Trading for Status*

Harrison Hong[†] Wenxi Jiang[‡] Bin Zhao[§]

First Draft: November 6, 2011

This Draft: September 18, 2012

Abstract

We use the rapid rise of a Chinese middle class from 1998-2009 to study the impact of status preferences on risk-taking. We measure intensity of status concerns by province based on per capita income, luxury brand internet searches and male-female sex ratio imbalance. Status preferences, in the form of Keeping-up-with-the-Jones, lead to demand for local stocks to track neighbors that rises with the stock market and generates trading between status and non-status seekers. Using large stocks as a control group, we find higher share turnover, price and sensitivity of turnover to returns for small relative to large stocks in high-status compared to low-status concern provinces. These difference-in-differences have also increased over the sample period consistent with status concerns increase risk-taking.

*Hong acknowledges support from the National Science Foundation through grant SES-0850404. We are grateful for the comments of Warren Bailey, and seminar participants at New York University, University of Amsterdam, Fudan University, Southwestern University of Finance and Economics, Hong Kong University of Science and Technology, China International Conference in Finance 2012, Peking University Symposium on Chinese Financial Markets, and the China Academy of Financial Research in Summer Institute of Finance 2012.

[†]Princeton University, NBER, and China Academy of Financial Research (e-mail: hhong@princeton.edu)

[‡]Yale University (e-mail: wenxi.jiang@yale.edu)

[§]Shanghai Advanced Institute of Finance, Shanghai Jiaotong University (e-mail: bzhao@saif.sjtu.edu.cn)

1. Introduction

Economists since the work of Veblen (1934) have recognized that the preferences of wealthier households depend not only on their own wealth but also on the wealth of their peers.[1] While social status preferences are widely used to understand conspicuous consumption, there has also been important work on modeling of how such preferences influence household portfolio choice and asset pricing (see, e.g., Friedman and Savage (1948), Abel (1990), Ait-Sahalia, Parker, and Yogo (2004), and Becker, Murphy, and Werning (2005)). This literature shows that status concerns can significantly increase household risk-taking. One particularly studied preference, labeled Keeping-up-with-the-Jones, posits that the investor's marginal utility of wealth is increasing with the average wealth of her peer group. Since peer groups are likely to be local, such as neighboring workers and entrepreneurs, DeMarzo, Kaniel, and Kremer (2004) show that this preference can also lead households to take excessive risk by holding concentrated portfolios that are tied to their neighbors' wealth.

This form of status preferences has the nice feature that it generates local bias in portfolios, which is consistent with the data. Investors living in a certain region are more likely to hold and trade stocks near them.[2] For instance, the local bias in middle class stock portfolios can be measured as the difference of the weight of a household's portfolio in local stocks (based on headquarters within 100 kilometer) and the corresponding weight of the local stocks in a value-weighted market portfolio. This local bias is around 10% and is similar across countries such as the United States and China (Feng and Seasholes (2008)). Moreover, the degree of excessive concentration on local stocks ought to be increasing with status concerns. Despite this sharp prediction, there has been relatively little empirical work in trying to identify how the intensity of status concerns influence household risk-taking.[3]

[1] There is ample micro-evidence from panel data and surveys that confirm households' social status preferences increase with household wealth (see, e.g., Dynan and Ravina (2007)).

[2] The original international home bias finding of French and Poterba (1991) is really part of a deeper local bias among investors.

[3] One notable exception is Gomez, Priestley, and Zapatero (2009) who test the implications of a Keeping-up-with-Jones model to explain the relationship of the cross-section of expected returns with labor income.

Building on these insights, we attempt to provide new estimates for this channel. We first show, using a simple model adapted from Basak and Pavlova (2011), that Keeping-up-with-the-Jones preferences lead to time-varying demand for and hence trading in local stocks. When the market for local stocks is doing well, the wealth of the peer group is high and so is the marginal utility of wealth of the status investors. This leads to a greater demand for the local risky assets. Low market values of the local stocks reduce the need for this status generated risk-demand since there is nothing to keep up with. The status households trade with market makers who do not have status preferences. We show that share turnover increases with the intensity of status concerns and so do local stock prices.

We then estimate the effect of status concerns on household risk-taking or trading in stock markets using a unique empirical design from China. China is ideal to consider status effects and risk-taking for two reasons. First, a rapidly rising middle class since the mid-nineties has led to considerable variation in status concerns by province. Second, its stock market is now the second largest in the world but still mostly driven by domestic retail investors. As such, there are several thousand companies in the stock market that are headquartered in different parts of the country. Hence, we can correlate the status concerns of a province to the trading volume of local stocks in that province. Such an exercise would be difficult in developed markets where trading volume of stocks is dominated by institutional investors. This layer of intermediation makes it difficult to pin down household preferences.

We use three proxies for the intensity of status preferences by Chinese province or city. First, China has a unique geography of status in what the Chinese refer to as Tier 1 (richer, more developed and higher status) compared to Tier 5 (poorer, less developed and lower status) regions. Tier 1 province's GDP per capita has passed over 20,000 Yuan by 2003. So status effects ought to matter more in top tier provinces since status effects are stronger with higher income and wealth. This perspective is in accord with the existing surveys showing that people in Tier 1 and 2 provinces are more concerned with status.[4] Moreover, there is

[4]Synovate LTD in 2010 published a marketing report, entitled "Media Atlas China: Revealing opportunities across upper, middle and lower tiers and rural in today's China", that points to the importance of

still tremendous inequalities and concomitant relative wealth concerns in the Tier 1 and 2 provinces (see Wu and Perloff (2005)).

The second measure of which provinces are most affected is based on luxury brand searches relative to normal brand searches using data from Baidu, the main internet search engine in China. While this measure of status is correlated with income, a measure of luxury to normal brand internet searches in each province controlling for income in that province provides a separate test of status effects.

Third, recent important work by Wei and Zhang (2011) and Wei, Zhang, and Liu (2012) point sex ratio imbalances across provinces due to the staggered implementation of China's one-child policy influencing household consumption and savings decisions. Families save to buy apartments for their sons so they might attract a mate. Their mechanism points directly to social status effects. We use their male-female sex ratio imbalance variable by province as another proxy for status concerns and examine the extent to which it influences the trading of local stocks. In contrast to owning homes which has a large consumption and signaling motive, the trading of stocks best captures the influence on status concerns on risk-taking as epitomized in the literature since Friedman and Savage (1948).

Our predictions are that high status concern areas ought to have more trading in local stocks than in low status concern places. Local stocks in high status concern places should also as a result have higher prices. Since our empirical strategy in identifying a status effect centers on comparing trading volume and pricing of the stocks of companies located in different places, we need to control for varying investment opportunity sets in these regions. This point is made clearly in Hong, Kubik, and Stein (2008)'s analysis of an only-game-in-

status concerns in Tier 1 and 2 cities. A recent study by KPMG in conjunction with Monash University on "Luxury Brands in China" points to a middle class of around 250 million people that spent US$6 billion on luxury goods in 2006 and are expected to account for 29% of the global luxury goods market worth an estimated US$80 billion a year—second only to Japan. Much of this consumption is driven by residents in Tier 1 provinces. An LATIMES article on February 7, 2011 entitled "In China, alpha males carry designer purses" reports that many successful business men carry designer purses to signal their status so that they can be distinguished from the others. Happiness surveys in China report that those living in first-tier areas were the least contented, feeling more pressure because of high-price housing and traffic congestion than their counterparts in smaller towns and counties (see, for instance, China.org's online survey of 1,348 individuals in March 2011).

town effect in which the lack of stocks located in low density cities or areas results in them having higher prices.

We do so by using large local stocks as a control group and looking at the share turnover and price gaps between small and large local stocks. This strategy is empirically well-motivated. First, large stocks suffer less from local bias than small stocks. Large stocks tend to be known nationally and many are state-owned enterprises (SOEs) and have plant operations throughout the country. Since we use headquarters to define what is local, defining large stock location in this manner is problematic. Second, large stocks are likely to attract institutional investors, whereas small stocks are traded predominantly by retail investors. Third, we provide some anecdotal evidence at the end of the paper that small publicly traded stocks are more similar to the private companies in the province than large ones. We have access to unique data on all the private manufacturing companies with annual sales higher than 5 million *yuan* in China between 1999 and 2005 and are able to show that small publicly traded companies most resemble the distribution of private companies in terms of asset size and most metrics of accounting performance.

To further buttress our identification, we consider how this cross region difference in the differences between small and large stock trading and pricing varies over time. China's economy, its stock market, and income inequality have developed extremely rapidly since the late nineties. On the same vein, the male-female sex ratio imbalance has been exacerbated over the last twenty years since the one-child policy was instituted after 1980 in most areas of China. These rapid developments allow us to not only compare risk-taking from inhabitants across different status places but to compare this difference over time. We expect that status effects to have increased in high status concern regions compared to low ones over the last ten years. In other words, our empirical strategy consists of employing a difference-in-difference-in-difference approach.[5]

We find larger share turnover and price gaps for small stocks relative to big ones in higher

[5] Anecdotal evidence cited above from luxury goods consumption in China, which comes predominantly from Tier 1 and 2 areas, backs up this time trend differential approach.

status places than in lower status places in the latter half of the sample, defined as 2004-2009. For instance, moving from Tier 5 provinces to Tier 1 provinces increase the turnover gap for small stocks relative to big ones by 80%, which is 38% of the turnover difference's standard deviation. But this estimate doubles in the 2004-2009 period. Similar results are found for the other two proxies of status concerns by region. We also find a large price effect when measured using the market-to-book ratio of companies. The increase in the market-to-book of small relative to big stocks in Tier 1 provinces during the latter half of the sample is about 93% of the market-to-book's difference's standard deviation. But the statistical significance of these estimates are weaker than for share turnover.

We then consider a further identification strategy that speaks directly to the status mechanism. Our model predicts that trading volume follows a rise in the stock market as investors are more concerned about status when the market is high. We regress share turnover in a given year on last year's stock return and a constant for small and for big stocks in different provinces and then calculate the difference in these two regression coefficients. Consistent with our theory, we find that the turnover-past return sensitivity is higher for small stocks than for big stocks in high status provinces in recent years.

Our benchmark findings can be contrasted with those on investor overtrading in Kumar (2009), who finds that there is excessive trading in small, local stocks among poorer and less educated households. In China, we actually find that richer households in more developed areas who are presumably more educated trade more. In other words, the status effects have to be strong enough to overwhelm the baseline effect from Kumar (2009), which is that poor households should trade more small local stocks.

Nonetheless, there are a couple of potential alternative explanations for our findings. The first is that richer areas have greater access to trading technology which might explain why there is more small stock trading in richer cities recently. But this cannot explain the Baidu internet luxury search results and the male-female sex ratio ones.

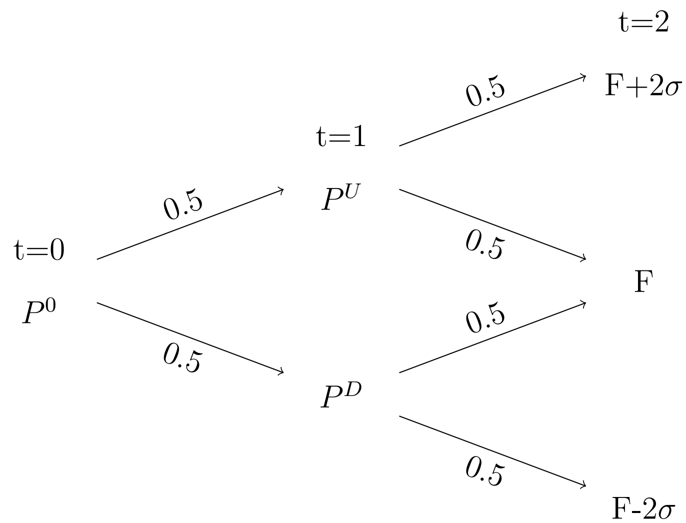
A second explanation for our findings, close in spirit to ours, is that investors have local bias due to familiarity bias (Huberman (2001)) or limited attention (Barber and Odean (2008)). Then even other types of status preferences in which the marginal utility of own wealth is decreasing (not increasing) with the average wealth of the household's peers would lead to more concentrated local bias and trading. When marginal utility of wealth is decreasing with the average wealth of peers, households actually want to take uncorrelated risks from their peers rather than concentrating in local stocks (see Roussanov (2010)). In other words, they will not want to trade local small stocks but stocks in other provinces or take uncorrelated bets such as playing lotteries. But if households have local bias due to behavioral factors, then they might trade small local stocks.[6] We are happy to interpret our findings using this alternative status mechanism. However, we emphasize the Keeping-up-with-the-Jones interpretation since it most parsimoniously generates local bias without needing an additional behavioral assumption on limited attention.

Our paper proceeds as follows. We develop the model in Section 2. We describe the data in Section 3. We present the empirical results in Section 4 and conclude in Section 5. All proofs are in the Appendix.

2. Model

We consider a simple model of stock trading in a pure exchange economy with three dates, $t = 0, 1, 2$. The payoff of the stock $\tilde{F}$ follows the following binomial tree.

[6] There is some evidence for this mechanism. When the jackpot for the national Taiwan lottery gets large, trading in small stocks in the Taiwanese stock market decreases, suggesting that trading of small stocks has a gambling feature (Gao and Lin (2011)) and hence is a substitute for lotteries.



At $t = 2$, there are three states with payoffs given by $F + 2\sigma$, F, and $F - 2\sigma$. At $t = 1$, investors receive a signal, either U or D, in which the signal equals U with probability 1/2 and equals D with probability 1/2. When the signal equals U, the terminal payoff $\tilde{F}$ equals either $F + 2\sigma$ or F at $t = 2$ with equal probability. When the signal equals D, the terminal payoff is either F or $F - 2\sigma$ with equal probability. There is also a riskless bond with an exogenous interest rate which we set at zero.

There are two types of investors in the population: status (denoted by s) and non-status (denoted by m) investors. We can think of non-status investors as being institutional market makers or speculators or retail investors who are immune to status concerns.[7] The utility of the s-investors are given by

$$U_s(\tilde{W}_{s,2}) = (1 + b\tilde{F})\log(\tilde{W}_{s,2}) - d\tilde{F}, \tag{2.1}$$

and for the m-investors it is given by

$$U_m(\tilde{W}_{m,2}) = \log(\tilde{W}_{m,2}). \tag{2.2}$$

[7]Surveys on status concerns cited in the Introduction find that not everyone is affected by such concerns.

We assume that d is large relative to b so that the utility of the status investor is decreasing in $\tilde{F}$, the payoff of the local stock and the measure of peer wealth in our model. But d is irrelevant for our analysis. Notice that b is our key parameter of interest since it affects the sign of the marginal utility of wealth, which is what matters for household risk-taking and asset pricing. When $b = 0$, the status and non-status investors are identical from a risk-taking perspective. $b > 0$ captures the Keeping-up-with-the-Jones preferences since it implies that

$$\frac{\partial U_s^2}{\partial W \partial F} > 0.$$

That is, wealth and peer wealth are complements. So marginal utility of own wealth rises with peer wealth $\tilde{F}$. When peer wealth rises, the household demands more of the local stocks. It is this assumption that is critical for our results.[8]

The status investors' preference for the risky asset changes between $t = 0$ and $t = 1$ depending on the signal or the realizations of $\tilde{F}$. Each type of investor chooses the portfolio weight in the stock of $\phi_{i,t}$ given their initial endowment of wealth, $W_{i,0}$. The dynamics of their wealth evolves for $i \in \{s, m\}$ as

$$\tilde{W}_{i,2} = W_{i,0}(1 + \phi_{i,1}\tilde{R}_1)(1 + \phi_{i,2}\tilde{R}_2) \tag{2.3}$$

where $\tilde{R}_t = \frac{P_t - P_{t-1}}{P_{t-1}}$ is the net-percentage return of the stock in period t. The initial endowment for the s-investors are given by $W_{s,0} = \lambda P^0$ and for the m-investors are given by $W_{m,0} = (1 - \lambda)P^0$.

Our empirical design in China can be mapped in the following way into this model. We assume that only the top tier places have status preference while the bottom tier places do not, since only the top tier places have a significant enough level of wealth to consume status. So in our analysis, we take for Tier 1 and 2 regions to be a non-zero b while lower tier places

[8]If $b < 0$, this is what Roussanov (2010) refers to as Getting-ahead-of-the-Jones preferences, own wealth and peer wealth are substitutes. The household would actually not want to own the same stock and prefer uncorrelated risks.

have a b close to zero. All details for the solution of this model are in the Appendix.

At the U-state, the demand function for both kinds of investors are given below:

$$\phi_s^U = \frac{P^U(\bar{F} - P^U)}{\sigma^2 - (\bar{F} - P^U)^2} + \frac{P^U}{\sigma^2 - (\bar{F} - P^U)^2} \frac{b\sigma^2}{1 + b\bar{F}} \tag{2.4}$$

$$\phi_m^U = \frac{P^U(\bar{F} - P^U)}{\sigma^2 - (\bar{F} - P^U)^2} \tag{2.5}$$

where $\bar{F} = F + \sigma$ is the expected time 2 payoff of the stock at the U-state.

These demand functions have intuitive interpretations. First, the s-investor will proportionally put more wealth on risky asset. Further, the extra demand for risky asset is increasing in her status preference parameter, b. When $b = 0$, s-investor holds the same portfolio as m-investor does. By applying the market clearing condition, $\phi_m^U W_m^U + \phi_s^U W_s^U = P^U$, we solve for P^U:

$$P^U = \bar{F} - \frac{\sigma^2}{\bar{F}} + \frac{\bar{k}\sigma^2}{\bar{F}} W_s^U, \text{ where } \bar{k} = \frac{b}{1 + b\bar{F}} \tag{2.6}$$

Notice that $\bar{k} \in [0, 1/\bar{F})$ and $\bar{k}$ increases in b. There are three components in P^U: $\bar{F}$ is the expected payoff at the U-state, $\sigma^2/\bar{F}$ is the risk premium when none of the agents have status preference, i.e. $b = 0$, and the last term $\bar{k}\sigma^2 W_s^U/\bar{F}$ is the overpricing component caused by status preference. Also, $\bar{k}\sigma^2 W_s^U/\bar{F}$ increases with b—that is, stronger preference on tracking status pushes the asset price higher.

By using the same method, we solve for the D-state optimal holding and asset price, which deliver identical economic intuitions as those in the U-state. Further, we solve the optimization problem at time 0, obtaining the following optimal portfolio choice:

$$\phi_s^0 = \frac{P^0}{2} \frac{P^U + P^D - 2P^0}{(P^U - P^0)(P^0 - P^D)} + \frac{b\sigma}{1 + bF} \frac{P^0}{2} \frac{P^U - P^D}{(P^U - P^0)(P^0 - P^D)} \tag{2.7}$$

$$\phi_m^0 = \frac{P^0}{2} \frac{P^U + P^D - 2P^0}{(P^U - P^0)(P^0 - P^D)} \tag{2.8}$$

The s-investors hold more risky asset at time 0 compared to the m-investors, by the amount given in the second term of equation (2.7). This is for exactly the same intuition as in the U-state and the D-state. Also, as b goes up the s-investors tend to bet more on the risky asset.

Proposition 1. *Risk premium decreases as b in U-state, D-state and time 0.*

The intuition of Proposition 1 is identical to that of equation (2.6). Status preferences make investors more willing to bear more risk. Thus, risk premium goes down with more risk-bearing.

In addition to the pricing effect, we are also interested in share turnover. Trading from time 0 to time 1 also varies with the intensity of status preferences. We denote θ_i^j as the optimal holding in shares for investor $i \in \{s, m\}$ in state $j \in \{U, D, 0\}$. And $\theta_i^j = \phi_i^j W_i^j / P^j$. We define the share turnover at time 1 as:

$$TURNOVER_1 = \frac{1}{2}(|\theta_m^0 - \theta_m^D| + |\theta_m^0 - \theta_m^U|)$$

Proposition 2. *With moderate λ (more precisely, $\lambda < (F - \sqrt{F^2 - 4\sigma^2})(1 + bF)/4b\sigma^2$), share turnover at time 1 is increasing in b.*[9]

The intuition of Proposition 2 is the following. First, note that the s-investor will purchase more at the U-state and liquidate some positions at the D-state. This is how trading is generated in this setting; when $b = 0$ the turnover would equal to zero. Thus, the turnover

[9]More precisely, λ has to be smaller than $(F - \sqrt{F^2 - 4\sigma^2})(1 + bF)/4b\sigma^2$. Appendix shows that the minimum value of this upper bound of λ is 1/2. That is, $\lambda < 1/2$ is the sufficient condition under which Proposition 2 holds with all feasible parameters. With moderate parameters, such as $b = 1$, $\sigma = .2$ (i.e. 20% annual volatility for local small stocks), the upper bound would be greater than 1 and would not bind. So again for most reasonable parameter values, we get turnover monotonically increasing with b. But there are parameter values for which λ is greater than the upper bound. In these instances, turnover at time 1 might first increase in b and then decrease. The economic intuition is the following. As b goes up, there are two effects: one is that the status traders will demand more shares, and the other one is that the strong status preference will push up the stock price. Note that the second effect in turn will decrease status investors' demand. When there are relatively more market makers, the second effect is negligible. However, if market makers are scarce, the depth of stocks decrease (market makers will never short) and hence the second effect will dominate. Given that China has a well-developed, national stock brokerage system, it is reasonable to believe that this price impact effect is not too large.

defined above equals to the difference of holding between the D-state and the U-state. Further, note that the risk premium at the D-state is decreasing more quickly than at the U-state. The difference of risk premium at the D- and the U-state is thus increasing in b. Also, since the difference of holding is proportional to that of risk premium, it rises as b.

These propositions are useful for capturing the economics of provinces in steady state and useful then to compare low versus high status provinces. But our empirical analysis emphasizes that there has been a shift in b within the certain provinces. As such, these propositions are inadequate to match the non-stationary nature of the data.

To get this non-stationarity or shift over time, we consider the exercise in which all investors in these regions have $b = 0$ at a date before time 0. We call this date time -1. A shift to a positive b for a fraction λ of the population will naturally increase the price at time 0. There is then also trading at time 0 which is due to the shift from a non-status (zero b) into status (positive b) regime. As mentioned above, when $b = 0$, everyone would hold the same initial shares and there will be no trading in the model. That is, during the first half of our sample period, most regions in China in general are too poor to have status concerns (i.e. zero b regime), and there is no status-driven trading. However, as those Tier 1 regions of China pass certain income level for status concerns, trading activities driven by status concerns increase between status seekers and market makers in those places. In other words, the trading is caused by the b shock.

At time 0, the market makers sell a fraction of their endowment to the status seekers. Then, we define share turnover from time -1 to 0 as,

$$TURNOVER_0 = (1 - \lambda) - \theta_m^0$$

We can show the following.

Proposition 3. *The price and share turnover between time -1 and time 0 are increasing in b.*

What if we modeled the increase in status demand across different regions using the other parameter λ while holding fixed b? Richer areas would have a larger fraction of status investors λ. If we viewed our experiment as all provinces starting out with a low λ close to zero and richer areas experienced a larger increase in λ over the sample, we would naturally get higher turnover and higher asset prices. This is likely to be the realistic way of calibrating the size of λ. But this is a bit of an unappetizing way to model the heterogeneity since when λ gets close to one, there would be no heterogeneity again. But this is assuming that there are no entry of speculators to make the market for the status investors which is an unappetizing way of modeling speculators or market makers. By focusing on b, we are assuming that market making capacity is similar across different provinces which seems more reasonable.

2.1. Empirical Predictions

Moving from our three propositions toward empirical analysis, we first use GDP per capita of each province as the proxy for the status preference parameter b in our model. When GDP per capita passes a certain threshold, people start caring about status and being concerned about relative wealth ranks, i.e. b becomes non-zero. Going further, status preference is increasingly stronger (i.e. even higher b) as wealth grows.

For the other parameter λ, the fraction of status versus non-status investors in the population, we think of it as capturing the fraction of retail investors to institutional or market makers or investors who trade in the market for non-status reasons. Thus we consider this being kept fixed across provinces. We could also think of holding fixed b and changing λ which could under certain scenarios accomplish a similar objective. But we prefer b since it speaks to the intensity of status preferences as opposed to heterogeneity of speculators in the population which might confound different economic channels.

We plot average GDP per capita across each tier of provinces for every year in our sample in Figure 1. Several important points stand out. First, Tier 1 provinces have much higher GDP per capita than Tier 5 ones during the whole sample period from 1998 to 2009. Second, the GDP per capita for Tier 1 and Tier 2 provinces passed the 10,000 *yuan* mark around the mid-point of our sample (2003 to 2004). We use this break-point in our identification strategy of status effects mattering more late in the sample. The geographic difference, as well as the time trend, of status preference naturally motivates us to adopt the difference-in-difference technique. That is, we expect the trading and pricing effects in Propositions 1 to 3 regarding local stocks to be stronger in richer provinces *and* in the later sample period.

In addition to GDP per capita, we also use luxury brand internet searches controlling for income in each region. We describe how we construct this second measure of status by region below. We simply replace the GDP per capita by province with this status measure. Since status concerns have gotten greater with rising income in China, we anticipate that this second status measure ought to be a more powerful determinant of trading later in the sample.

To identify the effect of a shift in the status parameter on asset price and trading turnover, our detailed empirical specification is as follows. First, we use local big stocks as a benchmark for regional varying investment opportunity sets and local small stocks as the proxy for local entrepreneurs' wealth that agents are keeping up with. Thus the first *difference* is small-minus-big (SMB) of turnover or market-to-book ratio in our baseline model. We also use average local turnover or market-to-book ratio in our robustness check. The second *difference* is the difference of SMB across developed, rich provinces compared to less-developed, poor ones. The third *difference* is these two differences over time, comparing the second half of the sample, 2004 to 2009, to the first half, 1998 to 2003.

The following regression model implements our difference-in-difference-in-difference strategy.

$$SMBGAP_{i,t} = \alpha + \beta_1 Status_{i,t} + \beta_2 LATE_t + \beta_3 Status_{i,t} LATE_t + \boldsymbol{\gamma' YearDummy} + \epsilon_{i,t}, \tag{2.9}$$

where $SMBGAP_{i,t}$ is either the small-minus-big of turnover or market-to-book ratio in province i and year t. $Status_{i,t}$ refers to proxies of status concerns in province i and year t and $LATE$ dummy equals to one for sample year of 2004 to 2009. We also include year dummies to control for time-specific factors. The variable of interest is the interaction term of $Status$ and $LATE$.

Based on Propositions 1 to 3, our central predictions lie in β_3 to be positive. The economic agents will start consuming status when their wealth level has passed a certain threshold. Figure 1 suggests that a significant amount of agents in rich provinces in the late sample period are status agents. As a result, we expect a strong economic effect for our estimate of β_3.

We finally use the male-female sex ratio by province as our third proxy for status preferences with higher male-female sex ratios engendering greater status concerns. Wei and Zhang (2011) show that these concerns have gotten worse in some areas over time and offer a regression specification which we adopt to estimate our effect.

$$SMBGAP_{i,t} = \alpha + \beta Sex_{i,t} + \boldsymbol{\phi' Controls} + \boldsymbol{\gamma' YearDummy} + \boldsymbol{\theta' ProvinceDummy} + \epsilon_{i,t}, \tag{2.10}$$

where $Sex_{i,t}$ is the male-female sex ratio in province i and year t. Following Wei and Zhang (2011), we add demographic and economic factors as controlling variables. Also, we control for year and province fixed effects. We examine whether the provinces with greater male-female sex ratios will have more small relative to big stock trading. That is, we expect β to be significantly positive.

3. Data

Our analysis for different tier locations is done at the province level and we use city level analysis as a robustness check. We obtain province level GDP per capita data from the

National Bureau of Statistics of China for each sample year for each province[10]. We get the city GDP per capita data from the Wind database from year 2005 to year 2008 for each city. Monthly stock trading volumes and prices for all Chinese firms listed on Shanghai and Shenzhen Stock Exchange are from CSMAR, then we convert them into annual basis. Annual book value for each company is also from CSMAR. The sample spans from 1998 to 2009.

We then merge the province and city GDP per capita data with CSMAR data based on firm's location information given in CSMAR. Baidu index data is manually collected from Baidu's website. Sex ratio is based on census data in 2000 sourced from the Chinese National Bureau of Statistics (NBS). Private firm annual financial report data is also from NBS.

In Table 1, we report the time series average of the characteristics of stocks located in different provinces. We rank the provinces from 1 to 30 based on their average GDP per capita (GDP PC) over the sample. RANK is the rank of GDP PC for each province in each year, with RANK equals to 1 being the province with the highest GDP PC. Then we break the provinces into five tiers, with 6 provinces in each tier, and TIER 1 being the richest six provinces. RICH is a dummy variable which equals to 1 if the province belongs to the top 2 TIERs and 0 otherwise. It is generally thought that the top two tiers have sufficient income and wealth to care about status, especially in the late sample period. The provinces are sorted by their average RANK in the table. GDP PC is the time-series average of GDP per capita for each province, quoted in Chinese *yuan*.

For each province, we report # OF STOCKS which is the time-series average of number of stocks each year in each province over the sample period. We see that generally the rich provinces have much more stocks located there than in the poor provinces. This highlights Hong, Kubik, and Stein (2008)'s "only-game-in-town" effect in which the poor provinces do not have many local stocks available for inhabitants in these areas.

TURNOVER is the time-series average of annual turnover of all stocks located in each

[10]Our sample starts from 1998 when the Chinese stock market is more matured and there are enough firms to execute our study. Also, Tibet is not included in this study because of lack of firms for the analysis.

province. We calculate the annual turnover (defined as the total number of shares traded divided by the number of tradable shares[11]) based on the monthly data available and winsorize them at the top and the bottom 1%. Notice that annual turnover is extremely high in China, nearly 500% per year over this sample period. Moreover, one can see from this turnover measure that turnover is actually slightly higher in the poorer areas than in the richer areas. This reflects the only-game-in-town effect in which poor areas have less stocks or investment opportunities and as a result investors there attract more interest and hence potentially more trading activity.

MB[12] is the median of the year-end market-to-book ratio of stocks in each province across sample years. The market-to-book ratio is also winsorized at the top and the bottom 1% as well. There is not as obvious a pattern in the market-to-book ratios across provinces.

BAIDU RATIO is the average Baidu search index for luxury goods over the average Baidu search index for non-luxury goods. Table 1 also suggests that TIER 1 provinces as measured by GDP per capita all have very high Baidu search index RATIO, which coincides with our use of different proxies of GDP per capita as a measure for status concerns. SEX RATIO is the male-female sex ratio for the age 7-21 age cohort in the sample period.

In Table 2, we report the summary statistics for the difference between turnover and the market-to-book of small compared to big stocks in these different regions. Panel A shows the summary statistics for provinces in China. Stocks are sorted on size (last year market capitalization). Small stocks are the bottom 30% of stocks sorted on size, big stocks are the top 30% of stocks sorted on size. This sort to determine size cut-offs is done using all stocks in China, independent of locations. Last year's market capitalization are used to calculate value-weighted variables.

Then for the stocks in each province, we calculate various permutations of turnover. We

[11]Here we use the total number of tradable shares rather than total number of shares outstanding as the denominator because before the reform in 2006 most Chinese stocks have a significant amount of shares outstanding that are not tradable on exchange.

[12]To decrease the noise of market-to-book ratio, we use median instead of the average for all market-to-book calculations, so we also report the median value here for summary statistics.

report value-weighted small-minus-big (VW SMB) and value-weighted small-minus-average (VW SMA). SMA refers to turnover rate of small stocks minus that of all stocks in every province, which we use as an alternative control for locally varying investment opportunity as a robustness check. We also report turnover of equal-weighted small-minus-big (EW SMB) in that province and industry-adjusted value-weighted small-minus-big (IND ADJ VW SMB) which is small stocks' industry adjusted turnover minus big stocks' industry adjusted turnover. We also calculate the analogs for market-to-book.

Panel B calculate the same statistics but for cities instead. Locations (both province and city) with less than 3 stocks in either small or big groups (sort on size) each year are deleted from the regression.

Looking at Panel A, notice that value-weighted small-minus-big turnover (VW SMB TURNOVER) has a mean of 1.62 with a standard deviation of 2.08. The corresponding figures for value-weighted small-minus-average (VW SMA) is 1.28 with a standard deviation of 1.65. Not surprisingly there is less of a difference between small and the average stock turnover than there is between small and big stocks. The mean of IND ADJ VW SMB TURNOVER is 1.47 with a standard deviation of 1.91. The equal weighted numbers are 1.46 with a standard deviation of 1.80. Regardless of how we measure this share turnover gap between small and big stocks, we find that small stocks trade much more than big stocks.

Turning to market-to-book, we find that the mean of the difference between the value-weighted market-to-book for small stocks and the value-weighted market-to-book for big stocks is 0.67 with a standard deviation of 2.45. That is, small stocks have a higher market-to-book than big stocks. The same conclusion is drawn when we consider the other metrics. Looking at Panel B, we get very similar results when we cut on cities rather than provinces for both turnover and market-to-book.

In Panel C, we break down these summary statistics by individual provinces. Eyeballing the statistics for turnover and examining their variation by ranks of the provinces, it is easy to see that small stock minus big stock turnover (whether adjusted by industry or equal or value weighted) is appearing to be greater in richer or top tier provinces. This is very comforting since it appears that our effect can be seen in even these simple statistics. A similar though less obvious pattern exists for the market-to-book of small stocks minus big stocks.

4. Empirical Findings

4.1. Province Status Measure Based on GDP Per Capita

With these comforting summary statistics in mind, we turn to our main results in Table 3. In Table 3, we regress turnover and market-to-book gap on our various measures of income level for provinces. This table reports the coefficients estimated from panel regressions of value-weighted small-minus-big turnover (VW SMB TURNOVER) and value-weighted small-minus-big market-to-book (VW SMB Market-to-Book) at the province level. The independent variables in all regressions are GDP PC PROXY, LATE, and the interaction term of GDP PC PROXY and LATE. LATE is a dummy variable that equals to 1 for years from 2004 to 2009, and 0 otherwise. Year dummies are included in regressions, but are not reported. Coefficients on LATE dummy are also not reported. Standard errors are clustered at the province level. T-statistics are reported below the coefficient in parenthesis.

In Panel A, the dependent variable is VW SMB TURNOVER. In specification (1) and (2), the GDP PC PROXY is RANK, where RANK is a number between 1 to 30. From column (1), a one rank move decreases the dependent variable of interest by 0.03 and the t-statistic of the coefficient is -2.17. A move from a province of RANK equals to 20 to one equals to 10 (or a 10 rank move) leads to an economic effect of .3 increase which is around 14% of the dependent variable's standard deviation. All the effect is coming from late in the sample as witnessed in the estimate from column (2). The coefficient on the interaction term of Rank with LATE is -0.074 with a t-statistic of -4.17. This means that the economic effect is around 2.5 times as large late in the sample.

In specifications (3) and (4), the GDP PC PROXY is LnGDPPC, which is the natural logarithm of GDP PC. From column (3), the coefficient of interest is 0.515. Moving from a GDP per capita of around 10,000 Yuan (or log (GDP PC) of around 9.21) to a GDP per capita of 30,000 Yuan (or a log (GDP PC) of around 10.31) yields an implied economic move of around 0.57 or roughly 27% of a standard deviation of the left-hand side variable. The estimate from column (4) indicates again that the effects are all coming from the latter half of the sample. The economic effect is more than double.

In specifications (5) and (6), the GDP PC PROXY is RICH, where RICH is a dummy variable equals to 1 if the province is in the top two tiers and zero otherwise. In column (5), the coefficient of interest is 0.582 with a t-statistic of 2.78. Being in the top two tiers increases the VW SMB TURNOVER by 0.582. The dependent variable's standard deviation is 2.08. So being in the top two tiers increases VW SMB TURNOVER by around 28% of its standard deviation, which is an economically significant move. In column (6), we see whether this effect is larger later in the sample period as our theory would predict since status effects have become more important in the last ten years as China's top tier residents have moved into middle class living standards. Indeed, almost the entire effect is coming from late in the sample period. The coefficient of interest in front of GDP PC PROXY×LATE is 1.180, which implies that in the second half of our sample, being a RICH province increases the VW SMB TURNOVER more than twice the estimated effect compared to early in the sample period.

In specifications (7) and (8), the GDP PC PROXY is TIER, where TIER takes on the values of 1 (developed) through 5 (less developed). From column (7), a one tier increase in the province's score leads to a change of -0.194 with a t-statistic of -2.36. A comparison of Tier 1 to Tier 5 which is a 4 tier move implies an economic effect of 4 times -0.194 or around a decrease of VW SMB TURNOVER of 80% which is around 38% of the dependent variable's standard deviation. In column (8), when we split this effect up by sample periods, we find that all the effect is from the late sample period and the coefficient of interest more than doubles.

In Panel B, the dependent variable is the value-weighted measure of the difference of the market-to-book of small firms versus big firms in different provinces. The right-hand side variables are the same as in Panel A. We expect based on our model that small firms' market-to-book to be greater than big firms' during the latter part of the sample. This is indeed what we find. Looking at columns (2), (4), (6) and (8), we find that the market-to-book of small versus big firms is much different during the latter part of the sample compared to the early part. Looking at Rank, the coefficient is -0.096 for the interaction term. So a 10 Rank move implies an economic effect of -0.96 or roughly 39% of a standard deviation of market-to-book. Looking at Rich, the effect is even bigger. The coefficient is 2.082 with a t-statistic of 2.63. This means that being Rich moves the market-to-book by almost 85% of a standard deviation of the left-hand side variable. These are sizeable effects.

In Table 4, we repeat the analyses of Table 3 using a variety of specifications as a robustness check. In Panel A, we use Industry Adjusted VW SMB Turnover and Market-to-Book as the dependent variable. For brevity, we report the results just for Rank and LnGDPPC. Looking at TURNOVER, we observe that the coefficient of interest for Rank from column (2) is -0.055 with a t-statistic of -3.15 and the coefficient of interest for LnGDPPC from column (4) is 0.844 with a t-statistic of 2.73. Both of these coefficients are comparable to their analogs in Table 4. Moreover, the standard deviation of Industry Adjusted VW SMB TURNOVER is comparable to that of VW SMB TURNOVER. As such, the economic significance is comparable using this industry adjusted measure. Thus, we can be assured that our effects are not being driven by heterogeneity in industry distributions across provinces. The figures for market-to-book are comparable. Indeed, the coefficients of interest in columns (2) and (4) are almost identical to their analogs in Table 3.

In Panel B, the dependent variable is VW SMA TURNOVER and Market-to-Book, which is simply the difference in the turnover and market-to-book of small stocks relative to the average (or median for market-to-book variables) in that province. Using this alternative measure of the demand for small stocks that presumably most closely track their community, we find similar results. The coefficients of interest for TURNOVER are -.065 with a t-statistic of -4.87 for Rank and 1.060 with a t-statistic of 4.55 for LnGDPPC. These are comparable to those in Panel A. For market-to-book, the coefficients of interest are -0.066 with a t-statistic of -2.55 for Rank and 1.086 with a t-statistic of 2.74 for LnGDPPC. In Panel C, the dependent variable is EW SMB TURNOVER and Market-to-Book. Again, the economic effects are very similar to those obtained in the earlier panels.

Finally, in Panel D, we redo our analysis using cities instead of provinces. We opt for provinces as our benchmark since there are not many stocks located in any given city per se. This then brings a lot of measurement error which will affect our t-statistics. Also, it is not clear that city is the right geographic unit since it might be too small a unit with which to consider these effects. Since there is not an obvious theory for what unit to take, we consider city level as an additional robustness check. Interestingly, we find similarly significant effects for VW SMB TURNOVER for Rank and LnGDPPC. The economic significance is a bit smaller for Rank but somewhat larger using LnGDPPC. Hence, we conclude that our turnover results are robust regardless of whether we look at provinces or cities. Turning to Market-to-book, we find that the effects are smaller again for Rank but somewhat comparable for LnGDPPC when compared for instance to the coefficients in Panel C. The t-statistics are not large although the point estimates are similar. This is not surprising since market-to-book is likely to be much noisier to measure than turnover and more subject to more variability. In other words, it is likely that averaging of market-to-book for more companies over a larger area would help reduce noise which is what our earlier analysis confirms. Nonetheless, the economic effects are all pointing in the right direction and we take comfort in the robustness along this dimension.

We carry out a similar analysis for the U.S. and use the same sample period for comparison. Our analysis is done on both the state and metropolitan statistical area (MSA) level. Although the results are not significant and the economic magnitudes are smaller than the effects in China, the signs of estimates still suggest that there is a relatively higher status effect in the richer area. The results are not surprising given that the income inequality across regions are not as big in the U.S. as in China. The richest area[13] (either state or MSA)'s GDP per capita is only around twice the number for the poorest area in our sample, however, this number is around 10 times for China. The U.S. results are not reported in the paper but are available upon request.

4.2. Province Status Measure Based on Luxury Brand Searches

We next consider an alternative measure of the status demand intensity of a province by using the ratio of internet searches of luxury brands to non-luxury brands for various goods including clothes, cars, sportswear and watches. We obtain our data from Baidu, which is the main internet search engine in China. We then re-run our analysis above using this luxury search index in addition to GDP per capita.

Table 5 reports the summary statistics of Baidu search index across sample provinces in China. Daily Baidu search index from November 2, 2008 to December 31, 2010 are used to calculate the RATIO reported in the table. PROVINCE is the provinces in our sample. RATIO is the average Baidu search index for luxury goods over the average Baidu search index for non-luxury goods. The first 4 columns report the RATIO for four consumption categories: CLOTHES, CARS, SPORTSWEAR, and WATCH. Luxury clothes brands include Chanel, Louis Vuitton, Gucci; non-luxury clothes brands include Only, Jack Jones. Luxury car brands include Audi, BMW, and Porsche; non-luxury car brands include Toyota, Honda, Hyundai, BYD, and Qirui QQ. Luxury sportswear brand includes Nike; non-luxury sportswear brand include Lining. Luxury watch brands include Omega and Rolex; non-luxury watch brands include Swatch and Citizen. The last column reports the average of the RATIO of Baidu search index for luxury over non-luxury brands across all four consumption categories for each province.

[13]Here we only compare areas which are the headquarters of the listed companies.

RATIO of Baidu search index can be used as a measure for status concern. The higher the RATIO of Baidu search index between luxury brands over non-luxury brands, the higher the status concerns in the corresponding province. Guangdong has the highest status concern among all provinces when using Baidu search index RATIO as the measure. In order to pin down the impact from the status concern as measured by Baidu search index, we also run a horserace between Baidu search index RATIO and GDP PER CAPITA in explaining SMB turnover and SMB market-to-book. The results are reported in Table 6. The set-up is the same as in our earlier tables. In Panel A, we report the results for VW SMB turnover.

Column (1) shows that the higher the ratio of search for luxury goods over non-luxury goods, the higher the VW SMB TURNOVER. If we move from Qinghai (with RATIO equals to 1.006) to Shanghai (with RATIO equals to 1.785), the VW SMB TURNOVER will increase by 61.3%, which is 29.47% of the left-hand side variable's standard deviation. Panel A, column (2) shows that the result is mainly coming from the late sample period. Moving from Qinghai to Shanghai in the late period of the sample will increase VW SMB TURNOVER by 91.6%, which is 44.04% of the left-hand side variable's standard deviation. Column (3) in Panel A presents the horserace result for Baidu search index and ln GDP per capita. Baidu search index remains economically meaningful and statistically significant after using ln GDP per capita in the analysis. For example, in Panel A, column (3), the interaction term for RATIO and LATE is 0.577, and the interaction term for ln GDP per capita and LATE is 1.001. Moving from Qinghai to Shanghai in the late period of the sample will move Baidu search index ratio up by 0.779, which will increase VW SMB TURNOVER by 44.9%, that is 21.6% of the standard deviation of the left-hand side variable.

In Panel B, we report the results for VW SMB Market-to-Book. In Column (1), the coefficient of interest is 0.177 indicating that high status RATIO areas have higher price ratio but the t-statistic is only 0.51 and is not statistically significant. In column (2), we see that the effect is again coming late in the sample. The coefficient on RATIO×LATE is 0.824. So if we moved from Qinghai with RATIO equals to around 1 to Shanghai with

RATIO equals to 1.785, we get an implied move in the VW SMB Market-to-Book of around 0.64, which is around 26.2% of the standard deviation of the left-hand side variable. This is an economically significant effect but the t-statistic is around 1. This result is in line with our earlier findings in which share turnover is more robust economically and statistically than is market-to-book. In column (3), we consider a horserace between RATIO and ln GDP per capita and find that the results are strong using ln GDP per capita. The coefficient for RATIO×LATE is around zero. For market-to-book, it appears that ln GDP per capita does a better job than RATIO in explaining the dispersion in SMB market-to-book.

4.3. Province Status Measure Based on Male-Female Sex Ratios

Our third measure of status concern is the male-female sex ratios across different provinces. Wei and Zhang (2011) has pointed out that sex ratio imbalance in China has created a status concern which is due to the shortage of females available for marriage, and this status concern has a significant impact on the households' savings motive. In this paper, we use sex ratio imbalance to show that status concern also has an impact on the individual investment behavior on the stock market.

Table 7 reports the summary statistics of sex ratio of age 7-21 cohort across all provinces. The legal marriage age in China is 20 for female, and 22 for male. So 7-21 is in general the pre-marriage age cohort whose parents will start caring about the future marriage market for their children. Following the empirical set up in Wei and Zhang (2011), we also report the share of population aged 0-19, the share of population aged 20-59, log of total income, and log of disposable income across sample provinces in China in the sample period 1998-2009. We use the most recent available Chinese Population Census done in 2000 for the corresponding calculation.

The census 2000 reports male and female population across different age groups for 0, age cohort from 1-4, to 80-84 with 5 years increments in each cohort, and a cohort for population beyond 85. By assuming the same birth/death rate for female and male in each province in each year, we calculate the sex ratio in year 2002 for 7-21 age cohort based on the number of age cohort 5-19 using census 2000 data. Sex ratio in year 1997 for 7-21 age cohort is calculated using the number of age cohort 10-24 in 2000 census data. Sex ratio in year 2007 for 7-21 age cohort is calculated using the number of age cohort 0-14 in 2000 census data. We assume constant sex ratio growth rate between the most adjacent 5 years to calculate the sex ratio for each year in our sample year. We then did similar calculations for the share of population aged 0-19 and 20-59.

Table 8 reports the coefficients estimate from the panel regression. The dependent variable is VW SMB TURNOVER, the independent variables are the male-female sex ratio for the 7-21 age cohort, the share of population aged 0-19, the share of population aged 20-59, per capita income proxy which is log total income in column (1) and log disposable income in column (2). Year and province dummies are included but are not reported. The coefficient of interest, which is the coefficient on sex ratio for 7-21 age cohort, is 6.902, with a t-statistics of 1.97. This means that if we move from Shanghai (with an average male-female sex ratio equals to 1.06) to Guangxi (with an average male-female sex ratio equals to 1.20), we get an implied move in the VW SMB TURNOVER of around 96.6%, which is around 46% of the left-hand side variable's standard deviation. This is both an economically meaningful and statistically significant effect. Hence, the higher the male-female sex ratio imbalance, the stronger the status concerns, the more the investors' motive to invest in small stocks to track the local entrepreneurial wealth so that the single male will have a better prospect on the marriage market.

4.4. Correlation between Turnover and Past Returns

Next, we test an auxiliary implication of our model as a means to achieve better identification of our mechanism. Status investors will increase their demand for local stocks with a rising market, leading to a stronger correlation of past returns and share turnover in high status compared to low status provinces. The same is not true in a falling market if there are fixed costs to participation or the disposition effect. To see if past good returns indeed lead to more trading volume in high status areas, we run a regression for turnover on last year's return and a constant for small and big stocks respectively. Then we take the difference between these two regression coefficients on last year's return for small and big stocks and run a regression of this difference on the same independent variables as in our earlier analysis.

In Table 9, we report the regression coefficients on last year's stock return for the small stocks, for the big stocks and for the difference in these two coefficients respectively. In Table 10, we then take these regression coefficients on last year's stock return and regress them on our GDP PC PROXY, LATE and GDP PC PROXY×LATE.

Panel A shows that in richer area, the higher the return for small stocks, the higher the turnover for small stocks. Based on the result in column (4), moving from a Tier 5 province into a Tier 1 province, this sensitivity between last year's stock return and current year stock turnover will increase by 366% in the late part of the sample period, which is 67.5% of the left-hand side variable's standard deviation.

Panel B shows that there is not a significant relation between last year's stock return and current year stock turnover for big stocks in different areas.

Panel C suggests that the difference of regression coefficients on last year's stock return between small and big stocks varies in different provinces in China. This difference in regression coefficient is higher in the richer areas late in the sample. From column (1), moving from a province 10 ranks up will result in a difference in this regression coefficient of 299%, which is 32.28% of the left-hand side variable's standard deviation. The impact is both economically meaningful and statistically significant.

These results suggest that the sensitivity of trading volume to past return is much higher in the richer areas than in the poorer areas, which is expected from the conclusion of our model. In Tier 1 provinces, when the entrepreneur's small stocks are performing well, the higher status concern for the residents in Tier 1 area will drive the turnover much higher than at the lower tier places, and this effect is more significant at the late sample period.

4.5. Small versus Large Publicly Traded Stocks and Private Company Performance

Finally, we address a potential objection of our use of small publicly traded stocks as the reference benchmark for peer wealth concerns. Most firms in China are private. So are the small publicly traded companies representative of these private firms? Presumably, status concerns are most likely driven by both private and public companies.

To this end, we provide some evidence that small publicly traded stocks actually do look like large private companies both in terms of asset size and various accounting measures. In contrast, large publicly traded stocks in any given province are not comparable in terms of asset size. Publicly traded firms are just much larger.

Our financial report data of private firms are collected by NBS, who started tracking manufacturing firms in China since 1998. Our sample is from 1999 to 2005 and includes all SOEs and private firms with more than five million (approximately $830,000) *yuan* annual sales. The sample includes 1,236,054 firm-year observations. For our analysis, we only keep private firms to compare with small public firms in the manufacturing industry.

First, the mean size of the private companies, as measured by total asset, is only 64,202 *yuan*. This stands in contrast to public manufacturing companies, which has a mean size of about 2.43 billion*yuan*. To make the private firms' sample comparable to the public firms' in terms of firm size, we need to restrict the sample of private firms to the top 10% of the asset size distribution.

Panel A of Table 11 reports the size distributions of largest 10% private firm sample and small public firm sample (bottom 30% of market capitalization) by each province. Although small public firms are still larger on average, they are comparably close.

Panel B and C summarize the correlation of economic performance for the large private firms and public (both small and large) firms in the manufacturing industry in China from year 2000 to 2005.

We look at the following accounting based performance: return on asset (ROA), return on equity (ROE), sales growth rates (GSALES), earnings growth rates (GEARNINGS), and asset growth rate (GASSET). All those measures are annual reports for both public and private firm samples. For each financial ratio each year, we calculate correlation of province medians. The last row of each panel reports the average of correlations in each year.

We find that there is a relatively high correlation between private firms and small public firms for three of five accounting based measures in each sample year and across all sample years. That is, for ROE, ROA and GASSET, the correlations on average are above 20%.

When we do the same exercise using large public firms, defined as the top 30% of the public firms sorted by last year's market capitalization, the correlations of these accounting based performance becomes about 10% lower on average. One exception here is GEARNINGS, where correlation with large public firms turns out higher (28.8%) than with small ones (10.2%).

These results to some extent justify our use of the small stocks as an interesting object of analysis and large stocks as a control group for the varying investment opportunity across regions.

5. Conclusion

We examine in this paper the hypothesis that status preferences lead to excessive risk-taking using a unique empirical design from China. We develop a simple model of trading to develop a volume metric to gauge such risk-taking and use a difference-in-difference-in-difference estimation strategy to identify the effect of a shift in the status parameter on risk-taking and asset pricing. The first difference is between small and big stocks in trading volume and market-to-book. The second difference is this difference across high income provinces in China compared to low income ones. The third difference is these two differences over time, comparing the 2004-2009 sample to the earlier period. We find higher share turnover and larger price ratio gaps for small stocks relative to big ones in developed than in less-developed places which has widened over our sample period. We also develop further identification by looking at internet search indices for luxury goods compared to non-luxury goods, the male-female sex ratio imbalance across different provinces, and also considering the sensitivity of share turnover to past price increases.

The topic of status preference and risk-taking has been an important one for economists over the last several centuries and it appears to be timely again with income inequality rising around the world over the last two decades. Indeed, Atkinson and Morelli (2011), Rajan (2010), and Fitoussi and Saraceno (2009) argue that inequality over the last twenty years drove the demand for housing leverage on the part of those falling behind. This point of view is consistent with status preferences. Our work links up to this big macro-debate using micro-evidence from China. Hence, an important next step would be to link income inequality to risk-taking.

A. Appendix

Solve Optimal Portfolio and Asset Price At the U-state, the expected time 2 payoff of the stock is $\text{E}[\tilde{F}|U] = \bar{F} = F + \sigma$ and the variance of the payoff is $\text{Var}[\tilde{F}|U] = \sigma^2$. At the D-state the expected payoff is $\text{E}[\tilde{F}|U] = \underline{F} = F - \sigma$ and the variance of the payoff is $\text{Var}[\tilde{F}|D] = \sigma^2$. First consider demand function of the s-investors at the U-state. The solution for the m-investors follows by setting $b = 0$. The s-investor chooses the proportion of total wealth invested in the stock, denoted as ϕ_s^U, to maximize the following objective function at time 1 in the U-state with wealth W_s^U given price P^U. Let θ_s^U be the optimal portfolio in number of shares, and $\theta_s^U = W_s^U \phi_s^U / P^U$.

$$\text{Max}_{\phi_s^U} \text{E}[(1 + b\tilde{F})\log(W_s^U(1 + \phi_s^U \tilde{R^U})|U] - d\tilde{F}$$

The F.O.C. for s-investor is

$$\frac{(1 + b(F + 2\sigma))R_+^U}{1 + \phi_s^U R_+^U} + \frac{(1 + bF)R_-^U}{1 + \phi_s^U R_-^U} = 0, \text{ where } R_+^U = \frac{\bar{F} + \sigma - P^U}{P^U} \text{ and } R_-^U = \frac{\bar{F} - \sigma - P^U}{P^U}$$

Solving for ϕ_s^U yields

$$\phi_s^U = -\frac{R_+^U + R_-^U}{2R_+^U R_-^U} - \frac{b\sigma}{1 + b\bar{F}} \frac{R_+^U - R_-^U}{2R_+^U R_-^U}$$

$$\phi_s^U = \frac{P^U(\bar{F} - P^U)}{\sigma^2 - (\bar{F} - P^U)^2} + \frac{P^U}{\sigma^2 - (\bar{F} - P^U)^2} \frac{b\sigma^2}{1 + b\bar{F}} \tag{A.1}$$

Let $b = 0$, we have demand function of m-investor,

$$\phi_m^U = -\frac{R_+^U + R_-^U}{2R_+^U R_-^U} = \frac{P^U(\bar{F} - P^U)}{\sigma^2 - (\bar{F} - P^U)^2} \tag{A.2}$$

Equation (A.1) and (A.2) show that s-investor puts more wealth on risky asset. Further, market clearing condition, $\phi_m^U W_m^U + \phi_s^U W_s^U = P^U$ gives solution for P^U

$$P^U = \bar{F} - \frac{\sigma^2}{\bar{F}} + \frac{\bar{k}\sigma^2}{\bar{F}} W_s^U, \text{ where } \bar{k} = \frac{b}{1+b\bar{F}} \tag{A.3}$$

Based on (A.1) and (A.2), we can transfer the optimal portfolio weights into the number of shares. Let θ_i^j be the optimal holding (in shares) at state $j \in \{0, U, D\}$ for agent $i \in \{s, m\}$.

$$\theta_s^U = \phi_s^U W_s^U / P^U = \frac{\bar{F} - P^U + \bar{k}\sigma^2}{\sigma^2 - (\bar{F} - P^U)^2} W_s^U \tag{A.4}$$

$$\theta_m^U = \phi_m^U W_m^U / P^U = \frac{\bar{F} - P^U}{\sigma^2 - (\bar{F} - P^U)^2} W_m^U \tag{A.5}$$

Applying the same procedure, we obtain the solution in D-state.

$$P^D = \underline{F} - \frac{\sigma^2}{\underline{F}} + \frac{\underline{k}\sigma^2}{\underline{F}} W_s^D, \text{ where } \underline{k} = \frac{b}{1+b\underline{F}} \tag{A.6}$$

$$\theta_s^D = \frac{\underline{F} - P^D + \underline{k}\sigma^2}{\sigma^2 - (\underline{F} - P^D)^2} W_s^D \tag{A.7}$$

$$\theta_m^D = \frac{\underline{F} - P^D}{\sigma^2 - (\underline{F} - P^D)^2} W_m^D \tag{A.8}$$

To calculate the equilibrium at $t = 0$, we solve the following problem,

$$\text{Max } \{\frac{1}{2}(1 + b\bar{F})\log(W_s^0(1 + \phi_s^0 R_+^0)) + \frac{1}{2}(1 + b\underline{F})\log(W_s^0(1 + \phi_s^0 R_-^0))\}$$

First order condition with respect to ϕ_s^0 gives,

$$\phi_s^0 = \frac{P^0}{2}\frac{P^U + P^D - 2P^0}{(P^U - P^0)(P^0 - P^D)} + \frac{b\sigma}{1+bF}\frac{P^0}{2}\frac{P^U - P^D}{(P^U - P^0)(P^0 - P^D)} \tag{A.9}$$

When $b = 0$, we have

$$\phi_m^0 = \frac{P^0}{2}\frac{P^U + P^D - 2P^0}{(P^U - P^0)(P^0 - P^D)} \tag{A.10}$$

Using market clearing condition $\phi_s^0 W_s^0 + \phi_m^0 W_m^0 = P^0$, or $\phi_s^0 \lambda + \phi_m^0(1-\lambda) = 1$, we solve for P^0,

$$P^0 = \frac{2P^U P^D}{(1-\lambda k\sigma)P^U + (1+\lambda k\sigma)P^D}, \text{ where } k = \frac{b}{1+bF} \tag{A.11}$$

Again, transfer the optimal portfolio weight into the number of shares,

$$\theta_m^0 = (1-\lambda)P^0 \frac{P^U + P^D - 2P^0}{2(P^U - P^0)(P^0 - P^D)} \tag{A.12}$$

$$\theta_s^0 = \lambda P^0 [\frac{P^U + P^D - 2P^0}{2(P^U - P^0)(P^0 - P^D)} + k\sigma \frac{P^U - P^D}{2(P^U - P^0)(P^0 - P^D)}] \tag{A.13}$$

Plug (A.12) and (A.13) into (A.3), (A.6), then with (A.11) we can solve all equilibrium prices.

$$P^U = \frac{F(F+2\sigma)[1+b(F+\lambda\sigma)]}{bF^2 + \sigma + F + bF(1+\lambda)\sigma} \tag{A.14}$$

$$P^D = \frac{F(F-2\sigma)[1+b(F-\lambda\sigma)]}{bF^2 - \sigma + F - bF(1+\lambda)\sigma} \tag{A.15}$$

$$P^0 = \frac{F(1+bF)(F-2\sigma)(F+2\sigma)}{F^2 + bF^3 - 2\sigma^2 - 2bF(1+\lambda)\sigma^2} \tag{A.16}$$

Proof of Proposition 1 We take the derivative of risk premium for each state with respect to b,

$$\frac{\partial(\bar{F} - P^U)}{\partial b} = -\frac{\lambda F(F+2\sigma)\sigma^2}{[bF^2 + \sigma + F(1+b(1+\lambda)\sigma)]^2} \leq 0$$

$$\frac{\partial(\underline{F} - P^D)}{\partial b} = -\frac{\lambda F(F-2\sigma)\sigma^2}{[bF^2 - \sigma + F(1-b(1+\lambda)\sigma)]^2} \leq 0$$

$$\frac{\partial(F - P^0)}{\partial b} = -\frac{2\lambda F\sigma^2(F+2\sigma)(F-2\sigma)}{(F^2 + bF^3 - 2\sigma^2 - 2b(1+\lambda)F\sigma^2)^2} \leq 0$$

This last two inequalities are due to $F > 2\sigma$. Thus all above derivatives are non-positive. We prove that risk premium in each state is decreasing in b. QED

Proof of Proposition 2

To prove Proposition 2, we fully solve the optimal holdings by market makers at each state by plugging (A.14), (A.15) and (A.16) into (A.5), (A.8) and (A.12).

$$\theta_m^U = \frac{(1-\lambda)[1+b(1-\lambda)F]}{1+2(F+2\lambda\sigma)} \tag{A.17}$$

$$\theta_m^D = \frac{(1-\lambda)[1+b(1-\lambda)F]}{1+2(F-2\lambda\sigma)} \tag{A.18}$$

$$\theta_m^0 = \frac{F(1+bF)(1-\lambda)(1+b(1-\lambda)F)}{2bF^2+b^2F^3-2b\lambda\sigma^2+F(1-2b^2\lambda(1+\lambda)\sigma^2)} \tag{A.19}$$

To prove that turnover rate at time 1 is increasing in b, we show the following equation is increasing in b.

$$\theta_m^D - \theta_m^U = \frac{4b(1-bF(1-\lambda))(1-\lambda)\lambda\sigma}{1+2bF+b^2(F^2-4\lambda^2\sigma^2)}$$

Take the partial derivative with respect to b,

$$\frac{\partial(\theta_m^D-\theta_m^U)}{\partial b} = \frac{4(1-\lambda)\lambda\sigma[1+2bF(1-\lambda)+b^2(F^2(1-2\lambda)+4\lambda^2\sigma^2)]}{(1+b(F-2\lambda\sigma))^2(1+b(F+2\lambda\sigma))^2} \tag{A.20}$$

The sufficient condition such that the derivative is positive is

$$1+2bF(1-\lambda)+b^2(F^2(1-2\lambda)+4\lambda^2\sigma^2) > 0$$

Equivalently,

$$\lambda > \frac{F+\sqrt{F^2-4\sigma^2}}{\frac{4b\sigma^2}{1+bF}}, \text{or } \lambda < \frac{F-\sqrt{F^2-4\sigma^2}}{\frac{4b\sigma^2}{1+bF}} \tag{A.21}$$

The first solution never holds. To see this, note that $(F+\sqrt{F^2-4\sigma^2})(1+bF)/4b\sigma^2$ is decreasing both in b and σ. Thus we plug in the maximum values of b and σ to obtain its lowest bound.

$$\lim_{\sigma\to F/2, b\to\infty} \frac{F+\sqrt{F^2-4\sigma^2}}{\frac{4b\sigma^2}{1+bF}} = \frac{F+\sqrt{F^2-F^2}}{F^2/F} = 1$$

Since $\lambda \in [0,1]$, the first solution never satisfies. Now, we consider the other solution. We show that its lower bound is 1/2. First, $(F-\sqrt{F^2-4\sigma^2})/(4k\sigma^2)$ is decreasing in b but increasing in σ, to obtain its possibly lowest value, we set b goes to ∞ and σ goes to zero.

$$\lim_{\sigma\to 0, b\to\infty} \frac{F-\sqrt{F^2-4\sigma^2}}{4\sigma^2/F} = \lim_{\frac{\sigma}{F}\to 0} \frac{1-\sqrt{1-4\frac{\sigma^2}{F^2}}}{4\frac{\sigma^2}{F^2}} = \frac{1}{2}$$

Thus, $\lambda < 1/2$ is one sufficient condition such that equation (A.20) is positive. For necessary condition, we have shown that when $\lambda < (F-\sqrt{F^2-4\sigma^2})(1+bF)/4b\sigma^2)$, $\theta_m^D - \theta_m^U$ is increasing in b. Given $\frac{1}{2}(|\theta_m^0 - \theta_m^D| + |\theta_m^0 - \theta_m^U|) = \frac{1}{2}(\theta_m^D - \theta_m^0 + \theta_m^0 - \theta_m^U) = \frac{1}{2}(\theta_m^D - \theta_m^U)$, we have proved that average share turnover is increasing in b if λ is not too large. QED

Proof of Proposition 3

Take partial derivative of $Turnover_0$ with respect to b, we have

$$\frac{\partial(1-\lambda-\theta_m^0)}{\partial b} = \frac{F(1-\lambda)\lambda[(1+bF)^2(F-2\sigma)(F+2\sigma)+2(bF\sigma(\lambda-1)-\sigma)^2]}{[2bF^2+b^2F^3-2b\lambda\sigma^2+F1-2b^2\lambda(1+\lambda)\sigma^2)]^2} \geq 0 \tag{A.22}$$

The last inequality is due to assumption that $F-2\sigma \geq 0$. Thus $Turnover_0$ is increasing in b. QED

References

Abel, A. B., 1990, "Asset Prices under Habit Formation and Catching Up with the Joneses," *American Economic Review*, 80(2), 38–42.

Ait-Sahalia, Y., J. A. Parker, and M. Yogo, 2004, "Luxury Goods and the Equity Premium," *Journal of Finance*, 59(6), 2959–3004.

Atkinson, A. B., and S. Morelli, 2011, "Economic Crises and Inequality," Working papers, Oxford University.

Barber, B. M., and T. Odean, 2008, "All That Glitters: The Effect of Attention and News on the Buying Behavior of Individual and Institutional Investors," *Review of Financial Studies*, 21(2), 785–818.

Basak, S., and A. Pavlova, 2011, "Asset Prices and Institutional Investors," Working papers, London Business School.

Becker, G. S., K. M. Murphy, and I. Werning, 2005, "The Equilibrium Distribution of Income and the Market for Status," *Journal of Political Economy*, 113(2), 282–310.

DeMarzo, P. M., R. Kaniel, and I. Kremer, 2004, "Diversification as a Public Good: Community Effects in Portfolio Choice," *Journal of Finance*, 59(4), 1677–1716.

Dynan, K. E., and E. Ravina, 2007, "Increasing Income Inequality, External Habits, and Self-Reported Happiness," *American Economic Review*, 97(2), 226–231.

Feng, L., and M. S. Seasholes, 2008, "Individual Investors and Gender Similarities in an Emerging Stock Market," *Pacific-Basin Finance Journal*, 16, 44–60.

Fitoussi, J.-P., and F. Saraceno, 2009, "How Deep is a Crisis? Policy Responses and Structural Factors Behind Diverging Performances," Working papers, OFCE.

French, K. R., and J. M. Poterba, 1991, "Investor Diversification and International Equity Markets," *American Economic Review*, 81(2), 222–226.

Friedman, M., and L. J. Savage, 1948, "The Utility Analysis of Choices Involving Risk," *Journal of Political Economy*, 56(4), 279–304.

Gao, X., and T.-C. Lin, 2011, "Do Individual Investors Trade Stocks as Gambling? Evidence from Repeated Natural Experiments," *Working paper*.

Gomez, J.-P., R. Priestley, and F. Zapatero, 2009, "Implications of Keeping-Up-with-the-Joneses Behavior for the Equilibrium Cross Section of Stock Returns: International Evidence," *Journal of Finance*, 64(6), 2703–2737.

Hong, H., J. D. Kubik, and J. C. Stein, 2008, "The Only Game in Town: Stock-Price Consequences of Local Bias," *Journal of Financial Economics*, 90(1), 20–37.

Huberman, G., 2001, "Familiarity Breeds Investment," *Review of Financial Studies*, 14(3), 659–680.

Kumar, A., 2009, "Who Gambles in the Stock Market?," *Journal of Finance*, 64(4), 1889–1933.

Rajan, R., 2010, *Fault Lines: How Hidden Fractures Still Threaten the World Economy*. Princeton University Press, Princeton, New Jersey.

Roussanov, N., 2010, "Diversification and Its Discontents: Idiosyncratic and Entrepreneurial Risk in the Quest for Social Status," *Journal of Finance*, 65(5), 1755–1788.

Veblen, T., 1934, *The Theory of the Leisure Class: An Economic Study of Institutions*. The Modern Library, New York, New York.

Wei, S.-J., and X. Zhang, 2011, "The Competitive Saving Motive: Evidence from Rising Sex Ratios and Savings Rates in China," *Journal of Political Economy*, 119(3), 511–564.

Wei, S.-J., X. Zhang, and Y. Liu, 2012, "Status Competition and Housing Prices," *NBER Working Paper*, (No. 18000).

Wu, X., and J. M. Perloff, 2005, "China's Income Distribution, 1985-2001," *Review of Economics and Statistics*, 87(4), 763–775.

Table 1. Distribution of Stocks

This table reports the time-series average of GDP per capita, annual stock distributions, Baidu search index, and male-female sex ratio across provinces in China over the sample year from 1998 to 2009. # OF STOCKS is the time-series average of number of stocks each year in each province over the sample period. GDP PC is the time-series average of GDP per capita for each province in China in Chinese Yuan. RANK is the average of rank of GDP PC for each province across sample years, with rank equals to 1 being the province with the highest GDP PC in each sample year. TIER is the sample average of tier for each province. All provinces are sorted into 5 tiers based on their GDP PC, with six provinces in each tier, and tier 1 being the six provinces with the highest GDP PC. RICH is the sample average of a dummy variable which equals to 1 if the province belongs to the top 2 tiers and 0 otherwise. TURNOVER is the time-series average of annual turnover of all stocks located in each province. MB is the median year end market-to-book value of all stocks in each province across sample years. Baidu Ratio is the Baidu search index ratio of luxury over non-luxury goods. Sex Ratio is the male-female sex ratio for age 7-21 cohort.

PROVINCE	# OF STOCKS	GDP PC	RANK	TIER	RICH	TURNOVER	MB	BAIDU RATIO	SEX RATIO
Shanghai	131.67	47527.08	1	1	1	4.97	3.02	1.79	1.06
Beijing	77.83	40168.39	2	1	1	4.88	2.8	1.48	1.1
Tianjin	21.33	32144.85	3	1	1	4.99	2.88	1.25	1.08
Zhejiang	75	24745.31	4.08	1	1	5.75	2.94	1.68	1.09
Jiangsu	80.83	22415.83	5.42	1	1	5.53	2.73	1.62	1.16
Guangdong	148.17	22196.25	5.5	1	1	4.94	2.79	2.96	1.08
Fujian	46.42	18124.07	8.08	2	1	5.23	2.92	1.45	1.11
Liaoning	50.92	18271.52	8.17	2	1	4.64	2.72	1.38	1.07
Shandong	69.92	18181.62	8.17	2	1	5.19	2.73	0.95	1.09
Hebei	31.5	13396.94	11.17	2	1	4.97	2.56	1.24	1.06
Heilongjiang	28.92	13292	11.25	2.25	0.75	4.56	2.74	1.24	1.06
Inner Mongolia	18.58	15730.32	11.83	2.42	0.58	5.07	2.42	1.08	1.11
Jilin	32.17	12972.42	12.58	2.67	0.33	4.87	2.62	1.41	1.08
Xinjiang	24.42	11863.33	13.83	2.75	0.33	5.51	3.13	1.05	1.05
Hubei	56.33	11140.33	15.92	3	0	5.03	2.59	1.09	1.13
Shanxi	21	11053.17	16.33	3.08	0	5.01	2.71	1.07	1.08
Hainan	21.42	10532.33	17.5	3.33	0	4.89	3.54	1.05	1.19
Chongqing	24.75	10487.75	17.58	3.17	0	5.15	3.43	1.21	1.11
Henan	30.17	10423.21	18.83	3.58	0	5.19	2.95	1.11	1.14
Hunan	38.58	9950.17	20	4	0	5.39	3.01	1.1	1.13
Ningxia	10.17	9965.58	20.25	3.92	0	5.31	2.91	1.07	1.06
Qinghai	8.92	9616.9	22.17	4	0	4.76	4.32	1.01	1.06
Shaanxi	24.25	9705.58	22.58	4.08	0	5.16	3.21	1.06	1.13
Sichuan	64	8750.67	24.25	4.33	0	5.15	3.79	1.26	1.11
Jiangxi	21	8685.58	25.08	4.67	0	5.94	2.62	1.15	1.07
Anhui	37.33	8364.07	26.08	5	0	5.76	2.2	1.38	1.14
Guangxi	19.83	8339.39	26.33	4.92	0	5.23	2.66	1.3	1.2
Yunnan	20.67	7519.08	27	4.83	0	5.84	3.22	1.21	1.11
Gansu	17	6963.54	29	5	0	5.65	2.6	1	1.1
Guizhou	14.17	4894	30	5	0	5.78	2.94	1.24	1.14

Table 2. Summary Statistics

This table reports the time-series average of annual cross-sectional statistics over the sample year from 1998 to 2009 of all stocks listed on Shanghai and Shenzhen Stock Exchange in China. Panel A shows the summary statistics for provinces in China. Panel B shows the summary statistics for cities in China. Panel C shows the summary statistics by province in China. TURNOVER equals to the total number of shares traded divided by the number of tradable shares. Market-to-Book is the year-end market-to-book ratio. Stocks are sorted on size (last year market capitalization). Small stocks are the bottom 30% of stocks sorted on size, big stocks are the top 30% of stocks sorted on size. Last year's market capitalizations are used to calculate value-weighted variables. VW is value weighted. SMB is small stocks minus big stocks. SMA is small stocks minus the average of all stocks in that province/city. IND ADJ is industry adjusted. EW is equal weighted. RANK is defined in the same manner as in Table 1. We use median value for all market-to-book calculation.

Panel A: Provinces in China

		MEAN	StDev	25%	MEDIAN	75%	# of OBS
TURNOVER	VW SMB	1.62	2.08	0.16	1.03	2.62	244
	VW SMA	1.28	1.65	0.18	0.66	2.09	244
	IND ADJ VW SMB	1.47	1.91	0.14	0.92	2.46	244
	EW SMB	1.46	1.80	0.25	0.99	2.52	244
Market-to-Book	VW SMB	0.67	2.45	-0.24	0.42	1.42	244
	VW SMA	0.70	2.13	-0.08	0.37	1.22	244
	IND ADJ VW SMB	0.68	2.37	-0.14	0.41	1.25	244
	EW SMB	0.83	1.82	-0.08	0.57	1.45	244

Panel B: Cities in China

		MEAN	StDev	25%	MEDIAN	75%	# of OBS
TURNOVER	VW SMB	1.87	2.51	0.26	1.26	2.90	164
	VW SMA	1.57	2.10	0.25	0.98	2.25	164
	IND ADJ VW SMB	1.64	2.22	0.16	1.12	2.61	164
	EW SMB	1.69	2.08	0.47	1.17	2.62	164
Market-to-Book	VW SMB	0.51	2.18	-0.21	0.43	1.42	164
	VW SMA	0.57	1.61	-0.14	0.41	1.09	164
	IND ADJ VW SMB	0.44	2.09	-0.33	0.41	1.18	164
	EW SMB	0.78	2.04	-0.17	0.63	1.44	164

Panel C: Summary Statistics by Provinces									
		TURNOVER				Market-to-Book			
PROVINCE	RANK	VW SMB	VW SMA	VW IND ADJ SMB	EW SMB	VW SMB	VW SMA	VW IND ADJ SMB	EW SMB
Shanghai	1.00	2.37	2.11	2.02	2.03	1.49	1.33	1.36	1.63
		(1.91)	(1.76)	(1.61)	(1.53)	(0.53)	(0.36)	(0.83)	(0.65)
Beijing	2.00	1.73	1.67	1.29	1.50	1.20	1.16	1.34	0.98
		(2.03)	(1.99)	(1.74)	(1.34)	(0.80)	(0.77)	(1.08)	(1.05)
Tianjin	3.00	2.11	1.99	2.22	1.91	0.39	0.74	0.40	0.42
		(2.27)	(2.14)	(2.26)	(1.98)	(1.60)	(1.28)	(2.33)	(1.49)
Zhejiang	4.08	1.66	1.12	1.60	1.50	0.55	0.62	0.43	0.56
		(2.26)	(1.54)	(2.11)	(2.06)	(1.69)	(1.29)	(1.64)	(1.65)
Jiangsu	5.42	2.05	1.50	1.79	1.73	0.50	0.78	0.63	0.74
		(2.59)	(1.76)	(2.27)	(1.94)	(2.04)	(1.77)	(2.40)	(1.45)
Guangdong	5.50	2.66	2.31	2.23	2.26	1.01	1.01	1.17	1.59
		(2.34)	(2.07)	(1.64)	(1.72)	(1.04)	(1.01)	(1.10)	(1.59)
Fujian	8.08	2.08	1.52	1.75	1.73	0.06	0.48	0.02	0.59
		(2.47)	(1.95)	(1.95)	(1.94)	(1.07)	(0.70)	(0.88)	(1.06)
Liaoning	8.17	1.41	1.18	1.34	1.24	0.58	0.50	0.39	0.23
		(2.30)	(2.01)	(2.22)	(1.98)	(1.18)	(0.88)	(0.90)	(1.06)
Shandong	8.17	1.39	1.13	1.34	1.33	0.89	0.75	0.52	0.98
		(1.50)	(1.19)	(1.41)	(1.34)	(1.19)	(1.03)	(0.89)	(1.29)
Hebei	11.17	2.02	1.61	1.86	1.92	1.31	1.19	1.32	1.03
		(2.22)	(1.88)	(2.07)	(2.35)	(1.23)	(1.22)	(1.22)	(1.27)
Heilongjiang	11.25	1.66	1.06	1.83	1.65	-0.08	-0.16	0.45	-0.01
		(1.33)	(0.86)	(1.43)	(1.38)	(0.46)	(0.32)	(0.88)	(0.53)
Inner Mongolia	11.83	1.35	1.08	1.11	1.06	0.34	0.38	-0.26	0.38
		(1.40)	(1.23)	(1.39)	(1.00)	(0.79)	(0.63)	(0.70)	(0.82)
Jilin	12.58	1.43	1.15	1.43	1.40	1.25	1.44	0.81	1.29
		(2.06)	(1.53)	(2.20)	(1.81)	(1.82)	(1.73)	(1.46)	(1.94)
Xinjiang	13.83	1.02	0.86	0.60	0.87	-2.03	-0.51	-1.20	-1.48
		(1.63)	(1.23)	(1.40)	(1.48)	(1.81)	(1.85)	(1.60)	(1.62)
Hubei	15.92	1.48	1.18	1.39	1.43	0.08	0.07	-0.23	0.15
		(2.02)	(1.59)	(1.97)	(1.71)	(1.32)	(0.95)	(1.20)	(0.98)
Shanxi	16.33	1.80	1.56	1.62	1.51	0.11	-0.11	-0.11	0.57
		(2.75)	(2.62)	(2.31)	(2.45)	(1.68)	(1.47)	(2.27)	(1.42)
Hainan	17.50	1.10	0.70	0.82	1.22	3.94	3.67	3.37	3.07
		(2.44)	(1.35)	(2.09)	(1.76)	(7.00)	(6.88)	(6.63)	(4.52)
Chongqing	17.58	0.63	0.42	0.84	0.56	1.25	0.97	1.25	0.25
		(2.48)	(1.37)	(2.35)	(2.68)	(2.13)	(0.74)	(1.91)	(2.47)
Henan	18.83	1.87	1.44	1.78	1.76	1.75	1.80	1.83	1.23
		(2.11)	(1.57)	(2.03)	(1.97)	(4.13)	(4.08)	(4.11)	(2.17)
Hunan	20.00	2.36	1.72	2.10	2.03	1.35	1.25	1.06	1.67
		(2.52)	(1.90)	(2.31)	(2.06)	(3.63)	(2.67)	(3.22)	(3.08)
Ningxia	20.25	0.30	0.26	0.19	0.23	-1.65	-0.49	-1.60	-1.63
		(1.10)	(0.89)	(1.00)	(1.12)	(2.93)	(0.62)	(2.68)	(3.32)
Qinghai	22.17	1.67	1.08	1.69	1.00	0.41	-0.36	-0.08	1.95
		(2.21)	(1.90)	(2.48)	(1.33)	(2.97)	(2.02)	(2.74)	(2.85)
Shaanxi	22.58	0.72	0.40	0.77	0.63	-1.02	-0.53	-1.13	-1.00
		(2.00)	(1.16)	(1.94)	(2.06)	(2.99)	(1.95)	(2.97)	(2.80)
Sichuan	24.25	2.23	1.57	2.16	1.61	0.46	0.24	0.87	1.78
		(2.13)	(1.78)	(2.02)	(1.70)	(4.07)	(2.64)	(3.44)	(1.52)
Jiangxi	25.08	1.12	0.76	0.86	1.67	0.91	0.53	0.68	1.07
		(1.75)	(1.30)	(1.68)	(2.21)	(1.26)	(0.80)	(1.11)	(1.02)
Anhui	26.08	1.09	0.84	0.89	0.92	0.85	0.35	0.35	0.63
		(2.31)	(1.69)	(2.27)	(1.82)	(0.98)	(0.42)	(0.96)	(0.99)
Guangxi	26.33	1.81	0.70	1.96	1.64	-0.32	0.40	0.14	-0.25
		(2.50)	(1.41)	(2.35)	(2.74)	(3.26)	(1.23)	(3.21)	(2.96)
Yunnan	27.00	1.18	0.73	0.99	1.25	-0.21	-0.27	-0.42	0.18
		(1.61)	(1.25)	(1.51)	(1.47)	(1.81)	(1.59)	(1.78)	(1.70)
Gansu	29.00	0.29	0.35	0.51	0.39	1.05	0.67	0.86	0.86
		(1.13)	(0.55)	(1.37)	(1.08)	(1.00)	(0.84)	(1.24)	(0.84)
Guizhou	30.00	2.76	2.00	2.62	1.55	-3.33	-2.83	-2.94	-0.76
		(3.70)	(3.15)	(3.54)	(2.32)	(8.57)	(8.19)	(7.77)	(4.90)

Table 3. Panel Regressions of Turnover and Market-to-Book on GDP Per Capita Proxies at Province Level

This table reports the coefficients estimated from panel regressions of value-weighted small-minus-big (VW SMB) turnover and market-to-book at the province level. The dependent variable in Panel A is VW SMB TURNOVER. The dependent variable in Panel B is VW SMB Market-to-Book. We use median value for all market-to-book calculation. The independent variables in all regressions are GDP PC PROXY, LATE, and the interaction term of GDP PC PROXY and LATE. LATE is a dummy variable that equals to 1 for years from 2004 to 2009, and 0 otherwise. The GDP PC PROXY in each specification is defined as the following: in specifications (1) and (2), the GDP PC PROXY is RANK, where RANK is as defined in Table 1; in specifications (3) and (4), the GDP PC PROXY is LnGDPPC, which is the natural logarithm of GDP PC as defined in Table 1; in specifications (5) and (6), the GDP PC PROXY is RICH, where RICH is as defined in Table 1; in specifications (7) and (8), the GPD PC PROXY is TIER, where TIER is as defined in Table 1. Year dummies are included in regressions, but are not reported. Coefficients on LATE dummy are also not reported. Standard errors are clustered at the province level. T-statistics are reported below the coefficient in parenthesis.

Panel A: Analysis of VW SMB TURNOVER

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	RANK	RANK	LnGDPPC	LnGDPPC	RICH	RICH	TIER	TIER
GDP PC PROXY	-0.030	0.013	0.515	-0.102	0.582	-0.074	-0.194	0.087
	(-2.17)	(1.00)	(2.79)	(-0.47)	(2.78)	(-0.43)	(-2.36)	(1.22)
GDP PC PROXY×LATE		-0.074		1.157		1.180		-0.475
		(-4.17)		(3.59)		(3.91)		(-4.56)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of OBS	244	244	244	244	244	244	244	244

Panel B: Analysis of VW SMB MARKET-TO-BOOK

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	RANK	RANK	LnGDPPC	LnGDPPC	RICH	RICH	TIER	TIER
GDP PC PROXY	-0.006	0.049	0.129	-0.630	-0.086	-1.243	-0.030	0.307
	(-0.37)	(1.53)	(0.44)	(-1.27)	(-0.21)	(-1.64)	(-0.28)	(1.56)
GDP PC PROXY×LATE		-0.096		1.424		2.082		-0.569
		(-2.45)		(2.66)		(2.63)		(-2.41)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of OBS	244	244	244	244	244	244	244	244

Table 4. Robustness Check

This table reports the coefficients estimated from panel regressions of robustness check on the analysis for turnover and market-to-book. In Panel A, the dependent variable is Industry Adjusted VW SMB TURNOVER or Market-to-Book. In Panel B, the dependent variable is VW SMA TURNOVER or Market-to-Book. In Panel C, the dependent variable is EW SMB TURNOVER or Market-to-book. In Panel D, the analysis is done at the city level, with the dependent variable equals to VW SMB TURNOVER or Market-to-Book. We use median value for all market-to-book calculation. The independent variables in all regressions are GDP PC PROXY, LATE, and the interaction term of GDP PC PROXY and LATE. LATE is a dummy variable that equals to 1 for years from 2004 to 2009, and 0 otherwise. The GDP PC PROXY in each specification is defined as the following: in specifications (1) and (2), the GDP PC PROXY is RANK, where RANK is as defined in Table 1; in specifications (3) and (4), the GDP PC PROXY is LnGDPPC, which is the natural logarithm of GDP PC as defined in Table 1. Year dummies are included in regressions, but are not reported. Coefficients on LATE dummy are also not reported. Standard errors are clustered at the province/city level. T-statistics are reported below the coefficient in parenthesis.

Panel A: Industry Adjusted VW SMB								
	TURNOVER				MARKET-TO-BOOK			
	(1) Rank	(2) Rank	(3) LnGDPPC	(4) LnGDPPC	(1) Rank	(2) Rank	(3) LnGDPPC	(4) LnGDPPC
GDP PC PROXY	-0.024	0.008	0.389	-0.061	-0.008	0.048	0.144	-0.604
	(-1.80)	(0.67)	(2.03)	(-0.31)	(-0.47)	(1.67)	(0.52)	(-1.31)
GDP PC PROXY×LATE		-0.055		0.844		-0.096		1.402
		(-3.15)		(2.73)		(-2.78)		(2.82)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of OBS	244	244	244	244	244	244	244	244
Panel B: VW SMA								
	TURNOVER				MARKET-TO-BOOK			
	(1) Rank	(2) Rank	(3) LnGDPPC	(4) LnGDPPC	(1) Rank	(2) Rank	(3) LnGDPPC	(4) LnGDPPC
GDP PC PROXY	-0.034	0.004	0.575	0.009	-0.014	0.025	0.195	-0.384
	(-3.01)	(0.38)	(4.20)	(0.06)	(-0.89)	(1.03)	(0.79)	(-0.97)
GDP PC PROXY×LATE		-0.065		1.060		-0.066		1.086
		(-4.87)		(4.55)		(-2.55)		(2.74)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of OBS	244	244	244	244	244	244	244	244
Panel C: EW SMB								
	TURNOVER				MARKET-TO-BOOK			
	(1) Rank	(2) Rank	(3) LnGDPPC	(4) LnGDPPC	(1) Rank	(2) Rank	(3) LnGDPPC	(4) LnGDPPC
GDP PC PROXY	-0.019	0.009	0.343	-0.051	0.006	0.029	-0.008	-0.343
	(-2.05)	(0.89)	(2.60)	(-0.31)	(0.35)	(1.07)	(-0.03)	(-0.88)
GDP PC PROXY×LATE		-0.048		0.739		-0.039		0.628
		(-3.09)		(2.84)		(-1.60)		(1.96)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of OBS	244	244	244	244	244	244	244	244
Panel D: City VW SMB								
	TURNOVER				MARKET-TO-BOOK			
	(1) Rank	(2) Rank	(3) LnGDPPC	(4) LnGDPPC	(1) Rank	(2) Rank	(3) LnGDPPC	(4) LnGDPPC
GDP PC PROXY	-0.012	-0.002	0.879	0.167	-0.002	0.004	0.426	0.088
	(-3.54)	(-0.58)	(3.02)	(0.67)	(-0.18)	(0.41)	(0.78)	(0.13)
GDP PC PROXY×LATE		-0.021		1.311		-0.011		0.621
		(-3.49)		(2.74)		(-1.16)		(0.86)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of OBS	164	164	164	164	164	164	164	164

Table 5. Summary Statistics of Baidu Search Index

This table reports the summary statistics of Baidu search index across sample provinces in China. Daily Baidu search index from November 2, 2008 to December 31, 2010 are used to calculate the RATIO reported in the table. PROVINCE is the provinces in our sample. RATIO is the average Baidu search index for luxury goods over the average Baidu search index for non-luxury goods. The first 4 columns report the RATIO for four consumption categories: CLOTHES, CARS, SPORTSWEAR, and WATCH. Luxury clothes brands include Chanel, Louis Vuitton, Gucci; non-luxury clothes brands include Only, Jack Jones. Luxury car brands include Audi, BMW, and Porsche; non-luxury car brands include Toyota, Honda, Hyundai, BYD, Qirui QQ. Luxury sportswear brand includes Nike, non-luxury sportswear brand includes Lining. Luxury watch brands include Omega and Rolex; non-luxury watch brands include Swatch and Citizen. The last column reports the average of the RATIO of Baidu search index for luxury over non-luxury brands across all four consumption categories for each province.

PROVINCE	CLOTHES	CARS	SPORTSWEAR	WATCH	ALL FOUR CATEGORIES
Guangdong	3.05	1.19	6.57	1.01	2.96
Shanghai	2.92	1.66	1.71	0.85	1.79
Zhejiang	2.87	1.66	1.00	1.18	1.68
Jiangsu	2.44	1.94	1.11	0.97	1.62
Beijing	2.24	1.42	1.38	0.90	1.48
Fujian	2.07	1.43	1.07	1.21	1.45
Jilin	1.83	1.09	0.98	1.74	1.41
Anhui	1.48	1.00	1.96	1.08	1.38
Liaoning	2.03	1.10	1.17	1.21	1.38
Guangxi	1.70	1.66	0.69	1.14	1.30
Sichuan	1.57	1.28	1.12	1.06	1.26
Tianjin	1.75	1.13	1.19	0.94	1.25
Heilongjiang	1.62	1.06	0.97	1.32	1.24
Guizhou	1.72	1.11	1.10	1.04	1.24
Hebei	2.16	0.98	0.69	1.15	1.24
Yunnan	1.55	1.16	1.06	1.08	1.21
Chongqing	1.49	1.30	1.04	1.02	1.21
Jiangxi	1.58	1.14	0.76	1.11	1.15
Henan	1.60	1.11	0.56	1.17	1.11
Hunan	1.37	1.10	0.79	1.13	1.10
Hubei	1.63	1.22	0.47	1.06	1.09
Inner Mongolia	1.24	1.10	0.86	1.12	1.08
Shanxi	1.44	0.97	0.73	1.15	1.07
Ningxia	1.09	1.10	1.06	1.01	1.07
Shaanxi	1.38	0.98	0.86	1.03	1.06
Xinjiang	1.23	1.01	0.96	1.02	1.05
Hainan	1.30	1.11	0.98	0.80	1.05
Qinghai	1.01	1.04	0.99	0.99	1.01
Gansu	1.17	0.95	0.84	1.01	1.00
Shandong	0.94	1.25	0.57	1.05	0.95

Table 6. Panel Regressions of Turnover and Market-to-Book on Baidu Search Index and Ln GDP Per Capita

This table reports the regression results of using RATIO of Baidu search index for luxury over normal goods to analyze VW SMB TURNOVER and Market-to-Book for each year-province observation. In Panel A, the dependent variable is VW SMB TURNOVER. In Panel B, the dependent variable is VW SMB Market-to-Book. The independent variable in column (1) is RATIO; the independent variables in column (2) are RATIO, LATE, and the interaction term between RATIO and LATE; the independent variables in columns (3) are RATIO, LN GDP PC, the interaction term between RATIO and LATE, and the interaction term between LN GDP PC and LATE. RATIO is as defined in Table 5, LATE is as defined in Table 3. Year dummies are included in the regressions and are not reported. Coefficients on LATE dummy are also not reported. Standard errors are clustered at the province level. T-statistics are reported under the coefficient estimate in parentheses.

Panel A: Analysis of VW SMB TURNOVER by Using Baidu Search Index Ratio			
	(1)	(2)	(3)
RATIO	0.787	0.180	0.313
	(5.09)	(1.27)	(3.44)
RATIO×LATE		1.176	0.577
		(2.65)	(2.49)
LN GDP PC			-0.218
			-(0.91)
LN GDP PC×LATE			1.001
			(2.73)
Year Dummies	Yes	Yes	Yes
# of OBS	244	244	244
Panel B: Analysis of VW SMB Market-to-Book by Using Baidu Search Index Ratio			
	(1)	(2)	(3)
RATIO	0.177	-0.249	0.107
	(0.51)	-(0.41)	(0.22)
RATIO×LATE		0.824	0.036
		(1.14)	(0.08)
LN GDP PC			-0.586
			-(1.55)
LN GDP PC×LATE			1.311
			(2.64)
Year Dummies	Yes	Yes	Yes
# of OBS	244	244	244

Table 7. Summary Statistics of Sex Ratio, Population and Income

This table reports the summary statistics of sex ratio of age 7-21 cohort, the share of population aged 0-19, the share of population aged 20-59, total income, and disposable income across sample provinces in China in the sample period of 1998-2009. SEX RATIO (7-21) is the male-to-female ratio for population in 7 to 21 years old. %POPULATION(0-19) is the share of population aged 0-19. %POPULATION(20-59) is the share of population aged 20-59. LN TOTAL INCOME is the natural logarithm of total income per capita. LN DISPOSABLE INCOME is the natural logarithm of disposable income per capita. MEAN is the time series mean for the reported items across sample years. STD DEV is the standard deviation of the reported items across the sample years. The data is obtained from Chinese population census 2000. The census 2000 reports male and female population across different age groups for 0, age cohort from 1-4, to 80-84 with 5 years increments in each cohort, and a cohort for population beyond 85. By assuming constant birth/death rate for female and male in each province in each year, we calculate the sex ratio in year 2002 for 7-21 age cohort based on the number of age cohort 5-19 using census 2000 data. Sex ratio in year 1997 for 7-21 age cohort is calculated using the number of age cohort 10-24 in 2000 census data. Sex ratio in year 2007 for 7-21 age cohort is calculated using the number of age cohort 0-14 in 2000 census data. We assume constant growth rate between the most adjacent 5 years to calculate the sex ratio for each year in our sample year. Similar calculation is done for %POPULATION (0-19) AND %POPULATION (20-59).

PROVINCE	SEX RATIO (7-21)		%POPULATION (0-19)		%POPULATION (20-59)		LN TOTAL INCOME		LN DISPOSABLE INCOME	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
Anhui	1.14	0.03	0.32	0.01	0.59	0.03	8.99	0.41	8.94	0.38
Beijing	1.10	0.02	0.19	0.03	0.68	0.03	9.68	0.44	9.62	0.39
Chongqing	1.11	0.02	0.28	0.00	0.61	0.01	9.14	0.39	9.09	0.36
Fujian	1.11	0.04	0.30	0.03	0.62	0.05	9.35	0.41	9.29	0.37
Gansu	1.10	0.02	0.35	0.00	0.60	0.03	8.90	0.39	8.85	0.36
Guangdong	1.08	0.10	0.32	0.03	0.62	0.05	9.55	0.34	9.49	0.30
Guangxi	1.20	0.01	0.35	0.01	0.58	0.05	9.10	0.39	9.05	0.35
Guizhou	1.14	0.01	0.39	0.01	0.56	0.04	8.92	0.37	8.89	0.36
Hainan	1.19	0.04	0.37	0.01	0.58	0.05	9.00	0.37	8.95	0.35
Hebei	1.06	0.02	0.31	0.01	0.61	0.04	9.03	0.39	9.00	0.37
Heilongjiang	1.06	0.01	0.25	0.02	0.67	0.03	8.91	0.39	8.88	0.37
Henan	1.14	0.04	0.33	0.01	0.59	0.04	8.95	0.45	8.92	0.42
Hubei	1.13	0.03	0.30	0.02	0.63	0.04	9.02	0.40	8.98	0.37
Hunan	1.13	0.02	0.29	0.01	0.62	0.03	9.10	0.36	9.06	0.34
Jiangsu	1.11	0.04	0.25	0.02	0.63	0.02	9.31	0.46	9.26	0.43
Jiangxi	1.16	0.04	0.33	0.01	0.60	0.04	8.95	0.42	8.92	0.40
Jilin	1.07	0.01	0.24	0.02	0.67	0.03	8.95	0.44	8.91	0.41
Liaoning	1.08	0.02	0.23	0.02	0.66	0.02	9.05	0.46	8.99	0.42
Neimenggu	1.07	0.01	0.28	0.02	0.65	0.04	9.00	0.46	8.97	0.44
Ningxia	1.06	0.01	0.37	0.01	0.59	0.04	8.94	0.44	8.89	0.41
Qinghai	1.06	0.00	0.34	0.01	0.61	0.04	8.94	0.39	8.89	0.35
Shaanxi	1.13	0.02	0.32	0.01	0.60	0.04	8.96	0.42	8.91	0.39
Shandong	1.09	0.03	0.28	0.01	0.62	0.03	9.20	0.43	9.15	0.40
Shanghai	1.06	0.02	0.17	0.03	0.67	0.02	9.76	0.41	9.69	0.37
Shanxi	1.08	0.01	0.34	0.00	0.60	0.04	8.96	0.46	8.92	0.43
Sichuan	1.11	0.02	0.29	0.00	0.61	0.02	9.02	0.36	8.97	0.33
Tianjin	1.08	0.01	0.24	0.02	0.65	0.03	9.40	0.40	9.35	0.37
Xinjiang	1.05	0.00	0.36	0.01	0.60	0.05	9.00	0.33	8.93	0.29
Yunnan	1.11	0.00	0.33	0.01	0.60	0.04	9.11	0.33	9.06	0.30
Zhejiang	1.09	0.03	0.24	0.02	0.64	0.02	9.60	0.43	9.54	0.39

Table 8. Panel Regressions of Turnover on Sex Ratio Imbalance

This table reports the cross sectional results of using sex ratio to analyze VW SMB TURNOVER. The dependent variable is VW SMB TURNOVER. The independent variables are SEX RATIO(7-21), %POPULATION(0-19), %POPULATION(20-59), and PER CAPITA INCOME PROXY. The PER CAPITA INCOME PROXY is defined as LN DISPOSABLE INCOME in column (1), and LN TOTAL INCOME in column (2). SEX RATIO(7-21), %POPULATION(0-19), %POPULATION(20-59), LN DISPOSABLE INCOME, LN TOTAL INCOME are as defined in Table 7. Year dummies and province dummies are included in the regressions and are not reported. T-statistics are reported under the coefficient estimate in parentheses.

Dependent Variable: VW SMB TURNOVER		
	(1)	(2)
SEX RATIO (7-21)	6.902	6.946
	(1.97)	(1.99)
%POPULATION (0-19)	-38.308	-36.445
	(-4.23)	(-3.95)
%POPULATION (20-59)	-5.62	-4.68
	(-0.74)	(-0.61)
PER CAPITA INCOME PROXY	2.155	2.747
	(1.20)	(1.52)
# OF OBS	244	244
Year Dummies	Yes	Yes
Province Dummies	Yes	Yes

Table 9. Summary Statistics for Regressing Turnover on Lagged Return

This table reports the coefficients of regressing stocks' annual turnover on past year return by each province. The first column, SMALL STOCKS lists the coefficient for small stocks (bottom 30% of last year market capitalization) within each province. The second column, LARGE STOCKS lists the coefficient for large stocks (top 30% of last year market capitalization) within each province. The third column, SMB, lists the difference of coefficients between small stocks and large stocks. # of YEARS lists the number of province-year observation in each province. Mean and standard deviation are reported, standard deviations are in parentheses under the mean. Province-year with less than 3 small stocks or less than 3 big stocks is deleted from the sample.

PROVINCE	Correlation Between Last Year Return and Current Year Turnover			
	SMALL STOCKS	BIG STOCKS	SMB	# of YEARS
Anhui	-2.98	-1.30	-1.67	7
	(4.79)	(3.15)	(4.10)	
Beijing	0.32	0.13	0.20	12
	(3.62)	(1.78)	(4.26)	
Chongqing	-1.92	-1.76	-0.16	7
	(4.22)	(2.96)	(3.50)	
Fujian	-0.89	0.16	-1.05	12
	(1.93)	(1.78)	(3.16)	
Gansu	-19.88	9.73	-29.61	1
Guangdong	1.38	-0.10	1.48	12
	(2.19)	(1.50)	(2.94)	
Guangxi	-2.44	3.14	-5.58	2
	(0.24)	(1.82)	(1.59)	
Guizhou	-0.68	2.93	-3.62	1
Hainan	-4.43	6.14	-10.57	6
	(6.79)	(9.19)	(8.97)	
Hebei	-2.51	1.17	-3.68	12
	(5.77)	(4.52)	(8.05)	
Heilongjiang	-1.91	0.43	-2.34	11
	(5.84)	(2.80)	(6.56)	
Henan	-3.39	-0.34	-3.05	9
	(11.50)	(1.45)	(11.44)	
Hubei	0.42	0.39	0.03	12
	(2.57)	(2.68)	(4.06)	
Hunan	1.51	-0.80	2.31	11
	(4.45)	(5.56)	(7.25)	
Jiangsu	-0.39	-0.11	-0.28	12
	(2.71)	(1.28)	(3.13)	
Jiangxi	-0.92	-1.29	0.36	8
	(4.88)	(8.04)	(8.55)	
Jilin	-1.06	3.33	-4.40	12
	(2.16)	(8.63)	(8.87)	
Liaoning	-1.01	-0.48	-0.53	12
	(2.81)	(1.52)	(3.76)	
Inner Mongolia	2.20	1.47	0.73	5
	(4.41)	(1.12)	(4.01)	
Qinghai	-40.69	-2.72	-37.97	1
Shaanxi	3.34	-3.08	6.42	4
	(4.51)	(5.28)	(9.67)	
Shandong	0.37	-0.10	0.47	12
	(2.30)	(2.17)	(2.80)	
Shanghai	-0.60	0.41	-1.01	12
	(2.43)	(1.23)	(3.00)	
Shanxi	-2.26	0.25	-2.52	5
	(9.92)	(2.24)	(8.38)	
Sichuan	-1.73	0.70	-2.44	12
	(2.23)	(2.43)	(3.56)	
Tianjin	-0.01	-0.05	0.04	4
	(6.45)	(2.05)	(8.40)	
Xinjiang	2.03	-2.91	4.94	9
	(5.18)	(4.88)	(7.15)	
Yunnan	-0.68	-1.32	0.64	9
	(5.40)	(7.19)	(11.63)	
Zhejiang	0.56	0.96	-0.40	12
	(3.24)	(1.43)	(2.83)	
All Provinces	-0.84	0.20	-1.05	244
	(5.42)	(4.18)	(7.09)	

Table 10. Panel Regressions of Turnover-Return Sensitivity and GDP Per Capita Proxies

This table lists the results for regressing turnover-return sensitivity on different GDP per capita proxies. In Panel A, the dependent variable is the coefficient on lagged return from regressing small stocks' turnover on lagged return and a constant for all province-year observations. In Panel B, the dependent variable is the coefficient on lagged return from regressing big stocks' turnover on lagged return and a constant for all province-year observations. In Panel C, the dependent variable is the difference of the regression coefficients for small stocks and big stocks for all province-year observations. The independent variables are GDP PC PROXY, LATE, and the interaction term between GDP PC PROXY and LATE. In Panel A, B, and C, the GDP PC PROXY in column (1) is RANK, the GDP PC PROXY in column (2) is Ln GDP PC, the GDP PC PROXY in column (3) is RICH, and the GDP PC PROXY in column (4) is TIER. Year fixed effects are included and are not reported. Coefficients on LATE dummy are also not reported. Standard errors are clustered at the province level. T-statistics are reported under the coefficient estimate in parentheses.

Panel A: Analysis for Small Stock Turnover and Last Year Stock Return Correlation				
	(1) RANK	(2) LnGDPPC	(3) RICH	(4) TIER
GDP PC PROXY	0.010	-0.088	0.271	0.066
	(0.39)	-(0.23)	(0.53)	(0.40)
GDP PC PROXY×LATE	-0.168	2.408	1.564	-0.914
	-(2.82)	(2.76)	(1.43)	-(2.70)
Year Fixed Effects	Yes	Yes	Yes	Yes
# of OBS	244	244	244	244
Panel B: Analysis for Big Stock Turnover and Last Year Stock Return Correlation				
	(1) RANK	(2) LnGDPPC	(3) RICH	(4) TIER
GDP PC PROXY	-0.044	0.553	0.239	-0.240
	-(1.02)	(0.93)	(0.21)	-(0.82)
GDP PC PROXY×LATE	0.061	-1.062	-0.295	0.256
	(0.79)	-(1.06)	-(0.21)	(0.53)
Year Fixed Effects	Yes	Yes	Yes	Yes
# of OBS	244	244	244	244
Panel C: Analysis for SMB of Correlation of Turnover and Last Year Stock Return				
	(1) RANK	(2) LnGDPPC	(3) RICH	(4) TIER
GDP PC PROXY	0.055	-0.642	0.032	0.306
	(0.93)	-(0.80)	(0.02)	(0.77)
GDP PC PROXY×LATE	-0.229	3.471	1.858	-1.170
	-(2.04)	(2.25)	(0.94)	-(1.71)
Year Fixed Effects	Yes	Yes	Yes	Yes
# of OBS	244	244	244	244

Table 11. Performance Correlation between Public Firms and Private Firms

This table reports the correlation analysis for accounting based performance for private firms and public firms from year 2000 to 2005. Panel A reports the distribution of annual total assets (in billion yuan) of private firm sample and small public firm sample separately, by each province. # of OBS is the number of firm-year observations. Panel B reports the correlation of province median of annual performance measures between private firms and small public firms across all sample years and the cross year average. Panel C reports the correlation of annual province median of annual performance measures between private firms and big public firms across all sample years and the cross year average. Different accounting based performance meansures are calculated as the following. ROA is return on asset, which is current year s earning divided by last year s total asset. ROE is return on equity, which is current year's earning divided by last year's shareholder's equity. GSALES is sales growth rate, which is the percentage increase in sales from last year's sales. Sales is item "Total Operating Revenue" in CSMAR for public firms. GEARNINGS is earnings' growth rate, which is the percentage increase in earnings from last year's earning. Earnings is "Total Profit" in CSMAR for public firms. GASSET is annual growth rate of total assets. For each financial ratio, we use median of each province and calculate province level correlation in each year. The last row of each Panel reports the average of cross-sectional correlations. Small/big firms are the bottom/top 30% of firms sorted on last year's total market capitalization. The top 10% of the firms in our private firm sample are used in the analysis.

Panel A: Distribution of Total Asset (in Billion *Yuan*) of Private Firm Sample and Small Public Firm Sample

	Private Firms						Small Public Firms					
	Mean	St Dev	p25	p50	p75	# of	Mean	St Dev	p25	p50	p75	# of
Anhui	0.488	1.100	0.129	0.193	0.380	2092	0.947	0.365	0.707	0.882	1.150	44
Beijing	0.556	2.170	0.137	0.213	0.421	3576	0.577	0.256	0.384	0.514	0.682	38
Chongqing	0.474	1.040	0.135	0.198	0.357	1664	0.696	0.439	0.473	0.664	0.821	39
Fujian	0.384	0.778	0.127	0.174	0.314	3589	0.828	0.418	0.541	0.801	1.150	35
Gansu	0.751	1.970	0.135	0.237	0.512	887	0.736	0.171	0.581	0.732	0.869	23
Guangdong	0.396	1.100	0.131	0.188	0.333	15764	0.679	0.545	0.338	0.508	0.861	79
Guangxi	0.381	0.729	0.132	0.207	0.335	1621	1.020	0.335	0.861	1.070	1.190	25
Guizhou	0.476	0.979	0.139	0.214	0.380	1036	0.865	0.894	0.254	0.483	0.963	19
Hainan	0.373	0.790	0.127	0.194	0.376	388	0.790	0.291	0.505	0.886	0.995	17
Hebei	0.532	1.580	0.133	0.195	0.369	4136	0.887	0.184	0.743	0.859	1.070	28
Heilongjiang	0.572	1.270	0.134	0.207	0.407	1880	0.849	0.326	0.597	0.793	0.971	31
Henan	0.521	1.120	0.130	0.202	0.409	3138	0.751	0.370	0.430	0.706	0.933	19
Hubei	0.603	2.790	0.134	0.197	0.357	3303	0.999	0.592	0.548	0.805	1.470	75
Hunan	0.527	1.190	0.135	0.200	0.397	2133	0.728	0.318	0.518	0.674	0.993	36
Jiangsu	0.453	1.050	0.132	0.197	0.381	13388	0.954	0.675	0.494	0.777	1.110	63
Jiangxi	0.529	1.330	0.127	0.186	0.357	1304	0.864	0.409	0.634	0.679	1.150	23
Jilin	0.782	4.030	0.131	0.201	0.397	975	0.991	0.607	0.423	0.981	1.420	36
Liaoning	0.720	3.070	0.136	0.213	0.416	4658	0.892	0.488	0.563	0.651	1.180	42
Neimenggu	0.577	1.930	0.131	0.198	0.360	1000	1.040	0.627	0.588	1.070	1.320	10
Ningxia	0.413	0.617	0.135	0.199	0.362	426	1.110	0.568	0.660	1.020	1.350	31
Qinghai	0.511	0.995	0.140	0.195	0.333	223	0.396	0.095	0.340	0.368	0.380	6
Shaanxi	0.513	0.944	0.144	0.240	0.507	2023	0.866	0.248	0.635	0.939	1.040	19
Shandong	0.466	1.280	0.131	0.193	0.364	9989	0.923	0.407	0.601	0.946	1.210	78
Shanghai	0.494	1.820	0.133	0.198	0.356	8313	0.774	0.462	0.379	0.678	1.220	50
Shanxi	0.529	1.580	0.136	0.208	0.415	2094	0.755	0.543	0.415	0.501	0.938	6
Sichuan	0.516	1.500	0.130	0.195	0.389	3287	0.617	0.402	0.281	0.558	0.846	90
Tianjin	0.510	1.700	0.137	0.206	0.387	3360	0.796	0.006	0.793	0.794	0.799	4
Xinjiang	0.427	0.998	0.134	0.205	0.352	896	1.400	0.904	0.910	1.350	1.420	18
Yunnan	0.608	2.620	0.129	0.186	0.322	1698	0.615	0.291	0.416	0.554	0.839	27
Zhejiang	0.345	0.719	0.127	0.179	0.317	10921	0.724	0.318	0.519	0.606	0.925	35
Total	0.479	1.540	0.132	0.195	0.364	109799	0.830	0.493	0.491	0.720	1.060	109799

Panel B: Correlation for Private Firms with Small Public Firms					
Year	ROA	ROE	GSALES	GEARNINGS	GASSET
2000	-0.058	0.040	0.042	0.053	0.571
2001	0.096	-0.207	0.234	0.304	0.300
2002	0.158	0.350	-0.053	-0.257	0.112
2003	0.353	0.469	-0.270	0.054	0.149
2004	0.215	0.207	0.273	0.152	0.381
2005	0.415	0.351	0.092	0.308	0.304
Average	0.197	0.202	0.053	0.102	0.303

Panel C: Correlation for Private Firms with Big Public Firms					
Year	ROA	ROE	GSALES	GEARNINGS	GASSET
2000	-0.082	-0.058	-0.175	0.064	0.098
2001	0.171	-0.058	0.227	0.286	0.586
2002	0.315	0.275	0.194	0.554	0.307
2003	0.310	0.206	-0.419	0.411	0.284
2004	-0.039	0.102	0.310	0.151	0.031
2005	-0.070	-0.023	-0.211	0.263	0.056
Average	0.101	0.074	-0.012	0.288	0.227

Figure 1. GDP Per Capita across Different Tier Provinces in Sample Period

The horizontal axis denotes year, the vertical axis denotes the GDP per capita (in Chinese Yuan) for provinces in each Tier.