right) - \Delta E_t^A\left(\sum_{j=0}^{\infty}\rho_A^j(e_{t+1+j})\right)\\ &= \Delta E_t^B\left(\sum_{j=0}^{\infty}\rho_B^j(e_2^{/}z^B_{t+1+j})\right) - \Delta E_t^A\left(\sum_{j=0}^{\infty}\rho_A^j(e_2^{/}z^A_{t+1+j})\right)\\ &= \ldots\\ &= e_2^{/}\Gamma^B(I-\rho_B\Gamma^B)^{-1}\varepsilon_t^B - e_2^{/}\Gamma^A(I-\rho_A\Gamma^A)^{-1}\varepsilon_t^A\end{aligned}$$

The variance of this term is:

$$\begin{aligned}Var(\eta_t^{CN}) = Var&\left[e_2^{/}B(I-\rho_B B)^{-1}\varepsilon_t^B - e_2^{/}\Gamma^A(I-\rho_A\Gamma^A)^{-1}\varepsilon_t^A\right]\\ &= e_2^{/}\Gamma^B(I-\rho_B\Gamma^B)^{-1}\Sigma^B\left[e_2^{/}\Gamma^B(I-\rho_B\Gamma^B)^{-1}\right]^{/}\\ &+ e_2^{/}\Gamma^A(I-\rho_A\Gamma^A)^{-1}\Sigma^A\left[e_2^{/}\Gamma^A(I-\rho_A\Gamma^A)^{-1}\right]^{/}\\ &+ 2e_2^{/}\Gamma^B(I-\rho_B\Gamma^B)^{-1}\Sigma^{AB}\left[e_2^{/}\Gamma^A(I-\rho_A\Gamma^A)^{-1}\right]^{/}.\end{aligned} \tag{B4}$$

where we define $e_2 = (0,1,0)$.

APPENDIX C

In this Appendix, we consider how the variance decomposition of foreign share price discount is implemented when a richer two-lag VAR specification is taken for the inter-listed firm's log book to market ratio, log return on book value equity ratio and log market return. The long VAR specification with two lags is:

$$\begin{pmatrix} b_t^M - p_t^M \\ e_t^M \\ r_t^M \end{pmatrix} = C^M + \Gamma_1^M \begin{pmatrix} b_{t-1}^M - p_{t-1}^M \\ e_{t-1}^M \\ r_{t-1}^M \end{pmatrix} + \Gamma_2^M \begin{pmatrix} b_{t-2}^M - p_{t-2}^M \\ e_{t-2}^M \\ r_{t-2}^M \end{pmatrix} + \begin{pmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{pmatrix} \tag{C1}$$

where M denotes the market, as before, and where the polynomials are all of order two. We expand the matrix term into:

$$C^M = \begin{bmatrix} c_1^M \\ c_2^M \\ c_3^M \end{bmatrix}, \quad \Gamma_1^M = \begin{bmatrix} \alpha_1 & \alpha_2 & \alpha_3 \\ \beta_1 & \beta_2 & \beta_3 \\ \delta_1 & \delta_2 & \delta_3 \end{bmatrix}, \quad \Gamma_2^M = \begin{bmatrix} \alpha_1^/ & \alpha_2^/ & \alpha_3^/ \\ \beta_1^/ & \beta_2^/ & \beta_3^/ \\ \delta_1^/ & \delta_2^/ & \delta_3^/ \end{bmatrix}, \text{ and } \varepsilon^{\mathrm{M}} = \begin{pmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \end{pmatrix}.$$

We then substitute (C1) into (B1) and simplify by stacking the first-order system as suggested by Sargent (1979). For clarity of expression, we use the M superscript for the constant terms and the error terms. For simplicity, we ignore the M superscript for the elements of these matrices. Then, the two-lag VAR model (C1) can be written as a one-lag VAR model:

$$\begin{pmatrix} b_t^M - p_t^M \\ b_{t-1}^M - p_{t-1}^M \\ e_t^M \\ e_{t-1}^M \\ r_t^M \\ r_{t-1}^M \end{pmatrix} = \begin{pmatrix} c_1 \\ 0 \\ c_2 \\ 0 \\ c_3 \\ 0 \end{pmatrix} + \begin{bmatrix} \alpha_1 & \alpha_1^/ & \alpha_2 & \alpha_2^/ & \alpha_3 & \alpha_3^/ \\ 1 & 0 & 0 & 0 & 0 & 0 \\ \beta_1 & \beta_1^/ & \beta_2 & \beta_2^/ & \beta_3 & \beta_3^/ \\ 0 & 0 & 1 & 0 & 0 & 0 \\ \delta_1 & \delta_1^{'} & \delta_2 & \delta_3^/ & \delta_3 & \delta_3^/ \\ 0 & 0 & 0 & 0 & 1 & 0 \end{bmatrix} \begin{pmatrix} b_{t-1}^M - p_{t-1}^M \\ b_{t-2}^M - p_{t-2}^M \\ e_{t-1}^M \\ e_{t-2}^M \\ r_{t-1}^M \\ r_{t-2}^M \end{pmatrix} + \begin{pmatrix} \varepsilon_{1t} \\ 0 \\ \varepsilon_{2t} \\ 0 \\ \varepsilon_{3t} \\ 0 \end{pmatrix}. \tag{C2}$$

Model (C2) can be written more succinctly as:

$$z_t^M = C^M + \Gamma^M z_{t-1}^M + \varepsilon_t^M \tag{C3}$$

The error term $\varepsilon^{M}{}_{t}$ is assumed to have a covariance matrix Σ^{M} and to be independent of everything known at *t-1*. We make assumptions that errors are not correlated across firms at this stage. Taking the expectations on both sides of equation (C2) gives:

$$\begin{aligned}
E_t^M\left(z_{t+1+j}^M\right) &= C^M + \Gamma^M E_t^M(z_{t+j}^M) \\
&= C^M + \Gamma^M\left[C + ME_t^M(z_{t+j-1}^M)\right] \\
&= C^M + \Gamma^M C^M + \left(\Gamma^M\right)^2 E_t^M(z_{t+j-1}^M) \\
&= \ldots\ldots \\
&= \left[I + \Gamma^M + \left(\Gamma^M\right)^2 + \ldots + \left(\Gamma^M\right)^j\right]C^M + \left(\Gamma^M\right)^{j+1} z_t^M.
\end{aligned} \tag{C4}$$

Similar to Equation (B1), using (C4), we can derive the difference in expected return news as:

$$\begin{aligned}
\eta_t^{DN} &= \Delta E_t^B\left(\sum_{j=0}^{\infty}\rho_B^j(r_{t+1+j}^B)\right) - \Delta E_t^A\left(\sum_{j=0}^{\infty}\rho_A^j(r_{t+1+j}^A)\right) \\
&= \Delta E_t^B\left(\sum_{j=0}^{\infty}\rho_B^j(e_5^{\prime} z_{t+1+j}^B)\right) - \Delta E_t^A\left(\sum_{j=0}^{\infty}\rho_A^j(e_5^{\prime} z_{t+1+j}^A)\right) \\
&= \sum_{j=0}^{\infty}\rho_B^j e_5^{\prime}\Delta E_t^B\left(z_{t+1+j}^B\right) - \sum_{j=0}^{\infty}\rho_A^j e_5^{\prime}\Delta E_t^A\left(z_{t+1+j}^A\right) \\
&= e_5^{\prime}\sum_{j=0}^{\infty}\rho_B^j\left(\Gamma^B\right)^{j+1}\left[z_t^B - E(z_t^B)\right] - e_5^{\prime}\sum_{j=0}^{\infty}\rho_A^j\left(\Gamma^A\right)^{j+1}\left[z_t^A - E(z_t^A)\right] \\
&= e_5^{\prime}\Gamma^B(I-\rho_B\Gamma^B)^{-1}\left[z_t^B - E(z_t^B)\right] - e_5^{\prime}\Gamma^A(I-\rho_A\Gamma^A)^{-1}\left[z_t^A - E(z_t^A)\right] \\
&= e_5^{\prime}\Gamma^B(I-\rho_B\Gamma^B)^{-1}\varepsilon_t^B - e_5^{\prime}\Gamma^A(I-\rho_A\Gamma^A)^{-1}\varepsilon_t^A
\end{aligned} \tag{C5}$$

where $e_5^{'} = (0,0,0,0,1,0)$. Taking the variance of Equation (C5) yields:

$$\begin{aligned}
Var(\eta_t^{DN}) &= Var\left[e_5^{\prime}\Gamma^B(I-\rho_B\Gamma^B)^{-1}\varepsilon_t^B - e_5^{\prime}\Gamma^A(I-\rho_A\Gamma^A)^{-1}\varepsilon_t^A\right] \\
&= e_5^{\prime}\Gamma^B(I-\rho_B\Gamma^B)^{-1}\Sigma^B\left[e_5^{\prime}\Gamma^B(I-\rho_B\Gamma^B)^{-1}\right]^{\prime} \\
&\quad + e_5^{\prime}\Gamma^A(I-\rho_A\Gamma^A)^{-1}\Sigma^A\left[e_5^{\prime}\Gamma^A(I-\rho_A\Gamma^A)^{-1}\right]^{\prime} \\
&\quad + 2e_5^{\prime}\Gamma^B(I-\rho_B\Gamma^B)^{-1}\Sigma^{AB}\left[e_5^{\prime}\Gamma^A(I-\rho_A\Gamma^A)^{-1}\right]^{\prime}
\end{aligned} \tag{C6}$$

where $\Sigma^A = \mathrm{cov}(\varepsilon_t^A)$, $\Sigma^B = \mathrm{cov}(\varepsilon_t^B)$ and Σ^{AB} is the covariance matrix between ε_t^A and ε_t^B. In this expression, however, we need to estimate parameter matrix Σ^{AB}. To illustrate, suppose that

$\varepsilon_t^A = \begin{pmatrix} \varepsilon_{1,t}^A & 0 & \varepsilon_{2,t}^A & 0 & \varepsilon_{3,t}^A & 0 \end{pmatrix}$ and $\varepsilon_t^B = \begin{pmatrix} \varepsilon_{1,t}^B & 0 & \varepsilon_{2,t}^B & 0 & \varepsilon_{3,t}^B & 0 \end{pmatrix}$. Then, we have

$$\Sigma^{AB} = \begin{bmatrix} \text{cov}(\varepsilon_{1,t}^A, \varepsilon_{1,t}^B) & 0 & \text{cov}(\varepsilon_{1,t}^A, \varepsilon_{2,t}^B) & 0 & \text{cov}(\varepsilon_{1,t}^A, \varepsilon_{3,t}^B) & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ \text{cov}(\varepsilon_{2,t}^A, \varepsilon_{1,t}^B) & 0 & \text{cov}(\varepsilon_{2,t}^A, \varepsilon_{2,t}^B) & 0 & \text{cov}(\varepsilon_{2,t}^A, \varepsilon_{3,t}^B) & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ \text{cov}(\varepsilon_{3,t}^A, \varepsilon_{1,t}^B) & 0 & \text{cov}(\varepsilon_{3,t}^A, \varepsilon_{2,t}^B) & 0 & \text{cov}(\varepsilon_{3,t}^A, \varepsilon_{3,t}^B) & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}. \tag{C7}$$

The parameter matrix Σ^{AB} is estimated by taking the sample Variance-Covariance matrix of the residuals of the estimated VAR system. This shows how the variance of expected return news, (3a), is estimated through the long VAR model.

Similarly, Eq. (3b) can be written as,

$$\begin{aligned} \eta_t^{CN} &= \Delta E_t^B \left(\sum_{j=0}^{\infty} \rho_B^j (e_{t+1+j}^B) \right) - \Delta E_t^A \left(\sum_{j=0}^{\infty} \rho_A^j (e_{t+1+j}^A) \right) \\ &= \Delta E_t^B \left(\sum_{j=0}^{\infty} \rho_B^j (e_3^{\prime} z_{t+1+j}^B) \right) - \Delta E_t^A \left(\sum_{j=0}^{\infty} \rho_A^j (e_3^{\prime} z_{t+1+j}^A) \right) \\ &= \ldots \\ &= e_3^{\prime} \Gamma^B (I - \rho_B \Gamma^B)^{-1} \varepsilon_t^B - e_3^{\prime} \Gamma^A (I - \rho_A \Gamma^A)^{-1} \varepsilon_t^A \end{aligned}$$

Its variance is:

$$\begin{aligned} Var(\eta_t^{CN}) &= Var\left[e_3^{\prime} \Gamma^A (I - \rho_A \Gamma^A)^{-1} \varepsilon_t^A - e_3^{\prime} \Gamma^B (I - \rho_B \Gamma^B)^{-1} \varepsilon_t^B \right] \\ &= e_3^{\prime} \Gamma^A (I - \rho_A \Gamma^A)^{-1} \Sigma^A \left[e_3^{\prime} \Gamma^A (I - \rho_A \Gamma^A)^{-1} \right]^{\prime} + \\ &\quad e_3^{\prime} \Gamma^B (I - \rho_B \Gamma^B)^{-1} \Sigma^B \left[e_3^{\prime} \Gamma^B (I - \rho_B \Gamma^B)^{-1} \right]^{\prime} + \\ &\quad 2 e_3^{\prime} \Gamma^A (I - \rho_A \Gamma^A)^{-1} \Sigma^{AB} \left[e_3^{\prime} \Gamma^B (I - \rho_B \Gamma^B)^{-1} \right]^{\prime} \end{aligned} \tag{C8}$$

where $e_3^{\prime} = (0,0,1,0,0,0)$. The variance, (C8), of cash flow news can be estimated in a similar fashion to the variance of expected return news.

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Table 1a
Descriptive Statistics for A- and B-shares

Variable	Period	Mean	St. Dev	Min	25%-pct	Median	75%-pct	Maximum
Panel A: Descriptive Statistics								
Price Disc	1	-1.0143	0.6945	-2.5556	-1.5548	-0.9652	-0.3842	-0.2609
	2	-1.1736	0.6857	-2.5556	-1.7027	-1.1098	-0.6514	0.1531
	3	-0.9323	0.6861	-2.2220	-1.5209	-0.6893	-0.3353	0.2609
Book Value	1	0.0012	0.0217	-0.0570	-0.0095	0.0000	0.0126	0.0599
Differences	2	0.0037	0.0271	-0.0570	-0.0124	0.0021	0.0210	0.0599
	3	-0.0001	0.0183	-0.0563	-0.0084	0.0000	0.0097	0.0462
Panel B: Descriptive Statistics for A Shares								
ROE	1	0.0885	0.16525	-2.1453	0.0422	0.0936	0.1430	0.4819
	2	0.1189	0.0888	-0.0902	0.0637	0.1090	0.1511	0.4819
	3	0.0729	0.1914	-2.1453	0.0380	0.0885	0.1338	0.4411
RET	1	0.0703	0.4801	-0.9813	-0.2316	-0.0325	0.3156	1.5670
	2	0.2082	0.4889	-0.9199	-0.1510	0.1540	0.4068	1.5668
	3	-0.0007	0.4606	-0.9813	-0.2628	-0.0800	0.2474	1.2557
BM	1	-0.7512	0.7254	-2.6960	-1.2045	-0.7721	-0.3421	1.4199
	2	-0.6957	0.7903	-2.4706	-1.1711	-0.7987	-0.3171	1.4199
	3	-0.7798	0.6896	-2.6960	-1.2350	-0.7673	-0.3495	1.1556
Panel C: Descriptive Statistics for B Shares								
ROE	1	0.0824	0.1749	-2.2952	0.0396	0.0920	0.1387	0.4386
	2	0.1049	0.0831	-0.1658	0.0545	0.1000	0.1456	0.3748
	3	0.0708	0.2062	-2.2952	0.0360	0.0876	0.1360	0.4386
RET	1	0.1007	0.5626	-1.0916	-0.2773	0.0206	0.4520	1.6581
	2	0.3049	0.7302	-1.0573	-0.2875	0.3629	0.8885	1.6581
	3	-0.0043	0.4173	-1.0916	-0.2666	-0.0378	0.2853	0.9428
BM	1	0.8665	1.2530	-2.2846	-0.1800	0.7610	1.8430	3.9995
	2	1.2901	1.3220	-1.3684	0.2765	1.1965	2.5668	3.9995
	3	0.6484	1.1597	-2.2846	-0.2650	0.4420	1.6729	3.3923

Panel A shows the distribution of the price discount (Price Disc) and book value differences between A- and B-shares.

Panel B shows the distribution of the return on book equity (ROE), market return (RET), and book to market ratio (*BM*) for China A-shares.

Panel C shows the distribution of the return on book equity (ROE), market return (RET), and book to market ratio (*BM*) for China B-Shares.

The descriptive statistics are estimated from the entire population of A- and B-shares listed on the SHSE and SZSE national Chinese exchanges between 1995 and 2006. The results are segmented into three periods; with period one representing the entire sample period from 1995 to 2006, period two the years from 1995 to 2000 and period three the years from 2001 to 2006. The sample consists of 56 firms (355 firm-year observations).

Table 1b
Descriptive Statistics for A- and H-shares

Variable	Period	Mean	St. Dev	Min	25%-pct	Median	75%-pct	Maximum
				Panel A: Descriptive Statistics				
Price Disc	1	-0.8326	0.5305	-2.1016	-1.2059	-0.8559	-0.4272	0.1598
	2	-1.2369	0.4447	-1.9213	-1.6101	-1.2086	-0.9593-	-0.0599
	3	-0.6483	0.4605	-2.1016	-1.0008	-0.6102	-0.2441	0.1598
Book Value	1	0.0009	0.0471	-0.1232	-0.0209	0.0000	0.0195	0.1391
Differences	2	-0.0072	0.0554	-0.1232	-0.0396	0.0000	0.0179	0.1363
	3	0.0046	0.0425	-0.1114	-0.0168	-0.0002	0.0196	0.1391
				Panel B: Descriptive Statistics for A Shares				
ROE	1	0.0500	0.1789	-1.2565	0.0170	0.0633	0.1145	0.4726
	2	0.0031	0.1665	-0.7444	0.0073	0.0287	0.0692	0.2203
	3	0.0714	0.1809	-1.2565	0.0355	0.0753	0.1501	0.4726
RET	1	0.1141	0.4834	-0.8967	-0.2348	0.0659	0.4355	1.3871
	2	0.1767	0.3542	-0.5373	-0.0788	0.2043	0.3723	1.0116
	3	0.0855	0.5309	-0.8967	-0.2682	-0.0013	0.4696	1.3871
BM	1	-1.0311	0.5246	-2.6522	-1.3553	-0.9636	-0.7411	0.2437
	2	-1.1069	0.5478	-2.6522	-1.4234	-0.9985	-0.7926	-0.1746
	3	-0.9965	0.5121	-2.2903	-1.3488	-0.9340	-0.7263	0.2437
				Panel C: Descriptive Statistics for H Shares				
ROE	1	0.0512	0.1929	-1.2417	0.0159	0.0619	0.1291	0.4905
	2	0.0017	0.1766	-0.7731	0.0066	0.0251	0.0655	0.2929
	3	0.0737	0.1965	-1.2417	0.0331	0.0776	0.1522	0.4905
RET	1	0.1118	0.5249	-1.5026	-0.1925	0.1217	0.4461	1.6243
	2	-0.0848	0.6126	-1.5026	-0.4749	-0.1372	0.3539	1.1946
	3	0.2015	0.4548	-1.0351	-0.1082	0.2033	0.4759	1.6243
BM	1	0.1575	0.7998	-1.8334	-0.4348	0.1683	0.6230	2.6424
	2	0.7651	0.6428	-0.8238	0.3757	0.6828	1.2738	2.2802
	3	-0.1195	0.7072	-1.8334	-0.5712	-0.1872	0.3683	2.6424

Panel A shows the distribution of the price discount (Price Disc) and book value differences between A- and H-shares.

Panel B shows the distribution of the return on book equity (ROE), market return (RET), and book to market ratio (*BM*) for China A-shares.

Panel C shows the distribution of the return on book equity (ROE), market return (RET), and book to market ratio (*BM*) for China H-Shares.

The descriptive statistics are estimated from the entire population of A- and H-shares listed on the SHSE and SZSE national Chinese exchanges between 1995 and 2006. The results are segmented into three periods; with period one representing the entire sample period from 1995 to 2006, period two the years from 1995 to 2000 and period three the years from 2001 to 2006. The sample consists of 30 firms (165 firm-year observations).

Table 2a
Short VAR and Long VAR for returns of A- and B-Shares

Panel A: Short VAR

A Shares	BM_{t-1}	ROE_{t-1}	r_{t-1}
BM_t	0.7963***	0.2660	-0.0617
	(0.0324)	(0.2560)	(0.0558)
ROE_t	0.0101	0.5283***	0.0393***
	(0.0082)	(0.0964)	(0.0127)
r_t	0.1783***	-0.0304	0.0310
	(0.0321)	(0.2558)	(0.0581)

B Shares	BM_{t-1}	ROE_{t-1}	r_{t-1}
BM_t	0.8987***	0.5000***	-0.0972
	(0.0254)	(0.2418)	(0.0553)
ROE_t	-0.0054	0.5000***	0.0936
	(0.0074)	(0.1237)	(0.0082)
r_t	0.0932***	-0.2034	0.0744
	(0.0261)	(0.2464)	(0.0552)

Panel B: Variance Decomposition

	var(N_{total})	var(N_{DN})	var(N_{CN})	cov($N_{CN,DN}$)	diff($N_{DN,CN}$)
Short VAR - A	0.1797***	0.1215***	0.0617**	-0.0018	0.0598*
	(0.0140)	(0.0275)	(0.0310)	(0.0234)	(0.0316)
Short VAR - B	0.3088***	0.0719***	0.1108***	0.0631***	-0.0389
	(0.0217)	(0.0258)	(0.0300)	(0.0111)	(0.0501)
Long VAR - A	0.1679***	0.1133***	0.0646*	-0.0050	0.0487
	(0.0141)	(0.0282)	(0.0363)	(0.0272)	(0.0317)
Long VAR - B	0.2500***	0.0491***	0.0917***	0.0546***	-0.0426
	(0.0196)	(0.0180)	(0.0272)	(0.0111)	(0.0395)

Panel C: Relative Variance Decomposition

	$\frac{Var(N_{DN})}{Var(N_{Total})}$	$\frac{Var(N_{CN})}{Var(N_{Total})}$
Short VAR - A	0.6761	0.3434
Short VAR - B	0.2329	0.3588
Long VAR - A	0.6748	0.3848
Long VAR - B	0.1964	0.3668

Panel A lists the parameters estimates of the short Vector Autoregressive model (VAR) of A- and B-shares. The model variables include the log book-to-market ratio BM_t *(the first element of the state vector z*), the log return on equity ROE_t *(the second element) and* the log market return r_t *(the third element).* The parameters of the table correspond to the VAR system: $z_t^M = C + Mz_{t-1}^M + \varepsilon_t$ The first number reported in Panel A is the weighted least squares point estimate of the parameter, where observations are weighted such that each cross-section receives an equal weight. The second number (in parenthesis) shows the robust jackknife standard error computed using the Shao and Rao (1993) jackknife method. The short VAR is based on one lag of each state variable whereas the long VAR is based on two lags of each state variable.

Panel B lists the variance decomposition of the short VAR and the long VAR where the variances are defined as follows:

Var (N_{total})	=	total variance of the stock returns of A- and B-shares
	=	Var (N_{DN}) + Var (N_{CN}) – 2 cov(N_{CN},N_{DN})
Var (N_{DN})	=	variance of expected return news
Var (N_{CN})	=	variance of cash flow news
cov(N_{CN},N_{DN})	=	covariance between expected return news and cash flow news
Diff (N_{CN},N_{DN})	=	var (N_{CN}) – var(N_{DN})

Panel C lists the relative size of each variance component to the total variance of stock returns of A- and B-shares.

***, ** and * denote significance at the 1%, 5% and 10% levels (two-tailed), respectively.

Table 2b

Short VAR and Long VAR for returns of A- and H-Shares

Panel A: Short VAR

A Shares	BM_{t-1}	ROE_{t-1}	r_{t-1}
BM_t	0.5182***	0.4399**	-0.1098
	(0.0711)	(0.2245)	(0.0931)
ROE_t	-0.0228	0.3944	0.0435
	(0.0283)	(0.3178)	(0.0410)
r_t	0.4546***	-0.1207	0.1269
	(0.0727)	(0.3074)	(0.0983)

H Shares	BM_{t-1}	ROE_{t-1}	r_{t-1}
BM_t	0.7927***	-0.1961	-0.0200
	(0.0593)	(0.2248)	(0.0747)
ROE_t	-0.0804***	0.2169	0.0205
	(0.0422)	(0.3612)	(0.0310)
r_t	0.1416**	0.4087	0.0490
	(0.0627)	(0.3532)	(0.0773)

Panel B: Variance Decomposition

	var(N_{total})	var(N_{DN})	var(N_{CN})	cov($N_{CN,DN}$)	diff($N_{DN,CN}$)
Short VAR - A	0.1868***	0.1596***	0.0880**	-0.0304	0.0716**
	(0.0204)	(0.2387)	(0.2713)	(0.2556)	(0.0432)
Short VAR - H	0.2781***	0.0566	0.1567**	0.0324	-0.1001
	(0.0331)	(0.0720)	(0.1307)	(0.0857)	(0.1216)
Long VAR – A	0.1592***	0.1196***	0.0732**	-0.0168	0.0464*
	(0.0190)	(0.1822)	(0.2069)	(0.1959)	(0.0378)
Long VAR - H	0.2737***	0.0444	0.1416**	0.0439**	-0.0972
	(0.0324)	(0.0363)	(0.0829)	(0.0424)	(0.0938)

Panel C: Relative Variance Decomposition

	$\frac{Var(N_{DN})}{Var(N_{Total})}$	$\frac{Var(N_{CN})}{Var(N_{Total})}$
Short VAR - A	0.8544	0.4711
Short VAR - H	0.2035	0.5635
Long VAR - A	0.7513	0.4598
Long VAR - H	0.1622	0.5174

Panel A lists the parameters estimates of the short Vector Autoregressive model (VAR) of A- and H-shares. The model variables include the log book-to-market ratio BM_t *(the first element of the state vector z*), the log return on equity ROE_t *(the second element) and* the log market return r_t *(the third element).* The parameters of the table correspond to the VAR system: $z_t^M = C + Mz_{t-1}^M + \varepsilon_t$ The first number reported in Panel A is the weighted least squares point estimate of the parameter, where observations are weighted such that each cross-section receives an equal weight. The second number (in parenthesis) shows the robust jackknife standard error computed using the Shao and Rao (1993) jackknife method. The short VAR is based on one lag of each state variable whereas the long VAR is based on two lags of each state variable.

Panel B lists the variance decomposition of the short VAR and the long VAR where the variances are defined as follows:

Var (N_{total})	=	total variance of the stock returns of A- and H-shares
	=	Var (N_{DN}) + Var (N_{CN}) – 2 cov(N_{CN},N_{DN})
Var (N_{DN})	=	variance of expected return news
Var (N_{CN})	=	variance of cash flow news
cov(N_{CN},N_{DN})	=	covariance between expected return news and cash flow news
Diff (N_{CN},N_{DN})	=	var (N_{CN}) – var(N_{DN})

Panel C lists the relative size of each variance component to the total variance of stock returns of A- and H-shares.

***, ** and * denote significance at the 1%, 5% and 10% levels (two-tailed), respectively.

Table 3a

Short VAR and Long VAR for Foreign Share Price Discount on A- and B-shares

Panel A: Variance Decomposition

	var(N_{total})	var(N_{DN})	var(N_{CN})	cov($N_{CN,DN}$)	diff($N_{DN,CN}$)
Short VAR	0.2130***	0.1569**	0.0030	0.0266	0.1539**
	(0.0342)	(0.0775)	(0.0027)	(0.0942)	(0.0775)
Long VAR	0.4122***	0.1629**	0.0045	0.1224	0.1585**
	(0.4148)	(0.0804)	(0.0036)	(0.3581)	(0.0805)

Panel B: Relative Variance Decomposition

	$\frac{Var(N_{DN})}{Var(N_{Total})}$	$\frac{Var(N_{CN})}{Var(N_{Total})}$
Short VAR	0.7366	0.0141
Long VAR	0.3952	0.0109

Panel A lists the variance decomposition of the short VAR and long VAR for A- and B-shares.

Var (N_{total})	=	total variance of price discount
	=	Var (N_{DN}) + Var (N_{CN}) – 2 cov(N_{CN},N_{DN})
Var (N_{DN})	=	variance of expected return news
Var (N_{CN})	=	variance of cash flow news
cov(N_{CN},N_{DN})	=	covariance between expected return news and cash flow news
Diff (N_{CN},N_{DN})	=	var (N_{CN}) – var(N_{DN})

Panel B lists the relative size of each variance component to the total variance of A-and B-shares.
***, **and * denotes significance at the 1%, 5% and 10% level, two-tailed.

Table 3b

Short VAR and Long VAR for Foreign Share Price Discount on A- and H-shares

Panel A: Variance Decomposition

	var(N_{total})	var(N_{DN})	var(N_{CN})	cov($N_{CN,DN}$)	diff($N_{CN,DN}$)
Short VAR	0.8298	0.6692	0.0153	0.0727	0.6539
	(0.6372)	(0.3584)	(0.0124)	(0.3596)	(0.3542)
Long VAR	0.3363**	0.6524	0.0270	-0.2891	0.6254
	(0.1487)	(0.4060)	(0.0484)	(0.3706)	(0.4001)

Panel B: Relative Variance Decomposition

	$\frac{Var(N_{DN})}{Var(N_{Total})}$	$\frac{Var(N_{CN})}{Var(N_{Total})}$
Short VAR	0.8065	0.0184
Long VAR	1.9400	0.0803

Panel A lists the variance decomposition of the short VAR and long VAR on A- and H-shares.

Var (N_{total})	=	total variance of price discount
	=	Var (N_{DN}) + Var (N_{CN}) – 2 cov(N_{CN},N_{DN})
Var (N_{DN})	=	variance of expected return news
Var (N_{CN})	=	variance of cash flow news
cov(N_{CN},N_{DN})	=	covariance between expected return news and cash flow news
Diff (N_{CN},N_{DN})	=	var (N_{CN}) – var(N_{DN})

Panel B lists the relative size of each variance component to the total variance of A-and H-shares.
***, **and * denotes significance at the 1%, 5% and 10% level (two-tailed), respectively.

Table 4a: Earning Response Coefficient (ERC) Analysis: A and B- Shares

Dependent Variable	N	Intercept	SUE_a	SUE_b	$SUCF_a$	$SUCF_b$	Adj. R^2
$(p_t^B - p_t^A) - (p_{t-1}^B - p_{t-1}^A)$	335	(+/-) 0.031* (2.08)	(-) -0.170 (-0.88)				-0.0007
	335	(+/-) 0.031 (2.07)		(-) -0.018 (-0.98)			-0.0001
	335	(+/-) 0.031* (2.07)	(-) -0.041 (-0.11)	(-) -0.015 (-0.44)			-0.0031
	335	(+/-) 0.09 (0.98)			(-) -0.060 (-0.52)	(-) -0.003 (-0.26)	-0.0042

Predicted sign above coefficient, t-statistics below coefficient
**p<0.05 **p<0.01*

Panel A of this table shows the estimated regression of the unexpected change in the logarithms of the price discount of A- and B-shares on standardized unexpected earnings (SUE) or standardized unexpected cash flows (SUCF) for 1997 – 2006 (N =335).

Table 4b: Earning Response Coefficient (ERC) Analysis: A- and H- Shares

Dependent Variable	n	Intercept	SUE_a	SUE_h	$SUCF_a$	$SUCF_h$	Adj. R^2
$(p_t^H - p_t^A) - (p_{t-1}^H - p_{t-1}^A)$	165	(+/-) 0.074** (3.05)	(-) -0.039 (0.44)				-0.0061
	165	(+/-) 0.074** (3.09)		(-) -0.021 (-1.21)			0.0028
	165	(+/-) 0.074** (3.05)	(-) 0.145 (0.31)	(-) -0.023 (-1.24)			-0.0028
	165	(+/-) 0.057* (2.31)			(-) 0.291 (0.75)	(-) 0.051 (0.56)	0.011

Predicted sign above coefficient, t-statistics below coefficient
$^*p<0.05$ $\quad ^{**}p<0.01$

Panel B of this table shows the estimated regression of the unexpected change in the logarithms of the price discount of A- and H-shares on standardized unexpected earnings (SUE) or standardized unexpected cash flows (SUCF) for 1997 – 2006 (N =165).