OWNERSHIP STRUCTURE AND PRICE DISEQUILIBRIUM

BETWEEN A AND B SHARES ON CHINA'S STOCK MARKET

A Thesis

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ABSTRACT

China's A-share market and B-share market are initiated for Chinese domestic investors and foreign investors respectively. With the identical issuing companies, trading rules, voting rights and dividends policies, B shares have been selling at a discount relative to A-share counterparts, which is considered as a puzzle over years. This thesis emphasizes the importance of the ownership structures on the price disequilibrium, especially, the individual-institutional structure and tradable-nontradable structure in China. By building up a multi-regression model, the A-share premium (or B-share discount) can be explained by the different ownership structures between the two markets. More specifically, the results show that in Chinese stock markets institutional investors help to stabilize the stock prices; the results also indicate that non-tradable shares limit the liquidity level of Chinese stock markets.

BIOGRAPHIAL SKETCH

Xiaolin Cui was born on November 8, 1986, in Beijing, China. She has been focusing her study on financial economics since undergraduate.

In 2005, she entered University of International Business and Economics (UIBE), in Beijing, and majored in banking and finance. After four year's study in finance and economics, she received her Bachelor of Economics degree in 2009 and was recommended by her department to the Graduate School with honors. However, to obtain higher level of education and improve her quantitative analytical skills in finance and economics, she decided to go to graduate school in the U.S.

In fall of 2009, she entered the Graduate School at Cornell University to pursue a M.S. degree in Applied Economics and Management. She completed her Master's degree in July 2011.

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CHAPTER ONE

INTRODUCTION

1.1. Problem: Apparent Disequilibrium between Two Stock Markets in China

The fast growing Chinese capital markets have received a great deal of attention in recent years. China's stock markets have experienced tremendous growth and development since the establishment of the two stock exchanges—Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange (SZSE) in 1990, which formed the "A-share" market. Two years later, Chinese securities markets opened a door to foreign investors and created the "B-share" market in both Shanghai and Shenzhen. Initially, to avoid global capital shocks and to protect state-owned assets, domestic investors and foreign investors were separated perfectly into A-share and B-share markets respectively. After the reforms were implemented in 2001, domestic Chinese retail investors have been allowed to trade in B-share market. With the identical issuing companies, trading rules, voting rights and dividends policies as A shares, B shares have been selling at discount relative to A-share counterparts, which is considered as a puzzle and has attracted the interest of numerous researchers.

Some works have been done to analyze the possible explanations to this phenomenon. Bailey (1994) studies and documents the behavior of B-share returns since the market just established. He emphasizes the relationship between B-share returns and international stock index returns to analyze the diversification value of B shares. The results demonstrate that B shares have considerable diversification value, which could be one of the factors that B shares selling at a cheaper price than A-share counterparts. Bailey continued his study on international asset

pricing, especially the Chinese stock markets disequilibrium in his "Foreign Ownership

Restrictions and Equity Price Premiums: What Drives the Demand for Cross-Border

Investments?" (1999). In this paper, he and the other researchers explain the large price premium

by the concepts focusing on foreign investor's demand and supply of shares. Ma (1996) finds

that the price difference between Chinese A shares and matching B shares is correlated with

investors' attitudes toward risk and the correlations between B shares and foreign shares. Sun

and Tong (1999) test mainly the differential demand argument and several other factors about

information, liquidity and speculation. They find that the B-share discount phenomenon is due to

demand elasticity differences. More specifically, B-share investors are facing a more elastic

demand curve than A-share investors because B shares have more substitutes. Chakravarty,

Sarkar and Wu (1998) argue that one reason for the large price discount of B shares is due to

market segmentation and information asymmetry. The empirical study suggests that foreign

investors have less information on Chinese capital markets. Gao (2001) investigates the

behaviors of the investors in A-share and B-share markets. Gao documents that A-share investors

have internal news in advance of the public disclosure, which is one reason for the

disequilibrium. In another study about information asymmetry, however, Chui and Kwok (2001)

find empirical evidence showing that the information flow is actually from B-share market to A-

share market, meaning foreign investors receive news faster than domestic investors due to

information barriers in China. To support and extend Sun and Tong's (1999) concept centering

on the demand elasticity difference, Yang (2005) proves that the number and trading volume of

Chinese firms traded in the U.S. are also related to the large price premium in A-share market

than B-share market. In other words, the shares listed in the U.S. stock markets are another

substitute for B shares.
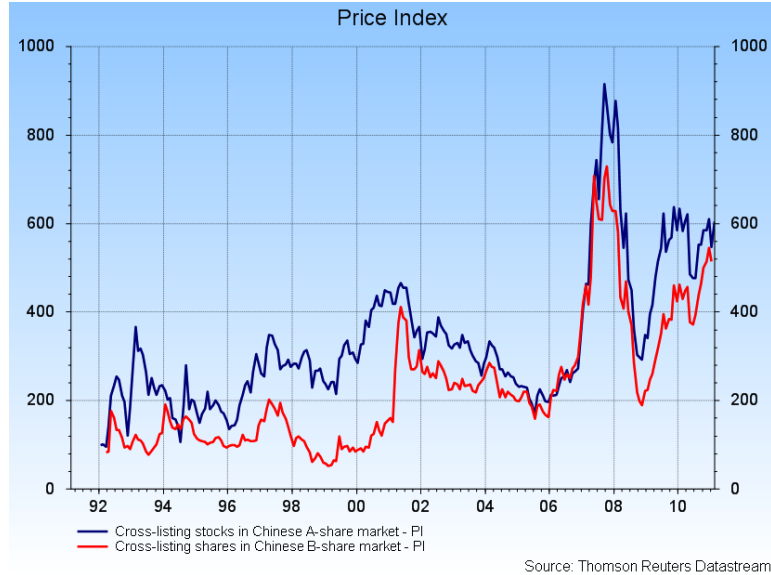
Figure 1-1 Comparison of A-Share Price and B-Share Price (Price Indices of 85 stocks in A-share market and B-share market, 1992-2011) [1]

1.2. Objectives of Research

To further analyze the causes of the pricing disequilibrium, it is necessary to dig into the core

of the problem and study the structure of Chinese capital markets and its influence on the price

differences. The special ownership structure in China may significantly influence the price

differences between A shares and B shares.

The general objective of this study is to examine how the ownership structure in China's stock

markets has affected the price gap between the two markets. The ownership structure in this

paper indicates two classes of shares: tradable shares and non-tradable shares; institutional shares

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[1] The Price indices are created by weighted cross-listed stocks in A-share market and B-share market from 1992 to 2011. In the graph the two price lines are not perfectly parallel, which indicates that there are different factors working on the price differences and changing over time. And A-share price is always higher than B-share price.

and individual shares. Tradable shares in China defined as shares that are currently listed and available for public trading, which are called "float" in other countries. And nontradable shares or restricted nontradable shares in China are calculated by subtracting tradable shares from shares outstanding. The nontradable shares in China are distinguished from the restricted shares in other countries. For restricted shares in other countries, their dates to become tradable in open markets are known in advance. However, the timetable for nontradable shares in China to become liquid is not specified and it is all based on the government's policy.

The specific objectives in sequential order are to:

1. Describe the price disequilibrium and analyze the causes centering on the ownership structure of China's stock markets;

2. Review the historic development of Chinese capital markets during the period of 1992 to 2011, and summarize the characteristics of A-share and B-share markets;

3. Examine the ownership structure factors that cause the phenomenon using data during the period 2001-2011 (due to the discontinuity of the price series since 2001).

This thesis emphasizes the importance of the ownership structures in China on the price disequilibrium, especially, the individual-institutional structure and tradable-nontradable structure. The main questions are: Are individual investors considered to be more irrational and less informed? Will a higher proportion of individual investors over institutional investors lead a higher price away from the stocks' fundamental values? As for capital control, do more shares tradable mean that more shares add liquidity to the market? And will a higher proportion of non-tradable shares in the market limit the liquidity and lead to mispricing of the stocks? In this thesis, I will investigate the causes of price difference from the ownership structure aspect. I will be analyzing a 10-year quarterly panel data from 2001 to 2010 over the 85 cross-listing stocks in

A- and B-share markets. Other factors considered in prior research such as differential demand, liquidity and speculation will also be included in the model for control purpose.

1.3. Thesis Organization

The rest of the paper is organized as follows. In order to understand disequilibrium in the Chinese stock markets, we must understand what comprise equilibrium. Capital asset pricing is discussed in Chapter 2 and then used to discuss the possible causes of disequilibrium in Chapter 3 (literature review). Chapter 4 summarizes the data and methodology. Chapter 5 provides an overview of Chinese capital markets and comparison of A-share and B-share markets; lays out the model and analyzes the econometric results. Chapter 6 concludes the paper with a summary of results and discussion of implications.

CHAPTER TWO

CAPITAL ASSET PRICING

2.1. Law of One Price

The law of one price is an economic law stated as "In an efficient market, all identical goods must have only one price." For example, an ounce of gold should cost the same in commodity exchanges in Chicago and London. If the gold costs more in one exchange than the other, then traders would have incentive to arbitrage. Another example is exchange rate (e.g., the spot exchange rates for a currency in everywhere in the world markets must trade at the same price).

A cross-listed company is a firm that lists its equity shares on one or more stock exchanges. According to the law of one price, the prices of cross-listed shares should be the same in different stock exchanges. For example, numerous large Canadian companies are listed on the New York Stock Exchange or NASDAQ as well as the Toronto Stock Exchange. The cross-border put-call parity holds well in the two countries. In other words, the prices of the domestic market and foreign market are identical. Likewise, in China shares of identical company trading on the Shanghai and Shenzhen markets should have the same price under the law of one price.

2.2. Arbitrage Pricing Theory (APT) and Capital Asset Pricing Model (CAPM)

APT holds that the expected return of a financial asset can be modeled as a linear function of various macro- economic variables (Ross, 1980). If the price diverges, arbitrage should bring it back into line. And it can be expressed as:

$$r_j = a_j + b_{j1}F_1 + b_{j2}F_2 + \cdots + b_{jn}F_n + \varepsilon_j$$

Where a_j is a constant; F_k is a factor; b_{jk} is the sensitivity of the asset to factor k; and ε_j is residual. And it can be rewritten in expected returns form as:

$$E(r_j) = r_f + b_{j1}RP_1 + b_{j2}RP_2 + \cdots + b_{jn}RP_n$$

Where RP_k is the risk premium of the factor k; r_f is the risk-free rate.

A special case of APT is CAPM (Capital Asset Pricing Model) in which the expected return is defined by a single index, measured against the return of a well-diversified market portfolio.

$$E(r_j) = r_f + \beta_j RP$$

The assumptions of CAPM are: all investors are rational and risk-averse; are price takers; can lend and borrow unlimited amounts under risk free rate of interest; trade without transaction or taxation costs; receive the same information at the same time. APT has more flexible assumption requirements. It assumes that each investor will hold a unique portfolio with its own particular array of betas, as opposed to the identical "market portfolio" in CAPM.

Under capital asset pricing theories, arbitrage works when the current price of an asset diverges from the price predicted by the above model. Arbitragers will "sell high and buy low" till the market price comes back on the line. One inference from equilibrium models is that if two or more shares of identical asset and influenced by the same asset, then by CAPM or APT they should obtain the same price. However, this is not the case in China. Thus, here comes the question: how can an arbitrage opportunity exist and persist in Chinese equity markets? And why can't arbitrage as predicted by capital asset pricing models close the gap? The price difference between Chinese A-share and B-share markets counterparts is because of mispricing or a risk compensation? Or the theory does not apply due to violation of its assumptions.

2.3. Assumptions of market equilibrium

Economists generally assume that the law of one price applies in liquid and efficient markets, which means that the markets should be extreme liquid; the prices reflect all the information in the markets; and there are no transaction costs and trade barriers. China's capital markets are still during its developing period and market inefficiency exists. China's abnormal phenomenon of A-share premium (or B-share discount) may have something to do with its going against the assumptions of the one price theory. Chinese stock markets violate the assumptions from the following aspects:

(a) Liquidity

The liquidity of A-share market and B-share market are much different—size, trading volume, turnover rate, and number of listed companies in A-share market is much larger than that of B shares. More specifically, A-share market is about 40 times larger than B-share market by total value of tradable stocks. And the turnover rate of A-share market is approximately 3 times higher than that of B-share market. As such, less liquidity of B-share market could be one of the reasons for B-share discount. In order to compensate for the investors, illiquid shares are required to have higher expected return and hence lower price.

(b) Market efficiency

The Chinese stock markets consist of tradable shares and non-tradable shares. The tradable shares or free float are the shares that are listed and traded in the exchange. The restricted nontradable shares or nontradable shares are shares owned by the government and cannot be traded in the stock markets. Nontradable shares are calculated by subtracting float from shares

outstanding. The original justification for the creation of nontradable shares was to ensure that state-owned enterprises would not fall into private or foreign hands. By locking up about 20% of shares outstanding in A-share market, non-tradable shares have strongly impacted market transparency. B shares, on the contrary, are almost all tradable shares. From historical data, A shares are more volatile than B shares, representing their price fluctuation risk. Therefore, it makes sense if investors in A-share market require a larger price premium to compensate higher price volatility.

Another issue about market efficiency is that short-selling is not allowed in mainland China. Economists believe that banning on short-selling delays price adjustment to the correct value and reduce market efficiency. If a stock is overvalued, then a good way to correct this overvaluation is to sell the stock short. The existence of the tremendous price difference between A-share and B-share market may due to banning on short-selling in mainland China.

(c) Information asymmetry

The finance literature documents that the information asymmetry exits between A-and B-share markets. Chakravarty, Sarkar, Wu (1998) argue that one reason for the large price discount of B shares is because foreign investors have less information on Chinese stock markets than domestic investors. However, Chui, Kwok (2001) document that foreign investors receive news faster than domestic investors due to information barriers in China; as a result, the returns on B shares should lead the returns on A shares.

Another level of information asymmetry is between institutional investors and retail investors. Institutions generally tend to be banks, insurance companies, pension funds, mutual funds, investment trusts and hedge funds. They are a very special group of investors because of the size

of assets that they manage and amount of information and experience they have and use on stock selection. Compared to institutional investors, retail investors are more irrational and less experienced in general. The speculative activities of retail investors may then increase the volatility of stock prices.

Given the inefficient features of Chinese stock markets, this paper will find the relationship between substantial price differences and market inefficiency, especially, from ownership structures (tradable-nontradable structure and individual-institutional structure) aspect. And next chapter will summary the possible causes of the price disequilibrium based on previous studies.

CHAPTER THREE

POSSIBLE CAUSES OF DISEQUILIBRIUM (LITERATURE REVIEW)

As discussed in the previous chapters, financial economists believe that the equilibrium

conditions in which the same quality stocks in two markets should obtain the exact same price.

Unlikely, there exists a large price discount for B shares relative to the A shares in China. Given

substantial price differences between the two classes of shares, a number of researchers provide

their explanations and perform empirical tests based on their hypotheses. There are four

hypotheses on the A-share price premium (or B-share discount): differential demand hypothesis,

information asymmetry hypothesis, liquidity hypothesis, and speculation hypothesis/ differential

risk hypothesis. I will include a few of factors that in prior research into my model. And at the

same time, I will test several new variables from the aspect of ownership structures.

3.1. Hypotheses

(a) Liquidity hypothesis

In the liquidity hypothesis, the price gap between A shares and the matching B shares is

explained as the differential liquidity levels between the two markets. As empirical proxies for

liquidity measurement, trading volume and turnover rate[2] are mostly used. According to the

previous studies, A-share market is more liquid than B-share market, which drives B-share price

lower than A-share price to compensate for illiquidity. Bailey (1994) documents that differential

liquidity levels may explain the time-series and cross-sectional variation of the price difference.

Sun and Tong (1999) find a positive relationship between the trading volume ratio (B shares over

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[2] The turnover rate in this paper means the average daily volume.

A shares) and the B-share discount, which suggests that relatively less trading activity in B-share market than A-share market drives the price gap larger. Based on the results of previous studies, if I use turnover rate ratio or trading volume ratio (A shares over B shares) as an independent variable and A-share premium as dependent variable, the coefficient between the two should be positive.

(b) Asymmetric information hypothesis

Researchers under this topic mainly test which market has more information over the other. Chakravarty, Sarkar and Wu (1998) argue that the discount in B-share market is due to foreign investors' lack of information relative to domestic investors. They argue that difficulties of gaining information are due to language barriers, different accounting standards and lack of knowledge about the local economy. They develop a model focusing on information asymmetry and market segmentation, and derive a pricing equation for A shares and B shares. The results show that information asymmetry explains a significant portion of the cross-sectional variation of the B-share discounts. However, Chui and Kwok (2001) argue and prove with empirical evidence that the information flow is from B share market to A share market, which is right opposite of what Chakravarty, Sarkar and Wu (1998) found. They argue that the returns on B shares should lead the returns on A shares, and this pattern of information flow is due to the segmentation in the China's capital markets and China's information barriers.

(c) Differential demand hypothesis

According to differential demand argument, researchers mainly focus on the share supply (shares outstanding) and demand elasticity (substitutes for A shares and B shares), and their

influence on the stock prices. Under differential demand hypothesis, the demand elasticity of domestic investors is relatively lower than that of foreign investors. As a result, A-share investors would like to pay a higher price for the same stocks than B-share investors. Sun and Tong (1999) argue that the China's B-share discount phenomenon is due to foreign investors facing a more elastic demand curve than Chinese domestic investors. They state that B shares have more substitutes than A shares, which makes the demand curve of B shares more elastic. The result shows that when more H shares and red chips listed in Hong Kong (which they believe are the substitutes of B shares), the B-share discount becomes larger. As an empirical proxy for relative demand of share; I use the ratio of number of shareholders in A-share market to B-share market. And as a possible proxy for relative share supply, I use the ratio of number of shares outstanding in A-share market to B-share market. Theoretically, the price premium of A shares over B shares should be negatively related with share supply ratio and positively related with share demand ratio according to demand-supply equations.

(d) Differential risk hypothesis/Speculation hypothesis

For differential risk argument, researchers study the differential risk aversions of A shareholders and B shareholders. The hypothesis argues that Chinese domestic investors are highly speculative, which drives the A-share price much higher than B-share price. Ma (1996) documents that "cross-sectional differences between prices of A shares and B shares are correlated with investors' attitudes toward risk and correlations between B shares and foreign shares". Sun and Tong (1999) conclude that "the higher of the A-share market volatility relative to the B-share market volatility the larger B-share discount will be". That means Chinese

domestic investors excessive speculative activities on A shares seem to be related to the A-share price premium.

3.2. Additional Considerations

Among prior studies, few of them focus on ownership structures of China's capital markets. However, stock market structure greatly affects share prices because different investors have different behaviors working on the stock prices. I add individual-institutional structure and tradable-nontradable structure variables into the model. And ownership structure is not totally segregated from the four arguments of disequilibrium (liquidity, demand elasticity, information asymmetry and risk aversion level). The following studies document how tradable-nontradable structure and individual-institutional structure work on stock prices.

(a) Individual investors vs. institutional investors

Sias (1996) states that, from academic point of view, institutional investors are more likely attracted by less-risky stocks because of several reasons: (1) many institutional investors are governed by more strict rules, thus they are more cautious and conservative when picking their stocks, (2) greater institutional ownership may gather more information, and (3) institutional investors tend to be more rational than individual investors.

Gompers and Metrick (1999) find that institutions have different behaviors when choosing stocks compared with the other investors: institutions invest in stocks that are larger, more liquid, and with relatively lower returns. What's more, their demands in certain stocks are stable over time. Given this stable demand for stocks, a shift of investment from individuals to institutions

implies changes in the buying behaviors. In other words, an increase in the institutional share of the market will result in a greater demand for large, liquid and low return stocks.

In Gompers and Metrick's (1999) paper, they argue that "investors would prefer liquid assets over illiquid ones and would be willing to give up some amount of expected future cash flows to buy more liquidity, especially institutional investors". Except for facing a stricter legal environment and being more sensitive to liquidity and transaction cost, the reason why institutional investors are so different is that they have better knowledge about historical return patterns and believe that the rate of return for any stock must in relation to its risk class.

Cohen (2002) provides empirical evidence on the stabilizing impact of institutions. Institutions buy shares from individuals in response to positive cash-flow news. And when stock price goes up without any positive news, institutions sell shares to individuals. Barber and Odean (2003) find that individual investors display "attention-based" buying behavior on days with high trading activities. In contrast, institutional investors do not show this buying behavior.

Bohl and Brzeszczynski (2005) argue that if institutional herds all react to the same news, it will help with the adjustment of stock prices to new information faster and thus make the stock market more efficient. In other words, institutional investors may stabilize stock prices and help the stock prices move towards their fundamental values. Thus, the more shares held by institutional investors, the more the stock prices reflect the firms' true values. Liu and Han (2010) also find that large shareholder trades will incorporate more information about the firm's prospects and push prices towards their fundamental value.

However, a number of studies document that institutional investors have negative herding effect on stock markets. Some researchers argue that instead of stabilizing asset prices as suggested by much of the academic literature, institutional investors cause volatility because they

are actually associated with riskier stocks. Sias (1996) find evidence that an increase in relative

institutional holdings drives an increase in volatility. Gabaix, Gopikrishnan, Plerou and Stanley

(2006) present a theory of excess stock market volatility, in which market movements are due to

large institutional trading in relatively illiquid markets. And such trades generate significant

extreme values in returns and volume.

(b) Tradable shares vs. nontradable shares

As discussed in previous chapters, the Chinese government opened stock exchanges in the

early 1990s to raise capital and improve the performance of state-owned firms. To ensure

government's control of state-owned firms, nontradable shares were created and took up about

20% of China's stock markets. And as described before, tradable shares in this thesis mean the

free float in the market; and nontradable shares are the restricted shares that cannot be traded in

the stock exchanges. Chen and Xiong (2002) find that the non-tradable state-owned shares and

legal-person shares in China have an average illiquidity discount about 70% to 80% when they

are traded over the counter.

Beltratti and Bortolotti (2006) document some negative effects of non-tradable shares on the

stock markets and stock prices. First, the tradable shares investors are typically minority

shareholders with little power to affect management decisions. Second, the limited free float

available due to the existence of non-tradable shares makes the stock markets illiquid, volatile

and speculative. Thus, by changing tradable and non-tradable structure (unlocking non-tradable

shares and increasing tradable shares) the market would expect better liquidity given the

substantial increase in the free float. Moreover, the increase in the percentage of tradable shares

will put a downward pressure on the market, which will pull the A-share prices close to B-share prices.

According to studies on tradable and nontradable shares and individual and institutional shares, I believe that those two structures will have some influence on the A-share premium in China.

CHAPTER FOUR

DATA AND METHODOLOGY

4.1. Data

This chapter describes the data and illustrates the methodology used to test and analyze possible factors of the price disequilibrium phenomenon in China. By the end of 2010, there were 1339 firms listed in A-share market and 108 firms listed in B-share market. Meanwhile, 85 firms are listed in both A- and B-share markets. To analyze the price differences between the two markets and its possible factors; I only include firms that have listed in both A- and B-share markets into my data sample. Therefore, I use quarterly data of those 85 stocks from December 2001 to December 2010 to perform a panel data analysis[3]. I choose 2001 as the start year is because after the reform in 2001 domestic retail investors have been able to invest in B-share market, which was seen as a turning point of the markets. The sources of the data include Resset Database, Bloomberg, Datastream and Shanghai Stock Exchange and Shenzhen Stock Exchange websites.

4.2. Methodology

4.2.2. Panel Data Analysis

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[3] the companies are showed in Appendix A and Appendix B

A panel is a cross-section over a given time span. The combination of time-series with cross-sections can enhance the quality and quantity of data. Fixed effects panel model is one type of model that built with panel data.

If both time and cross-section factors are used as dummy variables, the slope coefficients are constant, but the intercept will vary over sections as well as time. For example, there are *m* different sections and *n* different years in the panel data. And then the model could be specified as follows:

$$y_{i,t} = a_0 + a_1 Section_1 + a_2 Section_2 + \cdots + a_{m-1} Section_{m-1}$$
$$+ \lambda_0 + \lambda_1 year_1 + \lambda_2 year_2 + \cdots + \lambda_{n-1} year_{n-1}$$
$$+ \beta_1 X_{1i,t} + \beta_2 X_{2i,t} + \cdots + \beta_k X_{ki,t} + e_{i,t}$$

This model is the basic model of this thesis.

4.2.3. Model

I perform a panel data analysis, which was also used by Domowitz et al. (1997), and Sun and Tong (1999). My regression model is as follows:

$$apremium_{i,t} = \beta_1 volatility_{i,t} + \beta_2 turnover_{i,t} + \beta_3 nsh_{i,t} + \beta_4 trdpct_{i,t} + \beta_5 lnshn_{i,t} + \beta_6 lninshold_{i,t}$$
$$+ a_1 exchange_1$$
$$+ b_1 industry_1 + b_2 industry_2 + \cdots + b_6 industry_6$$
$$+ c_1 firm_1 + c_2 firm_2 + \cdots + c_{84} firm_{84}$$
$$+ d_1 year_1 + d_2 year_2 + \cdots + d_9 year_9 + \alpha_i + \varepsilon_{i,t} \quad (i=1, 2,..., N; t=1,2,...,T)$$

Where $apremium_{i,t}$ is A-share price premium divided by B-share price; $volatility_{i,t}$ is the

ratio of volatility (in A-share market over that in B-share market); $turnover_{i,t}$ is the ratio of

turnover rate; $nsh_{i,t}$ is number of shares outstanding; $trdpct_{i,t}$ is ratio of percentage of tradable

shares; $lnshn_{i,t}$ is ratio of number of shareholders (in logarithm); $lninshold_{i,t}$ is ratio of

institutional holdings (in logarithm); $exchange_j$, $industry_j$, $firm_j$, $year_j$ are dummy

variables representing stock exchange, industry category, individual firm and year respectively

($year_j$ is the "time factor" and $firm_j$ is the "cross-section" factor; β_k is the sensitivity of the

asset to factor k; and ε_i is residual with a mean of zero.

4.3. Description of Variables

The dependent variable in the model is "apremium", which is the A-share premium defined as

$(P_A-P_B)/P_B$, where P_A and P_B are quarterly-end prices of A and B shares. A shares are all traded in

Chinese Renminbi. B shares listed in Shanghai Stock Exchange are traded in U.S. dollars (USD),

while those listed in Shenzhen Stock Exchange are traded in Hong Kong dollars (HKD). To

unify the prices and calculate "apremium", all the prices are converted into USD by using

quarterly-end exchange rates. Most of the time A shares are more expensive than their

counterparts in B-share market; as a result, "apremium" are almost all positive in the sample

data. I assume $\varepsilon_{i,t}$ has a zero mean and is uncorrelated with dependent variables.

There are six numerical independent variables in the model. There are all in the form of ratios

(A-share market over B-share market). Two variables represent the two ownership structures that

may cause the price difference between A shares and matching B shares—the percentage of

tradable shares ("trdpct") and institutional holdings ("lninshold); two are proxies to capture the

differential demand factors—number of shares outstanding ("lnshn") and number of shareholders ("nsh"); the other two are indicators of the market general features—market volatility ("volatility") and turnover rate[4] ("turnover").

(a) Proxies to test ownership structure influences

"trdpct" and "lninshold" are the two main variables in the model, representing two classes of ownership structures in China's stock markets. Those variables are to test the hypothesis about the influence of ownership structures in China's stock markets on the price disequilibrium. "trdpct" is the ratio of percentage of tradable shares in A-share market over tradable shares in B-share market.[5] Tradable shares are shares that can be traded in the stock exchanges and are the real share supply in the market. On the opposite, non-tradable shares are shares that held by the Chinese government or organizations that backed by the government and cannot be traded in the stock exchanges. And most of the non-tradable shares are represented by state-owned shares or legal-person shares. Non-tradable shares are an unparalleled feature of the ownership structure of Chinese listed companies (Beltratti and Bortolotti, 2006). The existence of non-tradable shares extremely limits free float available and makes the markets illiquid, volatile and speculative. The more shares are not tradable, the less the free float will be available in the market, and the higher stock prices will be. As for variable "trdpct" (ratio of tradable shares percentage in A-share market to B-share market), the higher the ratio is, the higher the A-share premium will be. Thus, the null hypothesis on "trdpct" is there is no relationship between the percentage of tradable shares and A-share premium. If tradable and non-tradable share structure is one important factor of the price differences, "trdpct" should be negatively related to "apremium" (A-share premium).

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[4] The turnover rate in this thesis means the daily average volume
[5] The tradable A shares increase over time from 60% in 2005 of the market to about 90% of the market today. B shares are almost all tradable in the market.

Another possible factor of ownership structure on the price difference is "lninshold", which represents the relative institutional holdings (number of shares owned by institutional investors) between A shares and B shares. As a very important group of investors, institutional investors are considered to be more informed and experienced, and thus help to stabilize asset prices as suggested by most of academic literature. However, there is a number of studies show that institutional investors are associated with more volatile stocks. "Herding and positive feedback trading are the two main arguments put forward for the destabilizing impact on stock prices induced by institutional investors." (Bohl and Brzeszczynski, 2006) To test the relationship between institutional ownership and the price difference, the null hypothesis is that there is no relationship between the ratio of relative institutional holdings and the A-share premium. If institutional investors help with stock price stability, "lninshld" (ratio of institutional holdings) will be negatively related to "apremium" (A-share premium) because the more shares held by institutional investors the closer the stock price will come toward its fundamental value and the smaller the price gap will be. If institutional investors are associated with disability of the market, the estimate will be positive indicating that institutions prefer risker stocks and drive the price difference between the two markets larger. When checking the assumptions of the model, the residuals pattern of the institutional shares ratio is mostly scattered on the left hand side in the graphs, indicating a different residuals variance. Therefore, I use natural logarithm of this variable. The adjusted R square of the multi-regression is greatly improved after the transformation.

(b) Proxies to test the differential demand argument

   "lnshn" and "nsh" represent the share demand and share supply in the markets respectively. "nsh" is the ratio of the number of shares outstanding in A-share market over B-share market, which represents the relative share supply in the two markets. In Sun and Tong (1999), they use shares outstanding as the supply of the market to test whether the demand curve is downward sloping. And they get a negative sign in the result, which demonstrates that when the supply of A shares increases relative to the supply of B shares, price pressure would push A-share prices to drop relative to B-share prices. With the same expectation as Sun and Tong (1999), I expect that "nsh" (number of shares outstanding) will be negatively related with "apremium" (A-share price premium).

   "lnshn" is the ratio of number of shareholders in A-share market to that of B-share market. I use this variable as share demand in the model. Merton (1987) suggests that an increase in a firm's investor base increases the firm's value. Amihud, Mendelson and Uno (1999) find that a reduction in the minimum trading unit increases a firm's base of individual investors, and significantly increases stock liquidity and price. Further, the stock price appreciation drives an increase in the number of shareholders in return. To sum up, as a factor of share demand, the more investors in the market, the higher the prices will be. Thus, with the same expectation, the relationship between "lnshn" (number of shareholders) and "apremium" (A-share premium) should be positive. I use natural logarithm of this variable because of left-scattered residual pattern. The adjusted R square of the multi-regression is greatly improved after the transformation.

(c) Proxies to test general factors

The model also includes some general variables—"volatility" and "turnover", which are the ratio of volatility and turnover rate in the two market and representing relative speculative activities and liquidity levels. Sun and Tong (1999) test those two factors and find that they are significantly influence the price difference between the two markets. "volatility" is included in the model to test the speculative argument. It is calculated by the volatility of A shares divided by the volatility of B shares. Volatility is used to quantify the risk of the financial instrument over the specified time period. At the same time, the ratio of volatility is a way to capture the relative speculative activities of investors in the two markets: the excess of volatility of A shares over B shares can be explained by the relative excess of speculative activities. If A-share market is more speculative than B-share market, the relationship between "volatility" (ratio of volatility) and "apremium" (A-share price premium) should be positive.

"turnover" is the ratio of turnover rate (A shares over B shares). Turnover rate is a liquidity variable. And liquidity is viewed as a very important factor in many of previous studies. In Sun and Tong (1999), instead of using turnover rate as the liquidity proxy they use trading volume. As a ratio, "turnover" in the model is the indicator of relative liquidity levels between A- and B-share markets. If the B-share discount is due to lack of liquidity of B-share market, the "turnover" (ratio of turnover rate) should be positively related to "apremium" (A-share premium).

(d) Firm, industry, stock exchange and time effects

Except for six numerical variables, there are four dummy variables in the model. "exchange" represents the stock exchanges. There are two stock exchanges in mainland China—Shanghai Stock Exchange and Shenzhen Stock Exchange. Shanghai Stock Exchange (SSE) is the world's

5th largest stock market by market capitalization at US$2.7 trillion as of Dec 2010. Shenzhen

Stock Exchange (SZSE) is another stock exchange in mainland China. The exchange opened the

a NASDAQ-type exchange high-tech start-ups in 2009. They are perfectly exclusive— one

company cannot be listed in both stock exchanges. The reason that why I include this variable in

the model is that the firms that listed in the two markets are quite different from each other.

Specifically, the companies that listed in SSE are large-capital firms who have over 4 trillion

capital stocks. On the contrary, the companies that listed in SZSE are usually much smaller with

a capitalization of less than 1 trillion.

"industry" shows different industry categories and there are 7 types of industries associated in

the data sample. Information Technology Industry, Manufacturing, Production & Supply of

Power, Gas & Water, Real Estate, Social Services, Transportation & Storage, and Wholesale

And Retail Trades. "firm" includes all the 85 individual firms. And it is the "cross-section factor".

And "year" is the time factor in the model, which is from 2001^6 and 2010. I include this variable

in the model because as showed in Figure 1-1, the price difference changes over time, which

indicates time variance exists in the sample.

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[6] The sample data start from December 2001, the year when the B-share market opened to domestic retail
investors. In other words, the B-share market has been opened to both foreign investors and domestic
retail investors since then.

Table 4-1 Summary statistics of the regression variables

Year	A-share price premium (%)	Volatility	Turnover ratio	Number of shares outstanding	Tradable shares percentage	Number of shareholders (logarithm)	Institutional holdings (logarithm)
2001	7.9034412	0.687209302	5.585505618	2.43948	0.473	0.54199107	-1.95905773
2002	8.8066957	0.848921569	22.94557214	2.50449	0.483	0.52439403	-1.63973177
2003	8.65601	1.081878788	35.61286624	2.50988	0.488	0.46810194	-0.60857184
2004	8.897913	1.091012146	38.02125	2.57972	0.497	0.43734334	-1.822444943
2005	9.2796181	1.106492308	53.624	2.59548	0.507	0.59290029	-3.123882477
2006	7.2204044	1.132302158	35.68102041	2.6738	0.773	0.63839914	0.877461922
2007	6.6027655	1.118526316	36.28331915	2.80315	0.953	0.49287162	1.885575487
2008	7.3897758	1.150343137	72.89940928	2.88612	0.975	0.57677051	1.825210075
2009	8.4538934	1.227960526	74.27459877	3.01817	0.981	0.67849468	0.946580285
Mean	8.1345019	1.049405139	41.65861573	2.66781	0.681	0.55014073	-0.402095666

From Table 4-1 we can see that the A-share price premium is about 8% of B-share price. The volatility of A-share market is a little bit higher than that of B-share market. The ratio of turnover rate changed tremendously from year to year, but A-share market is much more liquid than B-share market. Number of shares outstanding in A-share market is about 2.5 times of number of shares outstanding in B-share market. Tradable shares in the markets increased greatly since 2005 when the reform[7] started. After taking logarithm of number of shareholders, the numbers are above zero, which indicates that the number of shareholders in A-share market is more than that in B-share market. And after taking logarithm of institutional shareholdings, the mean of 10 years institutional holdings are higher in B-share market than that in A-share market.

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[7] In 2005, the China Securities Regulatory Commission initiated the reform to transform non-tradable shares into tradable shares. The reform process has been working successfully—the percentage of non-tradable shares (over total issued shares) is from 65% in 2005 to today's 20%, which actually increased the shares supply and liquidity of the whole markets. The change can be seen from Table 1 that the percentage of tradable shares over shares outstanding has increased from 2007 to 2010 in A-share market.

CHAPTER FIVE

MARKET OVERVIEW, MODEL RESULTS AND ANALYSIS

5.1. The Chinese Capital Markets

5.1.1. Historic Development of A-Share and B-Share Markets

After the Cultural Revolution ended, China was re-opened to the outside world in 1978. China's securities market has evolved and developed during the reforms in1980s. One of the significant events is to privatize state-owned companies and open the Shanghai Stock Exchange on December 19, 1990 and the Shenzhen Stock Exchange on December 1, 1990.

To further develop stock market and attract foreign capital, the Chinese government opened B-share market to foreign investors in 1992, which is separated from A-share market for Chinese domestic investors. And the segmentation of the two markets is to protect Chinese government interest and prevent negative international capital impact.

From historical data, there is always a tremendous price gap between the two markets. Starting from March 2001, aiming at stimulating the liquidity of B-share market, Chinese domestic retail investors are allowed to trade B shares. When this news broke out at the beginning of 2001, Chinese B share prices went up dramatically in a few weeks. And the price gap was narrowed thereafter, but still exits.

5.1.2. Overview of Chinese Stock Markets

The Chinese equity market is still at its early stage of development; and segmentation is one of its most dominating characteristics. In general, Chinese listed firms have two classes of shares outstanding: shares which are traded domestically in mainland China, including A-share and B-share; and shares listed in overseas markets, such as H-share, N-share, S-share and T-share, representing shares issued in Hong Kong, the U.S, Singapore, and Japan markets. Segmentation further exists within the domestic shares—A shares are traded by domestic investors while B shares are denominated in foreign currencies and designated for foreign investors.

Another unparalleled feature of ownership structures in China is its tradable and non-tradable shares. Non-tradable shares typically belong to Chinese government or domestic financial institutions owned by the government. Non-tradable shareholders have exactly the same voting and dividends rights assigned to the holders of tradable shares but cannot be traded publicly (Beltratti and Bortolotti, 2006).

As it is showed in Table 5-1, there are currently 1,339 stocks listed in A-share market and 108 stocks listed in B-share market. And there are 85 companies listed in both A-share and B-share markets. A shares are quoted in Chinese Renminbi, while B shares are quoted in foreign currencies (B Shares listed in Shanghai Stock Exchange are listed in US dollars and B Shares in Shenzhen Stock Exchange are listed in Hong Kong dollars). A-share market is open to Chinese domestic retail and institutional investors, while B-share market is open to foreign investors and Chinese domestic retail investors, not including domestic institutional investors. Except those difference mentioned above, the B shares and A-share counterparts are identical—they have the same voting rights, dividends and trading rules.

Table 5-1 Chinese Stock Market Overview

	2010		2009		2008		2007	
Shanghai	A share	B share	A share	B share	A share	B share	A share	B share
No. of Listings	884	54	860	54	854	54	850	54
Issued Volume(billion)	21,810	130	16,536	124	15,289	121	14,058	115
Market Value(billion)	178,000	1,007	183,800	855	96,875	377	268,497	1,342
Trading Volume(billion)	25,812	152	33,477	203	16,207	104	23,931	394
Deals Traded(million)	1,653	8	2,133	10	1,273	6	1,599	19
Trading Value(billion)	303,216	1,096	345,443	1,069	179,762	668	301,960	3,474
Tradable Volume(billion)	15,901	130	11,455	124	4,795	121	3,284	115
Tradable Market Value(billion)	141,330	1,007	113,950	855	31,929	377	63,191	1,342
Individual Investors(accounts)	75,555,733	-	69,108,156	-	60,883,646	1,453,400	54,468,593	1,422,000
Institutional Investors(accounts)	307,508	-	290,514	-	262,770	11,885	250,615	3,030
Total Accounts	75,863,241	-	69,398,670	-	61,146,416	1,465,285	54,719,208	1,425,030
Shenzhen	A share	B share	A share	B share	A share	B share	A share	B share
No. of Listings	455	54	454	55	455	55	464	55
Issued Volume(million)	292,888	14,995	270,110	14,916	230,362	13,846	210,445	12,817
Market Value(million)	3,984,450	95,675	1,742,156	42,329	4,544,363	121,155	1,498,071	79,551
Trading Volume(million)	1,385,000	25,517	651,628	11,426	1,093,697	32,584	538,756	17,695
Deals Traded	918,307,700	8,189,763	527,046,338	4,412,890	741,164,554	12,077,341	243,983,287	4,877,318
Trading Value(million)	13,834,451	102,872	6,949,071	55,472	13,663,734	231,094	2,890,045	68,029
Tradable Volume(million)	206,616	14,794	161,652	14,702	124,909	13,549	100,343	11,879
Tradable Market Value(million)	2,770,379	94,733	981,711	41,820	2,351,229	119,623	707,373	77,795
Individual Investors(accounts)	74,668,041	-	68,169,084	-	59,865,636	926,700	53,244,974	899,900
Institutional Investors(accounts)	267,548	-	250,044	-	223,358	11,500	203,487	10,400
Total Accounts	74,935,589	-	68,419,128	-	60,088,994	938,200	53,448,461	910,300
Total	A share	B share	A share	B share	A share	B share	A share	B share
No. of Listings	1,339	108	1,314	109	1,309	109	1,314	109
Issued Volume(billion)	22,103	145	16,807	138	15,520	135	14,268	128
Market Value(billion)	181,984	1,103	185,542	898	101,420	498	269,995	1,421
Trading Volume(billion)	27,197	178	34,128	214	17,301	137	24,470	412
Deals Traded(million)	2,572	16	2,660	14	2,014	18	1,843	23
Trading Value(billion)	317,050	1,199	352,392	1,124	193,426	899	304,850	3,542
Tradable Volume(billion)	16,108	145	11,617	138	4,920	135	3,384	127
Tradable Market Value(billion)	144,101	1,102	114,931	897	34,281	496	63,898	1,419
Individual Investors(accounts)	150,223,774	-	137,277,240	-	120,749,282	2,380,100	107,713,567	2,321,900
Institutional Investors(accounts)	575,056	-	540,558	-	486,128	23,385	454,102	13,430
Total Accounts	150,798,830	-	137,817,798	-	121,235,410	2,403,485	108,167,669	2,335,330

I collect the market information in Table 5-1 from "factbooks" 2007 to 2010 published on Shanghai Stock Exchange website and Shenzhen Stock Exchange website. The table shows two pairs of shares: A shares & B shares and shares listed in SSE & shares listed in SZSE. To compare A shares and B shares, I combine the shares in the two stock exchanges. As showed in the table, A-share market is much bigger than B-share market. There are about 10 times more companies listed in A-share market than B-share market. And the market value of A-share market is about 100 times of the market value of B-share market.

The ratio of trading volume in A-share market over B-share market is about 150, and the ratio of tradable volume in A-share market over B-share market is about 100. The difference between the two ratios is because about 80% of shares in A-share market are tradable shares; while almost all the shares in B-share market are tradable. The huge differences existing between the two markets in issued volume, market value, and trading volume further also suggest that A-share market is much bigger than B-share market. And Figure 5-1 shows the tremendous market size differences between the two markets.
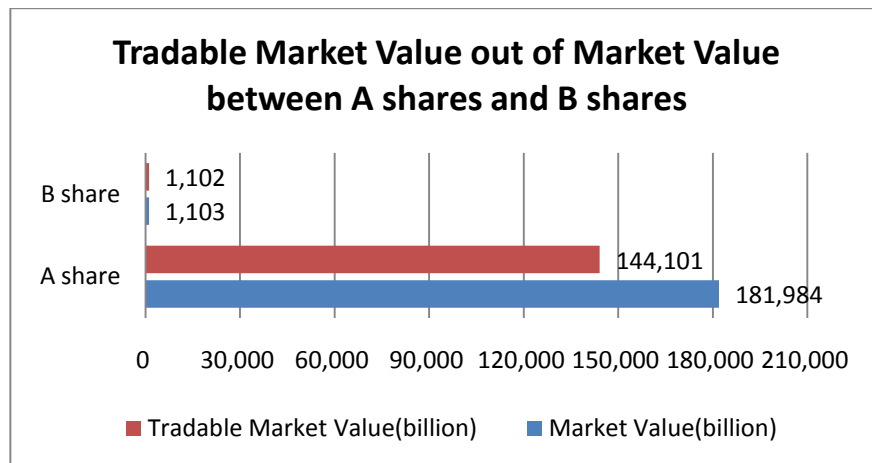
Figure 5-1 Tradable Market Value and Market Value of A-Share and B-Share Markets

5.1.3. Foreign Investor Structure in B-Share Market

The B-share market is targeted by foreign investors all over the world. Researchers have been studying the diversification value of B shares to the world market. Table 5-2 shows the major investors of B shares around the world. And the top three investors (except mainland China) are from Hong Kong, United States and Taiwan. I, therefore, test the correlation between B shares index[8] and foreign indices of markets of those places. SPX is the S&P 500 Index with the same time period as B shares price index. It is downloaded from Bloomberg. HIS is the Hang Seng Index, which is one of the earliest stock market indexes in Hong Kong. TWSE is the Taiwan Capitalization Weighted Stock Index, which is a stock market index for companies traded on the Taiwan Stock Exchange (TWSE). SPGLOB is the S&P Global 1200 Index. It is a free-float weighted stock market index of global equities from Standard & Poor's. The index covers 31 countries and approximately 70 percent of global stock market capitalization.

The correlations between B shares and the foreign indices are all positive. The result shows that B-share prices are highly correlated with Hong Kong stock prices and relatively less correlated with Taiwan stock prices. The correlation between B-share price and S&P Global 1200 is 0.572, which means the diversification benefit of B shares is not very significant.

Pearson correlation of B PI and SPX = 0.436

P-Value = 0.000

Pearson correlation of B PI and HIS = 0.803

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[8] The B-share price index is created through Thompson Reuters Datastream. The B-share price index ("B PI") is the B-share daily price index from February 2, 1992 to February 18, 2011, and is weighted average price by market value.

P-Value = 0.000

Pearson correlation of B PI and TWSE = 0.360

P-Value = 0.000

Pearson correlation of B PI and SPGLOB = 0.572

P-Value = 0.000

Table 5-2 B-Share Investors Categories (Shanghai Stock Exchange, 2010)

→ Breakdown of B-share Investors by Country or Region

Country or Region	Cumulative Trading Accounts	Percentage in Total Accounts (%)	New Trading Accounts in 2008	Percentage in New Accounts (%)
China (Mainland)	1280259	87.01	30914	93.35
United States	12861	0.87	728	2.2
Taiwan, China	7936	0.54	232	0.7
Hong Kong SAR, China	16637	1.13	137	0.41
Korea	1626	0.11	118	0.36
Canada	3193	0.22	108	0.33
Australia	3035	0.21	108	0.33
Japan	4284	0.29	102	0.31
United Kingdom	2127	0.14	89	0.27
China (overseas)	125713	8.54	42	0.13
Singapore	1812	0.12	33	0.1
Germany	655	0.04	19	0.06
Holland	372	0.03	9	0.03
Macao SAR, China	772	0.05	7	0.02
France	591	0.04	4	0.01
Others	9524	0.65	467	1.41
Total	1471397	100	33117	100

5.1.4. Comparison between A-Share and B-Share Markets

To compare A-share and B-share markets in general, I created the Price Index through Thomson Reuters Datastream. I only pick the shares listed in both A- and B-share markets to create A- and B-share indices for comparison purpose. The cross-listing shares are altogether 85 from year 1992 to 2011. And I focus on comparing the general market features between the two markets, including price difference, market sizes, and liquidity levels.

Figure 5-2 B-Share Discount as Percentage of A-Share Price
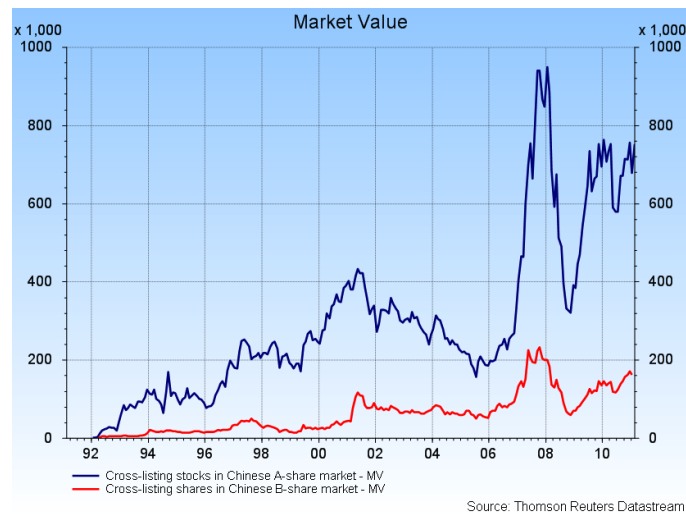
Figure 5-3 Market Values of A-Share Market and B-Share Market

I calculate the B-share discount as a percentage of A-share price by using equation $(P_B-P_A)/P_A$. Figure 5-2 shows how the B-share discount was changing from 1992 to 2011. The numbers in the graph is below 0 in most years, meaning B shares have been selling at a discount compared to A-share counterparts. The graph also shows that the price difference changes over time, which indicates time variance is related to B-share discount.

Figure 5-3 shows the comparison of market values between A-share market and B-share market. Market value in the graph is calculated by stock price × numbers of shares outstanding. From the graph, we can see that A-share market value is about 4 to 5 times of B-share market value.
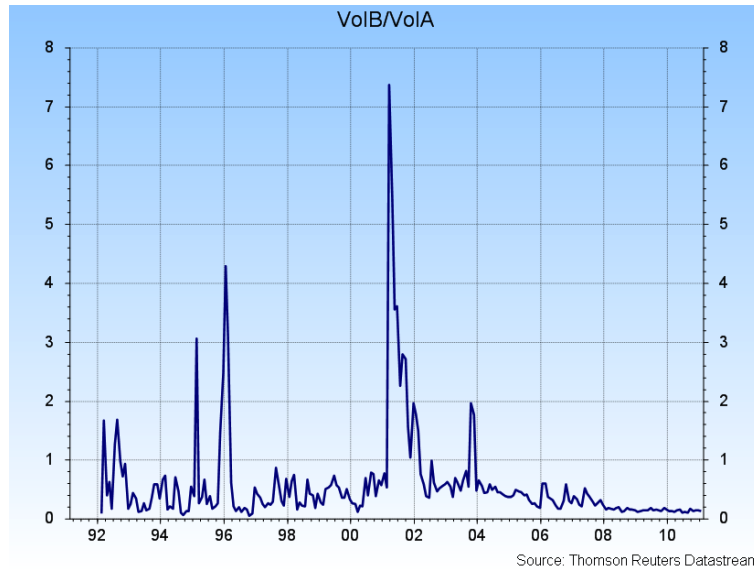
Figure 5-4 Trading Volumes of A-Share Market and B-Share Market

Figure 5-4 shows for most of the time the trading volumes of A-share market are larger than trading volumes of B-share market (the ratios in the graph are mostly under 1). But it is not always the case—for a number of times B share market volume is much larger than that is of A-share market, which are displayed as the spikes in the graph.

5.2. Model Results

5.2.1. Model Selection and comparison

Table 5-3 Models Selection (among Four Dummy Variables)

| Dummies	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8	Model9	Model10	Model11	Model12	Model13	Model14	Model15
volatility	2.6284*	2.5962*	2.6284*	0.2057	2.6284*	2.5962*	0.6306	0.3949	2.5962*	2.6284*	2.9991*	0.3315	2.5962*	0.6070	3.5236*
turnover	0.0046*	0.0053*	0.0046*	0.0031**	0.0046*	0.0053*	0.0033*	0.0036*	0.0053*	0.0046*	0.0336*	0.0037*	0.0053*	0.0330*	0.0351*
nsh[9]	0.3603*	0.4095*	0.3603*	0.0216	0.3603*	0.4095*	-0.0291	0.1817**	0.4095*	0.3603*	-0.0694	0.1034	0.0410*	-0.1980	0.5091*
trdpct[10]	-2.3619*	-4.1329*	-2.3619*	0.7858	-2.3619*	-4.1329*	-1.7113*	1.7252**	-4.1329*	-2.3619*	1.5016	-1.6296*	-4.1329*	-2.2792**	2.8000
lnshn[11]	-1.8452*	-1.7391*	-1.8452*	-1.7587*	-1.8452*	-1.7391*	-1.6382*	-1.7086*	-1.7391*	-1.8452*	-4.7893*	-1.5272*	-1.7391*	-4.6694*	-4.7153*
lninshold[12]	-0.0606**	-0.0608**	-0.0606**	-0.1105*	-0.0606**	-0.0608**	-0.1091*	-0.1515*	-0.0608**	-0.0606**	-0.2042*	-0.1418*	-0.0608**	-0.1701*	-0.2054*
exchange	●	●	●	●		●	●	●				●			
firm	●	●	●		●	●			●	●				●	
industry	●	●		●	●		●		●		●				●
year	●			●	●	●			●	●	●	●	●		●
adj R2	0.9332	0.9205	0.9332	0.8832	0.9332	0.9205	0.8747	0.8663	0.9205	0.9332	0.5611	0.8574	0.9205	0.5511	0.5139
F	101.07	93.37	101.07	201.97	101.07	93.37	298.03	230.56	93.37	101.07	36.46	427.27	93.37	56.94	40.67
MSE	1.9009	2.0726	1.9009	2.5128	1.9009	2.0726	2.602	2.6887	2.0726	1.9009	4.8705	2.7761	2.0726	4.9259	5.1259
RSSp	1983.67	2396.98	1983.67	3876.9	1983.67	2396.98	4217.9	4482.07	2396.98	1983.67	14589.1	4847.63	2396.98	15140.98	16316.83
P	111	102	104	26	109	95	17	19	100	102	24	10	93	15	17
Cp	1154.543	1353.971	1140.543	1980.508	1150.543	1339.971	2141.896	2284.867	1349.971	1136.543	7611.84	2459.176232	1335.971	7884.164	8506.739

Table 5-3 shows the model efficiency of models with different combinations of dummy

variables. By calculating Mallow's Cp[13], Model 10, in which dummy variables "firm" and "year"

are being used, is the best model among all the models tested. And Model 1, which includes all

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[9] "nsh" is the ratio of number of shares outstanding.

[10] "trdpct" is the ratio of tradable shares.

[11] "lnshn" is the ratio of number of shareholders (in logarithm).

[12] "lninshold" is the ratio of institutional holdings (in logarithm).

* is a 5% significance level

** is a 10% significance level

[13] It is applied in the context of model selection $C_p = \dfrac{SSE_p}{S^2} - N + 2P$, where SSE_P is the error sum of squares; P are regressors.

four dummy variables as my hypothsis described, is extremely efficient as well. With no big difference from Model 10, I choose Model 1 as my final model. All the results analysis in the following paragraphs are based on this model.

Table 5-4 Model Comparison[14] (Final Model vs. Model without transformation vs. model without new variables)

	Final model	model w/o transformation	model w/o new variables
volatility	2.6284*	-0.7467	0.9540**
turnover	0.0046*	0.0061*	0.0054*
nsh[15]	0.3603*	-0.0344	0.2278
trdpct[16]	-2.3619*	-5.0130*	
lnshn[17]	-1.8452*		-1.417*
lninshold[18]	-0.0606**		
shn[19]		0.0003	
inshold[20]		0.0009	
F-value	105	97	174
adj R^2	0.9340	0.9200	0.9250

Table 5-4 shows the comparison among three models: the final model, which is also the Model 1 in Table 5-3; model without logarithm transformation on number of shareholders and institutional holdings; model without the percentage of tradable shares and institutional holdings.

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[14] In the model without transformation, the ratio of number of shareholders and the ratio of institutional holdings are without logarithm. In the model without new variables, "trdpct" (ratio of tradable shares) and "lninshold" (ratio of institutional holdings) are not included in the model.

[15] "nsh" is the ratio of number of shares outstanding.

[16] "trdpct" is the ratio of tradable shares.

[17] "lnshn" is the ratio of number of shareholders (in logarithm).

[18] "lninshold" is the ratio of institutional holdings (in logarithm).

[19] "shn" is the ratio of number of shareholders without transformation.

[20] "inshold" is the ratio of institutional holdings without transformation.

* is a 5% significance level

** is a 10% significance level

From the comparison table we can see that the final model has the highest R^2 which indicates

that it is more significant than the other two models. Therefore, I keep the percentage of tradable

shares and institutional holdings in the model.

Table 5-5 Cross-sectional Regression (from 2001 to 2010) and Pooled Regression Results[21]

apremium	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	All years
volatility	-5.6720	-0.1954	-2.5386	-6.7026*	0.8178	3.0469	4.8943	4.3637*	3.8275	1.4616	2.6284*
turnover	-0.0052	-0.0208	-0.0062	-0.0142	0.0135	0.0051	-0.0006	0.0103*	-0.0014	0.0126*	0.0046*
nsh[22]	-1.1170	-0.3849	-0.0391	0.2221	-0.7181**	0.1541	0.6355**	0.4138**	-0.0990	-0.2911	0.3603*
lnshn[23]	0.0054	-2.6596*	-1.0801	-2.8845*	-0.9439	-1.9779*	-1.2961*	-0.4797	-1.6404*	-1.3848*	-1.8452*
lninshold[24]	0.0384	0.0735	0.1940	-0.1047	-0.1548	-0.0547	-0.1782	-0.1378	0.1330	-0.0809	-0.0606**
trdpct[25]	-5.3727	-1.8609	3.3524	2.0287	0.1777	2.1725	2.2656	0.6955			-2.3619*
cons	26.6515*	18.4802*	13.4459*	10.156*	19.074*	7.0654**	3.0087	2.7098	-2.8697	16.9883	15.2664*
adj R^2	0.9629	0.9526	0.9500	0.8874	0.8792	0.8641	0.9091	0.9162	0.9331	0.9288*	0.9340*

Table 5-5 shows the final results. I further test the model year by year from 2001 to 2010 to

identify the yearly difference and the consistency of the model. The results with significance

levels are showed in Table 5-5. For the panel data model (the last column), its R square adjusted

is 0.9339, indicating that the independent variables explain about 93% of the change in

dependent variable. The p-value of the model as a whole is 0, which again shows that the model

is significant as a whole and the independent variables in the regression well explained the

dependent variable—"apremium". For the cross-sectional models year by year, the coefficients

for "volatility", "turnover", "nsh" and "trdpct" are not consistent over years. The signs change

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[21] The pooled regression result is in the last column named "All years".
[22] "nsh" is the ratio of number of shares outstanding.
[23] "lnshn" is the ratio of number of shareholders (in logarithm).
[24] "lninshold" is the ratio of institutional holdings (in logarithm).
[25] "trdpct" is the ratio of tradable shares.
* is a 5% significance level
** is a 10% significant level

dramatically during the period of 2005 to 2008. And my explanation is the reform in 2005 that the Chinese government started to unblock nontradable shares had some influence on the free float, liquidity, volatility in the markets.

5.2.2. Pooled Regression Results Analysis

(a) General factors

For the general variables, "volatility" is the ratio of volatility of A shares to B shares, and it represents the relative speculative activities between A-share and B-share markets. In the pooled regression model in Table 5-5, the coefficient of this variable is significantly positive. The result is consistent with the hypothesis that the greater the volatility of A shares relative to B shares, the higher the A-share prices relative to the B-share prices, and the higher the A-share premium will be. In other words, the excessive speculative activities in A-share market than B-share market is one of the factors that enlarge the price difference between the two markets. And this result supports the speculation argument by Sun and Tong (1999)—a higher of the volatility ratio of A shares over B shares will lead to a larger B-share discount.

The variable "turnover" is the ratio of turnover rates of A shares to B shares and it represents the relative liquidity of the two markets. The pooled regression result in Table 5-5 shows that the variable is significant in the model. The estimate of "turnover" is positive, which is consistent with the hypothesis that turnover rate ratio between A shares and B shares is positively correlated with A-share price premium or B-share price discount; the higher the turnover rate ratio of A-share over B-share is, the larger the price difference will be. Therefore, liquidity difference between the two markets is another factor that triggers the price difference. This result

supports the liquidity argument of Bailey (1994) and Sun and Tong (1999) that the relationship between A-share premium and relative market liquidity should be positive.

(b) Demand factors

For the possible factors for share supply and share demand, "nsh" and "lnshn" are ratio of number of shares outstanding and ratio of number of shareholders. For "nsh", it has a positive coefficient and a p-value of 0.029 in the pooled regression results. It becomes insignificant with a significance level of 2.5% while it is significant with a significance level of 5%. However, the positive sign of the coefficient is unexpected. In the Sun and Tong (1999), they use the same variable—number of shares outstanding. And they get a negative relationship between the A-share price premium and this variable, which is consistent to their hypothesis. The positive sign in my model is interpreted as that when the number of shares outstanding in A-share market rises relative to B-share market A shares are getting more expensive than B-share counterparts. It is against the demand theory in general. The unexpected results may be explained by "the greater fool" theory[26]—when the market is too optimistic, even though the stock price is really high, investors still believe that they can sell shares at a higher price to the "greater fools". In this case, as the ratio of shares outstanding in A-share market relative to B-share market rises, the relative prices rises as well due to investors' optimism in A-share market.

For "lnshn"—the ratio of number of shareholders in A-share market over B-share market—has a negative sign in the pooled regression results in Table 5-5, which is also unexpected and inconsistent with the hypothesis. As a variable of share demand, the more number of shareholders in A-share market relative to B-share market, the higher the A-share price premium

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[26] The "greater fool theory" was first documented by William A. Sahlman and Howard H. Stevenson in their paper "Capital Market Myopia" (1985).

should be. The explanations to the unexpected result could be that the ratio of number of

shareholders between A-share market and B-share market increases, the ratio of the shares

demand between the two markets is not necessarily increases. In other words, even though the

account numbers in A-share market increase faster than that in B-share market, the trading

volumes in B-share market grow faster than the trading volumes in A-share market due to their

different investor structures.

Another explanation could be that the demand elasticity of the two markets is different. If the

demand curve of A shares are more elastic than that of B shares, the rise of share demand in A-

share market relative to B-share market can bring a decrease of A price premium.
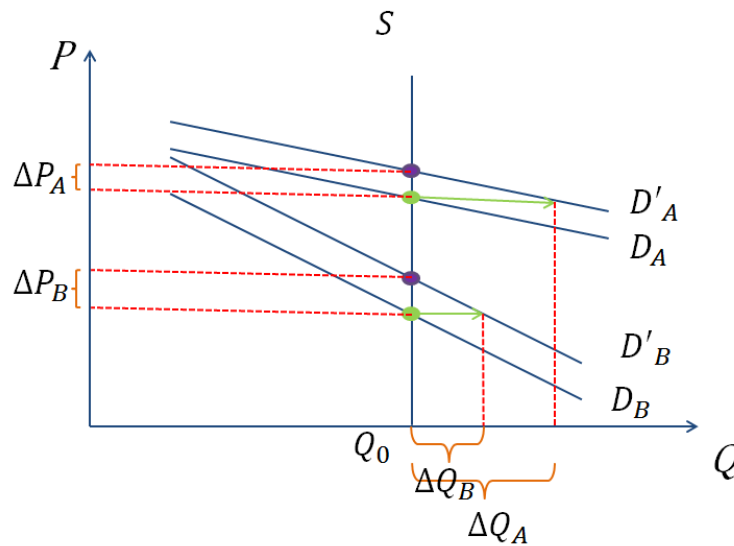
Figure 5-5 Explanation on Demand Elasticity

Figure 5-5 shows that a more elastic demand curve of A shares over B shares may result in a

negative relationship between number of shareholders and A-share premium. In the graph,

assuming that the demand curve of A shares are more elastic than that of B shares, the demand

curve of A shares are drawn less steep than that of B shares. When there are more demand in A-

share market relative to B-share market, the price increases more in B-share market over A-share market due to demand elasticity differences.
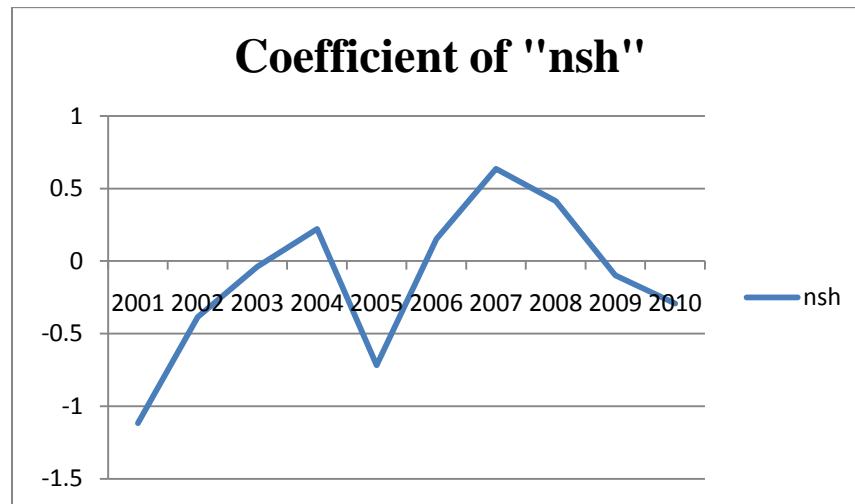
Figure 5-6 The Coefficients of "nsh" (number of shares outstanding) in the Cross-sectional

Regression Results

Figure 5-6 shows that the coefficients of "nsh" (number of share outstanding) are not consistent over years—the numbers go above and below zero. Therefore, another explanation to the unexpected sign of this variable is the average effect. More specifically, on average the sign is positive due to relatively larger negative numbers in certain years; however, the variable appears to be negative in a number of years. Thus, the relationship between "nsh" and "apremium" need to be further confirmed.

(c) Ownership structure factors

For the ownership structure variables, "trdpct" is the ratio of percentage of tradable shares in A-share market to B-share market. The pooled regression result shows that the coefficient of "trdpct" is negative with a p-value of 0.016. "trdpct" is significant in the model and is negatively

related with "apremium". The negative relationship between the ratio of tradable shares and A-share price premium is consistent with the hypothesis that the more shares tradable in A-share market over B-share market, the more the share supply will be in A-share market relative to B-share market, and the lower the A-share prices will be relative to B-share prices.

Another important factor of ownership structure is the institutional shares—"lninshold" is the natural logarithm of the ratio of institutional shares of A-share market over B-share market. In other words, it's the relative shares held by institutional investors between A shares and B shares. In pooled regression the model in Table 5-5, it has a t-value of -1.84 and p-value of 0.066, which is significant at a significance level of 10%. The negative sign of the coefficient indicates that the more institutional investors relatively in A-share market over B-share market, the smaller the A-share premium will be. And it is consistent with the hypothesis that institutional investors help to narrow the price difference.

CHAPTER SIX

CONCLUSION

The objective of this study is to examine how the ownership structure in China's stock markets has affected the price gap between A-share and B-share markets. This thesis emphasizes the importance of the ownership structures in China on the price disequilibrium, especially, the individual-institutional structure and tradable-nontradable structure.

The overview of China's stock markets shows that there is always a tremendous price gap between China's A- and B-share markets; and B shares have been traded at discount relative to matching A shares. The general comparison shows that A-share market is much larger and more liquid than B-share market. By building up multi-regression models, the A-share premium can be explained by the ownership structure differences between the two markets. More specifically, the results show that in Chinese stock markets, institutional investors help to stabilize prices. As the number of institutional holdings in the A-share market rises relative to B-share market, the price difference between the two markets decreases. It indicates that institutional investors help in narrowing down the price gap between A shares and B shares and it may due to their advantage in knowledge, experience, information over individual investors.

Non-tradable and tradable shares structure is another important factor. Nontradable shares were created since the China's stock markets first established in 1990s and took up about 20% of China's stock markets. In the pooled regression model, the percentage of tradable shares has significant influence on the price differences. And the results show that when tradable shares in A-share market increase relatively to that in B-share market, the price gap decreases. In other words, more shares are tradable in the market, the closer the prices come to their true values. It

indicates that the existence of non-tradable shares limit the liquidity level of stock market. The result is consistent with the hypothesis.

Interestingly, the demand factors—"nsh" (number of shares outstanding) and "lnshn" (number of shareholders) have unexpected signs. The ratio of number of shares outstanding should be negatively related with A-share premium, however, the pooled regression result shows a positive sign. On the other hand, number of shareholders should have a positive relationship with A-share premium but I received a negative sign in the pooled regression result. Although the results can be explained by a number of reasons, further testing is needed to confirm the results.

The other factors like liquidity factor and speculation factor are explanatory to the phenomenon as expected. The results support previous studies on liquidity and speculation factors.

In this thesis, I also test the diversification value of B shares relative to the world market. The results show that B shares prices are highly correlated with Hong Kong stock prices and relatively less correlated with Taiwan stock prices. And the diversification benefit of B shares to the global market is not very significant.

Financial analysts and economists predict that in the long run the Chinese government will merge A-share and B-share markets, since QFII[27]—the new tool for foreign investors to invest in Chinese stock market was created. However, the tremendous price differences between the two markets will make the process extremely difficult. Given the results of the influence of ownership structures on the price disequilibrium, the Chinese government should consider the following policies: (1) unlock more nontradable shares in A-share market; (2) invite more institutional investors into the markets. The above policies may drive the A-share price down and

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[27] is a program that was launched in 2002 in China to allow licensed foreign investors to buy and sell "A" shares in China's mainland stock exchanges.

decrease the price difference between China's A-share and B-share markets, and thus make the future mergence smooth and successful.

APPENDIX A: 85 CROSS-LISTING SHARES IN CHINA'S A-SHARE AND B-SHARE MARKETS

Bloomberg Codes

A-share code	B-share code	A-share code	B-share code
000002 CH Equity	200002 CH Equity	600190 CH Equity	900952 CH Equity
000011 CH Equity	200011 CH Equity	600221 CH Equity	900945 CH Equity
000012 CH Equity	200012 CH Equity	600272 CH Equity	900943 CH Equity
000016 CH Equity	200016 CH Equity	600295 CH Equity	900936 CH Equity
000017 CH Equity	200017 CH Equity	600320 CH Equity	900947 CH Equity
000018 CH Equity	200018 CH Equity	600555 CH Equity	900955 CH Equity
000019 CH Equity	200019 CH Equity	600602 CH Equity	900901 CH Equity
000020 CH Equity	200020 CH Equity	600604 CH Equity	900902 CH Equity
000022 CH Equity	200022 CH Equity	600610 CH Equity	900906 CH Equity
000024 CH Equity	200024 CH Equity	600611 CH Equity	900903 CH Equity
000025 CH Equity	200025 CH Equity	600612 CH Equity	900905 CH Equity
000026 CH Equity	200026 CH Equity	600613 CH Equity	900904 CH Equity
000028 CH Equity	200028 CH Equity	600614 CH Equity	900907 CH Equity
000029 CH Equity	200029 CH Equity	600617 CH Equity	900913 CH Equity
000030 CH Equity	200030 CH Equity	600618 CH Equity	900908 CH Equity
000037 CH Equity	200037 CH Equity	600619 CH Equity	900910 CH Equity
000039 CH Equity	200039 CH Equity	600623 CH Equity	900909 CH Equity
000045 CH Equity	200045 CH Equity	600639 CH Equity	900911 CH Equity
000055 CH Equity	200055 CH Equity	600648 CH Equity	900912 CH Equity
000056 CH Equity	200056 CH Equity	600650 CH Equity	900914 CH Equity
000058 CH Equity	200058 CH Equity	600663 CH Equity	900932 CH Equity
000413 CH Equity	200413 CH Equity	600679 CH Equity	900916 CH Equity
000418 CH Equity	200418 CH Equity	600680 CH Equity	900930 CH Equity
000429 CH Equity	200429 CH Equity	600689 CH Equity	900922 CH Equity
000488 CH Equity	200488 CH Equity	600695 CH Equity	900919 CH Equity
000505 CH Equity	200505 CH Equity	600698 CH Equity	900946 CH Equity
000513 CH Equity	200513 CH Equity	600726 CH Equity	900937 CH Equity
000521 CH Equity	200521 CH Equity	600751 CH Equity	900938 CH Equity
000530 CH Equity	200530 CH Equity	600754 CH Equity	900934 CH Equity
000539 CH Equity	200539 CH Equity	600776 CH Equity	900941 CH Equity
000541 CH Equity	200541 CH Equity	600801 CH Equity	900933 CH Equity
000550 CH Equity	200550 CH Equity	600818 CH Equity	900915 CH Equity
000553 CH Equity	200553 CH Equity	600819 CH Equity	900918 CH Equity
000570 CH Equity	200570 CH Equity	600822 CH Equity	900927 CH Equity
000581 CH Equity	200581 CH Equity	600827 CH Equity	900923 CH Equity
000596 CH Equity	200596 CH Equity	600835 CH Equity	900925 CH Equity
000613 CH Equity	200613 CH Equity	600841 CH Equity	900920 CH Equity
000625 CH Equity	200625 CH Equity	600843 CH Equity	900924 CH Equity
000725 CH Equity	200725 CH Equity	600844 CH Equity	900921 CH Equity
000726 CH Equity	200726 CH Equity	600845 CH Equity	900926 CH Equity
000761 CH Equity	200761 CH Equity	600848 CH Equity	900928 CH Equity
000869 CH Equity	200869 CH Equity	600851 CH Equity	900917 CH Equity
600054 CH Equity	900942 CH Equity		

APPENDIX B: OVERVIEW OF 85 CROSS-LISTING STOCKS

A-share Code	B-share Code	Industry	Date	Full Shares	Tradable Shares	Listed in HK market
C000002	200002	Real Estate	2001-12-31	121,755,136	121,755,136	N
C000002	200002	Real Estate	2010-12-31	1,314,955,468	1,314,955,468	N
C000011	200011	Real Estate	2001-12-31	61,459,312	61,459,312	N
C000011	200011	Real Estate	2010-12-31	67,605,243	67,605,243	N
C000012	200012	Metal, Nonmetal	2001-12-31	299,052,546	299,052,546	N
C000012	200012	Metal, Nonmetal	2010-12-31	762,583,992	762,583,992	N
C000016	200016	Electronic	2001-12-31	202,837,902	202,837,902	N
C000016	200016	Electronic	2010-12-31	405,675,804	405,675,804	N
C000017	200017	Machinery, Equipment, Instrument	2001-12-31	178,620,649	178,620,649	N
C000017	200017	Machinery, Equipment, Instrument	2010-12-31	248,362,982	248,362,982	N
C000018	200018	Textile, Clothing, Fur	2001-12-31	69,421,903	69,421,903	N
C000018	200018	Textile, Clothing, Fur	2010-12-31	69,421,903	69,421,903	N
C000019	200019	Food And Beverage	2001-12-31	26,136,000	26,136,000	N
C000019	200019	Food And Beverage	2010-12-31	26,136,000	26,136,000	N
C000020	200020	Information Technology Industry	2001-12-31	101,995,836	101,995,836	N
C000020	200020	Information Technology Industry	2010-12-31	101,995,836	101,995,836	N
C000022	200022	Transportation, Storage	2001-12-31	106,447,000	106,447,000	N
C000022	200022	Transportation, Storage	2010-12-31	179,611,983	179,611,983	N
C000024	200024	Transportation, Storage	2001-12-31	136,221,800	136,221,800	N
C000024	200024	Real Estate	2010-12-31	141,633,850	141,633,850	N
C000025	200025	Wholesale And Retail Trades	2001-12-31	26,400,000	26,400,000	N
C000025	200025	Wholesale And Retail Trades	2010-12-31	26,400,000	26,400,000	N
C000026	200026	Machinery, Equipment, Instrument	2001-12-31	58,320,000	58,320,000	N
C000026	200026	Machinery, Equipment, Instrument	2010-12-31	58,320,000	58,320,000	N
C000028	200028	Wholesale And Retail Trades	2001-12-31	54,885,600	54,885,600	N
C000028	200028	Wholesale And Retail Trades	2010-12-31	54,885,600	54,885,600	N
C000029	200029	Real Estate	2001-12-31	120,000,000	120,000,000	N
C000029	200029	Real Estate	2010-12-31	120,000,000	120,000,000	N
C000030	200030		2001-12-31	39,600,000	39,600,000	N
C000030	200030	Papermaking, Printing	2010-12-31	39,600,000	39,600,000	N
C000037	200037	Production & Supply Of Power, Gas & Water	2001-12-31	108,565,928	108,565,928	N
C000037	200037	Production & Supply Of Power, Gas & Water	2010-12-31	263,854,446	263,854,446	N
C000039	200039	Metal, Nonmetal	2001-12-31	142,403,801	142,403,801	N
C000039	200039	Metal, Nonmetal	2010-12-31	1,430,478,709	1,430,478,709	N
C000045	200045	Textile, Clothing, Fur	2001-12-31	33,000,000	33,000,000	N
C000045	200045	Textile, Clothing, Fur	2010-12-31	49,500,000	49,500,000	N
C000055	200055	Metal, Nonmetal	2001-12-31	145,368,000	145,368,000	N
C000055	200055	Metal, Nonmetal	2010-12-31	223,967,460	223,967,460	N

C000056	200056	Wholesale And Retail Trades	2001-12-31	72,000,000	72,000,000	N
C000056	200056	Wholesale And Retail Trades	2010-12-31	101,688,192	101,688,192	N
C000058	200058	Electronic	2001-12-31	228,041,727	228,041,727	N
C000058	200058	Electronic	2010-12-31	246,461,318	246,461,318	N
C000413	200413	Electronic	2001-12-31	100,000,000	100,000,000	N
C000413	200413	Electronic	2010-12-31	100,000,000	100,000,000	N
C000418	200418	Machinery, Equipment, Instrument	2001-12-31	127,357,248	127,357,248	N
C000418	200418	Machinery, Equipment, Instrument	2010-12-31	160,184,158	160,184,158	N
C000429	200429	Transportation, Storage	2001-12-31	303,750,000	303,750,000	N
C000429	200429	Transportation, Storage	2010-12-31	348,750,000	348,750,000	N
C000488	200488	Papermaking, Printing	2001-12-31	206,480,550	206,480,550	N
C000488	200488	Papermaking, Printing	2010-12-31	557,497,485	557,497,485	Y
C000505	200505	Real Estate	2001-12-31	57,500,000	57,500,000	N
C000505	200505	Real Estate	2010-12-31	64,975,000	64,975,000	N
C000513	200513	Medicine, Biologic Products	2001-12-31	122,306,984	122,306,984	N
C000513	200513	Medicine, Biologic Products	2010-12-31	111,993,354	111,993,354	N
C000521	200521	Machinery, Equipment, Instrument	2001-12-31	113,100,000	113,100,000	N
C000521	200521	Machinery, Equipment, Instrument	2010-12-31	113,100,000	113,100,000	N
C000530	200530	Machinery, Equipment, Instrument	2001-12-31	115,000,000	115,000,000	N
C000530	200530	Machinery, Equipment, Instrument	2010-12-31	115,000,000	115,000,000	N
C000539	200539	Production & Supply Of Power, Gas & Water	2001-12-31	665,340,000	665,340,000	N
C000539	200539	Production & Supply Of Power, Gas & Water	2010-12-31	665,326,500	665,326,500	N
C000541	200541	Machinery, Equipment, Instrument	2001-12-31	82,500,000	82,500,000	N
C000541	200541	Machinery, Equipment, Instrument	2010-12-31	225,225,000	225,225,000	N
C000550	200550	Machinery, Equipment, Instrument	2001-12-31	344,000,000	344,000,000	N
C000550	200550	Machinery, Equipment, Instrument	2010-12-31	344,000,000	344,000,000	N
C000553	200553	Petroleum, Chemical, Rubber, Plastic	2001-12-31	115,000,000	115,000,000	N
C600602	900901	Electronic	2010-12-31	293,370,465	293,370,465	N
C600604	900902	Machinery, Equipment, Instrument	2001-12-31	232,925,000	232,925,000	N
C600604	900902	Machinery, Equipment, Instrument	2010-12-31	232,925,000	232,925,000	N
C600611	900903	Social Services	2001-12-31	202,800,000	202,800,000	N
C600611	900903	Social Services	2010-12-31	533,871,000	533,871,000	N
C600613	900904	Transmitting, Culture Industry	2001-12-31	45,626,375	45,626,375	N
C600613	900904	Social Services	2010-12-31	45,626,375	45,626,375	N
C600612	900905		2001-12-31	120,051,360	120,051,360	N
C600612	900905	Wholesale And Retail Trades	2010-12-31	132,056,496	132,056,496	N
C600610	900906	Machinery, Equipment, Instrument	2001-12-31	120,120,000	120,120,000	N
C600610	900906	Machinery, Equipment, Instrument	2010-12-31	120,120,000	120,120,000	N
C600614	900907	Petroleum, Chemical, Rubber, Plastic	2001-12-31	41,745,000	41,745,000	N

C600614	900907	Real Estate	2010-12-31	120,643,050	120,643,050	N
C600618	900908	Petroleum, Chemical, Rubber, Plastic	2001-12-31	406,560,000	406,560,000	N
C600618	900908	Petroleum, Chemical, Rubber, Plastic	2010-12-31	406,560,000	406,560,000	N
C600623	900909	Petroleum, Chemical, Rubber, Plastic	2001-12-31	243,100,000	243,100,000	N
C600623	900909	Petroleum, Chemical, Rubber, Plastic	2010-12-31	243,100,000	243,100,000	N
C600619	900910	Machinery, Equipment, Instrument	2001-12-31	179,400,000	179,400,000	N
C600619	900910	Machinery, Equipment, Instrument	2010-12-31	284,169,608	284,169,608	N
C600639	900911	Real Estate	2001-12-31	204,490,000	204,490,000	N
C600639	900911	Real Estate	2010-12-31	272,176,190	272,176,190	N
C600648	900912	Real Estate	2001-12-31	200,557,500	200,557,500	N
C600648	900912	Real Estate	2010-12-31	200,557,500	200,557,500	N
C600617	900913	Petroleum, Chemical, Rubber, Plastic	2001-12-31	64,558,440	64,558,440	N
C600617	900913	Real Estate	2010-12-31	64,558,440	64,558,440	N
C600650	900914	Social Services	2001-12-31	146,409,120	146,409,120	N
C600650	900914	Transportation, Storage	2010-12-31	161,050,032	161,050,032	N
C600818	900915	Machinery, Equipment, Instrument	2001-12-31	69,000,000	69,000,000	N
C600818	900915	Machinery, Equipment, Instrument	2010-12-31	75,900,000	75,900,000	N
C600679	900916	Machinery, Equipment, Instrument	2001-12-31	132,000,000	132,000,000	N
C600679	900916	Real Estate	2010-12-31	171,600,000	171,600,000	N
C600851	900917	Textile, Clothing, Fur	2001-12-31	167,773,761	167,773,761	N
C600851	900917	Textile, Clothing, Fur	2010-12-31	468,850,582	468,850,582	N
C600819	900918	Metal, Nonmetal	2001-12-31	125,000,000	125,000,000	N
C600819	900918	Metal, Nonmetal	2010-12-31	187,500,002	187,500,002	N
C600695	900919	Food And Beverage	2001-12-31	346,732,848	346,732,848	N
C600695	900919	Integrated	2010-12-31	346,732,848	346,732,848	N
C600841	900920	Machinery, Equipment, Instrument	2001-12-31	217,000,000	217,000,000	N
C600841	900920	Machinery, Equipment, Instrument	2010-12-31	217,000,000	217,000,000	N
C600844	900921	Papermaking, Printing	2001-12-31	96,896,677	96,896,677	N
C600844	900921	Petroleum, Chemical, Rubber, Plastic	2010-12-31	193,793,606	193,793,606	N
C600689	900922	Textile, Clothing, Fur	2001-12-31	48,787,200	48,787,200	N
C600689	900922	Textile, Clothing, Fur	2010-12-31	48,787,200	48,787,200	N
C600827	900923	Wholesale And Retail Trades	2001-12-31	107,078,400	107,078,400	N
C600827	900923	Wholesale And Retail Trades	2010-12-31	179,718,197	179,718,197	N
C600843	900924	Machinery, Equipment, Instrument	2001-12-31	97,500,000	97,500,000	N
C600843	900924	Machinery, Equipment, Instrument	2010-12-31	243,943,750	243,943,750	N
C600835	900925	Machinery, Equipment, Instrument	2001-12-31	113,760,000	113,760,000	N
C600835	900925	Machinery, Equipment, Instrument	2010-12-31	216,235,008	216,235,008	N
C600845	900926	Information Technology Industry	2001-12-31	88,000,000	88,000,000	N
C600845	900926	Information Technology	2010-12-31	88,000,000	88,000,000	N

		Industry				
C600822	900927	Wholesale And Retail Trades	2001-12-31	66,550,000	66,550,000	N
C600822	900927	Wholesale And Retail Trades	2010-12-31	99,825,006	99,825,006	N
C600848	900928	Machinery, Equipment, Instrument	2001-12-31	107,145,500	107,145,500	N
C600848	900928	Machinery, Equipment, Instrument	2010-12-31	107,145,500	107,145,500	N
C600680	900930	Information Technology Industry	2001-12-31	124,800,000	124,800,000	N
C600680	900930	Information Technology Industry	2010-12-31	124,800,000	124,800,000	N
C600663	900932	Real Estate	2001-12-31	509,600,000	509,600,000	N
C600663	900932	Real Estate	2010-12-31	509,600,000	509,600,000	N
C600801	900933	Metal, Nonmetal	2001-12-31	164,000,000	164,000,000	N
C600801	900933	Metal, Nonmetal	2010-12-31	78,238,700	78,238,700	N
C600754	900934	Social Services	2001-12-31	156,000,000	156,000,000	N
C600754	900934	Social Services	2010-12-31	156,000,000	156,000,000	N
C600295	900936	Textile, Clothing, Fur	2001-12-31	210,000,000	210,000,000	N
C600295	900936	Textile, Clothing, Fur	2010-12-31	420,000,000	420,000,000	N
C600726	900937	Production & Supply Of Power, Gas & Water	2001-12-31	432,000,000	432,000,000	N
C600726	900937	Production & Supply Of Power, Gas & Water	2010-12-31	432,000,002	432,000,002	N
C600751	900938	Transportation, Storage	2001-12-31	180,000,000	180,000,000	N
C600751	900938	Transportation, Storage	2010-12-31	180,000,000	180,000,000	N
C600776	900941	Information Technology Industry	2001-12-31	150,000,000	150,000,000	N
C600776	900941	Information Technology Industry	2010-12-31	300,000,000	300,000,000	N
C600054	900942	Social Services	2001-12-31	104,000,000	104,000,000	N
C600054	900942	Social Services	2010-12-31	156,000,000	156,000,000	N
C600272	900943	Textile, Clothing, Fur	2001-12-31	80,000,000	80,000,000	N
C600272	900943	Integrated	2010-12-31	80,000,000	80,000,000	N
C600221	900945	Transportation, Storage	2001-12-31	76,680,000	76,680,000	N
C600221	900945	Transportation, Storage	2010-12-31	184,723,201	184,723,201	N
C600698	900946	Machinery, Equipment, Instrument	2001-12-31	230,000,000	230,000,000	N
C600698	900946	Machinery, Equipment, Instrument	2010-12-31	230,000,000	230,000,000	N
C600320	900947	Machinery, Equipment, Instrument	2001-12-31	110,000,000	110,000,000	N
C600320	900947	Machinery, Equipment, Instrument	2010-12-31	858,000,000	858,000,000	N
C600190	900952	Transportation, Storage	2001-12-31	166,500,000	166,500,000	N
C600190	900952	Transportation, Storage	2010-12-31	222,806,970	222,806,970	N
C600555	900955	Textile, Clothing, Fur	2001-12-31	110,000,000	110,000,000	N
C600555	900955	Social Services	2010-12-31	330,000,000	330,000,000	N

APPENDIX C: DATA MANUAL

Tradable Shares-Tradable A Shares		
A_Trdshr	Tradable A Shares	Num.
Lstatrdshr	Listed A Trade Shares	Num.
Mngshr	Managing Shares	Num.
Strgplashr	Strategic Investor Placing	Num.
Lpplashr	Legal Person Placing	Num.
Fundplashr	Fund Placing	Num.
Nlstsni	Non Listed Seasoned New Issue	Num.
Nlstrigoff	Non Listed Right Offering	Num.
Othtrdshr	Other Tradable Shares	Num.
Resashr	Restricted A Shares	Num.
Tradable Shares-Tradable B Shares		
B_Trdshr	Tradable B Shares	Num.
Lstbtrdshr	Listed B Trade Shares	Num.
Resbshr	Restricted B Shares	Num.
Institutional Investors Holding Shares		
InsHoldB	Institutional Investors Holding of A Shares	Share
InsHoldB	Institutional Investors Holding of B Shares	Share

APPENDIX D: POOLED REGRESSION RESULTS BY STATA 11.1

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. reg apremium  volatilityratio turnoverratio nshratio  trdpct lnashnbshn lnins
> holdainsholdb exchange1 exchange2 v5 v6 v7 v8 v9 v10 v11 v12 v13 v14 v15 v16
> v17 v18 v19 v20 v21 v22 v23 v24 v25 v26 v27 v28 v29 v30 v31 v32 v33 v34 v35 v
> 36 v37 v38 v39 v40 v41 v42 v43 v44 v45 v46 v47 v48 v49 v50 v51 v52 v53 v54 v5
> 5 v56 v57 v58 v59 v60 v61 v62 v63 v64 v65 v66 v67 v68 v69 v70 v71 v72 v73 v74
> v75 v76 v77 v78 v79 v80 v81 v82 v83 v84 v85 v86 v87 v88 v89 industry1 indust
> ry2 industry3 industry4 industry5 industry6 industry7 yr1 yr2 yr3 yr4 yr5 yr6
> yr7 yr8 yr9
note: exchange2 omitted because of collinearity
note: v9 omitted because of collinearity
note: v12 omitted because of collinearity
note: v19 omitted because of collinearity
note: v20 omitted because of collinearity
note: v24 omitted because of collinearity
note: v28 omitted because of collinearity
note: v35 omitted because of collinearity
note: v49 omitted because of collinearity
note: v51 omitted because of collinearity
note: v52 omitted because of collinearity
note: v57 omitted because of collinearity
note: v58 omitted because of collinearity
note: v59 omitted because of collinearity
note: v60 omitted because of collinearity
note: v64 omitted because of collinearity
note: v66 omitted because of collinearity
note: v73 omitted because of collinearity
note: v75 omitted because of collinearity
note: v78 omitted because of collinearity
note: v84 omitted because of collinearity
note: industry4 omitted because of collinearity
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Source	SS	df	MS		
				Number of obs =	639
				F(87, 551) =	104.60
Model	32515.3691	87	373.739875	Prob > F =	0.0000
Residual	1968.83728	551	3.57320741	R-squared =	0.9429
				Adj R-squared =	0.9339
Total	34484.2064	638	54.0504802	Root MSE =	1.8903

apremium	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
volatility~o	2.628454	.7470656	3.52	0.000	1.161009	4.095899
turnoverra~o	.0046736	.0013372	3.50	0.001	.0020469	.0073002
nshratio	.3603135	.1649885	2.18	0.029	-.0362302	.6843969
trdpct	-2.361983	.8495885	-2.78	0.006	-4.030812	-.6931547
lnashnbshn	-1.845219	.2532582	-7.29	0.000	-2.342689	-1.347749
lninsholda~b	-.0606309	.0329222	-1.84	0.066	-.1252992	.0040374
exchange1	-8.96349	2.065159	-4.34	0.000	-13.02004	-4.906943
exchange2	(omitted)					
v5	-2.583701	2.781364	-0.93	0.353	-8.047075	2.879673
v6	-8.19566	2.738891	-2.99	0.003	-13.57561	-2.815715
v7	-13.06825	2.901389	-4.50	0.000	-18.76739	-7.369115
v8	-9.087762	3.130478	-2.90	0.004	-15.23689	-2.938631
v9	(omitted)					
v10	-11.97254	2.97907	-4.02	0.000	-17.82427	-6.120818
v11	-13.17028	3.054522	-4.31	0.000	-19.17021	-7.170347
v12	(omitted)					
v13	.5726135	.8200094	0.70	0.485	-1.038113	2.18334
v14	1.981522	.9788374	2.02	0.043	.0588126	3.904232
v15	-6.700642	2.728732	-2.46	0.014	-12.06063	-1.340651
v16	-13.86817	2.92224	-4.75	0.000	-19.60827	-8.128077
v17	-8.541078	2.540917	-3.36	0.001	-13.53215	-3.55001
v18	-8.468416	2.926977	-2.89	0.004	-14.21781	-2.719018
v19	(omitted)					
v20	(omitted)					
v21	-9.604871	3.045944	-3.15	0.002	-15.58795	-3.621788
v22	-12.44853	3.098558	-4.02	0.000	-18.53496	-6.362093
v23	-11.10342	2.99401	-3.71	0.000	-16.98449	-5.222352
v24	(omitted)					
v25	-11.72237	3.005265	-3.90	0.000	-17.62555	-5.819193
v26	-12.60565	2.967459	-4.25	0.000	-18.43457	-6.776732
v27	-11.94658	2.975456	-4.02	0.000	-17.7912	-6.101952
v28	(omitted)					
v29	-11.65727	2.989256	-3.90	0.000	-17.52901	-5.785543
v30	-6.797738	2.805991	-2.42	0.016	-12.30949	-1.28599
v31	-12.28482	2.945717	-4.17	0.000	-18.07102	-6.498607
v32	-12.18724	3.140754	-3.88	0.000	-18.35655	-6.017921
v33	-11.18614	3.013654	-3.71	0.000	-17.1058	-5.266488
v34	-.0043118	1.002964	-0.00	0.997	-1.974412	1.965789
v35	(omitted)					
v36	-11.27764	2.966272	-3.80	0.000	-17.10423	-5.451058
v37	-10.96346	3.068352	-3.57	0.000	-16.99056	-4.936364
v38	-11.00843	3.001736	-3.67	0.000	-16.90468	-5.112186
v39	-10.04835	3.61124	-2.78	0.006	-17.14183	-2.954865
v40	-15.05591	3.415965	-4.41	0.000	-21.76581	-8.346
v41	.8899187	2.579214	0.35	0.730	-4.176376	5.956213
v42	-11.36802	3.006283	-3.78	0.000	-17.27319	-5.462839
v43	-11.65529	2.940298	-3.96	0.000	-17.43086	-5.879728
v44	-12.6509	3.07316	-4.12	0.000	-18.68744	-6.614354
v45	-13.53598	3.441528	-3.93	0.000	-20.29611	-6.775864
v46	-12.33982	2.935319	-4.20	0.000	-18.10561	-6.57404
v47	2.036377	.8505295	2.39	0.017	.3657005	3.707054
v48	.0727092	2.045702	0.04	0.972	-3.945621	4.091039
v49	(omitted)					
v50	-10.97198	2.180724	-5.03	0.000	-15.25553	-6.688428
v51	(omitted)					
v52	(omitted)					
v53	-13.12507	2.2217	-5.91	0.000	-17.48911	-8.761037
v54	-9.226446	2.177996	-4.24	0.000	-13.50464	-4.948255
v55	-3.34279	2.354727	-1.42	0.156	-7.968129	1.28255
v56	-6.663596	2.723477	-2.45	0.015	-12.0132	-1.313867
v57	(omitted)					
v58	(omitted)					
v59	(omitted)					
v60	(omitted)					
v61	-6.767512	2.351259	-2.88	0.004	-11.38604	-2.148984
v62	-7.465228	1.958631	-3.81	0.000	-11.31252	-3.617931
v63	-8.942002	1.978871	-4.52	0.000	-12.82906	-5.054947
v64	(omitted)					
v65	-2.778742	1.551909	-1.79	0.074	-5.827125	.2696402
v66	(omitted)					
v67	-.0107486	.898023	-0.01	0.990	-1.774716	1.753219
v68	-3.174814	1.452653	-2.19	0.029	-6.028229	-.3213995
v69	-5.081045	2.359917	-2.15	0.032	-9.71658	-.4455103
v70	6.926246	2.625396	2.64	0.009	1.769237	12.08326
v71	-11.69158	2.152546	-5.43	0.000	-15.91978	-7.463375
v72	-7.111975	2.743308	-2.59	0.010	-12.5006	-1.723354
v73	(omitted)					
v74	1.497612	2.21698	0.68	0.500	-2.857154	5.852378
v75	(omitted)					
v76	.9142255	.9204769	0.99	0.321	-.8938478	2.722299
v77	3.414049	2.567456	1.33	0.184	-1.629151	8.457248
v78	(omitted)					
v79	-5.148703	2.032089	-2.53	0.012	-9.140293	-1.157114
v80	-8.256789	2.068031	-3.99	0.000	-12.31898	-4.1946
v81	-3.443804	1.158838	-2.97	0.003	-5.720086	-1.167522
v82	-6.768866	1.038329	-6.52	0.000	-8.808433	-4.729299
v83	-11.44212	2.044184	-5.60	0.000	-15.45747	-7.426776
v84	(omitted)					
v85	-3.717911	1.976884	-1.88	0.061	-7.601061	.1652392
v86	-8.801402	2.355164	-3.74	0.000	-13.4276	-4.175204
v87	4.251695	2.687171	1.58	0.114	-1.026657	9.530048
v88	-8.117948	2.249703	-3.61	0.000	-12.53699	-3.698904
v89	-5.00035	2.045151	-2.44	0.015	-9.017597	-.9831026
industry1	-7.385926	2.874427	-2.57	0.010	-13.0321	-1.739749
industry2	6.085561	2.371186	2.57	0.011	1.427891	10.74323
industry3	-6.933069	2.607835	-2.66	0.008	-12.05558	-1.810553
industry4	(omitted)					
industry5	-5.534858	1.564689	-3.54	0.000	-8.608344	-2.461373
industry6	-6.870039	2.423447	-2.83	0.005	-11.63037	-2.109713
industry7	1.490854	1.686766	0.88	0.377	-1.822424	4.804133
yr1	-.5658251	.7881934	-0.72	0.473	-2.114057	.9824065
yr2	1.374446	.6371756	2.16	0.031	.1228553	2.626036
yr3	.2227564	.5967875	0.37	0.709	-.9495005	1.395013
yr4	.9486112	.5430595	1.75	0.081	-.118109	2.015331
yr5	-.1660362	.515399	-0.32	0.747	-1.178423	.846351
yr6	-.9263141	.3687758	-2.51	0.012	-1.650693	-.2019356
yr7	-1.356546	.3903065	-3.48	0.001	-2.123216	-.589875
yr8	-1.033118	.3456276	-2.99	0.003	-1.712027	-.354209
yr9	.4317438	.3159405	1.37	0.172	-.1888514	1.052339
_cons	15.26641	1.941542	7.86	0.000	11.45268	19.08014

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