

Information in Hong Kong H-share Prices

by

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## **Abstract**

China has been undergoing rapid development over the past decades. The Chinese stock market, comprising the Shanghai and Shenzhen stock exchanges has grown to be the second largest in market capitalization. However, this does not capture the true growth of Chinese firms in the capital markets as companies have been listing overseas for decades. One of the favorite destinations is Hong Kong. This paper seeks to analyze the price informativeness of the stocks of Hong Kong-listed, China-incorporated companies, known as H-shares. Our findings reveal that information in H-shares on future corporate profits appears to be less than that of stocks in China and the U.S. We have also found that mining, service firms and dual-listed shares seem to have lower price informativeness, and that including financial firms into our sample would have lowered price informativeness in H-shares. Hong Kong's capital market has been seen to be as one of the most developed market in the world. It is surprising that information in H-shares is so low. This study reveals that more research needs to be done on the Hong Kong stock market to see if such low level of information in its stock prices applies across all its listings. Informative prices are important to corporate investment efficiency, so if Hong Kong stock prices generally not informative, market regulators should be concerned.

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## 1. Introduction

China has been undergoing rapid development over the past decades. Since 2010, China has surpassed Japan to become the world's second largest economy. The Chinese domestic stock markets, comprising the Shanghai and Shenzhen stock exchanges, has grown to be the second largest in market capitalization. However, this does not capture the true growth of Chinese firms in capital markets as companies have been listing overseas for decades. Figure 1 shows the growth of China's domestic stock market since 1992 to March of 2016. The market capitalization and number of firms listed on the domestic Chinese stock markets is around 71% of its listings of Chinese firms in China, H.K., U.S., British, and Singapore in 2015/2016. More information on China's listings in overseas markets could be found in Table 1.

Historically, foreign investors who wanted to invest in Chinese companies had typically been only able to invest in the companies that have been listed were listed overseas. Until 2002, China's stock markets were mostly open only to domestic investors<sup>1</sup>. In 2002, China implemented the Qualified Foreign Institutional Investor (QFII) program, allowing licensed foreign investors participate in China's domestic A-share stock markets. However, there was limited quota and the approval process was long. In 2010, China implemented the RMB Qualified Foreign Institutional Investors (RQFII) which was more efficient and facilitated more foreign investment in China. Yet, these were still limited opportunities and most foreign investors could not access China's domestic stock market. Great improvements in foreign accessibility to China's domestic market occurred recently in November 2014, with the Shanghai-Hong Kong Stock Connect. Now, all global investors have direct access to a portion of A-shares on the Shanghai Stock Exchange through the Hong Kong Stock Exchange (around 570

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<sup>1</sup> Foreign investors could have invested in the B-shares market but its size is negligible in comparison to the overall A-share and B-share markets.

companies). More access is to be expected by the end of 2016 with the implementation Shenzhen-Hong Kong Stock Connect, which would provide access to A-shares on the Shenzhen Stock Exchange.

While Chinese firms listed in overseas markets have been quite well-received, perceptions on the Chinese domestic stock markets have been generally negative. Even in 2016, the A-share stock markets is seen to be casino-like in the media due to the large portion of local retail investors (80% - 90%). (CNBC, 2016) (Financial Times, 2015) However, research has shown that China's stock prices have in fact been becoming more informative and has reached comparable levels as those in the U.S. (Carpenter, Lu and Whitelaw, 2015).<sup>2</sup> Thus leading to the question of whether stock prices of Chinese firms listed in overseas markets are more or less informative than prices in its domestic markets. It should be the case that there should be more information in prices of Chinese firms that are listed in more developed overseas markets as these markets are presumed to have better legal and market institutions, better disclosure and accounting regulations, higher proportion of institutional investors and such.

Our paper analyzes a portion of these overseas-listed Chinese firms, H-shares, which are Hong Kong-listed, China-incorporated firms. H-shares include both state-owned and private enterprises. We have looked at H-shares from 1993 to 2011 and have used the Bai, Philippon and Savov (2013) model to estimate price informativeness. Our results contradict our presumptions that H-share prices would be more informative than A-shares, since A-shares are comparable to U.S. shares in price informativeness, as noted in Carpenter, Lu, and Whitelaw (2013), we can also suggest that H-shares are less price informative than U.S. stocks. This paper will attempt to provide explanations for the trend of price informativeness in H-shares throughout 1996 – 2011

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<sup>2</sup> Price informativeness is defined as how well current market capitalization and/or stock prices reflect future earnings of companies.

and the overall low-levels of price informativeness. We have also analyzed the effects industry and dual-listing has on price informativeness of H-shares and found that mining, service firms and dual-listed shares all seem to be less price informative than other stocks. We have also found that incorporating financial firms into our sample would have lowered price informativeness in H-shares. Our comparison to A-shares allowed us to suggest with statistical significance that H-shares have been less price informative than A-shares since 2004 – 2011.

With Hong Kong's capital markets seen as one of the most developed market in the world, it was surprising to see that information in H-shares to be so low. This study reveals that more research needs to be done on the Hong Kong stock market to see if such low level of information in prices applies across all its listings. Informative prices are important corporate investment efficiency, so if Hong Kong stock prices are generally not informative, market regulators should be concerned.

The rest of the paper is organized as follows. Section 2 provides an overview of the Hong Kong Stock Exchange with a focus on H-shares. Section 3 describes our method in determining price informativeness and the data we have used. Section 4 analyzes price informativeness in H-shares. Section 5 concludes our results, reemphasizes the shortcomings of this paper and areas for future research.

## **2. Overview of Hong Kong's Stock Markets**

Hong Kong is known for being one of the world's leading international financial centers, consistently being named among the Top 10 on Z/Yen Group's Global Financial Centers Index. It has long departed from its image in the 1840s as a small fishing village and barren island. Instead of being visited by refuge-seeking pirates seeking, it has now been welcoming investors

from all around the world. Forbes has identified it as one of the two Asian countries that are listed in the Top 20 Best Countries for Business List. What distinguishes Hong Kong from other leading international markets is its close ties with China.

Since July 1<sup>st</sup>, 1997, Britain has returned Hong Kong to China after over 150 years of colonizing it. Hong Kong had flourished under a free market economy under the British rule and, upon the turnover, was still able to maintain its way of life for at least 50 years under the policy of “One Country, Two Systems”. Hong Kong, as a special administrative region, has seen been to continue its success and operate under a capitalist system while facing enhanced connections with China. As outlined in China’s 13<sup>th</sup> Five Year Plan, Hong Kong has been and will continue to function as a gateway to China and help the Mainland with liberalizing its economy. One role Hong Kong has taken up in China’s gradual process of opening up its economy was to be a listing destination for Chinese companies. As early as in the 1980s, Chinese firms have been listing in Hong Kong. Since then, Hong Kong has been the most popular location for Chinese overseas listing and a long IPO lineup for 2016 indicates that this trend will at least continue for some years. Its popularity not only lies in being an IPO destination. In Asia, it was the second largest private equity center and large venture capitalist center in Asia.

### *2.1 Characteristics of the Hong Kong Stock Market*

The Hong Kong Stock Market is the 8th largest in the world and 3rd largest in Asia. In 2015, it had the most IPO activity in the world and most of the activity comes from Chinese companies. It is an order-driven market comprising of two boards: the Main Board and the Growth Enterprise Market Board. The Main Board consists of larger and more mature stocks (around 1600) and the Growth Enterprise Board has smaller stocks (around 210). Figure 2 shows



the growth of Hong Kong's stock market since 1992 to March, 2016 and the 2015 distribution of market capitalization, turnover value and number of firms listed on the exchange by country incorporated. The shares we have analyzed in this paper are the PRC-incorporated firms which take up 21% of market capitalization and 39% of turnover value of all Hong Kong stocks.

The Hong Kong Stock Exchange has been an ideal place to list and a popular platform among international investors. It attracts companies and investors not only through its close ties with China and ability to leverage on China's growth. Hong Kong's developed legal systems and transparent government structure also provide an ideal basis for its strong capital markets. Hong Kong is considered to have a sound regulatory framework that ensures good corporate governance, accurate disclosures and financial reporting that are up to international standards. Its capital markets are seen to have no barriers to entry and a free flow of information due to its zero capital flow restrictions, numerous tax advantages, currency convertibility and the free transferability of securities. With one of the highest concentration of banking institutions in the world (71 of the largest 100 banks in the world have an operation in Hong Kong), international and domestic investors are seen to have easy access to information. In recent years, its equity stock market has mostly been dominated by institutional investors of which are mostly foreign. In 2015, foreign institutional investors accounted for 31% of its trading value, followed by local institutional and retail investors, both at 19%. While the proportion of trading value by institutional investors has shrunk in 2014, most years since 2000, investment made by institutional investors accounts for more than 50% and is mostly from overseas. A high proportion of institutional investors, especially international institutional investors, is one of the characteristics of the recent Hong Kong stock markets. Its goal for 2016 – 2018 is to be “the most effective platform for cross-border market access and unique destination market for

products with both Chinese and international relevance”. (HKEX, 2016) As seen, the Hong Kong Stock Exchange will continue to position itself as a bridge between China and the rest of the world.

## *2.2 Chinese Enterprise Dimension on the Hong Kong Stock Market*

Listings by mainland companies in Hong Kong are greatly underplayed in Figure 2. There, in fact, have been Chinese companies that have been incorporated outside of China that are not considered part of H-shares. Besides, H-shares, non-China-incorporated Chinese companies have been listing on the Hong Kong Stock Exchange a Red Chips (state-owned) and P-chips (private). More details can be seen in Table 1. Figure 3 reveals the true nature of Chinese companies in proportion to other listings from 1994 – 2015. Chinese firms, in reality, take up a much larger proportion of Hong Kong’ stock markets than H-shares indicate.

The first H-share, Tsingtao Brewery Company, was listed on the Hong Kong Stock Exchange in July 1993. Prior to 1993, Chinese firms were not officially allowed to list directly overseas and companies who did were considered back-door listings that involved a Mainland company taking over a Hong Kong “shell” company and listing through it. These companies are now identified as Red Chips. H-shares emerged to counter these listings and to ensure that the Chinese government had some degree of control over the situation. In 1992, the State Council of China approved and published the first official list of nine state-owned enterprises that could directly list overseas, on the Hong Kong Stock Exchange (HKEX), calling them H-shares. Since then, we have seen a rise in Chinese companies listing in Hong Kong. It is to be noted that dual-listing is relatively common among Chinese firms. This means that the company is listed on both China’s A-share market and Hong Kong’s H-share market.

Prior to the Shanghai-Hong Kong Stock Connect in November 2014, H-shares, Red Chips and P-Chips were how most international investors accesses the Chinese markets. Since the Stock Connect, the doors to both the Shanghai and Hong Kong stock markets have been opened both ways. Through this program, mainland Chinese investors have direct access to the Hong Kong stock market for the first time and all global investors will have direct access to the once exclusive Chinese stock markets. While there are still quotas and restrictions involving this program, it still provides international investors the option to invest in 500+ A-shares that they would otherwise not have direct access to. Most H-shares were accepted into the program unless they were identified as high-risk company and these companies had the potential to be re-accepted once their high-risk status has been cleared.

### **3. Methodology and Data**

Price informativeness has been defined, more broadly, as how well prices reflect firms' future earnings and this information refers to firm-specific information in oppose to market- and industry- information. As noted in Carpenter, Lu and Whitelaw (2015), literature that studies price informativeness and its connection to good legal and market institutions goes back to Hayek (1945), Fama (1970) and before. Their paper notes that over the years, people have attributed effective listing, disclosure and auditing policy, and accessibility to information to the increase in price informativeness. (Diamond and Verrecchia, 1991) (Hail and Leuz, 2009) (Grossman and Stiglitz (1980). There has also been studies that increasing liquidity improves market efficiency and informativeness (Chordia, Roll, and Subrahmanyam, 2008). Hou, Kuo and Lee (2010) suggest that in the case of China, unlocking state-owned shares improved price informativeness and the higher proportion of shares unlocked, the more price informativeness is improved. The effect of retail investors and institutional investors have also been studied in

Grossman and Stiglitz (1980), Roll (1988), Luo, Chen and Yan (2014), Kim and Yi (2008) and Dvorak (2005). Recent consensus is that typical institutional investors increase price informativeness.

In this paper, we have used the Bai, Philippon and Savov (2013) model to analyze price informativeness. Another common method to choose was created by Morck, Yeung, and Yu (2000) which uses stock price asynchronicity and idiosyncratic firm risk as measures.

### *3.1 Price Informativeness Using the Bai, Philippon and Savov (2013) Model*

Bai, Philippon, and Savov (2013) indicate that informative prices imply that market valuations have been able to differentiate between profitable firms and money losing firms. The model used is a cross-sectional regression of future earnings on current market equity value and current earnings, normalized by book value with industry fixed effects to control for different discount rates.  $k$  represents the forecasting horizon and the model is as follows,

$$\frac{\text{Earnings}_{i,t+k}}{\text{Assets}_{i,t}} = c_{i,t} + a_t \ln \left( \frac{\text{Market Capitalization}_{i,t}}{\text{Assets}_{i,t}} \right) + b_t \left( \frac{\text{Earnings}_{i,t}}{\text{Assets}_{i,t}} \right) + e_{i,t+k} \dots \dots (1)$$

Price informativeness is the predicted variation,  $a_t \times \sigma \left( \log \left( \frac{M}{A} \right) \right)$ .

Bai, Philippon and Savov (2013) study the U.S. markets and have concluded that U.S. financial markets have been informative and increasingly informative, specifically at medium and long horizons of three and five years. They have attributed this increase to lowered informational costs, in addition to increased liquidity, acting on price discovery and trends in institutional investing. Carpenter, Lu and Whitelaw (2015) apply the same method and analyzed the Chinese A-share markets, showing that China's stock market no longer is a casino and its price informativeness has been increasing and compares favorably with that in the US. This improvement has been attributed to regulatory reforms that occurred in China.

### 3.2. Data

We have looked at a total of 205 H-shares (including financial firms) from 1993 – 2014 using data from Bloomberg, Thompson Reuters, China Stock Market and Accounting Research (CSMAR), Annual Reports and the Hong Kong Stock Exchange. However, most of our analysis will focus on non-financial H-shares except section 4.2 when we looked into industry effects. As noted by the Bai, Philippon and Savov (2013) model, we required data on share prices and number of shares outstanding to compute market capitalization, net income, and total assets to normalize our variables. We also collected data on each firm's industry classification to determine the effects of industry on price informativeness.

Due to limited number of shares and observations, especially for the earlier years, we took extra care in ensuring a full and complete data set as possible. Table 2 shows the number of observations we had each year when analyzing non-financial H-shares. Table 3 We collected H-shares prices using data from Bloomberg. For total assets and net income, we mostly used Bloomberg but also referred to company specific annual reports where data as missing. For number of shares outstanding, we collected data using two sources. During the periods when a company was dual-listed, we used CSMAR to collect total number of shares outstanding in both the A- and H- universe because our model uses total market capitalization to compute price informativeness. Otherwise, we used H-shares outstanding with Bloomberg data. Differences in our adjusted market capitalization (A-H total number of shares outstanding when applicable) and unadjusted one (only H-shares) can be observed by industry in Figure 4 and by dual vs. non-dual-listed in Figure 8. Since price is the only variable denominated in Hong Kong Dollars, we converted it to renminbi using historical exchange rates data from Thompson Reuters. For industry variables, we converted Hang Seng industry codes to 1-digit SEC industry codes and the

distribution of H-shares by SEC classification can be seen in Figure 4. We also sourced all delisted stocks during this time period using Hong Kong Stock Exchange data to avoid having a biased sample and ensured data was accurate as the Hong Kong Stock Exchange reuses stock codes.

We then calculated the variables required and to eliminate extreme values, we winsorized our data to the 95<sup>th</sup> percentile. For all regressions, we used White heteroskedasticity-consistent standard errors to compute 95% intervals. Due to the limited number of observations, we also ran a panel regression in addition to cross-sectional regressions. This paper will focus on analyzing information in 1996 – 2014, when the number of observations exceeded 20.

#### **4. Price Informativeness in H-shares in 1996 – 2011**

This paper looks at price informativeness of H-shares' market capitalization on future earnings. Figure 5 plots the time series of our estimates by forecasting horizon,  $k=1, 2$  and  $3$ . The left panels plot the coefficients,  $a_t$ , from regression (1), with their 95% confidence bands. The confidence bands are calculated using White heteroscedasticity consistent error. The middle panels show predicted variation (price informativeness,  $a_t \times \sigma\left(\log\left(\frac{M}{A}\right)\right)$ ). The right panels show the marginal increment  $\log\left(\frac{M}{A}\right)$  adds to the regression  $R^2$ . Results indicate that H-shares are generally price informative, with the exception the period of 1999 – 2001. However, price informativeness of this category of stocks appear to be lower than China' A-shares (Carpenter, Lu and Whitelaw, 2015) and U.S. stocks (Bai, Philippon and Savov, 2013). Since H-shares only began in July 1993, we have capped the forecasting period at three years to ensure enough that we have enough data. This paper will focus on forecasting period  $k=3$ .

Looking over the panel data of H-shares for a three-year forecasting period (Table 3), Hong Kong H-shares are overall price informative. The t-statistics and confidence interval show that we can reject that the coefficient to regression (1) of H-shares is above 0. This paper will proceed to analyzing price informativeness year-by-year, industry and dual-listing effects on information in prices and finally comparing our data with A-share price informativeness data from Carpenter, Lu, and Whitelaw (2015).

#### *4.1 Baseline Year-by- Year Price Informativeness of non-Financial H-shares in 1996- 2011*

This section will analyze Table 2, which are our results to regression (1) and Figure 6 which plots is our price informativeness estimates,  $a_t \times \sigma \left( \log \left( \frac{M}{A} \right) \right)$ , for 1996 – 2011 at  $k = 3$  in the context of issues that might affect price informativeness. Overall, H-shares seem to mostly price informative over from 1996 – 2011, with the exception of years 1999, 2000, 2001 with negative values indicating that prices might not have always been informative. The following part will attempt to provide some explanation on the price informativeness trend through overall macroeconomic conditions, H-shares relevant policies and reforms, and changes in investor composition trading on the Hong Kong Stock Exchange.

Low and even negative price informativeness of Hong Kong H-shares throughout 1996 – 2001 could be attributed to the Asian Financial Crisis in 1997 and the Dot-Com boom in 2000. The Asian Financial crisis can be said to have reduced H-share price informativeness due to similar reasons Carpenter, Lu and Whitelaw (2015) indicate that possible reasons to the decline in A-share price informativeness during the global financial crisis were that stock prices integrated “extreme realizations from the distribution of earnings” or that mistrust in the markets (10). This problem of mistrust might be especially true since leading up to the Asian Financial

Crisis, Hong Kong's Hang Seng Index had reached a historic high of 16,673 in August, 1997, before plummeting rapidly throughout October. Market conditions have led to many retail investors to divest, especially retail investors, further pushing down the prices. By January, 1998, it had dropped to a low of 8,121 (51% of its peak). (Jao, 2001) Otchere and Chan (2010) indicate that investors in the Hong Kong stock market had been exhibiting "overreacting" behavior, which is to overweight recent information and underweight prior information, even before the crisis in their study of the Hong Kong stock market in 1996 – 1998. The paper suggests that "overreaction" was more severe pre-crisis due to noise traders who traded irrationally pre-crisis and were unable to trade during the crisis. Another reason could be the severe short-selling activities of international speculators that have caused "market prices to overshoot "their 'fundamental' value". (Goodhart and Lu, 2003, p.4) This has led to the Hong Kong government, for the first time, to intervene in Hong Kong's free markets and inject \$120 billion into the Hang Seng Index to buy blue chips in response (6% of total market capitalization). The Hong Kong government noted that international hedge funds were observed to exhibit speculative behavior and were attempting to engage in "double market play", purposefully trying to depress the Hong Kong stock markets so as to profit through their short positions in the stock index fund. Thus price informativeness might have been low due to such tactics. Continuing this trend, a partial reason to the negative price informativeness could be attributed to the dot-com boom in 2000 when, as noted in Bai, Philippon and Savov (2013), be due to the fact that many previously high-valuation firms turned out to be not profitable. In addition, government interventions such as the injection of funds into the equity markets in 1998 to purchase shares have been attributed to decreasing price informativeness as it harms trading incentives for speculators and thus the ability of markets to aggregate information. (Bond and Goldstein, 2015) Thus this could explain



why price informativeness began to increase as the government began releasing the stocks it has bought since 1998 in 2001. Moreover, given the delicate situation of Hong Kong, which was just returned to China by Britain the previous year, government interventions in 1998 might have created fear among investors that the Hong Kong intended to “socialize” Hong Kong and was insane, further destroying confidence in the markets. (Tempest, 1998)

Another reason for price informativeness to be low in 1996 - 2001 could be that while the overall Hong Kong Stock Exchange had already evolved to becoming one of the world’s leading capital markets by then, the newly introduced H-shares had yet to meet the standards of other companies in terms of regulation.<sup>3</sup> It is widely known that prior to CSRC’s introduction of a split share structure reform to unlock non-tradeable shares in 2005, Chinese states had a significant presence in the Chinese equity markets. However, it is often neglected that in the early stages and even in some instances nowadays, H-shares also face the same problems. Low price informativeness in these early years could be attributed to the problems with state-ownership as seen in similar literature on Chinese A-shares. Hou, Kuo and Lee (2012) conclude this reform reduced information asymmetry as state-shareholders’ wealth become more sensitive to share price movement and thus improved price informativeness. Carpenter, Lu and Whitelaw (2015) also note that this reform marked the beginning of improved A-shares price informativeness with improved information discovery and better risk sharing. (Liao, Liu, and Wang, 2011) (Li, Wang, Cheung, and Jiang, 2011)

The first H-share Tsingtao Brewery is one of the many examples. Tsingtao’s H-shares were only 38.5% of total shares issued of which 5% was sold to Anheuser-Busch International Holdings. A-shares took up 11.11% and state bodies held 50.35%. Anheuser-Busch’s purchases

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<sup>3</sup> It is to be noted that as indicated in Table 1, results are found from a small sample of a market that is new and had significant industry concentrations (Figure 1). Thus price informativeness results may be dominated by certain companies.

of Tsingtao's H-shares was a strategic investment and it has increased its holdings since. Thus effectively public float of Tsingtao Brewery H-shares was only 33.5% of total shares issued. Another example being Beiren Printing Machinery Company limited that had 25% of stock floated in the Hong Kong Stock Exchange (HKEx), but 65% was still owned by the state-owned parent. This was a common situation with most Hong Kong H-shares, De Jonge noted that prior to 2000, H-share enterprises were "controlled by unlisted state-controlled China-based parent organizations". (64) Although H-shares had already begun listing on the HKEx in 1993, the China Securities Regulatory Commission (CSRC) only addressed this issue of majority state-ownership in off-shore listed Chinese firms through the *Measures on Further Promoting Standardized Operations and Deepening the Reform in Overseas-listed Companies* in 1999, in which it suggested the need to keep separate operations and assets between the controlling entity and listed firm. Attention should also be brought to HKEx listing rules Chapter 19A then, which indicated that mainland-listed shares and foreign shares are all shares of the mainland issuer. Thus implying that while Hong Kong authorities controls a mainland company's H-share listing in terms of whether it is allowed to list and board of directors structures and such, it is still the mainland that controls the firm's operations and management personnel. Moreover, this implies a need for the HKEx and SFC to be able to communicate and cooperate with Chinese authorities. Information on H-shares might not have been as transparent as other stock on the HKEx and would sometimes receive special treatment. For example, the Hong Kong stock exchange had at times waived the need to submit interim account and report on continues transactions with their parent company throughout this period. In addition, while H-share listed companies are required to have debt-equity ratio that satisfied that Hong Kong Stock Exchange's listing requirements, their unlisted parent companies may be overleveraged. Under the impression that H-share

companies were similarly regulated as other companies in the Hong Kong stock market, misinformation had occurred. The timing of this situation corresponded to the dot-com bubble. H-shares companies that have been highly valued during in 1998 to 2001 may turn out to be less profitable than portrayed such as in the case of Tianjin Capital Environmental Protection which was revealed to have improper accounting practices and that the general manager was in fact the vice-chairwoman of the parent company. The opposite could also occur when seemingly less profitable companies suddenly became more profitable. China Petroleum Corporation (CPC) listed Sinopec Corp on the Hong Kong Exchange and on behalf of the state, retained around 68% interest in this entity. In 2003, in order to restructure the parent company, CPC sold assets to its Hong Kong listed arm, effectively changing Sinopec's business to act as the downstream industry to Sinopec. Thus given such unforeseeable circumstances, price informativeness in H-shares would be low as information on these stocks may not be as reliable. Jia, Sun, and Tong (2005) report that throughout 1993 – 2002, while H-shares listings have had significant and positive impact on firms' performance, this positive effect seems to be limited because ownership percentages were not large for H-shares holders to exert effect control and governance. Perhaps information on H-shares was not as accurate due to inaccurate perceptions of H-shares being similar to other non-Chinese stocks and has led to investments that do not reflect true firm-specific information.

In 2001 to 2007, there had reforms relevant to H-shares that were similar to those of A-shares as noted in Carpenter, Lu and Whitelaw (2015). H-shares would have been affected to both changes made by the CSRC and Chinese government in addition to changes in the Hong Kong markets. Thus during this period, we have observed an overall upward trend in price informativeness. Since 1998, Hong Kong has been moving towards a disclosure-based regulatory

regime instead of its prior merit-based one. Under this reform, the HKEx had begun tightening its disclosure requirements. In June 2003, China and Hong Kong, as two regions have begun enhancing cooperation and working to foster a closer relationship through Closer Economic Partnership Agreement (CEPA). Public's access to stock and company information were improved through such policies. For example, with CEPA, the HKEx could set up offices in mainland China for the first time.

In addition, in 2003, the Hong Kong Stock Exchange began requiring all firms to have at least three independent non-executive directors and for China-incorporated companies, they require at least two to come from Hong Kong. There was also the requirement that the company secretary had to be knowledgeable about Hong Kong laws and accounting rules. Board structures have been noted to be a factor leading to informative stock prices. While some H-shares companies were quick to adopt to these changes, such as Tsingtao, others were more reluctant. There also has been a push towards better communication between Hong Kong and China as the HKEx first established an office in 2003. However, the problems associated with the ties H-share companies have in China is again revealed when a year later, CSRC has reported that 36% of Chinese firms have failed to comply to the June 2003 deadline. as a period of market reform in China and these reforms affected H-shares. Lianhua Supermarket had to push back its IPO due to such requirements.

In 2004, the HKEx listing rules were revised and for the first time, H-shares firms to send circulars to shareholders to notify and attain approval on transactions between the listed companies and their parent organizations. Another possible factor that increased price informativeness is the introduction of Hong Kong's Growth Enterprise Markets (GEM) Board in 1999. H-shares began listing on the GEM Board by 2000, when price informativeness began to

rise. Cheung and Liu (2013) compared that the Main Board and GEM Board of China's domestic stock markets and concluded that because of the nature of the GEM Board having riskier firms, only more experienced traders would typically invest in it and thus raising the chances of more information -based trading. A similar case could be made for Hong Kong's GEM Board.

In 2004, CSRC suspended IPOs in China. Unlike the last suspension in 1994, the Chinese government and CSRC were more willing to allow H-shares to be listed in Hong Kong, leading to a sharp rise in companies listed in Hong Kong that year. Chinese banks have also began listing in 2005 (not included in our main sample). Such increase in activity have strained Hong Kong stock market's regulatory boards. Listing committee have been reporting to have "no staff and no budge" since 2007 and in 2006 the SFC admitted that it lacked the power to take action against Hong Kong-listed Chinese companies. The SFC chairman reports that "the investigations of Chinese companies had been limited by the scope of powers granted to the CSRC, and the "unpalatable fact" that there was no full reciprocity of regulatory and law enforcement assistance between Hong Kong and the mainland and no mutual transfer of fugitives between jurisdictions". (Lau, 2006) As seen, H-shares, and perhaps other Chinese firms, are not exactly similar in transparency as other companies are on the stock exchange.

In 2008, Hong Kong's largest stock manipulation case was trialed and convicted in 2009, highlighting the inefficiency of the SFC and its inability to keep up with the growing markets. Moreover, as of 2014, it is noted that Hong Kong SFC's has miniscule staff numbers compared to other stock markets. (Timmons and McCaffrey, 2015) The low number of staffs was brought into light due to another case of potential fraud as Hanergy was suddenly suspended in the midst of 2015. Hanergy stocks had risen by more than 600% within a year and thus reflecting that regulatory rule in Hong Kong might not have been as effective as one would think. This and the

global financial crisis would have contributed to diminishing price informativeness as for the reasons listed for the Asian Financial Crisis. With Hong Kong regulatory boards running on low budgets and tight staff, it has been harder for them to ensure best practices in disclosure of its stock markets.

However, the above explanation may not fully explain the trend and low levels of price informativeness in H-shares. Thus we have also looked at investor characteristics and types in Hong Kong as another possible explanation. It is important to note that findings in this section describes of the entire Hong Kong Stock Market and not H-share specific. Thus may not be truly reflect behaviors in the H-share markets. For example, the smaller market capitalizations and low proportion of publically floated shares in the earlier years may have deterred institutional investors from purchasing H-shares. There have been different opinions towards how foreign investors affect price informativeness. It appears that when foreign investors have to bear relatively high information costs, it would reduce informed trading (Grossman and Stiglitz, 1980) (Roll, 1998). On the other hand, foreign investors might be better at collecting, processing and trading on private information as they are mostly sophisticated institutional investors who have better experience and skills relative to those in local markets as in the case of in Japanese markets (Luo, Chen and Yan, 2014), Korean markets (Kim and Yi, 2008) and Indonesian markets (Dvorak, 2005). Our findings in price informativeness trends seem to correspond to the latter view and that institutional investors do increase price informativeness of stocks.

Overall, yearly dips in price informativeness seems to reflect changes in proportion of annual trading turnover value generated by local retail investors compared to institutional investors, especially foreign institutional investors. Table 8 indicates portions of shareholder in 1996 – 2011. Until 2000, Hong Kong local retail investors contributed to the largest proportion

of market turnover value among all type of investors. In 1991 to 2000, local retail investors contributed an average of 44% of stock market turnover. The securities and Finance Commission (SFC) of Hong Kong and Hong Kong Stock Exchange (HKSE) noted that local retail investors took up a higher proportion during the years with bullish phases in 1997 (53%) and 2000 (49%), and a lower proportion in bearish years of 1996 (34%) and 1998 (41%). These changes match our findings and it is observed the price informativeness had dipped in 1997 and 2000 while risen in 1996 and 1998.

Characteristics of local retail investors then could present possible explanations in lower H-share price informativeness. The SFC explains that retail investors seem to be more sensitive to changes in market sentiment and may have been discouraged from trading or even withdraw all their investments in bearish time. (Tsoi, 2004) These people they refer to as fringe trades and the SFC suggests that Hong Kong retail investors consists a core group that continues to invest despite market sentiment and a fringe group who enters and exits depending on market conditions. In addition, the SFC reports that “unlike institutional investors who obtain research reports directly from brokerage firms ... just one-third of investors referred to corporate documents but over 50% relied on transaction volume, which seems to be less related to future stock performance”. Increase in local retail investors turnover value does not only reflect increase in trade but also the growing portion of the Hong Kong adult population investing in stocks (from 16% in 1997 to 21.5% in 2000). New market entrants perhaps lacked experience in investing, reports on these earlier years also suggested that these retail investors relied on their friends and families as sources of information. It is interesting to note that the SEC commented that in 2000, when price informativeness in H-shares seem to be at its lowest point, there was an increased proportion of stock investors who were homemakers/housewives (15%) and this

portion declined as price informativeness increased in 2003 (11%). Inexperienced retail investors trading on the Hong Kong Stock Exchange in 1996 – 2001 could explain the low price informativeness.

Beginning in the late 2000s, the Hong Kong stock market has seen a rise in contribution of trading value by international institutional investors. By 2003, local retail investors contributed less than one-third of total cash market turnover and foreign institutional investors have taken up 35% of the market turnover. It is also interesting to note that in 2003, Singapore had begun appearing as an international investor in the Hong Kong stock markets. Since 2003, when Singapore's share of total market turnover decreases, it appears that price informativeness of H-shares also decreases.

In 2004, we see a slight increase in local retail investors (34% vs. 2003: 30%) and the price informativeness of H-shares also faced a dip. Moreover, the SFC 2005 survey on retail investors in 2004 revealed many were not quite familiar with the financial markets and scored relatively low on the issued test. At the end of 2004, in September, China had implemented its Qualified Domestic Institutional Investors (QDII) and enabled licensed Chinese institutional investors to invest in capital markets of Hong Kong and other countries. This introduction could have two implications, either it encouraged more experienced Chinese institutional investors to invest in the Hong Kong markets or less of such investors as they now have access to more foreign markets such as the U.S and U.K. By proportion, investment value of Chinese investors was reduced in 2004-2005 but investment value in number terms could have risen. Regardless, we see a rise in proportion of institutional investors and in 2006, institutional investors dominated again and there was a rise in price informativeness. It is also to be noted that the HKSE also began putting more efforts to educating the public in Hong Kong's securities and



derivatives markets with the opening of the HKEx Public Viewing Room and New Exchange Exhibition Hall. Since 2000 to 2011, we still see the historical trend of Hong Kong retail investors taking up a great portion during bullish times and less so in bearish times. However, such fluctuations have decreased over the years. This may perhaps be an indicator that Hong Kong retail investors have been increasingly trading less on market-information and more on company fundamentals. However, no conclusion can be drawn without further research. Another thing to note is that towards the general low levels of price informativeness in H-shares, a reason could be because people have still yet to fully know how to assess these companies. As revealed by SFC's 2008 retail investor report, one of the biggest risk associated with China-concept stocks was the Mainland government's policy risk and that a portion of investors were still unsure of how to assess these stocks. Despite there being information, people still have had trouble in processing it.

Price informativeness has been decreasing since 2008. We have previously suggested that this could be due to the financial crisis of that time. However, another idea to consider is that while investors trading value has taken up large portions over those years (2008-2009: 38%, 2009-2010: 42%). It is unclear what this value proportion represents. Hong Kong stock markets have been sometimes seen to be fueled by "tourist money", implying that tradings on the Hong Kong Stock Exchanges by foreign institutions are done according to how well their domestic markets are doing and according to firm specific information of companies listed on the Hong Kong stock exchange. The idea the roles of foreign institutional investors in Hong Kong markets could be further explored as it is unclear how actively they have been trading. As noted in Table 7, turnover in H-shares are quite low in terms of its market capitalization, especially compared to A-shares and other parts of the world. Thus, perhaps the low price informativeness in H-shares

could be due to the fact that H-shares have been incorporated in indexes and some have chosen to trade these indexes instead of specific firm-information. Investors may be more passive and despite having the information, they choose not to act upon it. DeLisle, French and Schutte (2015) note passive institutional ownership will reduce information in prices because it reduces fundamentals-based trading and discourages corporate disclosure. More research can be done to differentiate between active investors and passive investors in Hong Kong. Another finding seems to be that H-shares price informativeness increases in years when nearby well-developed Asian countries (such as Singapore) contribute to a great investor volume and decrease in other years. Perhaps this reflect the different investment approaches each country has towards foreign stocks. More research is to be on in analyzing the Hong Kong stock markets before further conclusion can be made.

In summary, it is unclear as to why Hong Kong H-shares have not been as price informative as one would expect. The above section has attempted to shed light in terms of macro-situations, regulatory changes and investors developments.

#### *4.2 Industry Effects*

We have divided the companies by the following categories (1) mining, (2) construction, (3) manufacturing, (4) transportation, communication and utilities, (5) services sector, (6) non-classifiable and (7) wholesale. Table 4 describes the price informativeness panel data of non-financial H-shares at forecasting period  $k=3$  in 1993 – 2014 with industry dummy variable.  $x_1$  is  $\log\left(\frac{M}{A}\right)$  and  $x_2$  is  $\frac{E_t}{A}$ .  $x_3, x_5, x_7, x_9, x_{11}$  are the coefficients of companies in the mining, construction, manufacturing, transportation, communication and utilities, and services sectors respectively.  $x_4, x_6, x_8, x_{10}$  and  $x_{12}$  are coefficients of industry dummy  $\times \log\left(\frac{M}{A}\right)$  in the mining,

construction, manufacturing, transportation, communication and utilities, and services sectors respectively. We have divided each company into one of the following categories Our results show that price informativeness of mining firms is lower than other firms at 95% confidence interval (x4) and services firms are less price informative than other firms at a 90% confidence interval (x12). We are unable to draw a conclusion as to which firms are more price informative at this coarse industry segmentation. which firms. Firms not attributed to a dummy variable include wholesale and non-classifiable firms.

As mentioned previously, mining companies do not only consist of companies who extract minerals but also those who mine for coal and petroleum such as Sinopec. A possible explanation could be because companies related to natural resources are mostly state-owned and not China-incorporated private firms. Companies as such are more vulnerable to actions by the government and global economic issues. Net income of those firms seem to fluctuate more and are subject to regulatory approval. For example, some firms have had mining reserves that were waiting to be approved in China, African countries and such where the approval process is less transparent. Moreover, upon approval, mining companies still needed to construct and adapt the mines before they can harvest resources. Thus it may be more difficult to assess whether these firms will perform well in the future.

Figure 7 and Table 6 present findings we had when including financial firms into our sample. The major banks began listing in the Hong Kong Stock Exchange in 2005 with commercial bank, Bank of Communications and state-owned bank, China Construction Bank Corporation. Financial firms seem to overall, lower price informativeness.

#### *4.3 Dual-listing Effects*

To test the effect of dual-listing, we ran a panel regression of a three-year investment horizon. Note that our collection of dual listed firms does not consider subsidiaries as being dual-listed to their parent companies, such as Tong Ren Tang and its GEM board subsidiary, but only companies that itself has listing on both boards. As seen from the coefficient of  $x_4$  in Table 6, dual-listing has had a negative impact on H-share price informativeness.

This finding is similar to the findings in China's markets. Liu and Seasholes (2011) study A-H cross listing and suggests that with cross-listings, more noises that are not short lived and have a great impact are introduced. The paper further suggests that the presence of arbitrageurs may further influence prices such that they become less informative. Li (2013) indicates that H-shares contain more firm-specific information and thus the introduction of A-shares creates noise and hinders price informativeness. However, this may not be the case and that H-shares appear to be less price informative than A-shares as seen in the following section 4.4. Kot and Tam (2016) distinguish the order of cross-listing and analyzes the effect on price informativeness of H-share companies that first listed in a developed market, Hong Kong, after they proceed to list on the A-share market. This study concludes that the positive results from incorporating more firm-specific information through QDII's trading into the H-share markets is less in dual-listed firms than in non-dual-listed firms. There has been research done in other markets such as in the U.S where cross-listing enhanced price informativeness (Foucault and Gehrig, 2008) and a reduction in Canadian firms in the U.S. markets (Francis, Hasan and Kostova, 2011). More research is to be done on how dual-listing affects price informativeness.

#### *4.4 Comparison with A- Shares*

Using data received from Carpenter, Lu and Whitelaw (2015), it appears that H-shares are less price informative than A-shares. We have compared the coefficients between shares. Plot of their coefficient and the t-statistics by comparing A-shares to H-shares are seen in Figure 9. It is to be noted that we have taken the covariance to be zero, which is unlikely since we also expect A-shares and H-shares to be positively correlated, our results have become conservative. We can say that with statistical significance that information in H-prices is less than A-shares in 1996 – 1997 and since 2004. As Hong Kong has had a higher proportion of institutional investors than China throughout this time, this finding contradicts general consensus that markets with more institutional investors should have higher price informativeness. (Ding, Hou, Kuo and Lee, 2012). For the period of 1996 – 1997, the Asian Financial Crisis and uncertainties towards the Chinese government due to the handover could have been causes instability and for prices to be dominated by market information in oppose to firm specific information. Li, Yang and Xiao (2014) indicate that Chinese security analysts from 2005 to 2010 have been getting better at analyzing and transferring firm-specific information than industry-level information. As mentioned, firm-specific information, in oppose to industry- and market-level information, is often seen to be one of the most important features in price informativeness. Perhaps, Chinese analysts have just simply gotten better at analyzing China-incorporated companies and have guided the country's retail investors to make informed choices. Hong Kong's retail investing community might not have as much information on Chinese companies as those in China do as over the years there has been a large increase in public financial relevant news in China's media (newspapers, magazines, radio, blogs and such) whereas such information is less distributed publically. There is a greater emphasis on exclusive content provided by brokerage firms in

Hong Kong. Evan (2009) suggests that retail trading levels also affect the “flow” of information in stock prices and with greater news coverage, higher retail trading are associated with a lower  $R^2$ , which may be a sign of informational efficiency. Both the vast amount of retail investors and media coverage might have resulted in China’s A-share being more price informative than H-shares. Moreover, in general A-shares turnover as a ratio to market capitalization is higher than that of Hong Kong. Perhaps, as with one of the interpretations made by Chan, Menkveld and Yang (2007) on information asymmetry between foreign investors and domestic investors in the A-share and B-share markets, H-share investors might not in fact have less information but instead choose to act on the information in a different way.

## **5. Conclusion**

The Hong Kong Stock Market has often been seen as one of the most well-developed stock exchange in the world. However, non-financial H-shares are less price informative than U.S. stocks and China’s A-shares. This result is surprising given the high degree of transparency, good market and legal institutions, and little barriers to entries in the Hong Kong Stock Markets. We have also found that dual-listed stock, mining and services companies seem to be less price informative. It is important to note that our analysis has only been on H-shares on not on the entire Hong Kong Stock Market. Due to the limited number of observation and dominance of certain companies and industries, our results might be skewed. Perhaps, due to the fact that the economy of Hong Kong, being so integrated in the global economy and China has made it difficult for investors to distill information for H-shares.

We have found that H-shares are mostly price informative in 1996 – 2011, with the exception of 1999, 2000, and 2001. We have provided possible explanations to the trend and

lower levels of price informativeness through the lens of global economic situations, regulatory reforms, state-ownership proportion, information accessibility and accuracy, investor composition and profile changes, and the role of index funds. Our findings reveal that information in H-shares on future corporate profits appears to be less than that of stocks in China and the U.S. in 1996 – 2011. In this paper, we attempt to provide explanations for the trend of price informativeness in H-shares throughout 1996 – 2011 and the overall low-levels of price informativeness.

It was realized that there had been reforms in H-shares markets that were similar to A-shares throughout 1996 – 2005. Prior to 2005, H-shares were mostly state-owned enterprises that were subject to more lenient disclosure policies. In 1996 – 2001, Hong Kong stock market investors were also dominated by local, inexperienced investors who sought “informal” financial advice from friend and relatives. Reforms have been implemented to affect this situation such that H-shares face more similar standards to listings of non-Chinese companies. In 2001, the Hong Kong Stock Exchange was listed a public stock and attracted institutional investors. Price informativeness increased as more sophisticated foreign institutional investors entered. Since 2003, China and Hong Kong, as two regions, have been working foster a closer relationship, improving public’s access to stock and company information through policies such as the Closer Economic Partnership Agreement. Throughout this time, we see fluctuations in the composition of local retail investors and institutional investors that were mostly in line with the idea of institutional investors improving H-shares stock price informativeness. There has also increasing strain on Hong Kong Stock Markets’ regulatory boards as Hong Kong has been a increasingly popular region for companies to be listed on. Post-2008, the financial crisis reduced price informativeness due to lowered confidence in the markets and stock prices now integrated

perhaps more extreme realizations from the distribution of earnings. Despite the fact that foreign institutional investors have dominated trading activity since then and until 2011, it is unclear whether their investments were “tourist dollars” or not and whether these investors have made investments due to conditions in their own domestic markets which may or may not be relevant to the H-shares they were holding. We also consider the possibility that overall low price informativeness in Hong Kong H-shares could be due to the popularity of index funds and some have chosen to trade these indexes instead of on specific firm-information.

We have also looked at the industry effects on price-informativeness and found that mining and service firms seem to be less price informative than firms in other industries. Incorporating financial firms in our sample slightly lowered H-shares price informativeness. Dual-listed firms also seem to contain less information than non-dual-listed firms. Finally, we have concluded that H-shares are less price informative than A-shares, with information in price of A-share prices being comparable to the U.S., we can also suggest that H-shares are less price informative than U.S. stocks. An important caveat to note is that the sample of H-shares is relatively small and analysis on investor composition has been based on numbers and trends on the entire Hong Kong Stock Exchange. It is unclear whether institutional investors have invested more or less in H-shares than in other Hong Kong stocks.

Further research would need to be done in order to further understand the Hong Kong markets as it comprises of listings from all over the world. It would be interesting to compare informativeness of H-shares, Red Chips, P-Chips and other Hong Kong stocks and to see if price informativeness differs across. Also even within H-shares, the next steps could be factoring the fact that some H-shares are state-owned while others are private. With the Shanghai-Hong Kong Stock Connect, one could also look at the impact of such programs on price informativeness. The



trend in Hong Kong's trading volume across different types of investors also presents an interesting case and more analysis could be done on this topic. One could also look into what kind of H-shares institutional investors have invested in and from where these investors are from.

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## 7. Appendix

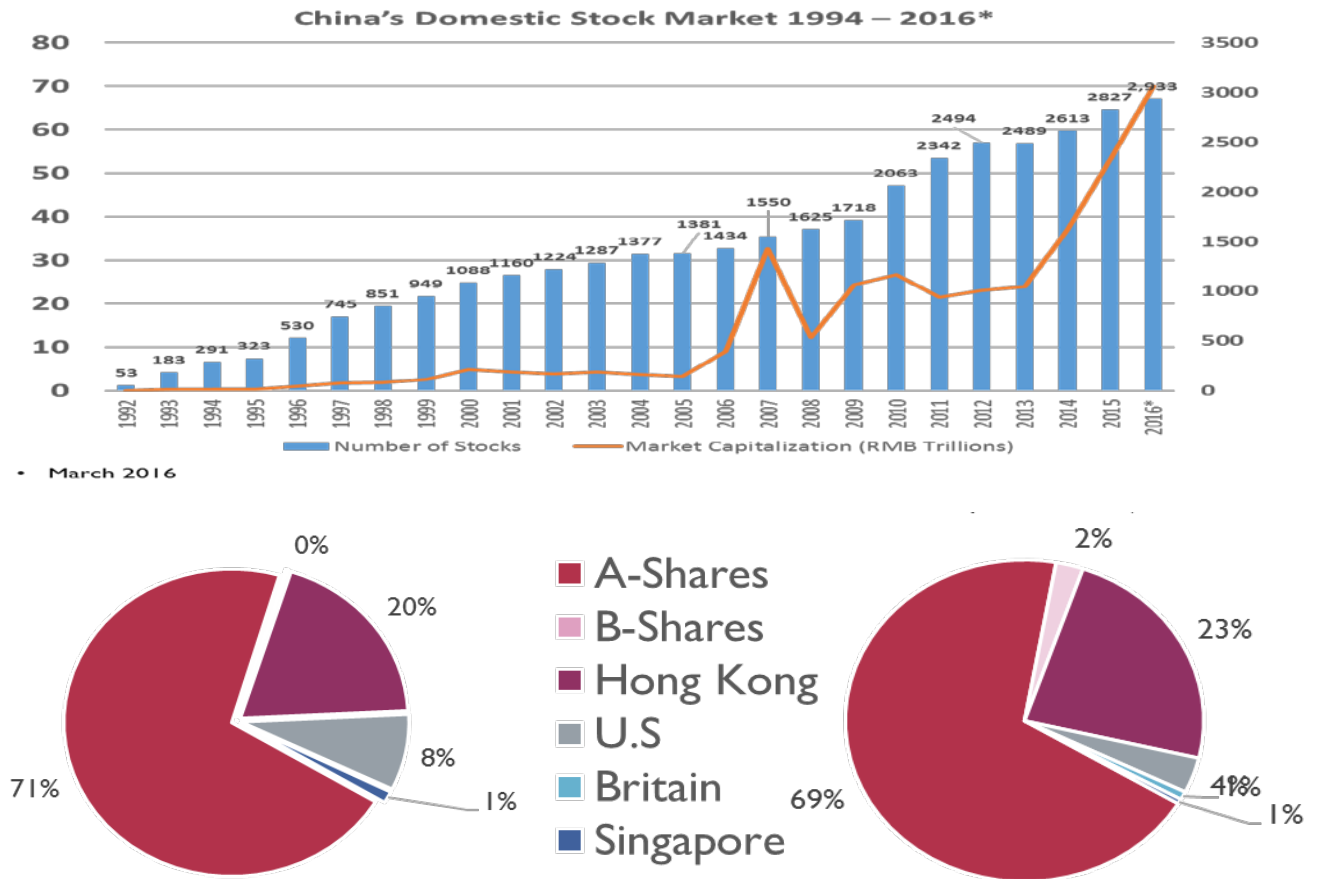


Figure 1:

Top: **Market Capitalization and Number of Firms in China's Domestic Stock Markets, 1992 – 2016**

The total number of stocks listed on the China's Stock Markets (left scale) and the total market capitalization in trillions of RMB (right scale)

Bottom Left: **Market Capitalization Distribution of Chinese firms in China's, Hong Kong's, U.S.'s, Britain's and Singapore's Stock Markets in 2015/2016**

Note that only China's, Hong Kong's, U.S.'s, Britain's and Singapore's Stock Markets were considered. Chinese firms have also been listing in other markets such as Germany and Australia.

Bottom Right: **Number of Firms Distribution of Chinese firms in China's, Hong Kong's, U.S.'s, Britain's and Singapore's Stock Markets in 2015/2016**

Note that only China's, Hong Kong's, U.S.'s, Britain's and Singapore's Stock Markets were considered. Chinese firms have also been listing in other markets such as Germany and Australia.

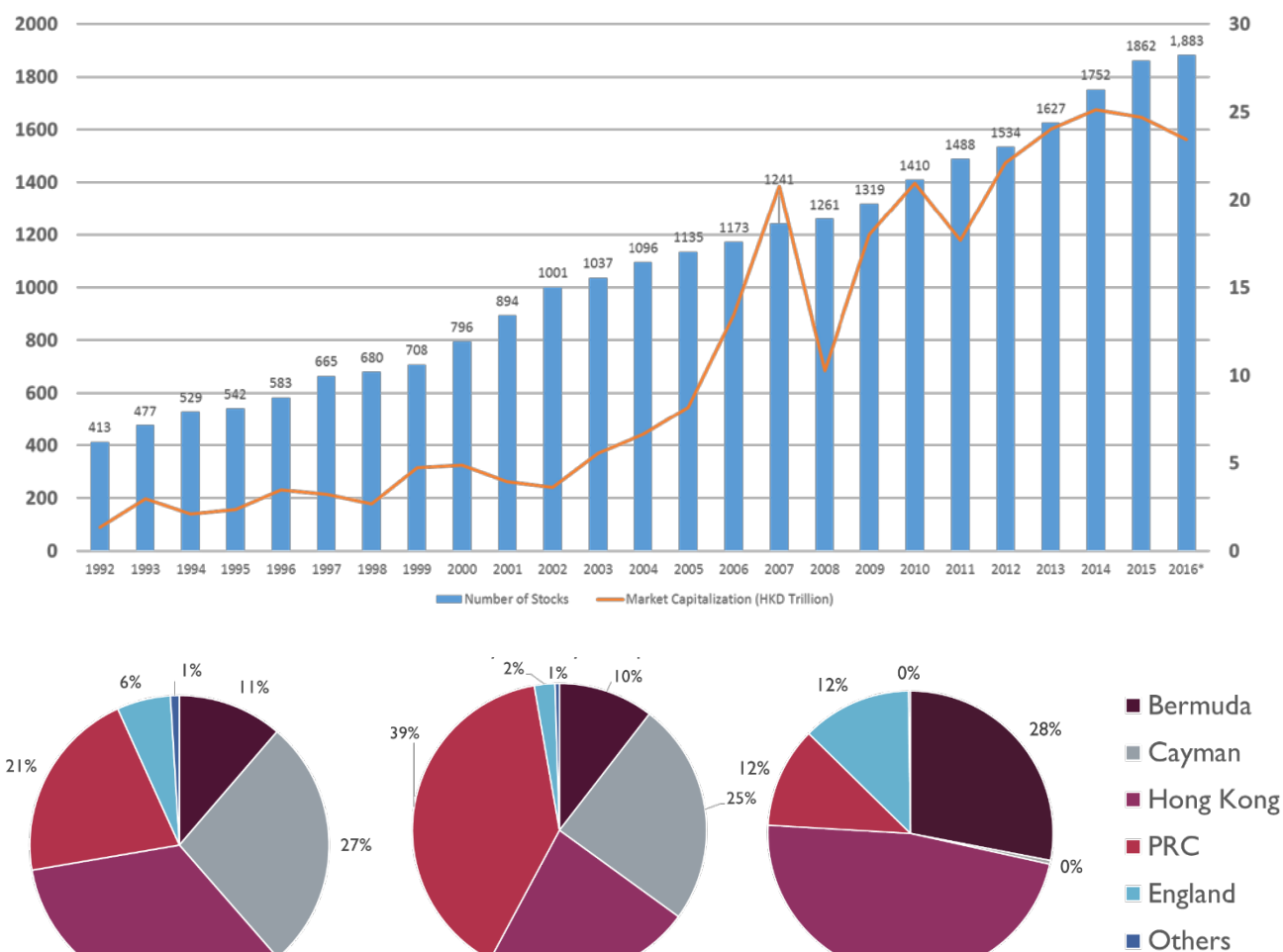


Figure 2:  
**Top: Market Capitalization and Number of Firms on the Hong Kong Stock Exchange 1992 – 2016**

The total number of stocks listed on the China's Stock Markets (left scale) and the total market capitalization in trillions of RMB (right scale)

**Bottom Left: Market Capitalization Distribution by Country Incorporated on the Hong Kong Stock Exchange in 2015**

**Bottom Center: Turnover Value Distribution by Country Incorporated on the Hong Kong Stock Exchange in 2015**

**Bottom Right: Number of Firms Distribution by Country Incorporated on the Hong Kong Stock Exchange in 2015**

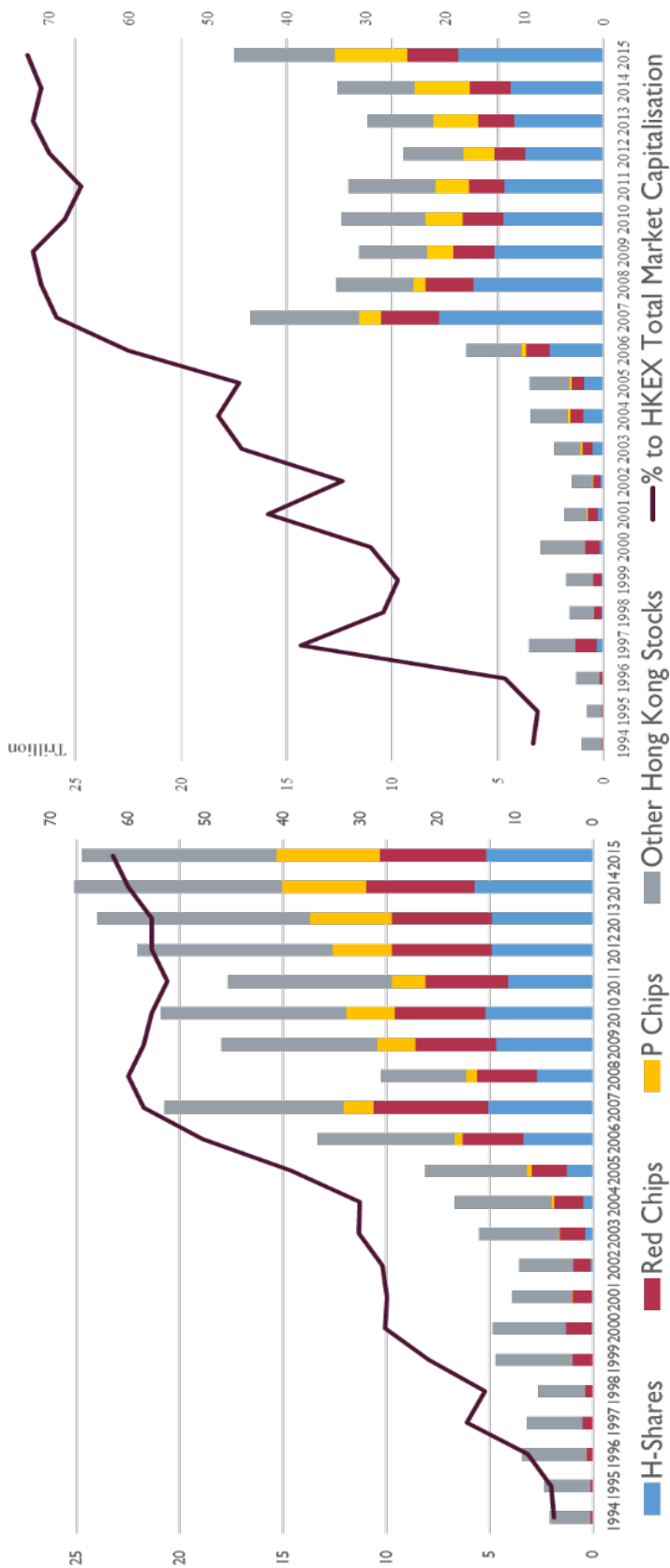


Figure 3

**Left: Market Capitalization of H-shares, Red Chips, P-Chips and other Hong Kong Stocks on the Hong Kong Stock Exchange in 1994 – 2015**

The market capitalization of Chinese and non-Chinese firms on the Hong Kong Stock Exchange in trillions of HKD (left scale) the proportion in percentages of Chinese stocks (H, Red and P) to other Hong Kong stocks. (right scale)

**Right: Total Annual Turnover of H-shares, Red Chips, P-Chips and other Hong Kong Stocks on the Hong Kong Stock Exchange in 1994 – 2015**

The total annual turnover of Chinese and non-Chinese firms on the Hong Kong Stock Exchange in trillions of HKD (left scale) the proportion in percentages of Chinese stocks (H, Red and P) to other Hong Kong stocks. (right scale)

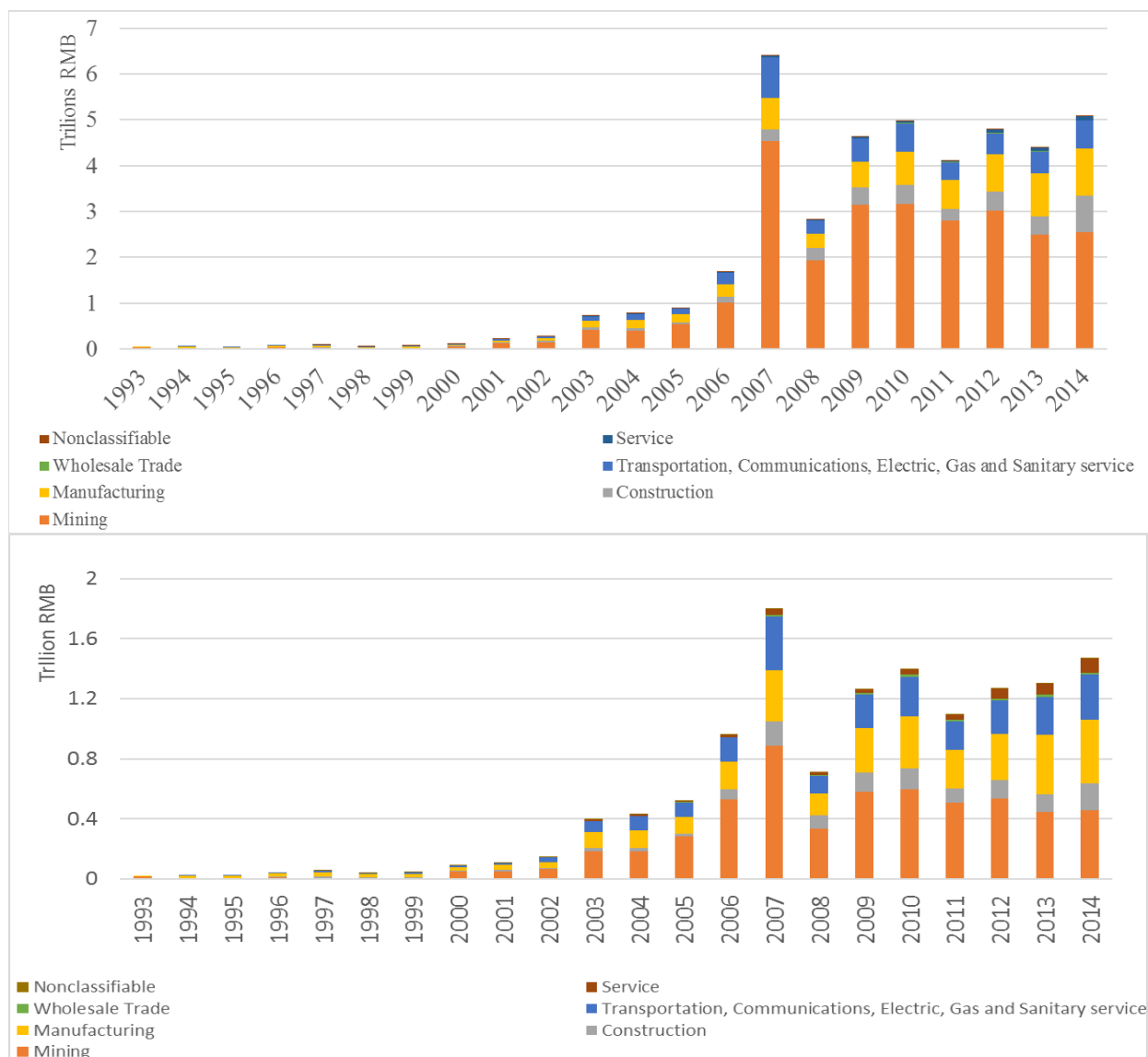


Figure 4

Top Panel: **Adjusted Market Capitalization Distribution of Non-Financial H-shares by Industry**

Bottom Panel: **Non-Adjusted Market Capitalization Distribution of Non-Financial H-shares by Industry**

Top panel shows market capitalization of non-financial H-shares by industry in 1993 – 2014 using dual-listed A/H companies' total shares outstanding in both markets.

Bottom panel shows market capitalization of non-financial H-shares by industry in 1993 – 2014 using only H-shares total shares outstanding.



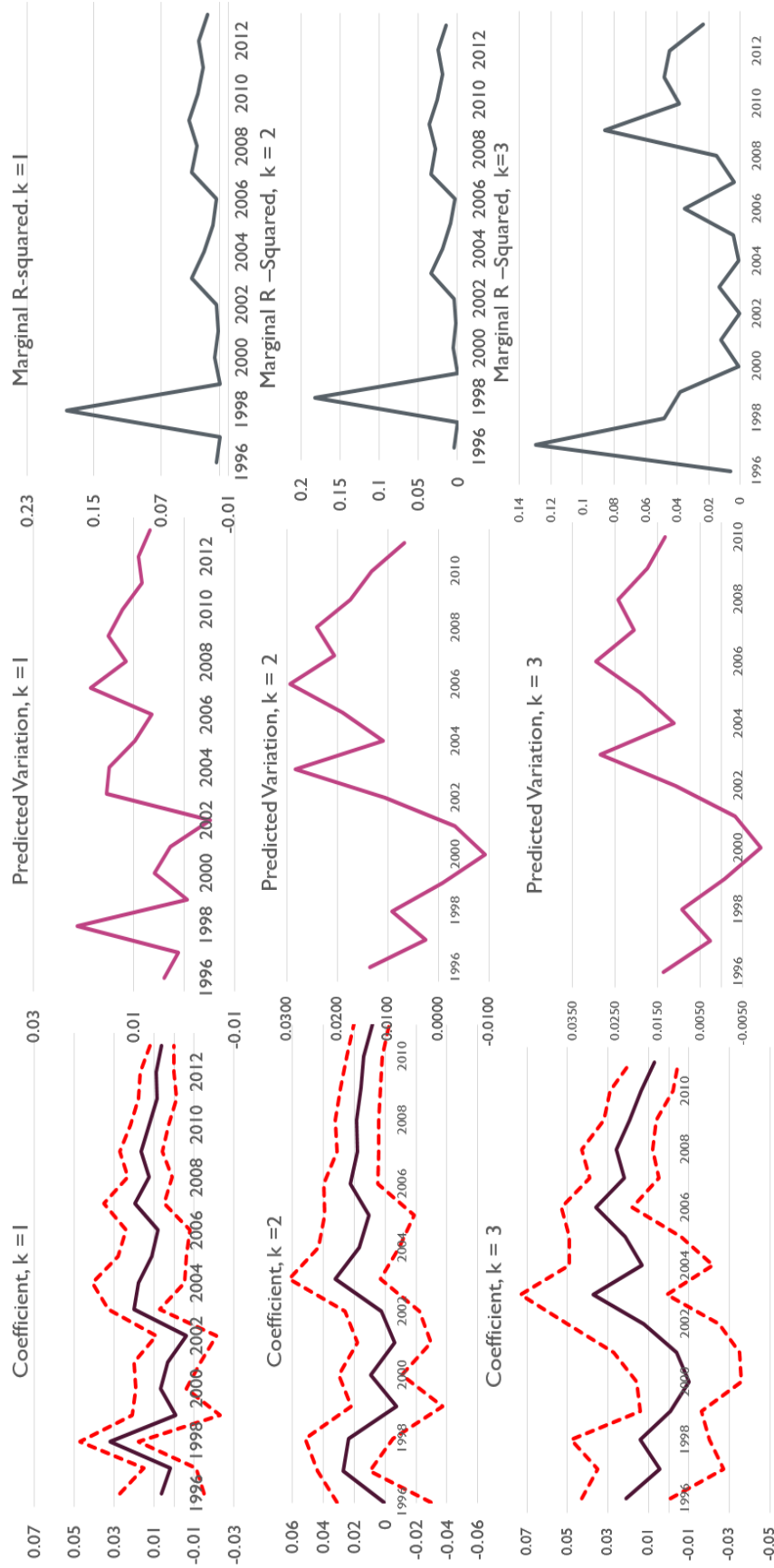


Figure 5: **Stock Price Informativeness in Non-financial Hong Kong H-shares: Forecasting Earnings with Equity Prices**

Results from cross-sectional regression of the form  $\frac{E_{i,t+k}}{A_{i,t}} = c_t + a_t \log\left(\frac{M_{i,t}}{A_{i,t}}\right) + b_t \frac{E_{i,t}}{A_{i,t}}$  for each calendar year  $t = 1996 - 2012$  -  $k$ , for forecasting horizon  $k = 1, 2$ , or  $3$  years.  $E$  is firm earnings (net income),  $A$  is firm total asset book value,  $M$  is firm equity market value. The left plots show the coefficients  $a_t$  with their 95% confidence bands, the center plots show the predicted variation, which is the coefficient  $a_t$  times the standard deviation of the regressor  $\log\left(\frac{M_{i,t}}{A_{i,t}}\right)$  and the right plots show the marginal  $R^2$  of this regressor.

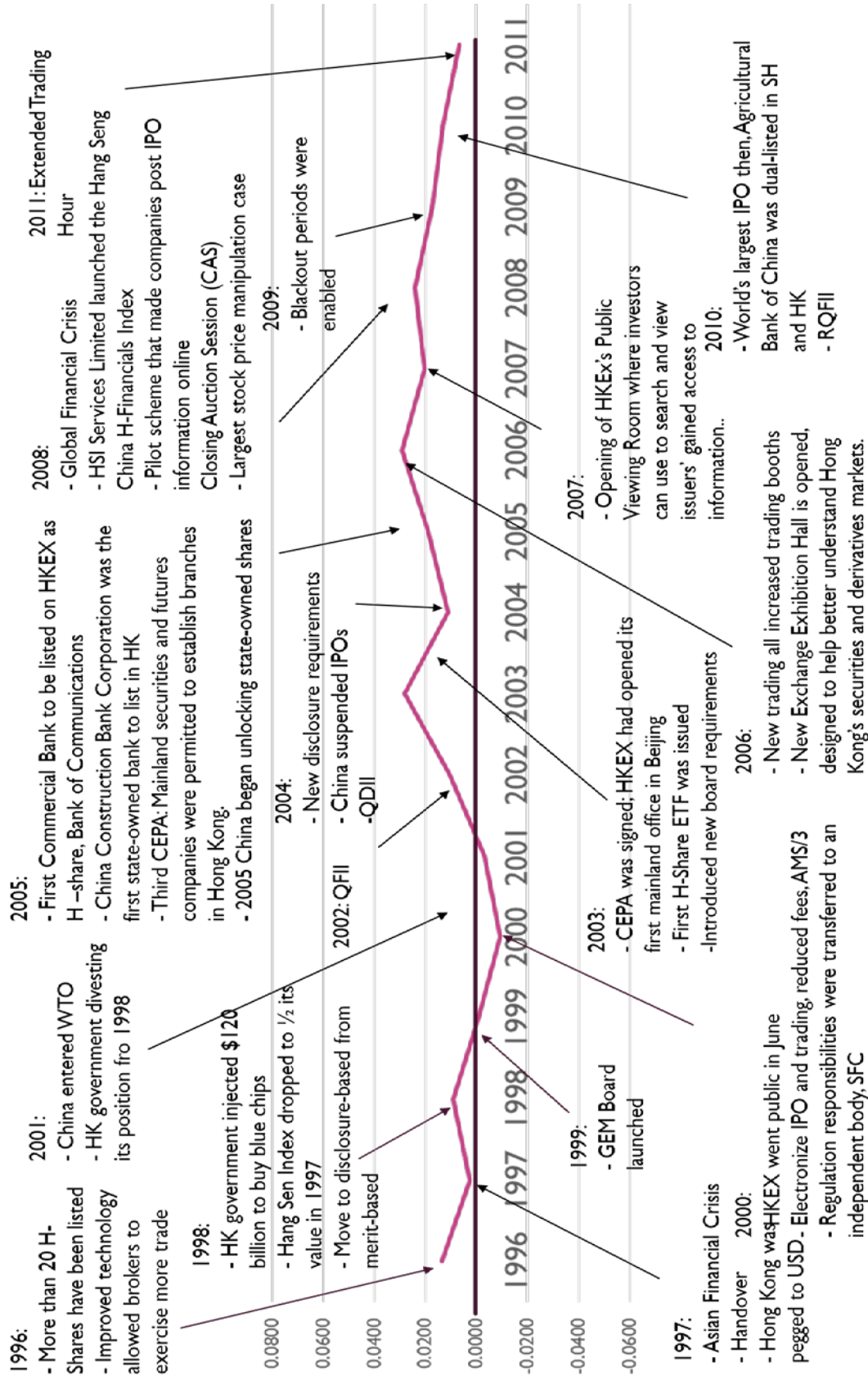


Figure 6: **Stock Price Informativeness in Non-financial Hong Kong H-shares at k=3**

Plot of price informativeness of H-shares, which is the predicted variation, which is the coefficient  $a_t$  times the standard deviation of the regressor  $\log\left(\frac{M_{i,t}}{A_{i,t}}\right)$  in 1996 – 2011 at forecasting horizon  $k = 3$  and major issues affecting price informativeness.

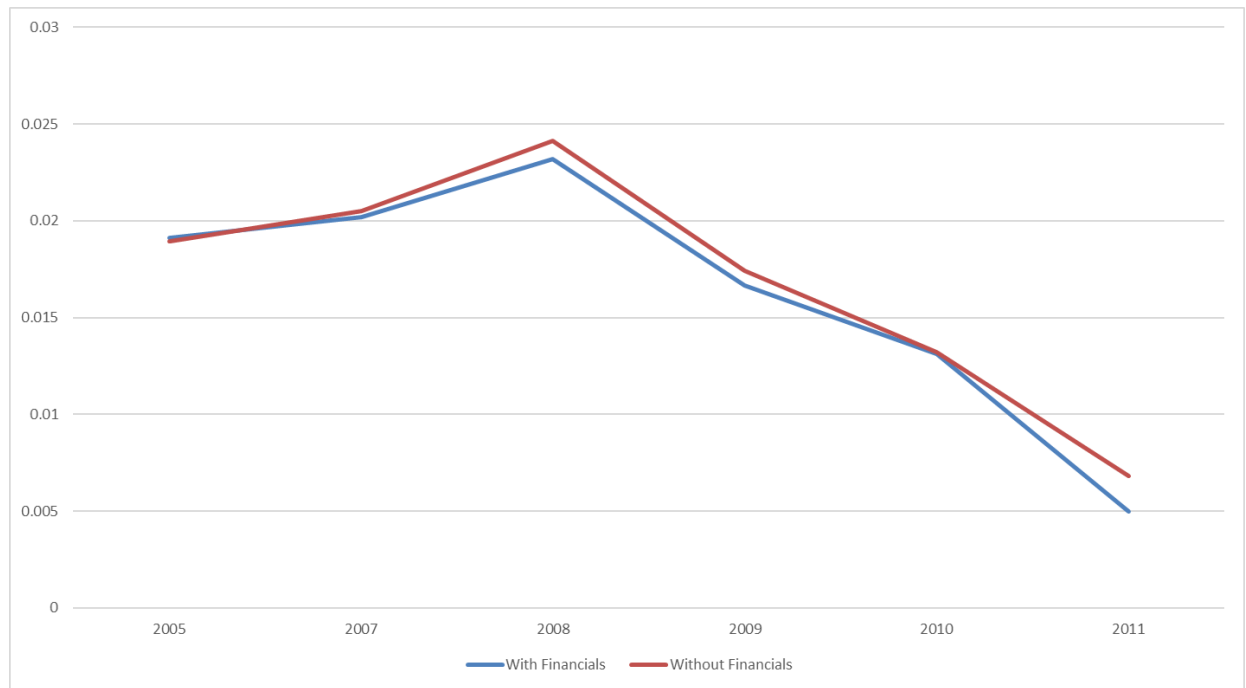


Figure 7

**Price Informativeness of H-shares with and without Financial Firms Included in 2005 – 2011, with  $k = 3$**

Plot of price informativeness which is the coefficient  $a_t$  times the standard deviation of the regressor  $\log\left(\frac{M_{i,t}}{A_{i,t}}\right)$  of non-financial H-shares firms vs. including financial firms since in 2005 – 2011 with a 3 year forecasting horizon.

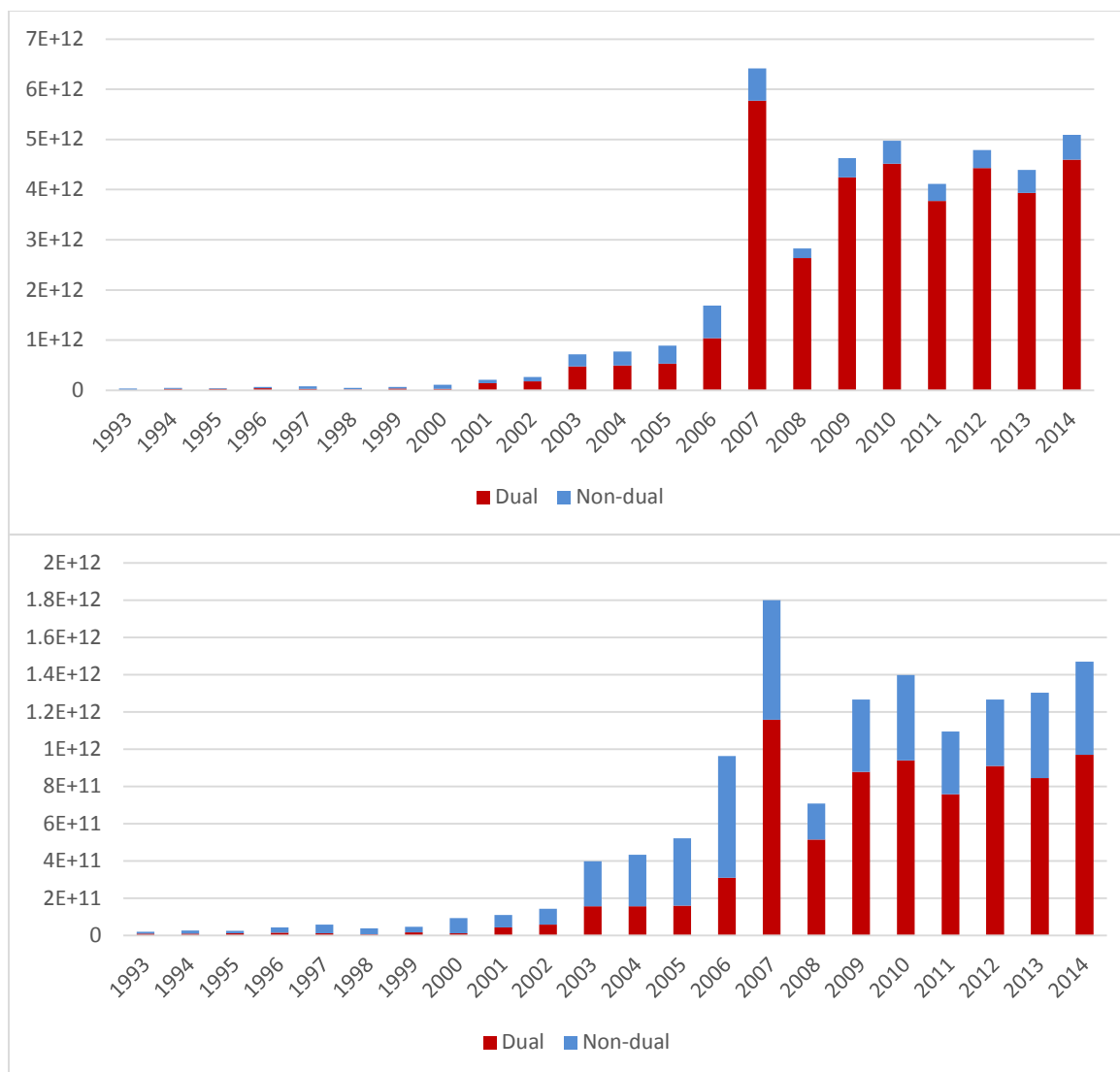


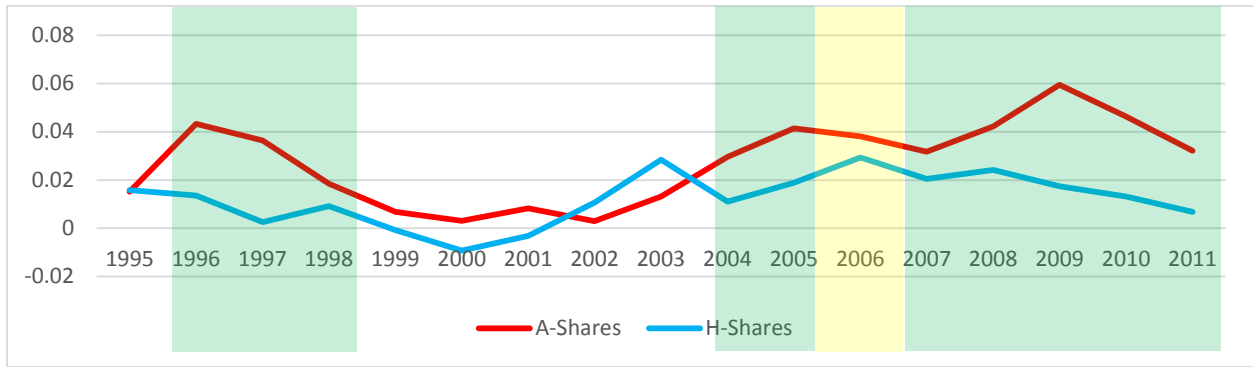
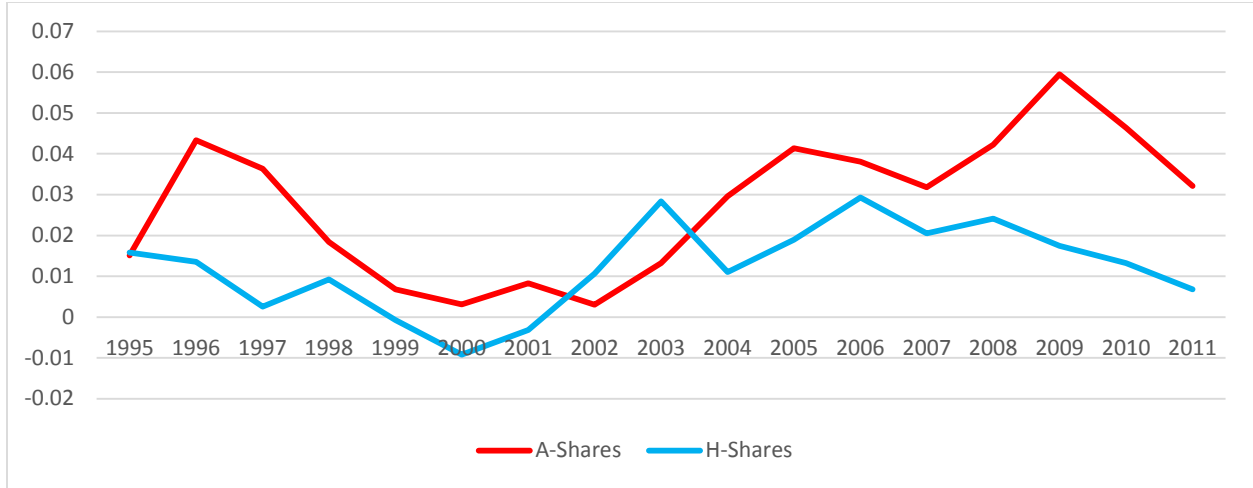
Figure 8.

Top Panel: **Adjusted Market Capitalization Distribution of Non-Financial H-shares by Dual vs. Non-dual-listed**

Bottom Panel: **Non-Adjusted Market Capitalization Distribution of Non-Financial H-shares by Dual vs. Non-dual-listed**

Top panel shows market capitalization of non-financial H-shares by dual vs. nondual in 1993 – 2014 using dual-listed A/H companies' total shares outstanding in both markets.

Bottom panel shows market capitalization of non-financial H-shares by dual vs. nondual in 1993 – 2014 using only H-shares total shares outstanding.



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
T-Stat (A-H)	0.204	3.63636	3.311	1.201	1.296	1.138	1.174	-0.357	-0.644	1.987	2.794	1.838	2.278	2.68193	4.448	3.749	4.476

Figure 9

#### Top Panel: Price Informativeness of A-shares and H-shares

Plot of price informativeness which is the coefficient  $a_t$  times the standard deviation of the regressor  $\log\left(\frac{M_{i,t}}{A_{i,t}}\right)$  of A-shares and H-shares from  $\frac{E_{i,t+k}}{A_{i,k}} = c_t + a_t \log\left(\frac{M_{i,t}}{A_{i,t}}\right) + b_t \frac{E_{i,t}}{A_{i,t}} + \varepsilon_{i,t+k}$

#### Bottom Panel: Coefficients and T-Statistics Comparing Coefficient $a_t$ of A-shares and H-share

Plot of coefficient,  $a_t$  from  $\frac{E_{i,t+k}}{A_{i,k}} = c_t + a_t \log\left(\frac{M_{i,t}}{A_{i,t}}\right) + b_t \frac{E_{i,t}}{A_{i,t}} + \varepsilon_{i,t+k}$  and the T-statistics

computed by 
$$\frac{a_{t,A-Shares} - a_{t,H-Shares}}{\sqrt{(SE_{t,A-Shares})^2 + (SE_{t,H-Shares})^2}}$$

	A-Shares		B-Shares		Hong Kong Stock Exchange's China-Related Stocks				N-Shares	L-Shares	S-Shares
	The onshore domestic market providing full A subset of the full largecap representation of all stocks and sectors traded		A subset of the full largecap market traded in foreign currency in China		H-Shares	Red Chips	P-Chips*		A subset of the full market trading on exchange in the US	A subset of the full small-cap market traded GBP in London	A subset of the full small to mid-cap market traded in SGD in Singapore
					Enterprises that are incorporated in the Mainland which are either controlled by Mainland Government entities or individuals.	Enterprises that are incorporated outside of the Mainland and are controlled by Mainland Government entities.	Enterprises that are incorporated outside of the Mainland and are controlled by Mainland individuals.				
Stock Exchange	Shanghai	Shenzhen	Shanghai	Shenzhen	Hong Kong	Hong Kong	Hong Kong		NYSE, NASDAQ	London	Singapore
# of Constituents	1082	1750	52	49	231	151	577		146	34	20
Market Cap (Billion USD)	3908	3078	17	13	626	632	645		785	20	120
Breakdown	All		Large		Mid-large		All		Small-Mid	Small	Small-Mid
Currency	RMB		USD	HKD	HKD				USD	GBP	SGD
Available to	PRC citizens & foreign investors who have been approved as QFII or RQFII + around 566 stocks that can be bought by all investors via the HKSE under the Shanghai-Hong Kong Stock Connect	PRC citizens & foreign investors who have been approved as QFII or RQFII	Foreign investors and since 2001 PRC citizens as well		All investors				All investors	All investors	All investors

**Table 1: Comparison of A-shares, B-Shares, H-shares, Red-Chips, N-Shares, L-Shares, and S-Shares**  
Updated with sources from Shanghai Stock Exchange, Shenzhen Stock Exchange, Hong Kong Stock Exchange, New York Stock Exchange, London Stock Exchange March 2016. \* HEKX: P-Chips Dec 2015

0

	Beta1	95% C.I.		Price Informativeness	Marginal R2	T-stats 1	Observations	SD for Beta 1
1993	0.00480			0.00295	0.00612	0.27440	6.00000	0.61530
1994	0.02562			0.01848	0.12976	1.46946	15.00000	0.72137
1995	0.02247			0.01582	0.04804	1.23197	17.00000	0.70376
1996	0.02109	-0.00100	0.04300	0.01353	0.03787	2.00171	23.00000	0.64150
1997	0.00424	-0.02700	0.03500	0.00260	0.00116	0.27606	38.00000	0.61216
1998	0.01400	-0.02000	0.04800	0.00920	0.01238	0.83537	40.00000	0.65703
1999	-0.00097	-0.01600	0.01400	-0.00076	0.00021	-0.12760	43.00000	0.79120
2000	-0.01023	-0.03600	0.01600	-0.00920	0.01324	-0.78845	49.00000	0.89917
2001	-0.00409	-0.03500	0.02700	-0.00316	0.00094	-0.26205	55.00000	0.77172
2002	0.01246	-0.02500	0.05000	0.01062	0.00437	0.66366	68.00000	0.85232
2003	0.03716	0.00100	0.07300	0.02836	0.03525	2.03728	85.00000	0.76318
2004	0.01317	-0.02200	0.04900	0.01105	0.00371	0.73534	101.00000	0.83899
2005	0.02167	-0.00600	0.04900	0.01893	0.01483	1.56455	111.00000	0.87392
2006	0.03574	0.01800	0.05300	0.02930	0.08576	4.00486	128.00000	0.81971
2007	0.02192	0.00500	0.03900	0.02052	0.03873	2.51207	132.00000	0.93596
2008	0.02566	0.00800	0.04300	0.02413	0.04807	2.89795	133.00000	0.94027
2009	0.01913	0.00600	0.03200	0.01742	0.04499	2.86071	137.00000	0.91082
2010	0.01362	-0.00200	0.02900	0.01321	0.02341	1.71433	143.00000	0.96998
2011	0.00691	-0.00500	0.01900	0.00681	0.00768	1.10203	145.00000	0.98486

Table 2

**Cross-sectional regression output for k = 3 in 1993 – 2011**

Cross-sectional regression output for a 3 year investing horizon of non-financial H-share firms in 1993 – 2011 showing coefficient of regressor  $\log\left(\frac{M}{A}\right)$ , 95% confidence interval using White heteroskedasticity-consistent standard errors, price informativeness  $a_t \times \sigma\left(\log\left(\frac{M}{A}\right)\right)$ , marginal  $R^2$ , number of observations and standard deviation of  $\log\left(\frac{M}{A}\right)$

Single Panel Regression Results							
OLS Regression Results							
=====							
Dep. Variable:	Y	R-squared:	0.179				
Model:	OLS	Adj. R-squared:	0.178				
Method:	Least Squares	F-statistic:	104.9				
Date:	Sat, 07 May 2016	Prob (F-statistic):	2.75e-43				
Time:	09:08:26	Log-Likelihood:	1418.1				
No. Observations:	1469	AIC:	-2830.				
Df Residuals:	1466	BIC:	-2814.				
Df Model:	2						
Covariance Type:	HC0						
=====							
	coef	std err	t	P> t	[95.0% Conf. Int.]		
-----							
Intercept	0.0613	0.006	10.949	0.000	0.050	0.072	
x1	0.0156	0.003	5.633	0.000	0.010	0.021	
x2	0.5277	0.053	9.923	0.000	0.423	0.632	
=====							
Omnibus:	253.146	Durbin-Watson:	1.716				
Prob(Omnibus):	0.000	Jarque-Bera (JB):	1591.710				
Skew:	0.642	Prob(JB):	0.00				
Kurtosis:	7.935	Cond. No.	29.4				
=====							

Table 3

**Price Informativeness Baseline Panel Data in 1993- 2014 at k=3**

Price informativeness panel data of non-financial H-shares at forecasting period k=3 in 1993 – 2014. x1 is  $\log(\frac{M}{A})$  and x2 is  $\frac{E_t}{A}$ . Price informativeness is estimated to be 0.01545715 by multiplying the coefficient of x1 and standard deviation of  $\log(\frac{M}{A})$ .



Single Panel Regression Results									
OLS Regression Results									
=====									
Dep. Variable:		Y	R-squared:		0.220				
Model:		OLS	Adj. R-squared:		0.213				
Method:		Least Squares	F-statistic:		34.70				
Date:		Sun, 08 May 2016	Prob (F-statistic):		2.87e-71				
Time:		11:04:16	Log-Likelihood:		1455.2				
No. Observations:		1469	AIC:		-2884.				
Df Residuals:		1456	BIC:		-2816.				
Df Model:		12							
Covariance Type:		HC0							
=====									
	coef	std err	t	P> t	[95.0% Conf. Int.]				
-----									
Intercept	0.0845	0.012	7.320	0.000	0.062		0.107		
x1	0.0274	0.005	5.192	0.000	0.017		0.038		
x2	0.4652	0.054	8.611	0.000	0.359		0.571		
x3	-0.0541	0.009	-6.064	0.000	-0.072		-0.037		
x4	-0.0203	0.006	-3.222	0.001	-0.033		-0.008		
x5	0.0228	0.030	0.757	0.449	-0.036		0.082		
x6	0.0131	0.016	0.836	0.403	-0.018		0.044		
x7	0.0533	0.015	3.575	0.000	0.024		0.083		
x8	0.0129	0.010	1.240	0.215	-0.008		0.033		
x9	0.0196	0.012	1.682	0.093	-0.003		0.042		
x10	0.0089	0.007	1.327	0.185	-0.004		0.022		
x11	-0.0130	0.012	-1.065	0.287	-0.037		0.011		
x12	-0.0118	0.007	-1.741	0.082	-0.025		0.001		
=====									
Omnibus:		232.153	Durbin-Watson:		1.790				
Prob(Omnibus):		0.000	Jarque-Bera (JB):		1695.271				
Skew:		0.519	Prob(JB):		0.00				
Kurtosis:		8.159	Cond. No.		35.7				
=====									
Warnings:									
[1] Standard Errors are heteroscedasticity robust (HC0)									

Table 4

### Price Informativeness Industry Panel Data for $t = 3$

Price informativeness panel data of non-financial H-shares at forecasting period  $k=3$  in 1993 – 2014 with industry dummy variable.  $x_1$  is  $\log\left(\frac{M}{A}\right)$  and  $x_2$  is  $\frac{E_t}{A}$ .  $x_3, x_5, x_7, x_9, x_{11}$  are the coefficients of companies in the mining, construction, manufacturing, transportation, communication and utilities, and services sectors respectively.  $x_4, x_6, x_8, x_{10}$  and  $x_{12}$  are coefficients of industry dummy  $\times \log\left(\frac{M}{A}\right)$  in the mining, construction, manufacturing, transportation, communication and utilities, and services sectors respectively. Our results show that price informativeness of mining firms is lower than other firms at 95% confidence interval ( $x_4$ ) and services firms are less price informative than other firms at a 90% confidence interval ( $x_{12}$ ). Firms not attributed to a dummy variable include wholesale and non-classifiable firms

	Beta1	95% C.I.		T-stats 1	Marginal R2	Observations	SD for Beta 1		
2005	0.02189	-0.005	0.048	1.60063	0.015722334	116	0.8727		
2006	0.03462	0.017	0.052	4.13296	0.080864492	138	0.8758		
2007	0.0218	0.006	0.038	2.67088	0.039547573	144	0.9266		
2008	0.02517	0.008	0.042	2.75557	0.046720417	145	0.9214		
2009	0.01849	0.006	0.031	3.02657	0.044670053	151	0.9021		
2010	0.01354	-0.002	0.029	2.09649	0.024895319	158	0.9700		
2011	0.00507	-0.006	0.016	0.99869	0.004077719	162	0.9774		
Single Panel Regression Results									
OLS Regression Results									
=====									
Dep. Variable:				Y	R-squared:		0.178		
Model:				OLS	Adj. R-squared:		0.177		
Method:				Least Squares	F-statistic:		107.1		
Date:				Thu, 05 May 2016	Prob (F-statistic):		2.66e-44		
Time:				13:13:38	Log-Likelihood:		1540.3		
No. Observations:				1561	AIC:		-3075.		
Df Residuals:				1558	BIC:		-3059.		
Df Model:				2					
Covariance Type:				HC0					
=====									
	coef	std err		t	P> t	[95.0% Conf. Int.]			
-----									
Intercept	0.0592	0.006		10.734	0.000	0.048		0.070	
x1	0.0150	0.003		5.590	0.000	0.010		0.020	
x2	0.5323	0.054		9.922	0.000	0.427		0.637	
=====									
Omnibus:				284.527	Durbin-Watson:		1.722		
Prob(Omnibus):				0.000	Jarque-Bera (JB):		1900.066		
Skew:				0.674	Prob(JB):		0.00		
Kurtosis:				8.234	Cond. No.		30.7		
=====									
Warnings:									
[1] Standard Errors are heteroscedasticity robust (HC0)									

Table 5

### Cross-sectional regression output for k = 3 in 1993 – 2011, including financials

Cross-sectional regression output for a 3 year investing horizon in 1993 – 2011 with financial firms, showing coefficient of regressor  $\log\left(\frac{M}{A}\right)$ , 95% confidence interval using White heteroskedasticity-consistent standard errors, price informativeness  $a_t \times \sigma\left(\log\left(\frac{M}{A}\right)\right)$ , marginal  $R^2$ , number of observations and standard deviation of  $\log\left(\frac{M}{A}\right)$

Single Panel Regression Results						
OLS Regression Results						
=====						
Dep. Variable:	Y		R-squared:	0.195		
Model:	OLS		Adj. R-squared:	0.193		
Method:	Least Squares		F-statistic:	60.83		
Date:	Sat, 07 May 2016		Prob (F-statistic):	1.39e-47		
Time:	12:23:10		Log-Likelihood:	1432.8		
No. Observations:	1469		AIC:	-2856.		
Df Residuals:	1464		BIC:	-2829.		
Df Model:	4					
Covariance Type:	HC0					
=====						
	coef	std err	t	P> t	[95.0% Conf. Int.]	
-----						
Intercept	0.0860	0.008	10.396	0.000	0.070	0.102
x1	0.0255	0.004	6.725	0.000	0.018	0.033
x2	0.4935	0.054	9.112	0.000	0.387	0.600
x3	-0.0416	0.009	-4.573	0.000	-0.059	-0.024
x4	-0.0141	0.006	-2.248	0.025	-0.026	-0.002
=====						
Omnibus:	246.095		Durbin-Watson:	1.730		
Prob(Omnibus):	0.000		Jarque-Bera (JB):	1733.430		
Skew:	0.581		Prob(JB):	0.00		
Kurtosis:	8.193		Cond. No.	31.1		
=====						
Warnings:						
[1] Standard Errors are heteroscedasticity robust (HC0)						

Table 6

### Price Informativeness Dual Listed Panel Data for $t = 3$

Price informativeness panel data of non-financial H-shares at forecasting period  $k=3$  in 1993 – 2014 with dual-listing dummy variable.  $x_1$  is  $\log\left(\frac{M}{A}\right)$  and  $x_2$  is  $\frac{E_t}{A}$ .  $x_3$  is coefficient of the dual-listing dummy variable and  $x_4$  is the dummy variable  $\times \log\left(\frac{M}{A}\right)$ . Dual-listed firms are seen negatively affect price informativeness at a 95% confidence interval as seen in the interaction term coefficient of  $x_4$ .

(HK\$ Million)								
Year-end	Market Capitalization		Annual Turnover Value		Annual Turnover Ratio	Trading Days	Average Daily Turnover Value	Average Daily Turnover Ratio
1994	19,981	(0.96%)	84,279	(3.32%)	422%	248	340	1.70%
1995	16,464	(0.7%)	110,701	(2.27%)	672%	247	448	2.72%
1996	31,531	(0.91%)	263,330	(1.93%)	835%	249	1058	3.35%
1997	48,622	(1.52%)	472,970	(8.48%)	973%	245	1930	3.97%
1998	33,533	(1.26%)	334,966	(4.61%)	999%	247	1356	4.04%
1999	41,889	(0.88%)	958,197	(5.79%)	2287%	247	3879	9.26%
2000	86,131	(1.77%)	1,204,358	(5.81%)	1398%	243	4956	5.75%
2001	101,702	(2.58%)	909,865	(13.51%)	895%	247	3684	3.62%
2002	131,641	(3.65%)	807,238	(9.47%)	613%	248	3255	2.47%
2003	408,180	(7.36%)	1,197,770	(21.96%)	293%	249	4810	1.18%
2004	461,528	(6.89%)	1,410,085	(27.49%)	306%	247	5709	1.24%
2005	1,286,916	(15.73%)	1,710,797	(26.44%)	133%	247	6926	0.54%
2006	3,378,740	(25.33%)	2,952,371	(39.22%)	87%	246	12002	0.36%
2007	5,079,515	(24.45%)	5,524,438	(46.44%)	109%	245	22549	0.44%
2008	2,731,740	(26.6%)	2,875,900	(48.55%)	105%	249	11550	0.42%
2009	4,713,480	(26.18%)	3,868,690	(44.64%)	82%	249	15537	0.33%
2010	5,230,480	(24.98%)	4,385,970	(38.03%)	84%	247	17757	0.34%
2011	4,101,270	(23.2%)	4,002,520	(38.66%)	98%	246	16270	0.40%
2012	4,896,000	(22.15%)	4,839,060	(38.89%)	99%	247	19591	0.40%
2013	4,912,540	(20.45%)	4,828,400	(37.82%)	98%	244	19789	0.40%
2014	5,729,660	(22.8%)	5,228,020	(34.99%)	91%	247	21166	0.37%
2015	5,164,639	(20.9%)	5,150,701	(39.38%)	100%	247	20853	0.40%
Annual Turnover Ratio: Annual Turnover Value/MK CAP								
Average Daily Turnover Value: Annual Turnover Value/ Trading Days								
Average Daily Turnover Ratio: Average Daily Turnover Value/MK CAP								

Table 7

### Market Capitalization, Annual Turnover Value, Annual Turnover Ratio and Daily Turnover Ratio in 1994 - 2015

Market Capitalization, Annual Turnover Value, Annual Turnover Ratio and Daily Turnover Ratio in 1994 – 2015. Values are in millions of HKD and numbers in brackets are values in proportion to the entire Hong Kong Stock Exchange.

Annual Turnover Ratio: Annual Turnover Value/MK CAP

Average Daily Turnover Value: Annual Turnover Value/ Trading Days

Average Daily Turnover Ratio: Average Daily Turnover Value/MK CAP

Contribution of market trading by investor type		1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Local retail		34%	53%	41%	45%	50%	36%	32%	30%	34%	30%	27%	28%	26%	25%	21%	22%
Local institutions		26%	20%	22%	18%	18%	19%	24%	28%	22%	27%	26%	25%	27%	24%	23%	20%
Overseas retail		2%	3%	2%	1%	2%	3%	2%	4%	3%	2%	3%	4%	3%	4%	4%	4%
Overseas institutions		29%	19%	31%	30%	28%	38%	35%	34%	33%	34%	39%	39%	38%	38%	42%	42%
Members' principal trading		8%	5%	5%	5%	3%	4%	7%	3%	7%	8%	5%	4%	6%	8%	10%	12%
Local		60%	73%	63%	63%	68%	55%	56%	58%	56%	57%	53%	53%	53%	49%	44%	42%
Overseas		31%	22%	33%	31%	30%	41%	37%	39%	36%	36%	42%	43%	41%	42%	46%	46%
Retail		36%	56%	43%	46%	52%	39%	34%	34%	37%	32%	30%	32%	29%	29%	25%	26%
Institutional		55%	39%	53%	48%	46%	57%	59%	62%	55%	61%	65%	64%	65%	62%	65%	62%

**Table 8 Contribution of Trading Value by Investor Type in 1996 - 2011**  
Contribution of Trading Value by Investor Type in 1996 - 2011