Market Concentration and Cost of Equity in Emerging Market - The Case of China

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Abstract

Cost of equity in emerging market may exhibit different pattern from developed markets, due to unique local market structures. This study examines the cross-section variations of expected returns at firm level in the Chinese stock market. Contrast to most empirical findings in developed markets we find size is positively correlated with expected returns while standard deviation and book-to-market ratio are negatively correlated with expected returns. Further investigation shows that Chinese stock market is dominated by a few large profitable monopoly state-owned enterprises. Most shares in these large companies are not traded in the stock market the limited tradable shares are chased by investors, leading to a persistent overpricing of extremely large companies. Our study shows the importance of incorporating local factors in determining cost of equity in emerging market.

Key words: Cost of equity; multi-factor model; size premium
JEL Classification Code: G8

I. Introduction

Cost of equity capital is an essential issue in financial economics. Corporate textbooks state that rational investors demand a required rate of return comparable for the risks they bear, thus projects with higher risk should be discounted at higher discount rate. The cost of equity often serves as a risk-adjusted discount rate in capital budgeting and firm valuation, it can also be used as benchmarks to assess manager's performance whereas the return on equity shall be no less than the cost of equity capital (Stern Stewart's EVA, for example). Despite the importance of cost of equity, there is remarkably disagreement on how to estimate cost of equity, particularly in emerging market, where the market is often believed as less efficient.

The well known Capital Asset Pricing Model (CAPM) of Sharpe (1964), Linter (1965) and Black(1970) states a linear relationship between expected stock return and its systematic risk beta. Recent studies tend to favor multi-factor models. For example, Banz(1981) documents that small stocks on average earn higher rate of return than large stocks. Fama and French (1992, 1993) and Lakonishok, Shleifer, and Vishny(1994) show that stocks with higher book-to-market ratio, P/E ratio and earnings growth rate on average earn higher returns. Carhart(1997) adds momentum effect to explain stock return where stocks with higher returns in previous year tend to earn higher returns in the consequent year. These models are initially applied to U.S. data and the market portfolio is assumed to be the U.S. market portfolio.

But there is wide disagreement on how to estimate cost of equity in emerging market, since emerging markets are often considered as irrational. Harvey (2002) show that emerging markets are often characterized as higher volatility, high average return and obvious non-normal distribution, which indicate that a standard Capital Asset Pricing model does not work in emerging markets. For example, market capitalization is most emerging countries is small, so local stock market is more likely to be concentrated on a few sectors or industries. From a production point of view, some industries are inherently more risky than others. If the market is concentrated on fewer industries, the volatility of local market index increases. If the risks in these industries are particularly higher/lower than the average risk, then risk premium in one country will be higher/lower than risk premium in other country, regardless of capital liberalization. Harvey (1996) finds significant relationship between expected return and price

fluctuation of natural resources in Indonesia, since local index is heavily weighted on natural resource industry. Roll (1992) concludes that the constitution of local stock market has remarkable effect on stock market volatility. Some markets, such as South Africa and Mexico are consistently more volatile than other countries. In a more recent paper, Hou and Robinson (2007) find firms in concentrated industries earn substantially lower rate of return than firms in competitive industries, even after controlling for size, book-to-market ratio and other return determinants.

We test multi-factor CAPM in China. Our null hypothesis is that the Chines stock market shares the same risk factors as those in developed market, so the international CAPM can explain expected rate of return in China. The alternative hypothesis is therefore, the unique local market structure may lead to completely different return-risk relation, and the international CAPM fails to explain price behavior in China. The case of China is of particular interest, partly because the dramatic economic achievements in China since the 1980s; partly because the long segmentation of the Chinese financial market from the world. While many emerging market as gradually integrated into international market (Saunders and Walter, 2002), China is an exception. Thus the case of China provides a good place to test the international asset pricing models.

We find beta have little explanatory power, adding size , book-to-market ratio and stock volatility significantly improve the explanatory power, together these four variables explain about 25% of the cross-sectional variations in stock returns in the Chinese stock market. But contrast to most empirical findings in developed markets we find size is positively correlated with expected returns. We find local stock market is dominated by large state-owned enterprises, and herding on very large companies lifts up the average return of large companies. We also find that book-to-market ratio and standard deviation is negatively correlated with expected returns.

The remaining of the paper is organized as follows. Section II provides a background description of the Chinese stock market. Section III examines the factor models in the Chinese stock market. Section IV discusses the interaction between expected returns and local market activities. Section V concludes the paper.

II. Data and Background of Chinese Stock Market

The stock market activities in the People's Republic of China can be dated back to 1991, when the ShangHai stock exchange and ShenZhen stock exchange were established as part of the progress the country determines to speed its economic reform and build a socialist market system. Initially, the market was broken into two separate parts where domestic residents trade A shares dominated in RMB and foreigners trade B shares dominated in U.S. dollar or Hong Kong dollar. Starting from March 2000, domestic residents are allowed to trade B share with their foreign currency savings. The market is further opened to foreign investors since October, 2004, when foreign qualified institutions (QFII) are allowed to trade in A-share market. Though the market opens gradually to foreign investors, there are still substantial barriers to free capital flows in China. On the one hand, domestic investors are not allowed to trade foreign securities which mean they cannot diversify their portfolio by investing in foreign stock markets.

In this study, we sample all A shares traded in ShangHai Stock Exchange between January, 1995 and December, 2005. The data is provided by SinoFin Data System. [1] Table I provides summary statistics of the market activities in the ShangHai stock exchange and the historical performance of the ShangHai Composite A share index. There is a clear pattern of rapid growth of local stock market. The number of stocks listed increases from 293 in 1996 to 834 in 2005, and the market capitalization increases almost four times in the past 10 years. Harvey (2002) finds that emerging markets can be characterized as high expected rate of returns with high risks, but the average rate of return is ShangHai stock market is only 3%, with a standard deviation of 25%. There are several reasons why the Chinese stock market is more volatile and less profitable. One reason is the lack of investment opportunities for Chinese residents.[2] In China, investors have few alternatives to diversify their portfolio due to interest rate control and capital control, so they have to invest on stock market even if price is already high. Fernald and Rogers (2002) find that domestic A shares are priced much higher than B shares or H shares, they call this phenomena of low return and high volatility as "puzzles" in the Chinese stock market. Another reason is only a small proportion of shares is tradable. The majority of shares, which are hold by central or local governments, are not tradable[3]. Table II provides the ratio of tradable shares to non-tradable shares before 2006. Since only a small proportion of shares is tradable, prices are easily to be manipulated.

III. Cost of equity and factor models

III.1 Determinants of cost of equity

A. Three-factor model

In the classical Fama and French (1993) three-factor model, beta is positively correlated with expected return of return, size is negatively correlated with expected return and B/M ratio is positively correlated with expected return. There is a large body of literatures discussing why small stocks and stocks with high book-to-market ratio can earn above average rate of returns. The model is initially tested by time-series regressions. The excess return from market portfolio, the average return difference between high B/M portfolio and low B/M portfolio and the average return difference between small size portfolio and big size portfolio serves as the systematic risk factors. More recently, some researchers have turn to firm-level cross-section data. Rather than identifying factor loadings from time-series regressions, they directly regress the average stock returns to firm-level characteristics such as beta, firm size and book-to-market ratios to determine whether the firm characteristics are priced (see Gehbardt, Lee Swaminathan, 2000; Lee, Ng and Swaminathan, 2003; etc.) . Given the short history of Chinese financial market, we are unable to find stable risk loadings on size and book-to-market. Instead, we run cross-section regressions on the individual size and book-to-market ratio.

B. Volatility

Goyal and Santa-Clara (2003) document a positive relation between idiosyncratic risk and returns in the stock market. Gebhard, Lee, and Swaminathan (2001) find return volatility dominates systematic risk beta in explaining expected stock returns at firm level. Volatility may be more important in emerging market since local market portfolio is less efficient.

[1] The SinoFin is founded by Chinese institution in Perking University, and is a well known financial data sets in China.

[2] Foreigners typically pay "premium" to acquire local stocks, see for example, Domowitz, Glen and Madhavan (1997).

[3] Initially, only those shares which are sold to general public investors through IPO are tradable. In 2006, China conduct "non-tradable share reform" and allow all shares to be tradable. However, most state-owned companies (SOEs) are controlled by government , and a large proportion of shares in SOEs are actually never traded.

Bekaert, Erb, Harvey and Viskana (1996) study the cross-country variations of cost of equity in emerging market, they find volatility has some ability to explain expected return. In particular, high volatility portfolios earn higher average rate of returns than lower volatility portfolios. We use the annualized standard deviation of monthly stock returns over 24 to 36 months to estimate standard deviation.

C. Turnover

Turnover ratio serves as proxy for liquidity, stocks with high turnover ratio are more liquid than stocks with lower turnover ratio. Average turnover ratio in China is substantially high comparing to average turnover in emerging markets. Rouwenhorst (1999) finds the median monthly turnover ratio in 20 emerging markets is 4%, corresponding to 48% per year. However, the average turnover is 360 percent per year in China. The extremely high turnover ratio shows local investors may care less about fundamentals since their investment horizon is short.

D. Proportion of tradable stocks

In China, only the shares that are initially sold to general public are tradable in the stock markets. The majority of shares, which are hold by central or local government are generally not tradable. Though after the "Non-tradable share reform" in 2006, all shares are tradable legally, but shares controlled by state and local government are rarely tradable in stock market.

The full model is :

$$R_i = \alpha + b_i\beta_i + s_i \log(size_i) + h_i(B/M_i) + v_i Volatility_i + t_i traderatio_i + l_i turnover_i + \varepsilon_i \quad (1)$$

where R_i is the expected rate of return of stock *I* in excess of a risk free rate; β_i is stock *I*'s beta computed with ShangHai Stock A-Share Index with at least 24 months of data. Volatility is the standard deviation of monthly returns computed using at least 24 months of data, both beta and volatility are rolling every year. Size is the market capitalization by the end of each year and B/M is the book-to-market ratio by the end of each year. Trade ratio is the proportion of tradable shares to the total shares and turnover is the aggregate turnover ratio each year.

3.2 Empirical Results

Table III reports the Fama-Macbeth cross-section regressions on various factor models. We first run univariate regressions between expected return and six risk factors independently. The univariate tests reject CAPM in Chinese stock market. Our results are consistent with Bakaert and Harvey (2002), who find that the capital asset pricing model typically performs poorly in emerging markets.

We then run multivariate regression tests of average returns and a combination of risk factors. The multivariate regressions provide a better sense of the incremental explanatory power of each risk factor, after controlling for common effects. The results confirm our findings in the univariate test: namely beta is negative and insignificant, book-to-market ratio is negative and significant and size is positive and modestly significant at 90% confidence interval. Why large firms on average outperform small firms? One possible explanation is that investors are herding on large firms. In China, many large firms are state-owned enterprises and concentrated on resource-based industries, due to monopoly powers and government protections, these firms earn higher profits in the history and are catered by investors. Because of this, the price of these firms may be systematically overpriced, driving the expected returns higher than they should be. We also find that the relation between average return and book-to-market ratio is negative, which means firms with lower book-to-market

ratio on average earn higher expected returns. Since large firms usually have lower book-to-market ratio, the negative book-to-market effect may be correlated with the positive size effect. We then add additional variable to explain expected returns. The most prominent improvement comes from adding volatility as explanatory variable. All together these four variables can explain 25% of the total cross-section variations of average returns. Similar to the univariate tests, the slope coefficient for volatility is negative, which means stocks with lower volatility generally earn high average returns. The results are again contradicted with the multi-factor asset pricing models. Previous researches find positive expected return and stock volatility, examples include Lee, Ng and Swaminathan (2003), Goyal and Santa-Clara (2003) etc. We suspect that the result is caused by large companies. For example, China Petro-Chemical Corporation, has a market weight of more than 15%, its annual volatility is only 24%, much lower than the average level of more than 2000% for the whole market. Adding turnover and proportion of tradable shares also increase R-square a little bit, but these two variables are not significant. A full model incorporating all variables yield a R-square of 29%, and the variables that are significantly correlated with average returns are: size, book-to-market ratio and volatility.

The univariate and multivariate tests in Chinese stock market show stocks with large size, lower book-to-market ratio and lower return volatility on average earn higher rate of returns. Though the factors explaining average returns are the same as those found in developed markets, the signs are opposite, which raise the question of how to interpret the empirical results. Intuitionally, one may blame the failure of multi-factor model to market inefficiency in emerging market. That is perhaps one reason. But, Rouwenhorst (1999) finds small firms earn lower average returns in Thailand, Indonesian, India and Colombia and substantially high average returns in Argentina, Mexico and Zimbabwe, no clear evidence shows market efficiency differs across these countries. There may be other reasons why large firms outperform small firms in China. One reason is the unique market structure in Chinese stock market the Chinese stock market is dominated by some extremely large state-owned companies, with higher expected return but lower risks. Actually, in the famous Fama-French three factor regressions (1993), though on average small firms earn higher returns than large firms the slope coefficient for SML is negative for the top 20% largest companies. We want to examine how large companies effect the return-risk relation in Chinese stock market.

IV. Market Structure and cost of equity

One possible reason that might explain the abnormal return pattern in the Chinese stock market is its unique market structure. We find the Chinese stock market is concentrated on a few large companies. Panel A in Table IV reports market concentration by dollar trading value. As we can see, trading value is concentrated on few stocks almost 15% of the total trading value are concentrated on the first 10 stocks. The top 10% heavily traded stocks account for more than 35% of the total trading value. And the 25% heavily traded stocks account for more than 56% of the total trading value. Panel B in Table 5 reports market concentration by tradable market capitalization. The results are quite similar to the results by dollar trading value. Large firms constitute a large proportion of the market capitalization. For example, the top 25% largest firms will constitute for almost 55% of the total market capitalization in China.

Some researchers think small stocks on average outperform large stocks because small stocks are on average less liquid. For example, Amihud and Mendelson (1991) show less-liquid stocks earn higher average returns than liquid stocks they call this premium liquid premium. But this is not the case in China. Table V and Table VI examines the liquidity of small stocks

and large stocks in terms of dollar trading value and turnover ratio. Panel A in Table 6 reports the proportion of size-trading value ranked portfolio's tradable capitalization to the total market tradable capitalization. As we can see, the smallest 20% stocks account for about 6.37% of the total market tradable capitalization while the largest 20% stocks account for about 48.6% of the total market tradable capitalization. Panel B in Table 6 reports the proportion of sized-trading value ranked portfolio's trading value to the total trading value. The results show small stocks are actually more active than large firms. For example, the smallest 20% stocks only account for 6.37% of total market capitalization, but account 8.14% of the total trading value. The largest 20% stocks, though account for 48.63% of the total market tradable capitalization, only account for 45.6% of the total trading value. However, herding on extremely large companies also prevails. For example, in the largest 20% stocks, the most actively traded stocks account for 17.9% of the total market tradable capitalization while the least traded stocks account for only 6.6% of the total market tradable capitalization. Judging from relative ratio of market tradable capitalization and trading value, we conclude that on average small stocks are active, but herding for some extremely large stocks also exists. Table VI compares the average turnover ratio across 5 size-ranked portfolios. We find on average, small stocks have higher average turnover ratio. But for the extremely large stocks, turnover ratio is high.

What is the relationship among size, trading activity and average stock returns? Panel A in Table VII reports the average return of portfolios sorted by size and trading value quintiles. Each year we first sort all stocks by tradable market size and form 5 groups, within each group, we then sort all stocks by its annual trading value. All together we have 25 size-trading value portfolios. We then compute average return of each portfolio. As we can see, large stocks outperform small stocks for each of the five size-sorted portfolio, but only significant for heavily traded stocks. This result shows that large and adequately traded stocks earn substantially high average return over small stocks, the average annual return difference is as big as 24%. But large and inadequately traded stocks only earn 2.8% higher average return over small stocks, and this difference is not statistically significant. Trading activity thus plays a very important role in explaining average returns, particularly for large stocks. For the smallest 20% stocks, there is no significant difference between actively traded stocks or inadequately traded stocks. This result shows that the observed premium by large stocks over small stocks is more likely to be caused by few most actively traded large stocks. Since market is herding few large stocks, their prices may be consistently overpriced, which distort the typical pattern of small stocks premium. Wermers (1999) find stocks buy-herded by mutual funds earn substantially high average returns. Panel B reports the average return sorted by size and turnover quintile, the results are quite similar. Within each turnover quintile, large stocks outperform small stocks, but the difference is only significant for size quintile 4 and marginally significant for quintile 5. Within each size group, on average, firms that have highest turnover ratio outperform firms with lowest turnover ratio, but this is not the case for the 20% smallest stocks. We get a conclusion that for small stocks, actively trading may not increase average return, but for large stocks, actively trading can increase average return substantially. Since the Chinese is concentrated on a few very large companies, catering for few very large stocks leads to negative size premium.

Table VIII reports the interaction between size, book-to-market ratio and standard deviation of asset return. Panel A reports the average returns of size ranked portfolios, we find a clear pattern than large stocks outperform small stocks in every year. Panel B and Panel C reports the average beta and standard deviation in each size ranked groups. As we can see, small stocks generally have high standard deviation and high beta, meaning small firms are

fundamentally more risky than large firms. Though small stocks are more risky, large stocks on average earn higher average returns. We find that the average returns on the first 20% large firms is 5.9%, but the average return on the last 20% large firms is –10.3%, this result again shows that the so-called size effect may not be a compensation for risks. Since large firms on average have lower standard deviation and beta but higher average returns, this result can explain why we observe a negative slope coefficient for beta and standard deviation in the multi-factor regressions. Panel D reports the average book-to-market ratio of size ranked portfolios, the pattern is not very clear. On average, large firms have lower book-to-market ratio, probably because their market price is high. But sometimes firms in size quintile 3 or 4 have higher book-to-market ratio than firms in quintile 5, which indicates that the largest firms may have lower book-to-market ratios. Table IX reports the average returns of BM and size sorted portfolios. We find that stocks with higher book-to-market ratio earn lower average return, this is true for stocks in every size quintile, though the return difference is even big for large stocks. This pattern is clearly different from developed markets. Fama-French (1993, 1996) document the HML premium which shows stocks with higher book-to-market ratio earn high premium over stocks with lower book-to-market ratio. They attribute this premium to the inherent financial distress risks in firms with lower book-to-market ratio. We observe an adverse relation between book-to-market ratio and average returns, and we link this difference to the market concentrations. In a less diversified market, investors may not have many choices, there are only very limited good firms available, mainly are large firms with lower book-to-market ratio. Since investors are herding for very big firms, they lift up the expected returns of large firms resulting to a positive relation between expected return and size together with a negative relation between expected return and book-to-market ratio. Our findings confirm "puzzles" founded by Fernald and Rogers (2002) in the Chinese stock market.

V. Conclusion

This study examines the validity of the multi-factor asset pricing model in China. We find size is positively correlated with expected returns, standard deviation and book-to-market ratio are negatively correlated with expected returns, in both unvariate and multi-factor tests under most situations. Our results indicate price behavior in China is significantly different from that in the developed market, while in developed markets, size is negatively correlated with the expected returns and book-to-market ratio is positively correlated with the expected returns. We attribute this different price behavior to the unique market structure in the Chinese stock market. In China, investors have a very short investment horizon of less than four months on average, so investors may care less about fundamentals. The Chinese stock market is dominated by a few very large state-owned enterprises, and a large proportion of shares in these companies are actually not tradable. Many of these large companies are in monopoly industries such as banking, tele-communication and energy industries and are very profitable. Demand herding on these companies combined with limited tradable shares leads to persistent overpricing of large stocks in Chinese stock market. Our study shows that cost of equity in emerging market is fundamentally determined by local factors, thus an international factor model which assumes the same risk loadings in every country is not appropriate even after the market is progressively opened to international investors.

Table I: Summary Statistics of ShangHai Composite A Share Index and properties in ShangHai Stock Exchange

This table provide yearly summary statistics for all stocks traded in ShangHai Stock Exchange. The sample period is from January 1996 to 2005. Average return is the yearly buy-and –hold return , standard deviation is the standard deviation of yearly returns. Market capitalization is is computed as all outstanding shares times the closing price by the end of the year. Market capitalization, tradable market capitalization and trading volume are transferred into dollar value with fixed exchange rate of 8.2RMB/$. Turnover ratio is measured as the number of shares traded in one year as a fraction of the total number of tradable shares outstanding by the end of the year. The data is provided by Sinofin Data System.

	No of Stocks	Average return	Standard deviation	Market capitalization ($in millions)	Trading Volume ($ in millions)	Average Turnover
1996	293	65%	37.21%	66237	110215.2	7.74
1997	382	23%	29.88%	111463	166426.8	6.24
1998	438	-3.8%	21.79%	128487	149771.5	4.99
1999	484	19.2%	38.29%	172412	205147.5	4.70
2000	572	46.4%	16.99%	325644	379368.8	4.82
2001	646	-20.6%	19.54%	333621	274598.5	2.36
2002	715	-16.8%	23.69%	306695	205043.4	2.00
2003	780	9%	15.59%	360397	251801.7	2.30
2004	837	-15.2%	21.68%	314562	320079.7	3.20
2005	834	-8.3%	21.14%	279275	232650.5	3.39
Mean		3.45%	25.82%			3.64

Table II Average tradable capitalization to the total market capitalization

This table reports the average proportion of the stocks' tradable capitalization to its total market capitalization. Stocks' tradable capitalization is computed as the number of tradable shares times the closing price by the end of the year; and total market capitalization is computed as all shares times the closing price by the end of the year. The sample includes all stocks traded in ShangHai stock exchange from 1996 to 2005. Stocks with less than 2 years of listing are excluded.

Year	Ranked by proportion of tradable capitalization					
	1(low)	**2**	**3**	**4**	**5(high)**	**mean**
1996	8.28%	17.48%	27.57%	37.98%	60.01%	30.04%
1997	11.87%	24.56%	27.48%	33.93%	50.55%	29.72%
1998	12.86%	25.19%	28.28%	34.98%	51.21%	30.50%
1999	13.23%	25.87%	30.54%	37.24%	52.49%	31.87%
2000	16.11%	27.37%	32.27%	38.65%	52.58%	33.36%
2001	17.61%	29.02%	34.45%	40.95%	55.34%	35.58%
2002	18.46%	29.91%	35.39%	41.79%	56.12%	36.44%
2003	19.01%	29.69%	35.05%	40.42%	54.23%	35.73%
2004	19.29%	29.97%	35.55%	41.15%	54.97%	36.23%
2005	19.69%	30.54%	36.20%	41.99%	55.74%	36.88%
mean	16.94%	28.21%	33.39%	39.63%	54.29%	34.53%

Table III Individual Firm Cross-Section Regressions with risk factors

This table presents time-series average of slope coefficient from cross-sectional Fama-MacBeth regressions estimated as of Dec 31 each year from 1996 to 2005. Individual firm buy and hold returns are regressed on : individual firm's beta, return volatility, log of market tradable capitalization, book-to-market ratio, proportion of tradable capitalization and the turnover ratios. Beta is computed by regressing monthly return of individual stocks to monthly return of ShangHai Composite A Share Index over 24 to 36 months; return volatility is computed as the standard deviation of monthly returns over 24 to 36 months. Both beta and return volatility are rolling every year. Logtsize is the log of stock's tradable market capitalization. B/M is the book-to-market ratio and tratio is the proportion of tradable capitalization to total market capitalization. T statistics are reported in parenthesis.

beta	logtsize	B/M	tratio	turnover	Return volatility	R-square
-0.08 (-0.9775)						0.065
	0.0646 (1.58)					0.079
		-0.4244 (-2.57)*				0.05
			0.024 (0.458)			0.0063
				0.08 (1.8)**		0.053
					-2.139 (-4.247)*	0.082
-0.078 (-1.09)	0.0737 (1.92)**	-0.434 (-3.135)*				0.185
-0.0835 (-1.158)	0.0754 (2.787)*	-0.369 (-2.663)*		0.0092 (0.776)		0.2086
-0.0757 (-1.04)	0.0747 (1.72)**	-0.348 (-2.6)*	-0.069 (-0.89)			0.198
0.016 (0.1964)	0.069 (1.88)**	-0.483 (-3.95)*			-2.477 (-4.33)*	0.246
0.043 (0.511)	0.0712 (2.506)*	-0.4989 (-3.81)*	-0.036 (-0.4795)	0.011 (0.56)	-3.13 (-5.863)*	0.2884

*significant at 5%
** significant at 10%

Table VI : Market Structure in ShangHai Stock Exchange

This table reports the degree of market concentration in ShangHai stock exchange. Panel A is ranked in terms of dollar trading value. Panel B is ranked in terms of tradable market capitalization. The sample period is from January 1996 to December 2005.

Panel A Market concentration by dollar trading value						
	Top 1	Top10	Top10%	First quintile	Second quintile	Total stocks
1996	7.6%	35.43%	45.37%	67.18%	86.97%	168
1997	5.83%	17.29%	37.43%	58.57%	80.45%	368
1998	2.72%	12.11%	27.46%	48.2%	72.26%	370
1999	1.98%	13.11%	31.85%	53.73%	75.81%	370
2000	0.94%	8.1%	28.28%	50.29%	74.22%	529
2001	1.3%	7.7%	26.22%	47.13%	71.52%	553
2002	1.21%	8.75%	30.36%	52%	75.66%	553
2003	4.21%	15.87%	41.82%	62.7%	82.45%	752
2004	3.77%	15.4%	42.49%	63.98%	83.18%	757
2005	2.56%	15.5%	42.4%	63.75%	83.26%	757
mean	3.21%	14.93%	35.37%	56.75%	78.55%	517
Panel B Market concentration by tradable capitalization						
1996	5.66%	27.65%	36.49%	57.8%	79.76%	168
1997	6.39%	18.61%	35.69%	56.36%	78.59%	368
1998	5.41%	14.94%	31.8%	53.54%	76%	370
1999	3.72%	13.16%	30.18%	52.67%	76.05%	370
2000	1.67%	8.55%	27.66%	49.52%	73.32%	529
2001	1.22%	8.3%	26.5%	47.8%	72.3%	553
2002	1.23%	8.91%	28.4%	49.5%	73.53%	553
2003	1.78%	11.4%	34.72%	55.72%	76.99%	752
2004	2.85%	14%	39.05	60.35%	80.515	757
2005	3.22%	18.12%	44.89%	65%	83.75%	757
Mean	3.32%	14.36%	33.54%	54.83%	77.08%	517

Table V: Interaction between size and trading value

This table reports the average percentage of portfolio's trading value to the total market trading value. Firms are first sorted by their tradable market capitalization to form 5 size groups, within each group, firms are sorted by their trading value or annual turnover ratio to create 5x5 double sorted portfolios. Panel A is double sorted by size and trading value; Panel B is double sorted by size and turnover ratio. The sample period is from January 1996 to December 2005.

Panel A: sized-trading value ranked portfolio's trading value to the total trading value					
Trading value quintiles	Size ranked quintile				
	1(low)	2	3	4	5(high)
1(low)	1.01%	2.03%	2.78%	4.00%	6.60%
2	1.22%	2.07%	2.82%	4.03%	7.07%
3	1.30%	2.07%	2.90%	4.11%	8.11%
4	1.40%	2.05%	2.98%	4.08%	8.95%
5	1.45%	2.14%	2.81%	4.15%	17.90%
total	6.37%	10.35%	14.28%	20.36%	48.63%
Panel B: sized-turnover ranked portfolio's trading value to the total market trading value					
Turnover quintile	size ranked quintile				
	1	2	3	4	5
1	0.76%	1.05%	1.34%	1.87%	3.08%
2	1.22%	1.72%	2.21%	2.91%	5.05%
3	1.53%	2.14%	2.88%	3.70%	6.91%
4	1.90%	2.61%	3.70%	4.62%	9.78%
5	2.73%	3.83%	4.72%	6.93%	20.80%
total	8.14%	11.34%	14.87%	20.04%	45.62%

Table VI : Interaction between size and average turnover ratio

This table reports the average annual turnover ratio of stocks in each of the 25 size and turnover ranked portfolios. Turnover ratio is measured as the number of shares traded in one year as a fraction of the total number of tradable shares outstanding by the end of the year. The t-statistics is for the null hypothesis that the mean turnover ratio of size quintile 1 and quintile 5 is the same. The sample period is from January 1996 to December 2005.

year	**Average turnover of sized ranked portfolios**						
	1(small)	**2**	**3**	**4**	**5(large)**	**5-1 spread**	**t-statistics**
1996	5.09	7.03	8.04	8.95	9.60	4.51	6.67
1997	7.35	6.59	5.91	5.56	5.78	-1.57	-4.55
1998	6.73	5.73	4.84	4.07	3.58	-3.15	-10.33
1999	5.90	4.87	4.26	4.37	4.08	-1.81	-5.46
2000	6.24	4.71	4.70	4.19	4.27	-1.97	-7.85
2001	3.04	2.61	2.32	2.03	1.79	-1.25	-8.07
2002	2.69	1.94	1.87	1.88	1.65	-1.04	-6.53
2003	2.46	2.38	2.18	2.18	2.30	-0.15	-0.88
2004	3.62	3.11	3.19	3.04	3.01	-0.61	-3.04
2005	4.47	3.44	3.23	3.21	2.62	-1.84	-7.54
mean	4.38	3.73	3.52	3.37	3.22	-0.89	

Table VII: Interaction between tradable market capitalization and trading value

This table reports the average portfolio returns. Firms are first sorted by their tradable market capitalization to form 5 size groups, within each group, firms are sorted by their trading value or annual turnover ratio to create 5x5 double sorted portfolios. Panel A is double sorted by size and trading value; Panel B is double sorted by size and turnover ratio. The sample period is from January 1996 to December 2005. The t statistics are reported in parenthesis for the null hypothesis that the mean equals zero.

Panel A average return of size and trading value sorted portfolios

Trading value quintiles	Size ranked quintile					
	1(low)	2	3	4	5(high)	5-1 spread
1(low)	-18.27%	-18.92%	-19.80%	-15.75%	-15.40%	2.86%
	(-8.51)*	(-13.12)*	(-14.26)*	(-8.88)*	(-8.53)*	(0.47)
2	-15.27%	-13.27%	-12.58%	-11.37%	-5.81%	9.46%
	(-6.13)*	(-6.34)*	(-5.58)*	(-5.68)*	(-2.18)*	(1.68)
3	-16.11%	-17.26%	-10.17%	-8.21%	-2.65%	13.45%
	(-7.00)*	(-8.20)*	(-4.09)*	(-3.48)*	(-1.01)	(1.89)
4	-14.41%	-11.48%	-11.10%	-4.55%	0.22%	14.62%
	(-5.67)*	(-4.44)*	(-4.71)*	(-1.75)	(0.07)	(1.61)
5(high)	-17.81%	-10.54%	-6.40%	-7.60%	5.97%	23.78%
	(-6.40)*	(-3.45)*	(-2.05)*	(-2.65)*	(2.07)*	(2.46)*
5-1 spread	0.46%	8.39%	13.49%	8.15%	21.37%	
	(0.11)	(1.17)	(2.22)*	(1.59)	(2.62)*	

Panel B average return on size and turnover sorted portfolios

Turnover quintile	size ranked quintile					
	1	2	3	4	5	5-1 spread
1(low)	-16.90%	-19.42%	-20.82%	-16.45%	-13.78%	2%
	(-7.78)*	(-14.33)*	(-15.63)*	(-9.31)*	(-5.96)*	0.41
2	-15.89%	-14.88%	-11.34%	-9.20%	-8.90%	7%
	(-7.09)*	(-6.93)*	(-5.01)*	(-4.53)*	(-4.08)*	(0.85)
3	-15.06%	-12.30%	-8.73%	-7.35%	-1.99%	15%
	(-5.97)*	(-5.35)*	(-3.58)*	(-3.05)*	(-0.80)	(1.69)
4	-15.62%	-14.33%	-10.81%	-7.71%	2.30%	19%
	(-6.35)*	(-5.95)*	(-4.12)*	(-3.13)*	(0.75)	(2.53)*
5(high)	-18.44%	-10.56%	-8.53%	-6.80%	4.76%	31%
	(-6.45)*	(-3.44)*	(-2.92)*	(-2.31)*	(1.58)	(2.29)*
5-1 spread	-1.54%	8.86%	12.3%	9.65%	18.53%	
	(-0.37)	(1.23)	(2.03)*	(1.88)	(2.27)*	

* significant at 5%

Table VIII: Average return and stock characteristics

Stocks are sorted into quintiles based on market concentration measurements. This table reports the time-series average firm level characteristics for each quintile. The firm characteristics are: average buy-and-hold rate of returns, three-year rolling beta; standard deviation of the previous 3-year monthly returns; total trading volume each year; market capitalization by the end of the year; P/E ratio; B/M ratio; The sample period is from January 1996 to December 2005, the t-statistics is for the null hypothesis that the average characteristics in the top quintiles is the same as the last quintiles.

Panel A: Average returns of size ranked portfolios											
Size ranked portfolio	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	average
1(small)	-0.7%	8.8%	1.7%	2.9%	52.1%	-33%	-24.6%	-42.0%	-35.3%	-32.6%	-10.3%
2	28.0%	-2.3%	1.4%	0.3%	50.3%	-31%	-33.1%	-31.9%	-28.5%	-25.2%	-7.2%
3	42.0%	-0.6%	-5.0%	4.3%	50.9%	-29%	-31.3%	-23.5%	-24.7%	-19.6%	-3.6%
4	86.1%	12.7%	-2.3%	1.0%	45.9%	-31%	-28.6%	-14.3%	-19.4%	-19.3%	3.1%
5(big)	104.2%	17.7%	-17.8%	1.7%	35.0%	-27%	-21.9%	1.3%	-20.4%	-13.6%	5.9%
Panel B: Average beta of size ranked portfolios											
1(small)	0.584	0.844	0.889	0.772	0.762	0.799	1.101	1.060	1.139	1.256	0.995
2	0.569	0.877	0.955	0.871	0.845	0.838	1.092	1.026	1.140	1.171	1.000
3	0.571	0.900	0.940	0.882	0.821	0.874	1.057	1.006	1.046	1.139	0.975
4	0.578	0.896	0.932	0.896	0.872	0.876	0.993	0.945	1.032	1.108	0.957
5(big)	0.587	0.916	1.039	0.992	0.990	0.937	0.959	0.887	1.028	1.012	0.961
Panel C: Average Standard Deviation of size ranked portfolios											
1(small)	0.67	0.47	0.46	0.43	0.44	0.44	0.41	0.36	0.38	0.39	0.44
2	0.65	0.51	0.46	0.41	0.40	0.40	0.37	0.32	0.33	0.36	0.42
3	0.63	0.46	0.42	0.41	0.39	0.37	0.34	0.32	0.33	0.36	0.40
4	0.66	0.48	0.45	0.42	0.37	0.35	0.32	0.30	0.31	0.33	0.40
5(big)	0.70	0.47	0.47	0.45	0.40	0.37	0.32	0.30	0.32	0.31	0.41
Panel D: Average Book-to-Market ratio of size ranked portfolios											
1(small)	0.36	0.30	0.24	0.15	0.01	0.11	0.05	0.16	0.29	0.48	0.21
2	0.32	0.31	0.28	0.25	0.12	0.13	0.21	0.39	0.49	0.69	0.32
3	0.33	0.35	0.31	0.26	0.15	0.17	0.29	0.40	0.51	0.70	0.35
4	0.25	0.29	0.30	0.28	0.19	0.25	0.35	0.45	0.57	0.70	0.36
5(big)	0.27	0.29	0.33	0.30	0.22	0.30	0.39	0.40	0.52	0.61	0.36

Table IX , Average returns of BM and size sorted portfolios

This table reports the average portfolio returns. Firms are first sorted by their tradable market capitalization to form 5 size groups, within each group, firms are then sorted by their book-to-market ratio to create 5x5 double sorted portfolios. The sample period is from January 1996 to December 2005.

BM ranked portfolio	**Size ranked portfolio**					
	1(small)	**2**	**3**	**4**	**5(big)**	**average**
1(Low)	-0.194	-0.081	0.088	0.045	0.151	-0.053
2	-0.125	-0.124	-0.044	-0.053	0.038	-0.062
3	-0.181	-0.164	-0.159	-0.091	-0.095	-0.138
4	-0.185	-0.165	-0.203	-0.167	-0.125	-0.171
5(high)	-0.257	-0.242	-0.213	-0.188	-0.165	-0.202

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