

In Search of Concepts: Returns, Trading Volume and Speculative Demand*

Owain ap Gwilym*, Iftekhar Hasan[†], Qingwei Wang[‡] and Ru Xie[§]

Abstract

Using a novel proxy of investors' speculative demand constructed from online search interest in "concept stocks", we examine how speculative demand affects the returns and trading volume of Chinese stock indices. We find that returns and trading volume increase with the contemporaneous speculative demand. In addition, the high speculative demand causes lower near future returns, while recent high past returns cause the high speculative demand. Moreover, the speculative demand explains more variation in returns and trading volume of A shares (more populated by retail investors) than B shares (less populated by retail investors). Our findings support the attention theory of Barber and Odean (2008).

Keywords: Investor Attention; Speculative Demand; Concept Stock; Market Returns; Trading Volume.

JEL Classification: G02; G12; G14

* We thank Jianhua Xie for helpful discussions. Errors and omissions remain the responsibility of the authors.

*Bangor Business School, Hen Goleg, College Road, Bangor LL57 2DG, United Kingdom. E-mail: owain.apgwilym@bangor.ac.uk

[†]Fordham University, 1790 Broadway, 11th Floor, New York, NY 10019. E-mail: ihasan@fordham.edu

[‡]Bangor Business School and Centre for European Economic Research (ZEW), Hen Goleg, College Road, Bangor LL57 2DG, United Kingdom. Tel: +44 (0) 1248 388162. E-mail: q.wang@bangor.ac.uk

[§]Bangor Business School, Hen Goleg, College Road, Bangor LL57 2DG, United Kingdom. E-mail: r.xie@bangor.ac.uk

1 Introduction

Concept stocks, prone to speculation, typically rely on certain business and investment opportunities or the emergence of a new technology. These stocks usually have high uncertain growth prospects and are difficult to value, which leaves more room for heterogeneous views and speculation. In the literature, concept stocks are related to several heated speculative episodes, including the biotechnology bubble in the 1980s and the dot-com bubble in the 1990s (Hsieh and Walkling (2006)). These authors document the history and performance of concept stocks thoroughly, revealing that concept stocks are overpriced as they underperform in the long run.

The popularity of concept stocks in Chinese stock markets in recent years is phenomenal. Populated by individual investors, the Chinese stock markets often experience frequent speculative episodes. Therefore, they are routinely mentioned in the Chinese financial press and on the internet. For example, between April 2005 and February 2006, concept stocks are mentioned 325 times in China Securities Journal, a major financial newspaper in China. Additional evidence can be seen from a search of the keywords "concept stocks" in Chinese on Google; such a search yields 57,600,000 results. A similar search on Baidu, the most popular Chinese online search engine, yields 14,000,000 relevant results. By contrast, a similar Google search on the same keyword in English yields only 116,000 results. Thus Chinese markets offer unique opportunities to better understand and investigate the impact of speculative trading on stock price dynamics and trading volume and this paper makes such attempt. This paper does not study concept stocks per se, rather, it traces investors' interest in these stocks. More specifically, the paper measures the interest in concept stocks by using investors' online queries on the keywords such as "concept stocks". Google provides a search volume index on certain keywords over a certain period relative to the total number of searches during that period. It argues that the search interest on concept stocks reflects investors' interest in speculation. This is due to the formidable search problem faced by the individual investor: among thousands of stocks, on which one(s) should he or she speculate? When speculators have short horizons, Froot, Scharfstein, and Stein (1992) show that they may herd on the same information. Therefore they will attempt to learn what other speculators also know. Arguably, "concept" or "ideas" provides ideal information for speculators to herd on, which

may explain why bubbles often start with emergence of concept stocks. When they search for such information online, the search intensity reveals the extent of their willingness to speculate.

To determine an unambiguous prediction of an increase in search intensity of concept stocks on stock returns, we need to know which price pressure it generates: buying or selling pressure. We argue that Chinese investors' search interest on concept stocks leads to buying pressure. First, the search problem is more severe when buying stocks than it is when selling stocks (Barber and Odean (2008)), implying that search activities are more likely to be related with buying interest. Investors need to select stocks from thousands of stocks when buying, but once they hold stocks, they only need to consider the subset of those stocks they hold. This is particularly true for individual investors because they hold fewer stocks and are less likely to short sell stocks. By contrast, institutional investors hold much larger stock portfolios and hence face a search problem when selling stocks too. This is the case especially when they want to short sell, since they need to search for which stocks to short sell. Second, Da, Engelberg, and Gao (2012) provide evidence that individual investors are more likely to use Google to search for information than professional investors. Barber and Odean (2008) test and confirm the hypothesis that individual investors are net buyers of attention grabbing stocks. Therefore the Google search volume index of "concept stocks" should reflect Chinese retail investors' speculative demand. Third, China has stringent short sales constraints,¹ which makes short selling unrealistic. Therefore online search of concept stocks is unlikely to reflect interest in short selling these stocks.

Using our novel proxy of investors' speculative demand, we test whether it affects the returns and trading volume of Chinese stock indices. More concretely, we test the following hypotheses related to the "theory of attention" in Barber and Odean (2008): when the speculative demand is high, 1) contemporaneous returns are high due to price pressure, which drives up current price and returns; 2) future returns are lower. The rise of the current price is only temporary. When the mispricing is corrected, future returns decline as the price falls; 3) contemporaneous trading volume is high, as the increased speculative demand initiates additional trades. Moreover, we hypothesize that 4) the search interest in concept stocks plays a stronger role for returns and trading volume of

¹On March 31, 2010, the China Securities Regulatory Commission (CSRC) permitted short selling of 90 securities by six pilot securities dealers for the first time. However, the short sales activity remains negligible (Sharif, Anderson, and Marshall (2011)).

Chinese A Shares indices than B Shares indices. This is due to the fact that A share markets are more populated by domestic individual investors than are B share markets, which have foreign institutional investors as their main market participants.

We find that returns and trading volume increase with the contemporaneous speculative demand. In addition, the high speculative demand causes lower near future returns while recent high past returns cause the high speculative demand. Moreover, the speculative demand explains more variation in returns and trading volume of A shares (dominated by retail investors) than B shares (dominated by institutional investors). Our results are robust to different measures of the speculative demand, outliers and nonlinearities. Inclusion of additional controls such as moments of past returns, lagged trading volume and macroeconomic variables does not change our results. Therefore, our results provide strong support to the attention theory of Barber and Odean (2008).

Measuring the speculative demand by search volume index adds our paper to a growing body of literature on the role of investor attention/information demand measured on asset markets. In an information abundant environment such as financial markets, attention constrained investors have to allocate attention across different assets before portfolio selection. Recent theoretical studies show that limited attention affects asset price dynamics such as stock market volatility (Andrei and Hasler (2011)), return comovement, and return predictability (Peng and Xiong (2006)). Empirically testing the theory of attention calls for a proxy of investor attention. Traditional measures include media coverage, extreme price movement, or advertising expense. Unlike these indirect proxies of investors' passive attention, Da et al. (2012) propose a direct measure of investors' active attention: the search intensity on certain assets through Google. Since their seminal paper, a growing literature revisits the relationship between investor attention and asset prices.² This literature examines the effect of search on either individual stocks or stock indices. Unlike them, we restrict our attention to concept stocks only.

To date, academic research on concept stocks are rare. The work of Hsieh and Walkling (2006) is

²This strand of literature examines the usefulness of Google search volume index in explaining asset market phenomena such as stock prices around earning announcements (Drake, Roulstone, and Thornock (2011)), liquidity and returns (Bank, Larch, and Peter (2011) and Ding and Hou (2011)), predicting a firm's future cash flow (Da, Engelberg, and Gao (2010)), biased attention towards local stocks (Mondria and Wu (2012)), and stock market volatilities (Vlastakis and Markellos (2012)).

a notable exception. The authors study the history and performance of concept stocks and show that concept stocks are overpriced.³ Along the same line, we trace investors' interest in concept stocks and how this interest affects asset price and trading volume dynamics. To our knowledge, this has not yet been considered in the existing literature.

Mei, Scheinkman, and Xiong (2009) examine how speculative trading affects stock prices in Chinese stock markets. Using trading volume as a measure of speculative trading, they find it explains a sizable fraction of Chinese A-B share premia. In our paper, we use the investors' online search interest as a novel proxy for investor's speculative demand. We examine whether it affects aggregate market returns and trading volumes in the Chinese stock market. Our finding of the positive relationship between trading volume and the speculative demand supports the use of trading volume as a measure of speculative trading in Chinese stock markets. Since our sample includes the Chinese stock bubble of 2007, our results provide additional evidence on the role of the speculative demand in explaining the returns and trading volume during bubbles and crashes.

The remainder of the paper is organized as follows. Section 2 describes and summarizes our data set. Our empirical results are provided in Section 3. Section 4 concludes. We provide some additional results in an appendix.

2 Data

2.1 Search Volume Index

Google Insights provides a Search Volume Index computed as the portion of worldwide Google web search on certain keywords over a certain period relative to the total number of searches using Google during that period. These numbers are firstly normalized and then scaled from 0 to 100 in order to make them comparable across regions. We download weekly data spanning from

³Shanghai Maling is an often cited example of overpriced concept stocks in China (see Figure 1). The company produces canned food for urban area markets. In June 1998 Shanghai Maling set up a web site for selling its own products, and was subsequently labeled as a internet concept stock. While its main business remained the same, the company's share price soared up from 149.96 on December 30, 1999 to 552.7 on February 18, 2000 before tumbling 46 percent to its trough four months later.

10/01/2004 to 24/12/2011 for a total of 416 weekly observations.

The phrase we use in Google Insights is “concept stocks” (in Chinese).⁴ It reflects investors’ interest in concept stocks in Mainland China. We consider two measures of investor attention based on the Google search volume index. The first one is the weekly change in the search volume index. We call this measure “Concept_stock_change”. The second measure is obtained as residuals from a linear regression of the original search volume index on its own first lag in order to remove the persistency of the original series. We call this measure “Concept_stock_innovation”. In the empirical analysis we report our results with both measures.

Table I contains the summary statistics of our speculative demand variables. It can be seen that they have substantial time variations and leptokurtosis. The large standard deviation could raise concern of biased estimation due to outliers, and we address this with median regressions, which are known to be robust to outliers.

[Insert Table I about here]

One important question relating to our attention variables is whether they have unit roots. For that purpose we conduct three unit root tests *without* a trend component: the Augmented Dickey-Fuller test, the Phillips-Perron test, and the Dickey-Fuller-GLS test. Dickey-Fuller-GLS test performs a modified Dickey-Fuller t test for a unit root in which the series has been transformed by a generalized least-squares regression. The results are reported in Table II. All tests reject the existence of a unit root at the 1% level for both measures of speculative demand.

[Insert Table II about here]

⁴We considered search volume indexes of several other phrases, such as “recommended stock”, “bullish stock” (a phrase often mentioned in the Chinese financial media/internet), “value stock” and “growth stock”. We find that they have much weaker relationship with returns and trading volume, and they do not affect the influence of “concept stocks”.

2.2 The Chinese Stock Market

The early 1990s saw the establishment of two domestic stock exchanges, the Shanghai stock exchange and the Shenzhen stock exchange. The market has been growing very fast since then. In 2009, Chinese stock market exceeded US\$3.21 Trillion, overtaking Japan by market capitalization as the second largest stock market in the world. At the end of 2010, China had 2062 listed companies, and the number of stock investors reached 130 million from 4 million in 1991.

Both exchanges issue A shares and B shares. A shares are specialized shares denominated in Renminbi. They can only be traded by Chinese citizens, except those foreign nationals who have acquired a QFII (Qualified Foreign Institutional Investor) quota. In contrast, B shares were initially available exclusively for foreign investors and are traded in foreign currencies. Since 2001, B shares can be held partially by Chinese domestic investors, though they can only trade after having foreign currency accounts, which limits the participation of domestic investors. Companies listed in the Shanghai stock exchange are dominated by state-owned enterprises while many companies listed in the Shenzhen stock exchange are joint ventures. To allow for the growth of small to medium companies, Shenzhen Stock Exchange also introduced small and medium enterprises Board in May 2004. Started with 8 listed companies at its establishment, SME board had 646 listed companies in 2011.

2.3 Descriptive Statistics of Weekly Returns and Trading volume

We collect data on stock indices and trading volume from Bloomberg. The sample period for both A Shares and B shares spans from 10/01/2004 to 24/12/2011. The data on the stock index and trading volume of Shenzhen SME, however, are only available from 01/12/2005. Due to the Golden week holidays (the annual 7-day national holidays) in China, our final sample consists of 387 weekly observations for both A Shares and B shares, and 294 weekly observations for Shenzhen SME. We report the descriptive statistics of weekly returns and trading volume for five Chinese stock indices in Table III. It shows that returns display high volatility and some degree of excess kurtosis during our sample periods. The trading volume in Panel B is in millions of shares. Its descriptive statistics differ substantially across indices, and all of them have positive skewness.

[Insert Table III about here]

3 Empirical Results

3.1 Returns, Volume and the Speculative Demand: a First Look

Before the regression analysis, we take a first look at how returns and trading volume are related to the speculative demand. We plot the time series of returns and trading volume of Shanghai A share indices together with the Google's search volume index on the phrase "concept stocks".

[Insert Figure 2 about here]

Figure 2 shows the strong correlation of the speculative demand with both returns and trading volume of Shanghai A share indices. A similar pattern can be found in the plot for Shenzhen A share indices in Figure 3.

We also examine returns and trading volume in periods of high speculative demand and low speculative demand. More specifically, for each measure of the speculative demand, we split our sample into periods of high speculative demand and periods of low speculative demand, where we define periods of high (low) speculative demand as the periods during which the speculative demand is higher (lower) than the median speculative demand over the whole sample period. We then calculate the average returns and trading volume for each stock index in both periods. We do the same for the original level of the speculative demand too.

[Insert Table IV about here]

Table IV contains these results. It shows substantial (mostly about twice to three times in absolute value) higher average returns in periods of high speculative demand and trading volume than those

of low speculative demand periods. In particular, returns in the high speculative demand periods are positive, while returns in the low speculative demand periods are negative. In addition, trading volume in the periods of high speculative demand is about double that in the low speculative demand periods.

We also estimate the conditional volatility using GARCH (1, 1) on weekly returns, and compare its magnitude in periods of high speculative demand and low speculative demand. Although conditional volatility appears higher in periods of high speculative demand, its magnitudes are smaller compared to returns and trading volume. In regression analysis of conditional volatility on the speculative demand (results not tabulated), we find that the coefficients of the speculative demand are usually positive, but insignificant.

3.2 Regression Analysis

We now turn to regression analysis of returns and trading volume on the speculative demand. We start with univariate regressions (in addition to a constant) in order to investigate how much variation in returns and trading volume can be explained by the speculative demand alone. We then proceed to multivariate regressions to control for other variables, such as the moments of past returns and macroeconomic variables.

3.2.1 Contemporaneous Regressions of Returns on the Speculative Demand

Table V reports univariate regressions of weekly returns on the speculative demand measured by Google search volume index of concept stocks. In parentheses, we report the Newey-West standard errors to control for potential serial correlation in residuals. Panel A demonstrates that the coefficients on the change in the speculative demand are positive and statistically significant at the 1% level for all five stock indices. The adjusted R-squared ranges from 2% to 6%. Moreover, adjusted R-squared for A share indices are double than those for B shares, suggesting that the speculative demand explains returns of the A share index substantially better than returns of the B share index. This is not surprising since A share is dominated by individual investors, while in the B share markets foreign institutional investors are the main market participants. Individual

investors are more likely to use Google to search for information. We therefore expect that speculative demand plays a more important role in A shares than in B shares. Results on the speculative demand in Panel B are very similar to those in Panel A, suggesting that the positive relationship between returns and the speculative demand does not hinge upon our particular measure of the speculative demand.

[Insert Table V about here]

Mei et al. (2009) examine how speculative trading affects stock prices in Chinese stock markets. Using trading volume as a measure of speculative trading, they find it explains a sizable fraction of Chinese A-B share premia. To investigate whether our measure of the speculative demand has incremental explanatory power for returns, we add the change or innovation of contemporaneous trading volume to our regression models (results not tabulated). While the model fit increases (adjusted R-squared values increase to 10-18%), the role of the speculative demand measured by change or innovation of search volume of concept stock remains the same.

In multivariate regressions, we additionally consider the effects of past price dynamics and trading volume on returns. We include the mean, volatility, skewness and kurtosis of the daily returns during the past month. Since trading volume is highly persistent, we run an AR(1) regression and retain the residual as our measure of trading volume innovation. We then include the trading volume innovation of the past month in our regressions to avoid endogeneity in the returns and trading volume.

Table VI reports the multivariate regression results. Similar to the univariate regressions, we find that the coefficients of the change of the speculative demand are positive and statistically significant at the 1% level for all five stock indices. In addition, the size of these coefficients are also similar to those in Table V. Panel B shows that the coefficients of innovation in the speculative demand are also similar to those in Panel B of Table V. Most coefficients of other regressors in both panels of Table VI are insignificant, although there is some evidence that the skewness of returns in the past month is negatively related to the current returns. There is a minor increase in the adjusted

R-squared values in the multivariate regressions compared with those in univariate regressions. In summary, the multivariate regressions confirm the role of the speculative demand in explaining contemporaneous returns while other regressors explain little of the variation.

[Insert Table VI about here]

In addition to weekly regressions, we examine whether our results sustain in monthly regressions. Table VII and VIII report monthly univariate and multivariate regressions respectively. Both tables show that the speculative demand is usually positively related to contemporaneous monthly returns. The statistical significance becomes substantially weaker, however. The coefficients of speculative demand for Shenzhen A shares and Shenzhen SME shares remain significant at the 10% significance level in most of the monthly regressions.

[Insert Table VII about here]

[Insert Table VIII about here]

Another robustness check is to examine the effect of outliers and nonlinearities. We run median regressions for the same model specifications. Median regression is well known for its robustness to nonlinearities and outliers. Table XVIII in the Appendix shows that all coefficients on measures of the speculative demand remain positive and significant for all indices.

3.2.2 VAR and Causality

Although we find that the speculative demand is significantly related to contemporaneous returns, this finding is open to the possibility that both variables can be jointly determined. In addition,

it cannot answer the question on causal effects between these variables. It can well be that an increase in returns inspires investors, thus raising their subsequent speculative demand.

We run Vector Autoregressive Regressions (VAR) to examine this question. More concretely, we estimate a VAR(2) model with the following specification:

$$\begin{aligned}
 SVI_t &= \beta_0 + \beta_1 Return_{t-1} + \beta_2 Return_{t-2} + \beta_3 SVI_{t-1} + \beta_4 SVI_{t-2} + \eta_{1,t} \\
 Return_t &= \lambda_0 + \lambda_1 SVI_{t-1} + \lambda_2 SVI_{t-2} + \lambda_3 Return_{t-1} + \lambda_4 Return_{t-2} + \eta_{2,t}
 \end{aligned}$$

[Insert Table IX about here]

where “SVI” refers to our measures of the speculative demand (“concept_stock_change” and “concept_stock_innovation”).

Table IX reports the results. Across all stock indices in both Panel A and Panel B, the first two lags of the speculative demand measures are negatively related to current returns. The second lags of both the speculative demand measures are significant for Shanghai A, Shenzhen A and Shenzhen SME shares, but are insignificant for both Shanghai B and Shenzhen B shares. Furthermore, the coefficients of the speculative demand measures of two A shares indices are much larger than those of two B share indices, indicating substantial difference in their economic significance. This result confirms our prediction that concept stock plays a more important role in the A shares market than in the B shares market since the former is dominated by retail investors while the latter is dominated by institutional investors.

Our results from contemporaneous regressions suggest that an increase of the speculative demand generates price pressure to drive the current price up and leads to higher current returns. This is however only short-lived. The negative relationship between the past speculative demand in Table IX shows that the overpricing is subsequently corrected, resulting in lower future returns in the near-term future.

Table IX also reveals that the first lag of past returns is always positive related to current measures of the speculative demand, which are significant at the 1% level for both A share indices, but less significant for both B share indices. Moreover, the coefficients of these past returns of A shares are also larger than those of B shares. Therefore, past returns have a stronger effect on the speculative demand in A shares markets than in B shares markets. The increase of the speculative demand due to higher past returns is consistent with irrational exuberance as described in Shiller (2005): “Investors, their confidence and expectations buoyed by past price increases, bid up speculative prices further, thereby enticing more investors to do the same, so that the cycle repeats again and again, ...”.

Although not reported, we also estimate a VAR(2) of the speculative demand and returns, which includes returns, volatility, skewness, kurtosis of last month daily returns and innovations of last month trading volume as exogenous variables. Our results are not affected. Including additional lags of endogenous variables does not change our findings either.

3.2.3 Contemporaneous Regressions of Trading Volume on the Speculative Demand

As mentioned in the previous section, trading volume and turnover are both persistent. To avoid persistency in the data, we filter both variables with an AR(1) process, and use the residual as a measure of innovation in trading volume or turnover. We test the stationarity of these measures, and find unit roots are rejected at the 1% significance level.

Table X reports univariate contemporaneous regressions of weekly trading volume on the measures of speculative demand. Both measures of the speculative demand are significantly and positively correlated with contemporaneous trading volume for Shanghai A, Shenzhen A and Shenzhen SME shares. By contrast, the coefficients of the speculative demand for both Shanghai B shares and Shenzhen B shares are insignificant, and their size is also much smaller compared to those for Shanghai A, Shenzhen A and Shenzhen SME shares. This lends support to our prediction that the speculative demand plays a stronger role in explaining the trading activities in A shares than B shares.

[Insert Table X about here]

Controlling for the moments of past returns and past trading volume does not change the influence of the speculative demand on trading volume. Indeed, Table XI shows that both measures of the speculative demand are significant (at the 1% level) and positive for Shanghai A shares, Shenzhen B shares and Shenzhen SME. In contrast, they are insignificant for both Shanghai B shares and Shenzhen B shares. There is some indication of persistence remaining in the innovation of trading volume as indicated by the coefficients on innovation of past trading volume, yet it seems rather mild. We also use Newey-West standard errors to account for potential serial correlation in residuals.

[Insert Table XI about here]

We run similar univariate and multivariate regressions of trading volume on the speculative demand at the monthly frequency and report the results in Table XII and Table XIII. We find positive coefficients on the speculative demand variables for all stock indices, which are significant at the 1% level. The speculative demand alone (in addition to a constant) explains on average about 20% of the variation in innovations of trading volume for A share markets, and about 15% of the variation for B shares. Although the size of those coefficients for the Shanghai B shares becomes slightly larger than those in the Shanghai A shares, their ability in explaining variations in innovation of returns remain lower than those in the Shanghai A shares. Both the coefficients and their statistical significance of speculative demand are smaller in the Shenzhen B shares than those in the Shenzhen A shares. Controlling for the moments of past returns and past trading volume does not change the positive influence of the speculative demand on trading volume.

[Insert Table XII about here]

[Insert Table XIII about here]

Instead of using trading volume for measuring trading activities, we use turnover as an alternative dependent variable. These results are reported in Table XVI and Table XVII in the Appendix. Employing turnover as the dependent variable does not affect the role of the speculative demand in explaining trading activities in those markets.

3.2.4 Controlling for Macroeconomic Variables

Expected returns are linked to macroeconomic variables or variables that forecast macroeconomic events (Cochrane (2001)). To disentangle effects of macroeconomic variables from the speculative demand on returns (and possibly trading volume), we include the GDP growth, the inflation rate (CPI) and the money supply (M2) in our regressions.⁵

Table XIV reports the multivariate weekly regressions of contemporaneous returns on the measure of speculative demand, the first four moments of the daily returns of the past month, the lagged trading volume, and lagged macroeconomic variables. In all regressions, the speculative demand is significantly and positively correlated with contemporaneous market returns, even after controlling for the moments of past returns, the lagged trading volume, and lagged macroeconomic variables. CPI is the only macroeconomic variable that is significantly related to returns. A higher inflation rate is associated with lower contemporaneous and next month returns on all stock indices.

[Insert Table XIV about here]

We also run regressions of weekly trading volume on the speculative demand, the first four moments of past month daily returns, and lagged macroeconomic variables. Table XV shows that our results on the role of the speculative demand are unaffected by the inclusion of lagged macroeconomic

⁵Data on quarterly GDP growth and monthly CPI are provided by National Bureau of Statistics, China and data on monthly M2 are provided by People's Bank of China. We collect information on these macroeconomic variables from Datastream.

variables. In fact, lagged macroeconomic variables are not significantly related to the weekly trading volume in most of the regressions.

[Insert Table XV about here]

Instead of lagged macroeconomic variables, we include contemporaneous macroeconomic variables in our regressions. Our results on the influence of speculative demand on trading volume do not change.

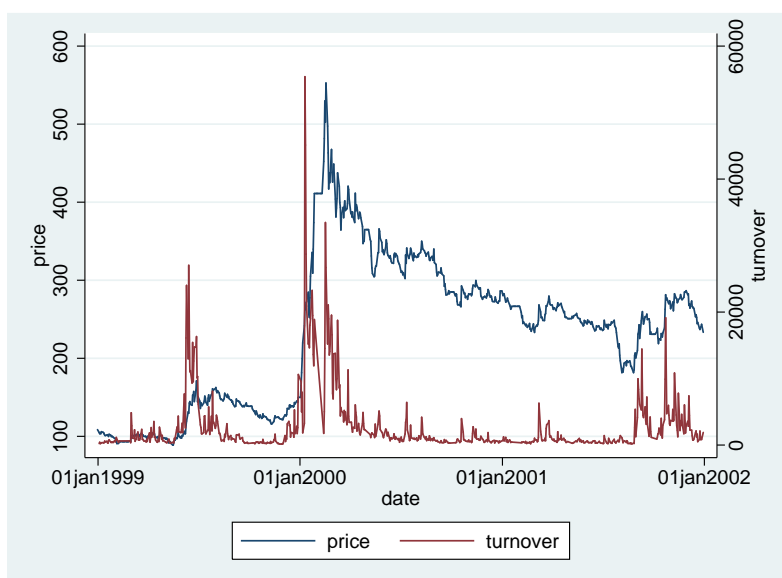
4 Conclusion

We construct a novel proxy of Chinese retail investors' speculative demand from online search interest in "concept stocks", a class of stocks which are particularly prone to speculation. We examine how the speculative demand affects the returns and trading volume of Chinese stock indices from January 2004 to December 2011. We find that: 1) returns and trading volume increase with the contemporaneous speculative demand; 2) the high speculative demand causes lower near future returns while recent high past returns cause the high speculative demand; 3) the speculative demand explains more variation in returns and trading volume of A shares (dominated by retail investors) than B shares (dominated by institutional investors). Our findings support the attention theory of Barber and Odean (2008).

Since our sample includes the Chinese stock bubble of 2007 and its subsequent crash, our results also provide additional evidence on the role of the speculative demand in explaining the returns and volumes during bubbles and busts.

5 Tables and Figures

Figure 1
Price and Trading Volume of Shanghai Maling



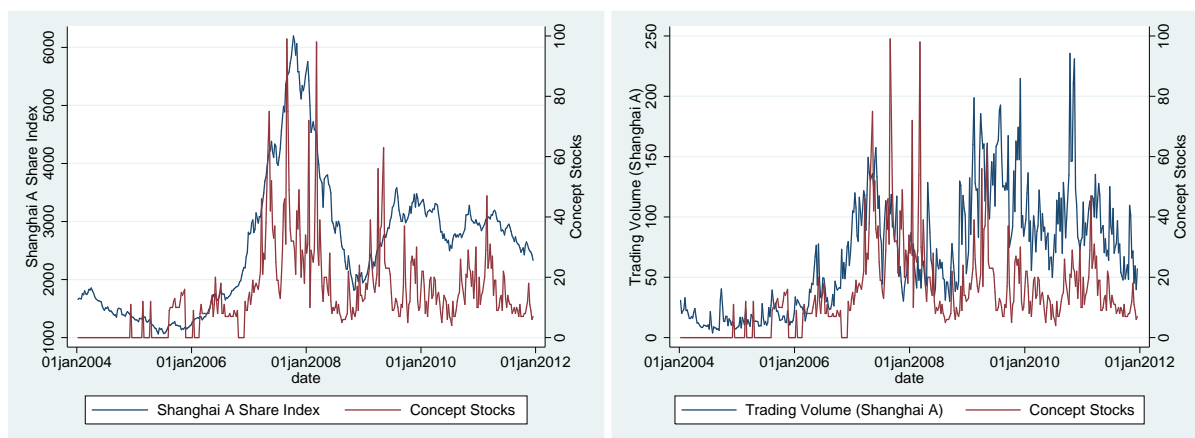
Note: The figure shows the stock price and turnover by volume of Shanghai Maling, a canned food producer for urban area, for the period of Jan 1999 to Dec. 2001.

Table I
Summary Statistics of Attention Variables

This table presents the summary statistics of attention variables. The sample spans from 10/01/2004 to 24/12/2011. “Concept stocks” is the search volume index from a search of the phrase “concept stocks” in Chinese on Google. “Concept_stock_change” is the weekly change in the search volume index. “Concept_stock_innovation” is the residual from a linear regression of the original search volume index on its own first lag in order to remove the persistency of the original series.

	Mean	Std. Dev.	Min.	Max.	Skewness	Kurtosis
Concept_stock	13.89	14.27	0.00	99.00	2.22	10.94
Concept_stock_change	0.02	10.35	-68.00	68.00	-0.43	17.44
Concept_stock_innovation	-0.00	9.64	-46.71	72.49	1.83	17.76

Figure 2
Shanghai A Share Index and Online Search Interest in Concept Stocks

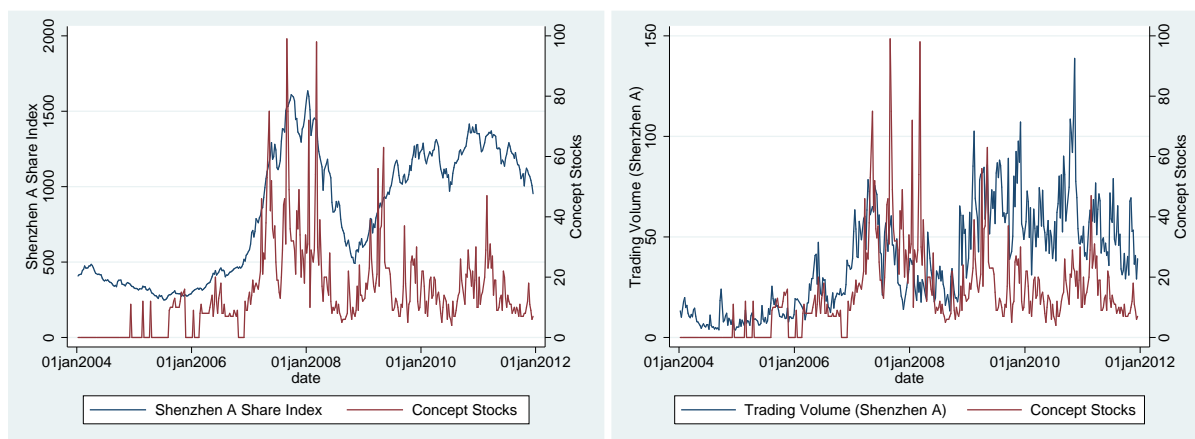


(a) Returns to Shanghai A Shares

(b) Trading Volume of Shanghai A Shares

Note: The figure presents the weekly returns and trading volume of Shanghai A share stock indices and search volume index of the key words “concept stocks” provided by Google Insights. The trading volume is in millions of shares. The sample period spans from 10/01/2004 to 24/12/2011.

Figure 3
Shenzhen A Share Index and Online Search Interest in Concept Stocks



(a) Returns to Shenzhen A Shares

(b) Trading Volume of Shenzhen A Shares

Note: The figure presents the weekly returns and trading volume of Shenzhen A share stock indices and search volume index of the key words “concept stocks” provided by Google Insights. The trading volume is in millions of shares. The sample period spans from 10/01/2004 to 24/12/2011.

Table II
Unit Root Tests of Speculative Demand

This table presents the results from unit root tests. Dickey-Fuller-GLS performs a modified Dickey-Fuller t test for a unit root in which the series has been transformed by a generalized least-squares regression. The sample spans from 10/01/2004 to 24/12/2011. ***, **, * indicate significance at the 1%, 5%, and 10% levels.

	Augmented Dickey-Fuller	Phillips-Perron	Dickey-Fuller-GLS
Concept_stock_change	-25.15***	-24.65***	-25.39***
Concept_stock_innovation	-30.36***	-35.48***	-30.39***

Table III
Summary Statistics of Weekly Returns and Trading Volume

This table presents the summary statistics of weekly returns and trading volume. The sample spans from 10/01/2004 to 24/12/2011.

	Mean	Std. Dev.	Min.	Max.	Skewness	Kurtosis
<i>Panel A: Weekly Return</i>						
Shanghai A	0.09	3.93	-14.92	13.93	0.03	4.35
Shanghai B	0.17	5.27	-18.17	29.19	0.45	6.80
Shenzhen A	0.22	4.45	-16.66	15.54	-0.26	4.16
Shenzhen B	0.17	4.47	-15.99	19.90	-0.02	4.55
Shenzhen SME	0.45	4.83	-16.49	17.71	-0.25	4.05
<i>Panel B: Weekly Trading Volume</i>						
Shanghai A	345.95	240.73	25.30	1034.94	0.58	2.56
Shanghai B	312.82	333.04	28.47	3316.80	4.60	34.09
Shenzhen A	189.74	129.53	14.99	588.31	0.56	2.43
Shenzhen B	3.37	2.41	0.42	17.52	2.07	9.40
Shenzhen SME	33.36	35.47	0.00	147.46	0.86	2.62

Table IV
Return, Volatility and Trading Volume in High and Low Speculative Demand Periods

This table presents the summary statistics of one week return (in percentage), conditional volatility (estimated from GARCH(1,1)) and trading volume (in millions) during high and low speculative demand periods. The time period is from 10/01/2004 to 24/12/2011.

	Shanghai A	Shanghai B	Shenzhen A	Shenzhen B	Shenzhen SME
<i>Panel A: Level of speculative demand</i>					
One week return					
Low	-0.52	-0.59	-0.52	-0.34	-0.49
High	0.77	1.02	1.06	0.74	1.11
Conditional volatility					
Low	13.43	25.95	17.02	19.82	23.03
High	18.17	33.94	23.20	19.84	24.26
Trading Volume					
Low	220.15	200.47	125.97	2.55	22.11
High	489.13	440.69	262.31	4.32	46.17
<i>Panel B: Change of speculative demand</i>					
One week return					
Low	-0.89	-0.86	-1.10	-0.44	-1.44
High	1.07	1.20	1.54	0.78	1.68
Conditional volatility					
Low	14.31	28.47	18.18	20.04	23.58
High	16.99	30.92	21.65	19.63	23.63
Trading Volume					
Low	250.73	250.12	139.10	2.86	23.10
High	442.32	375.14	241.08	3.89	43.80
<i>Panel C: Innovation in speculative demand</i>					
One week return					
Low	-0.64	-0.48	-0.70	-0.23	-0.66
High	1.38	1.32	1.85	0.87	1.88
Conditional volatility					
Low	14.84	28.96	18.90	19.93	23.38
High	17.09	30.99	21.72	19.66	24.00
Trading Volume					
Low	287.08	275.13	157.87	3.12	26.46
High	452.15	379.27	247.34	3.82	45.87

Table V
Univariate Regression of Contemporaneous Returns on Speculative Demand

Note: This table reports univariate regressions of weekly returns on speculative demand measured by Google search volume index of concept stocks. The sample period is from 10/01/2004 to 24/12/2011. Newey-West standard errors are in parentheses.

Significance levels : * : 10% ** : 5% *** : 1%

	Shanghai A	Shanghai B	Shenzhen A	Shenzhen B	Shenzhen SME
<i>Panel A: Change of speculative demand</i>					
	sse_a	sse_b	sz_a	sz_b	sz_sme
Concept_stock_change	0.089*** (0.021)	0.075*** (0.027)	0.104*** (0.024)	0.067*** (0.023)	0.097*** (0.022)
Constant	0.087 (0.207)	0.166 (0.289)	0.218 (0.237)	0.165 (0.238)	0.445 (0.289)
Adj. R-squared	0.05	0.02	0.06	0.02	0.05
N	386	386	386	386	293
<i>Panel B: Innovation of speculative demand</i>					
Concept_stock_innovation	0.096*** (0.024)	0.099*** (0.034)	0.117*** (0.028)	0.075*** (0.029)	0.105*** (0.026)
Constant	0.088 (0.206)	0.167 (0.285)	0.220 (0.235)	0.167 (0.236)	0.343 (0.292)
Adj. R-squared	0.05	0.03	0.06	0.02	0.05
N	386	386	386	386	293

Table VI
Contemporaneous Returns and Speculative Demand

Note: This table reports contemporaneous regressions of weekly returns on speculative demand measured by Google search volume index of concept stocks. The sample period is from 10/01/2004 to 24/12/2011. Newey-West standard errors are in parentheses.
Significance levels : * : 10% ** : 5% *** : 1%

	Shanghai A	Shanghai B	Shenzhen A	Shenzhen B	Shenzhen SME
<i>Panel A: Change of speculative demand</i>					
Concept_stock_change	0.088*** (0.021)	0.076*** (0.027)	0.101*** (0.025)	0.065*** (0.023)	0.093*** (0.022)
L.retmean_30	0.795 (0.620)	0.944 (0.725)	0.672 (0.629)	0.988 (0.691)	0.450 (0.681)
L.retvar_30	-0.074 (0.084)	-0.050 (0.068)	-0.021 (0.087)	-0.021 (0.092)	0.056 (0.085)
L.retskew_30	-0.385 (0.281)	-0.342 (0.298)	-0.849** (0.379)	-0.312 (0.286)	-1.922** (0.771)
L.retkurt_30	-0.108 (0.144)	-0.037 (0.130)	-0.292 (0.193)	0.061 (0.123)	-0.558* (0.322)
L.turnover_res	0.002 (0.002)	0.308 (2.575)	0.003 (0.003)	0.672*** (0.223)	0.013 (0.010)
Constant	0.634 (0.560)	0.439 (0.685)	1.019 (0.718)	-0.136 (0.597)	1.073 (0.982)
Adj. R-squared	0.07	0.02	0.08	0.04	0.07
N	385	385	385	385	287
<i>Panel B: Innovation of speculative demand</i>					
Concept_stock_innovation	0.093*** (0.025)	0.097*** (0.032)	0.108*** (0.028)	0.067** (0.028)	0.099*** (0.025)
L.retmean_30	0.544 (0.638)	0.732 (0.711)	0.387 (0.636)	0.835 (0.685)	0.247 (0.694)
L.retvar_30	-0.119 (0.087)	-0.068 (0.068)	-0.066 (0.091)	-0.051 (0.095)	0.046 (0.087)
L.retskew_30	-0.243 (0.282)	-0.248 (0.292)	-0.700* (0.377)	-0.244 (0.284)	-1.882** (0.773)
L.retkurt_30	-0.114 (0.145)	-0.020 (0.131)	-0.282 (0.192)	0.060 (0.124)	-0.580* (0.325)
L.turnover_res	0.002 (0.002)	0.032 (2.518)	0.003 (0.003)	0.631*** (0.235)	0.013 (0.010)
Constant	0.830 (0.573)	0.479 (0.682)	1.218* (0.718)	-0.002 (0.597)	1.135 (0.997)
Adj. R-squared	0.06	0.03	0.07	0.04	0.07
N	385	385	385	385	287

Table VII
Univariate Monthly Regression of Contemporaneous Returns on Speculative Demand

Note: This table reports univariate regressions of month returns on speculative demand measured by Google search volume index of concept stocks. The sample period is from 10/01/2004 to 24/12/2011. Newey-West standard errors are in parentheses.

Significance levels : * : 10% ** : 5% *** : 1%

	Shanghai A	Shanghai B	Shenzhen A	Shenzhen B	Shenzhen SME
<i>Panel A: Change of speculative demand</i>					
Concept_stock_change	0.018 (0.026)	0.007 (0.022)	0.045* (0.025)	-0.002 (0.019)	0.045* (0.024)
Constant	0.349 (1.060)	0.665 (1.363)	0.851 (1.156)	0.666 (1.187)	1.810 (1.326)
Adj. R-squared	-0.00	-0.01	0.02	-0.01	0.02
N	95	95	95	95	73
<i>Panel B: Innovation of speculative demand</i>					
Concept_stock_innovation	0.026 (0.034)	0.024 (0.031)	0.058* (0.030)	0.005 (0.024)	0.048* (0.027)
Constant	0.353 (1.051)	0.667 (1.342)	0.862 (1.131)	0.666 (1.181)	1.602 (1.354)
Adj. R-squared	0.00	-0.01	0.03	-0.01	0.02
N	95	95	95	95	73

Table VIII
Multivariate Monthly Regressions of Contemporaneous Returns on Speculative Demand

Note: This table reports multivariate monthly regressions of contemporaneous returns on speculative demand measured by Google search volume index of concept stocks. The sample period is from 10/01/2004 to 24/12/2011. Newey-West standard errors are in parentheses. Significance levels: * : 10% ** : 5% *** : 1%

	Shanghai A	Shanghai B	Shenzhen A	Shenzhen B	Shenzhen SME
<i>Panel A: Change of speculative demand</i>					
Concept_stock_change	0.021 (0.032)	0.005 (0.024)	0.063* (0.033)	0.006 (0.020)	0.051* (0.028)
L.retmean_30	6.756** (2.758)	5.945* (3.436)	4.747 (2.968)	4.720 (2.863)	3.134 (2.982)
L.retvar_30	0.145 (0.505)	0.323 (0.299)	-0.073 (0.482)	0.313 (0.345)	-0.361 (0.534)
L.retskew_30	-0.153 (1.338)	-1.422 (1.800)	-0.219 (1.705)	-0.669 (1.309)	-0.257 (2.494)
L.retkurt_30	-0.075 (0.540)	0.795 (0.698)	0.678 (0.612)	0.964** (0.436)	0.328 (0.781)
L.vol_res_m	-0.000 (0.002)	-0.001 (0.003)	0.005 (0.003)	0.160 (0.143)	0.007 (0.012)
Constant	-0.075 (2.087)	-4.941 (3.738)	-1.638 (2.292)	-4.879* (2.521)	1.880 (2.993)
Adj. R-squared	0.02	0.01	0.07	0.04	-0.01
N	94	94	94	94	70
<i>Panel B: Innovation of speculative demand</i>					
Concept_stock_innovation	0.022 (0.038)	0.010 (0.032)	0.072* (0.038)	0.003 (0.023)	0.055 (0.034)
L.retmean_30	6.550** (2.804)	5.846* (3.456)	4.171 (2.937)	4.744* (2.852)	2.858 (2.912)
L.retvar_30	0.095 (0.524)	0.311 (0.306)	-0.224 (0.493)	0.311 (0.347)	-0.418 (0.545)
L.retskew_30	0.036 (1.271)	-1.383 (1.807)	0.420 (1.756)	-0.644 (1.315)	0.135 (2.569)
L.retkurt_30	-0.083 (0.538)	0.799 (0.707)	0.715 (0.592)	0.967** (0.442)	0.348 (0.782)
L.vol_res_m	-0.000 (0.002)	-0.001 (0.003)	0.004 (0.003)	0.150 (0.138)	0.006 (0.012)
Constant	0.149 (2.149)	-4.889 (3.668)	-0.948 (2.257)	-4.878* (2.474)	2.046 (3.013)
Adj. R-squared	0.02	0.01	0.07	0.04	-0.01
N	94	94	94	94	70

Table IX
VAR of Returns and Speculative Demand

Note: This table reports regressions of VAR of returns and speculative demand. The sample period is from 10/01/2004 to 24/12/2011.
Significance levels : * : 10% ** : 5% *** : 1%

	Shanghai A	Shanghai B	Shenzhen A	Shenzhen B	Shenzhen SME
<i>Panel A: Change of speculative demand</i>					
return_1					
L.return_1	0.050 (0.052)	0.139*** (0.052)	0.098* (0.052)	0.074 (0.052)	0.063 (0.060)
L2.return_1	0.173*** (0.052)	0.003 (0.051)	0.124** (0.053)	0.033 (0.052)	0.123** (0.060)
L.Concept_stock_change	-0.028 (0.021)	0.024 (0.028)	-0.025 (0.024)	-0.028 (0.024)	-0.013 (0.027)
L2.Concept_stock_change	-0.054** (0.021)	-0.016 (0.028)	-0.052** (0.024)	-0.017 (0.024)	-0.059** (0.027)
Constant	0.066 (0.197)	0.140 (0.266)	0.162 (0.225)	0.146 (0.228)	0.364 (0.282)
Concept_stock_change					
L.return_1	0.383*** (0.125)	0.130 (0.094)	0.366*** (0.110)	0.223** (0.108)	0.346*** (0.132)
L2.return_1	0.139 (0.125)	0.039 (0.093)	0.178 (0.111)	-0.102 (0.109)	0.203 (0.132)
L.Concept_stock_change	-0.485*** (0.051)	-0.454*** (0.050)	-0.495*** (0.051)	-0.451*** (0.050)	-0.491*** (0.059)
L2.Concept_stock_change	-0.261*** (0.051)	-0.246*** (0.050)	-0.273*** (0.051)	-0.226*** (0.050)	-0.277*** (0.059)
Constant	-0.019 (0.474)	0.001 (0.480)	-0.095 (0.473)	0.010 (0.478)	-0.220 (0.621)
<i>Panel B: Innovation of speculative demand</i>					
return_1					
L.return_1	0.048 (0.052)	0.137*** (0.052)	0.096* (0.052)	0.074 (0.052)	0.063 (0.060)
L2.return_1	0.173*** (0.052)	0.001 (0.052)	0.124** (0.053)	0.032 (0.052)	0.129** (0.060)
L.Concept_stock_innovation	-0.028 (0.022)	0.030 (0.029)	-0.024 (0.025)	-0.025 (0.024)	-0.024 (0.028)
L2.Concept_stock_innovation	-0.052** (0.022)	-0.017 (0.029)	-0.049** (0.025)	-0.008 (0.024)	-0.070** (0.028)
Constant	0.066 (0.197)	0.140 (0.266)	0.162 (0.225)	0.146 (0.228)	0.454 (0.283)
Concept_stock_innovation					
L.return_1	0.344*** (0.125)	0.139 (0.094)	0.348*** (0.111)	0.235** (0.109)	0.291** (0.129)
L2.return_1	0.145 (0.126)	0.114 (0.094)	0.215* (0.112)	-0.086 (0.110)	0.226* (0.130)
L.Concept_stock_innovation	-0.234*** (0.052)	-0.213*** (0.052)	-0.251*** (0.052)	-0.206*** (0.052)	-0.293*** (0.060)
L2.Concept_stock_innovation	-0.021 (0.052)	-0.024 (0.052)	-0.039 (0.052)	0.006 (0.052)	-0.094 (0.060)
N	384	384	384	384	291

Table X
Univariate Regression of Contemporaneous Weekly Trading Volume on Speculative Demand

Note: This table reports univariate contemporaneous regressions of trading volume on speculative demand measured by Google search volume index of concept stocks. The sample period is from 10/01/2004 to 24/12/2011. Newey-West standard errors are in parentheses. Significance levels : * : 10% ** : 5% *** : 1%

	Shanghai A	Shanghai B	Shenzhen A	Shenzhen B	Shenzhen SME
<i>Panel A: Change of speculative demand</i>					
Concept_stock_change	1.588** (0.662)	0.182 (0.882)	0.850** (0.341)	-0.001 (0.006)	0.145** (0.069)
Constant	-0.029 (4.513)	-0.003 (9.121)	-0.015 (2.502)	0.000 (0.066)	0.713 (0.664)
Adj. R-squared	0.02	-0.00	0.02	-0.00	0.01
N	386	386	386	386	293
<i>Panel B: Innovation of speculative demand</i>					
Concept_stock_innovation	1.956*** (0.697)	1.190 (0.904)	1.018*** (0.359)	0.006 (0.008)	0.127* (0.070)
Constant	0.000 (4.397)	0.000 (9.005)	0.000 (2.451)	0.000 (0.065)	0.591 (0.672)
Adj. R-squared	0.03	0.00	0.03	-0.00	0.01
N	386	386	386	386	293

Table XI
Contemporaneous Regressions of Trading Volume on Speculative Demand

Note: This table reports contemporaneous regressions of trading volume on speculative demand measured by Google search volume index of concept stocks. The sample period is from 10/01/2004 to 24/12/2011. Newey-West standard errors are in parentheses.

Significance levels : * : 10% ** : 5% *** : 1%

	Shanghai A	Shanghai B	Shenzhen A	Shenzhen B	Shenzhen SME
<i>Panel A: Change of speculative demand</i>					
Concept_stock_change	1.803*** (0.654)	0.153 (0.820)	0.971*** (0.350)	-0.000 (0.006)	0.183** (0.074)
L.vol_res	-0.243*** (0.072)	0.174 (0.149)	-0.226*** (0.073)	-0.132* (0.077)	-0.279*** (0.077)
L.retmean_30	14.715 (14.930)	12.711 (26.292)	6.470 (7.068)	0.508** (0.216)	-2.126 (1.410)
L.retvar_30	1.287 (1.837)	-4.849** (2.078)	0.175 (0.836)	-0.038 (0.023)	-0.319 (0.195)
L.retskew_30	0.153 (6.192)	-4.382 (8.704)	-5.945* (3.512)	-0.032 (0.098)	1.626 (1.626)
L.retkurt_30	-4.237 (3.490)	-7.420* (3.958)	-3.391 (2.196)	0.019 (0.050)	-0.059 (0.524)
Constant	11.335 (15.224)	55.038** (21.516)	9.300 (9.385)	0.036 (0.234)	3.745* (2.244)
Adj. R-squared	0.07	0.05	0.06	0.03	0.08
N	385	385	385	385	287
<i>Panel B: Innovation of speculative demand</i>					
Concept_stock_innovation	2.383*** (0.763)	1.001 (0.864)	1.198*** (0.403)	0.008 (0.007)	0.187** (0.081)
L.vol_res	-0.256*** (0.072)	0.170 (0.150)	-0.235*** (0.074)	-0.138* (0.076)	-0.280*** (0.077)
L.retmean_30	8.235 (15.229)	10.941 (26.453)	3.275 (7.208)	0.494** (0.215)	-2.511* (1.438)
L.retvar_30	0.121 (1.858)	-5.018** (2.082)	-0.330 (0.855)	-0.041* (0.024)	-0.337* (0.197)
L.retskew_30	3.606 (6.192)	-3.382 (8.583)	-4.347 (3.426)	-0.021 (0.095)	1.699 (1.623)
L.retkurt_30	-4.315 (3.526)	-7.226* (4.001)	-3.247 (2.172)	0.019 (0.048)	-0.102 (0.527)
Constant	16.101 (15.517)	55.266** (21.410)	11.422 (9.355)	0.049 (0.228)	3.858* (2.248)
Adj. R-squared	0.08	0.05	0.07	0.03	0.08
N	385	385	385	385	287

Table XII
Univariate Monthly Regression of Contemporaneous Trading Volume on Speculative Demand

Note: This table reports univariate monthly regressions of contemporaneous trading volume on speculative demand measured by Google search volume index of concept stocks. The sample period is from 10/01/2004 to 24/12/2011. Newey-West standard errors are in parentheses. Significance levels : * : 10% ** : 5% *** : 1%

	Shanghai A	Shanghai B	Shenzhen A	Shenzhen B	Shenzhen SME
<i>Panel A: Change of speculative demand</i>					
Concept_stock_change	7.102*** (1.608)	7.681*** (2.306)	3.900*** (0.857)	0.067*** (0.017)	0.552*** (0.173)
Constant	-1.645 (53.743)	-1.779 (81.170)	-0.903 (29.011)	-0.016 (0.611)	-0.169 (7.820)
Adj. R-squared	0.17	0.11	0.18	0.15	0.07
N	95	95	95	95	72
<i>Panel B: Innovation of speculative demand</i>					
Residuals	8.711*** (1.765)	9.766*** (3.441)	4.670*** (0.986)	0.081*** (0.022)	0.576*** (0.208)
Constant	0.000 (48.490)	-0.000 (76.854)	-0.000 (26.992)	0.000 (0.583)	-2.718 (7.824)
Adj. R-squared	0.22	0.16	0.21	0.19	0.06
N	95	95	95	95	72

Table XIII
Multivariate Monthly Regression of Contemporaneous Trading Volume on Speculative Demand

Note: This table reports multivariate monthly regressions of contemporaneous trading volume on speculative demand measured by Google search volume index of concept stocks. The sample period is from 10/01/2004 to 24/12/2011. Newey-West standard errors are in parentheses. Significance levels: * : 10% ** : 5% *** : 1%

	Shanghai A	Shanghai B	Shenzhen A	Shenzhen B	Shenzhen SME
<i>Panel A: Change of speculative demand</i>					
concept_stock_m_d	6.325*** (1.573)	8.629*** (3.258)	3.465*** (0.892)	0.070*** (0.020)	0.468*** (0.169)
L.vol_res_m	-0.107 (0.074)	0.131 (0.162)	-0.102 (0.083)	0.043 (0.132)	-0.162* (0.092)
L.retmean_30	24.485 (163.314)	-66.682 (143.038)	-22.454 (91.531)	1.641 (1.550)	-42.930** (19.504)
L.retvar_30	27.559 (16.983)	-6.172 (18.538)	8.321 (8.583)	0.041 (0.271)	-2.907 (2.196)
L.retskew_30	-52.861 (57.359)	-136.406 (161.305)	-75.891* (45.322)	-0.652 (0.990)	-15.004 (21.506)
L.retkurt_30	-25.904 (29.816)	93.566 (70.138)	-26.108 (20.784)	0.591 (0.481)	-6.441 (5.380)
Constant	-3.990 (150.061)	-403.866 (289.833)	36.377 (92.093)	-2.882 (2.184)	34.205 (22.245)
Adj. R-squared	0.14	0.13	0.16	0.15	0.09
N	94	94	94	94	70
<i>Panel B: Innovation of speculative demand</i>					
Concept_stock_innovation	8.309*** (1.894)	10.733*** (3.975)	4.417*** (1.101)	0.083*** (0.023)	0.526** (0.217)
L.vol_res_m	-0.115* (0.065)	0.116 (0.148)	-0.101 (0.076)	0.016 (0.123)	-0.165* (0.091)
L.retmean_30	-59.172 (158.860)	-158.649 (138.897)	-58.237 (86.803)	0.732 (1.543)	-45.541** (19.384)
L.retvar_30	6.416 (17.130)	-17.643 (17.924)	-1.533 (8.937)	-0.138 (0.264)	-3.463 (2.218)
L.retskew_30	22.207 (54.802)	-72.824 (143.465)	-33.724 (43.695)	-0.163 (0.919)	-11.185 (21.743)
L.retkurt_30	-28.873 (28.810)	102.934 (70.141)	-23.650 (20.378)	0.630 (0.461)	-6.207 (5.494)
Constant	88.791 (144.317)	-370.856 (271.889)	81.006 (89.169)	-2.216 (1.975)	35.684 (22.555)
Adj. R-squared	0.19	0.18	0.19	0.18	0.08
N	94	94	94	94	70

Table XIV
Returns, Speculative Demand and Macro Variables

Note: This table reports multivariate monthly regressions of contemporaneous returns on speculative demand measured by Google search volume index of concept stocks, the first four moments of past month daily returns and the past month trading volume, as well as macroeconomic variables. The sample period is from 10/01/2004 to 24/12/2011. Newey-West standard errors are in parentheses.

Significance levels : * : 10% ** : 5% *** : 1%

	Shanghai A	Shanghai B	Shenzhen A	Shenzhen B	Shenzhen SME
<i>Panel A: Change in Speculative Demand</i>					
Concept_stock_change	0.085*** (0.020)	0.074*** (0.026)	0.097*** (0.023)	0.063*** (0.021)	0.091*** (0.021)
L.retmean_30	-0.087 (0.710)	0.275 (0.725)	-0.178 (0.686)	0.097 (0.726)	-0.505 (0.704)
L.retvar_30	-0.004 (0.082)	-0.040 (0.074)	0.070 (0.083)	0.014 (0.097)	0.074 (0.088)
L.retskew_30	-0.458 (0.312)	-0.424 (0.331)	-1.053** (0.409)	-0.364 (0.292)	-1.547** (0.760)
L.retkurt_30	-0.220 (0.165)	-0.014 (0.133)	-0.436** (0.217)	0.058 (0.119)	-0.549 (0.338)
L.turnover_res	0.003* (0.002)	0.517 (2.605)	0.004 (0.003)	0.766*** (0.231)	0.015 (0.010)
L.cpi	-0.476*** (0.121)	-0.453*** (0.148)	-0.576*** (0.137)	-0.423*** (0.114)	-0.567*** (0.157)
L.m2	-0.125** (0.063)	-0.032 (0.074)	-0.153** (0.072)	-0.037 (0.058)	-0.120 (0.081)
L.gdp	0.236 (0.153)	0.296 (0.248)	0.242 (0.167)	0.041 (0.158)	0.285* (0.161)
Constant	2.217 (1.877)	-0.708 (2.620)	3.330 (2.196)	1.381 (1.868)	2.479 (2.498)
Adj. R-squared	0.10	0.04	0.12	0.07	0.11
N	374	374	374	374	287
<i>Panel B: Innovation of Speculative Demand</i>					
Concept_stock_innovation	0.101*** (0.024)	0.104*** (0.031)	0.118*** (0.027)	0.077*** (0.026)	0.109*** (0.024)
L.retmean_30	-0.475 (0.728)	0.023 (0.716)	-0.607 (0.690)	-0.114 (0.723)	-0.831 (0.702)
L.retvar_30	-0.038 (0.084)	-0.054 (0.073)	0.038 (0.086)	-0.012 (0.100)	0.067 (0.089)
L.retskew_30	-0.374 (0.308)	-0.355 (0.325)	-0.980** (0.401)	-0.304 (0.289)	-1.486* (0.759)
L.retkurt_30	-0.232 (0.166)	0.002 (0.132)	-0.430** (0.215)	0.060 (0.118)	-0.573* (0.342)
L.turnover_res	0.002 (0.002)	0.314 (2.570)	0.004 (0.003)	0.726*** (0.239)	0.014 (0.010)
L.cpi	-0.541*** (0.122)	-0.516*** (0.149)	-0.649*** (0.137)	-0.470*** (0.115)	-0.645*** (0.155)
L.m2	-0.158** (0.062)	-0.071 (0.074)	-0.190*** (0.071)	-0.066 (0.059)	-0.153* (0.080)
L.gdp	0.216 (0.151)	0.261 (0.237)	0.207 (0.164)	0.018 (0.155)	0.263 (0.160)
Constant	3.417* (1.856)	0.573 (2.534)	4.720** (2.199)	2.411 (1.839)	3.662 (2.516)
Adj. R-squared	0.11	0.05	0.13	0.07	0.12
N	374	374	374	374	287

Table XV
Trading Volume, Speculative Demand and Macro Variables

Note: This table reports multivariate weekly regressions of contemporaneous trading volume on speculative demand measured by Google search volume index of concept stocks, the first four moments of past month daily returns and lagged macroeconomic variables. The sample period is from 10/01/2004 to 24/12/2011. Newey-West standard errors are in parentheses.

Significance levels : * : 10% ** : 5% *** : 1%

	Shanghai A	Shanghai B	Shenzhen A	Shenzhen B	Shenzhen SME
<i>Panel A: Change in Speculative Demand</i>					
Concept_stock_change	1.815*** (0.661)	0.127 (0.804)	0.978*** (0.352)	-0.000 (0.006)	0.184** (0.074)
L.vol_res	-0.259*** (0.073)	0.177 (0.141)	-0.240*** (0.074)	-0.133* (0.077)	-0.287*** (0.077)
L.retmean_30	15.359 (16.463)	6.592 (26.263)	7.501 (7.671)	0.381* (0.230)	-2.195 (1.491)
L.retvar_30	0.993 (2.039)	-5.596** (2.187)	0.087 (0.911)	-0.043* (0.025)	-0.276 (0.194)
L.retskew_30	3.817 (7.226)	-6.772 (9.665)	-3.599 (4.290)	-0.035 (0.095)	1.616 (1.681)
L.retkurt_30	-2.697 (3.926)	-8.309** (3.791)	-2.966 (2.490)	0.008 (0.046)	-0.022 (0.541)
L.cpi	1.060 (2.694)	-5.445 (3.595)	0.576 (1.437)	-0.057* (0.031)	-0.034 (0.326)
L.m2	3.445* (1.997)	-1.558 (2.505)	1.515 (1.086)	0.006 (0.025)	0.080 (0.243)
L.gdp	-3.373 (4.348)	11.716 (8.466)	-2.398 (2.207)	0.090 (0.058)	-0.679 (0.431)
Constant	-23.557 (56.599)	-12.182 (67.831)	4.505 (31.477)	-0.748 (0.645)	9.101 (7.578)
Adj. R-squared	0.08	0.06	0.07	0.03	0.08
N	374	374	374	374	287
<i>Panel A2: Innovation of speculative demand</i>					
Concept_stock_innovation	2.385*** (0.775)	0.938 (0.847)	1.221*** (0.409)	0.007 (0.007)	0.203** (0.082)
L.vol_res	-0.270*** (0.073)	0.174 (0.142)	-0.249*** (0.074)	-0.138* (0.077)	-0.290*** (0.077)
L.retmean_30	6.174 (16.825)	4.825 (26.683)	3.046 (7.841)	0.366 (0.229)	-2.809* (1.531)
L.retvar_30	0.178 (2.013)	-5.712*** (2.177)	-0.247 (0.910)	-0.045* (0.025)	-0.288 (0.195)
L.retskew_30	5.662 (7.093)	-6.093 (9.564)	-2.876 (4.166)	-0.027 (0.093)	1.732 (1.686)
L.retkurt_30	-2.913 (3.953)	-8.149** (3.817)	-2.899 (2.470)	0.008 (0.045)	-0.067 (0.550)
L.cpi	-0.454 (2.637)	-5.935* (3.564)	-0.176 (1.409)	-0.060* (0.031)	-0.182 (0.326)
L.m2	2.655 (2.011)	-1.896 (2.493)	1.139 (1.089)	0.003 (0.025)	0.019 (0.245)
L.gdp	-3.917 (4.283)	11.351 (8.320)	-2.762 (2.188)	0.088 (0.057)	-0.719* (0.430)
Constant	5.155 (57.819)	-0.638 (66.579)	18.996 (32.165)	-0.658 (0.634)	11.313 (7.681)
Adj. R-squared	0.09	0.06	0.08	0.03	0.08
N	374	374	374	374	287

6 Appendix

Table XVI
Univariate Regression of Contemporaneous Weekly Turnover on Speculative Demand

Note: This table reports univariate contemporaneous regressions of turnover on speculative demand measured by Google search volume index of concept stocks. The sample period is January 2004 to December 2011. Newey-West standard errors are in parentheses.

Significance levels : * : 10% ** : 5% *** : 1%

	Shanghai A	Shanghai B	Shenzhen A	Shenzhen B	Shenzhen SME
<i>Panel A: Change of speculative demand</i>					
Concept_stock_change	1.952*** (0.713)	-0.001 (0.002)	1.181*** (0.416)	-0.001 (0.004)	0.287** (0.122)
Constant	-0.035 (5.326)	0.000 (0.012)	-0.021 (3.362)	0.000 (0.042)	1.190 (1.348)
Adj. R-squared	0.03	-0.00	0.02	-0.00	0.01
N	386	386	386	386	293
<i>Panel B: Innovation of speculative demand</i>					
Concept_stock_innovation	2.493*** (0.746)	0.001 (0.001)	1.416*** (0.436)	0.004 (0.007)	0.271** (0.129)
Constant	0.000 (5.142)	-0.000 (0.012)	0.000 (3.288)	-0.000 (0.042)	0.929 (1.357)
Adj. R-squared	0.04	-0.00	0.03	-0.00	0.01
N	386	386	386	386	293

Table XVII
Contemporaneous Regressions of Turnover on Speculative Demand

Note: This table reports contemporaneous regressions of turnover on speculative demand measured by Google search volume index of concept stocks. The sample period is January 2004 to December 2011. Newey-West standard errors are in parentheses.

Significance levels : * : 10% ** : 5% *** : 1%

	Shanghai A	Shanghai B	Shenzhen A	Shenzhen B	Shenzhen SME
<i>Panel A: Change of speculative demand</i>					
Concept_stock_change	2.164*** (0.701)	-0.001 (0.001)	1.341*** (0.434)	-0.002 (0.004)	0.349** (0.136)
L.turnover_res	-0.190*** (0.069)	0.326** (0.153)	-0.197** (0.081)	0.004 (0.152)	-0.235*** (0.089)
L.retmean_30	19.999 (16.872)	0.003 (0.035)	11.087 (8.581)	0.187 (0.124)	-1.641 (2.534)
L.retvar_30	0.584 (2.053)	-0.005* (0.003)	-0.029 (1.127)	-0.034*** (0.012)	-0.617 (0.377)
L.retskew_30	1.325 (7.504)	0.005 (0.009)	-3.930 (4.627)	-0.036 (0.062)	2.784 (2.937)
L.retkurt_30	-3.020 (4.230)	-0.006 (0.004)	-4.217 (3.082)	0.022 (0.039)	-0.197 (1.029)
Constant	9.126 (18.147)	0.056** (0.022)	13.513 (13.312)	0.019 (0.157)	6.811 (4.728)
Adj. R-squared	0.05	0.12	0.05	0.01	0.06
N	385	385	385	385	287
<i>Panel B: Innovation of speculative demand</i>					
Concept_stock_innovation	2.976*** (0.810)	0.001 (0.001)	1.693*** (0.502)	0.004 (0.006)	0.368** (0.153)
L.turnover_res	-0.209*** (0.069)	0.324** (0.156)	-0.210** (0.081)	-0.001 (0.154)	-0.237*** (0.089)
L.retmean_30	12.257 (16.820)	0.002 (0.036)	6.664 (8.587)	0.180 (0.118)	-2.396 (2.578)
L.retvar_30	-0.882 (2.046)	-0.006* (0.003)	-0.750 (1.149)	-0.036*** (0.013)	-0.654* (0.379)
L.retskew_30	5.658 (7.479)	0.005 (0.009)	-1.651 (4.515)	-0.031 (0.058)	2.932 (2.925)
L.retkurt_30	-3.115 (4.258)	-0.006 (0.004)	-4.015 (3.049)	0.022 (0.038)	-0.280 (1.037)
Constant	15.092 (18.433)	0.056** (0.022)	16.539 (13.321)	0.026 (0.150)	7.040 (4.739)
Adj. R-squared	0.07	0.12	0.06	0.01	0.06
N	385	385	385	385	287

Table XVIII
Weekly Median Regression of Contemporaneous Returns on Speculative Demand

Note: This table reports weekly median regressions of contemporaneous returns on speculative demand measured by Google search volume index of concept stocks. The sample period is January 2004 to December 2011. Newey-West standard errors are in parentheses.

Significance levels: * : 10% ** : 5% *** : 1%

	Shanghai A	Shanghai B	Shenzhen A	Shenzhen B	Shenzhen SME
<i>Panel A: Change of speculative demand</i>					
Concept_stock_change	0.094*** (0.023)	0.040* (0.022)	0.073** (0.029)	0.052** (0.023)	0.073** (0.035)
lag_retmean_30	1.872** (0.745)	1.340*** (0.497)	1.659** (0.834)	0.905 (0.616)	0.262 (0.967)
lag_retvar_30	-0.139 (0.100)	0.023 (0.050)	-0.034 (0.109)	-0.069 (0.092)	0.078 (0.128)
lag_retskew_30	-0.605* (0.356)	-0.252 (0.275)	-0.950* (0.524)	-0.033 (0.321)	-1.281 (0.965)
lag_retkurt_30	-0.008 (0.168)	-0.183 (0.118)	-0.120 (0.224)	0.120 (0.129)	-0.170 (0.344)
lag_turnover_res	0.003 (0.002)	0.838 (1.227)	0.004 (0.004)	0.459 (0.296)	0.017 (0.015)
Constant	0.311 (0.708)	0.764 (0.653)	0.537 (0.911)	-0.087 (0.667)	0.024 (1.172)
N	385	385	385	385	287
<i>Panel B: Innovation of speculative demand</i>					
Concept_stock_innovation	0.106*** (0.023)	0.069** (0.027)	0.084** (0.034)	0.053* (0.028)	0.087** (0.042)
lag_retmean_30	1.548** (0.628)	1.011* (0.539)	1.558* (0.883)	0.745 (0.675)	0.155 (1.055)
lag_retvar_30	-0.190** (0.087)	0.023 (0.054)	-0.052 (0.115)	-0.094 (0.101)	0.067 (0.139)
lag_retskew_30	-0.357 (0.302)	-0.216 (0.305)	-0.851 (0.550)	-0.042 (0.347)	-1.266 (1.052)
lag_retkurt_30	-0.057 (0.141)	-0.192 (0.131)	-0.136 (0.233)	0.118 (0.138)	-0.221 (0.374)
lag_turnover_res	0.003 (0.002)	0.595 (1.311)	0.002 (0.004)	0.455 (0.324)	0.018 (0.016)
Constant	0.791 (0.596)	0.943 (0.724)	0.760 (0.948)	0.093 (0.725)	0.222 (1.270)
N	385	385	385	385	287

Table XIX
Weekly Median Regression of Contemporaneous Trading Volume on Speculative Demand

Note: This table reports weekly median regressions of contemporaneous trading volume on speculative demand measured by Google search volume index of concept stocks. The sample period is January 2004 to December 2011.

Significance levels: * : 10% ** : 5% *** : 1%

	Shanghai A	Shanghai B	Shenzhen A	Shenzhen B	Shenzhen SME
<i>Panel A: Change of speculative demand</i>					
Concept_stock_change	1.318*** (0.353)	0.319 (0.269)	0.668*** (0.200)	-0.001 (0.006)	0.080** (0.035)
lag_vol_res	-0.108*** (0.034)	-0.004 (0.018)	-0.026 (0.036)	-0.059 (0.051)	-0.068** (0.031)
lag_retmean_30	11.240 (10.604)	-0.826 (5.882)	5.108 (5.720)	0.218 (0.173)	-0.612 (1.038)
lag_retvar_30	2.192 (1.430)	-2.119*** (0.598)	0.899 (0.740)	-0.019 (0.026)	-0.157 (0.139)
lag_retskew_30	-2.696 (4.969)	-1.392 (3.271)	-2.512 (3.599)	0.001 (0.088)	0.768 (1.048)
lag_retkurt_30	-2.840 (2.335)	-6.346*** (1.415)	-1.730 (1.582)	0.026 (0.035)	-0.178 (0.354)
Constant	-15.491 (9.972)	20.509*** (7.853)	-8.770 (6.374)	-0.259 (0.185)	0.582 (1.220)
N	385	385	385	385	287
<i>Panel B: Innovation of speculative demand</i>					
Concept_stock_innovation	1.733*** (0.404)	0.779** (0.308)	0.773*** (0.211)	0.000 (0.006)	0.076** (0.034)
lag_vol_res	-0.127*** (0.037)	-0.020 (0.020)	-0.052 (0.035)	-0.054 (0.047)	-0.082*** (0.025)
lag_retmean_30	11.336 (11.610)	-3.606 (6.469)	5.313 (5.637)	0.226 (0.165)	-0.476 (0.849)
lag_retvar_30	1.344 (1.593)	-2.270*** (0.661)	0.352 (0.737)	-0.021 (0.025)	-0.106 (0.113)
lag_retskew_30	-0.349 (5.541)	-0.476 (3.631)	-1.697 (3.563)	0.004 (0.082)	0.792 (0.848)
lag_retkurt_30	-2.515 (2.650)	-6.237*** (1.561)	-0.610 (1.557)	0.026 (0.032)	-0.174 (0.289)
Constant	-12.740 (11.126)	20.764** (8.670)	-9.593 (6.279)	-0.245 (0.175)	0.191 (0.993)
N	385	385	385	385	287

REFERENCES

- Andrei, D., and M. Hasler, 2011, Investors' attention and stock market volatility, Working paper, Swiss Finance Institute .
- Bank, M., M. Larch, and G. Peter, 2011, Google search volume and its influence on liquidity and returns of German stocks, *Financial Markets and Portfolio Management* 1–26.
- 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, 785.
- Cochrane, John H., 2001, *Asset Pricing* (Princeton University Press).
- Da, Z., J. Engelberg, and P. Gao, 2010, In search of fundamentals, Working paper, University of Notre Dame and University of North Carolina at Chapel Hill .
- Da, Z., J. Engelberg, and P. Gao, 2012, In search of attention, *Journal of Finance* .
- Ding, R., and W. Hou, 2011, Retail investor attention and stock liquidity, Working paper, Durham University .
- Drake, M.S., D.T. Roulstone, and J.R. Thornock, 2011, Investor information demand: Evidence from Google searches around earnings announcements, *Journal of Accounting Research* .
- Froot, K.A., D.S. Scharfstein, and J.C. Stein, 1992, Herd on the street: Informational inefficiencies in a market with short-term speculation, *Journal of Finance* 47, 1461–84.
- Hsieh, J., and R.A. Walkling, 2006, The history and performance of concept stocks, *Journal of Banking & Finance* 30, 2433–2469.
- Mei, J., J.A. Scheinkman, and W. Xiong, 2009, Speculative trading and stock prices: Evidence from Chinese AB share premia, *Annals of Economics and Finance* 10, 225–255.
- Mondria, J., and T. Wu, 2012, Asymmetric attention and stock returns, Working paper, University of Toronto .

Peng, L., and W. Xiong, 2006, Investor attention, overconfidence and category learning, *Journal of Financial Economics* 80, 563–602.

Sharif, S., H. Anderson, and B. Marshall, 2011, Against the tide: The commencement of short selling and margin trading in mainland china, Working paper, Massey University .

Shiller, R., 2005, *Irrational Exuberance* (Princeton University Press).

Vlastakis, N., and R.N. Markellos, 2012, Information demand and stock market volatility, *Journal of Banking & Finance* .