

# Speculative Trading and Stock Prices: An Analysis of Chinese A-B Share Premia

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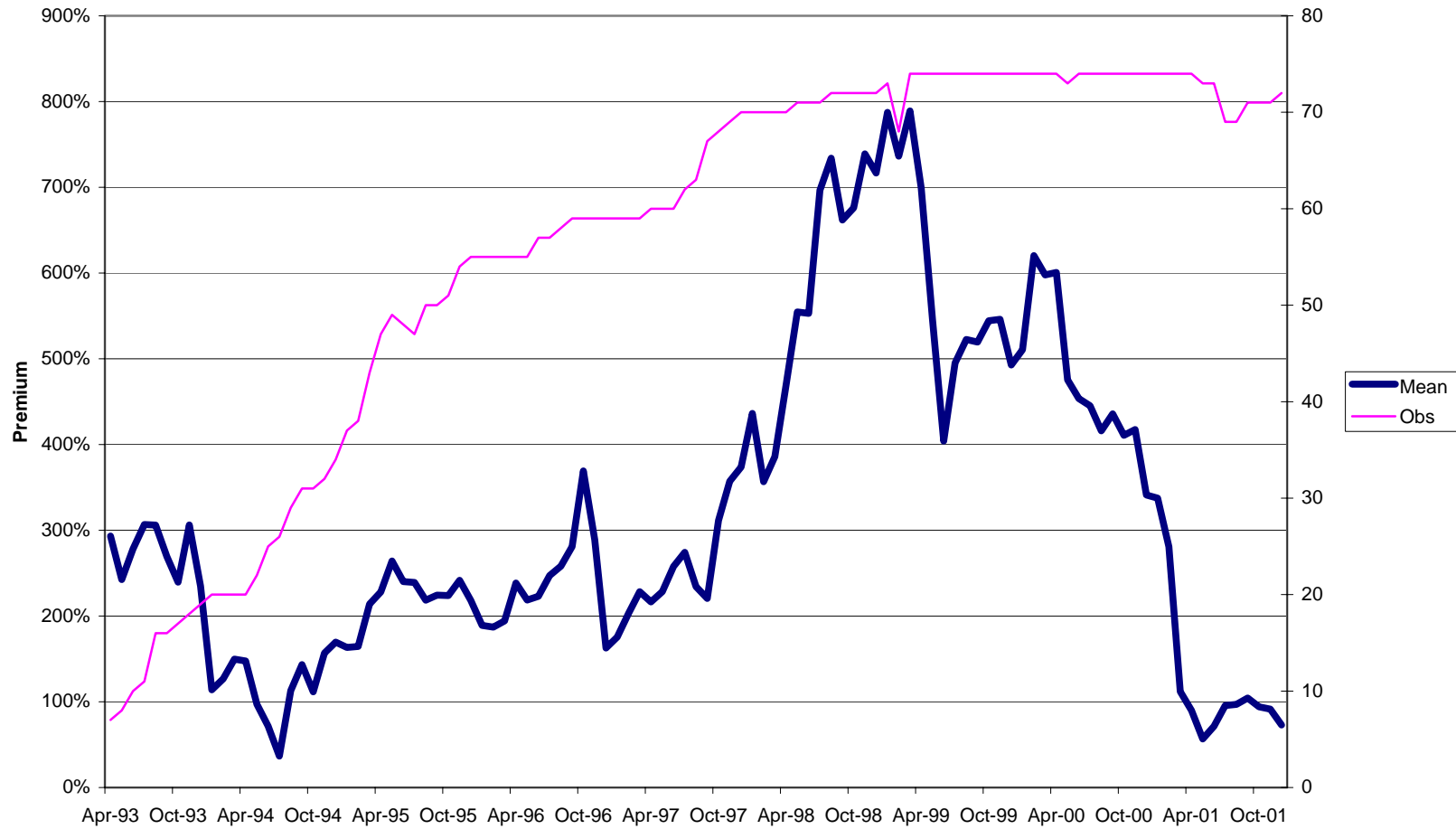
## The Role of Stock Markets in Chinese Economy

- Quick growth in the development of China's stock markets.
  - In 1990, Shanghai and Shenzhen stock exchanges were established.
  - By 2001, over 500 firms were listed in each exchange.
  - The number of shareholders increased from 400,000 in 1991 to 64 million in 2001.
- Stock markets had been used as an important tool to finance ailing state enterprises.
- The trading behavior of Chinese investors and the determinants of Chinese stock prices are important factors in understanding the governance of public firms and the market reform in China.

## Speculativeness of Chinese Stock Markets

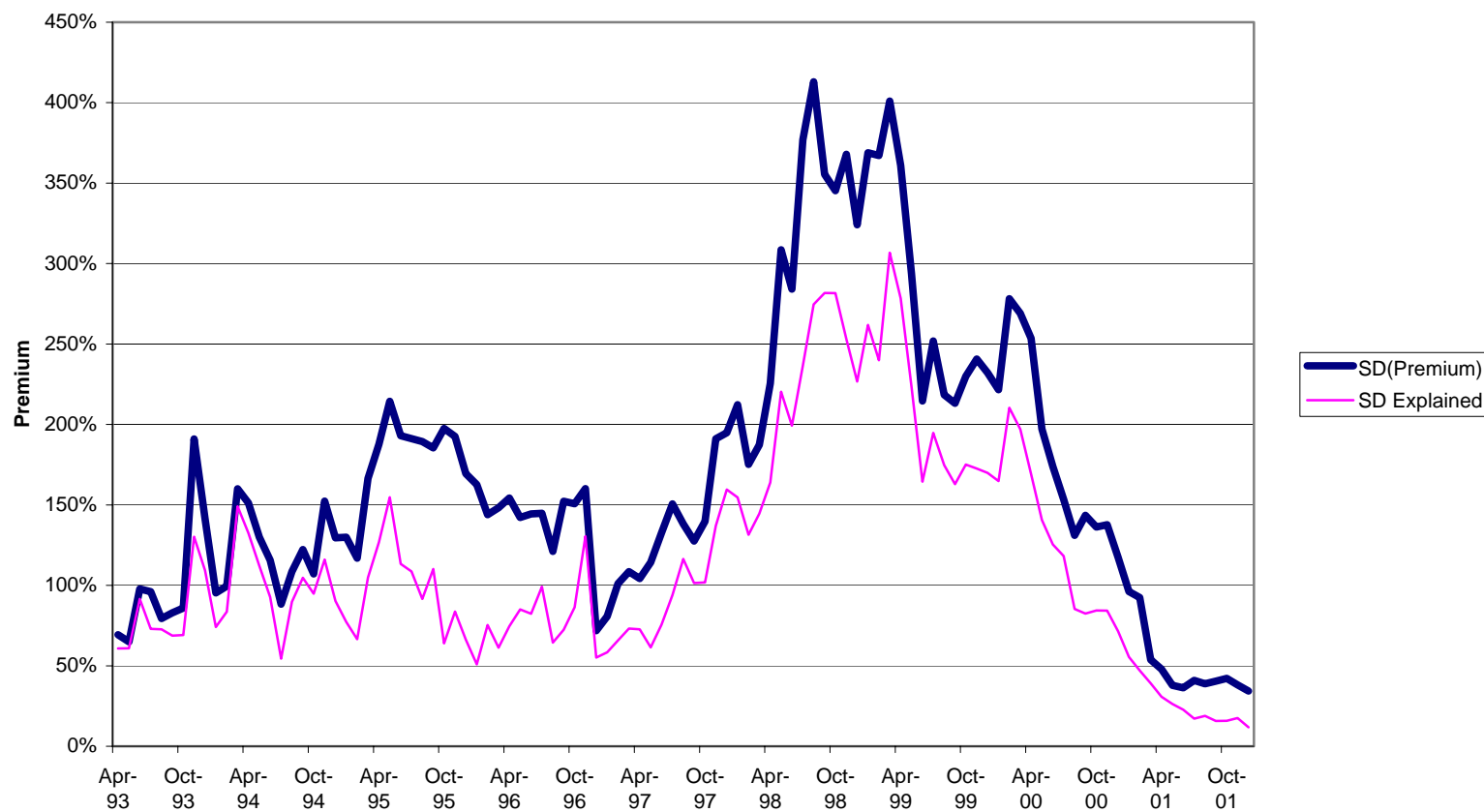
- Several dozen firms have offered two classes of shares, class A and class B, with identical rights. Class-A shares to domestic investors, and class-B shares to foreigners.
- During the period 1993-2000, despite their identical payoffs, A-shares were traded on average for 420% more than the corresponding B-shares.
- A-shares turned over 500% per year, despite the high round trip transaction cost of 1.4%. B-shares turned over at a much more modest rate of 100% per year.
- Many believe that the speculative behavior of Chinese investors is a key factor in explaining the puzzling phenomenon. We provide a formal analysis of this argument.

**Figure 2: A Share Price Premium over B Shares and Number of Firms in the Sample (4/1993-12/2001)**



**Figure 4: Cross-sectional Standard Deviation of Price Premium over Time and the Variation Explained by the Following Regression (4/1993-12/2001)**

$$\rho_{it} = c_{0t} + c_{1t} \text{Log}(\text{Turnover}_{it}^A) + c_{2t} \text{Log}(\text{Turnover}_{it}^B) + c_{3t} \text{Log}(\text{MarketCap}_{it}^A) + c_{4t} \text{Log}(\text{MarketCap}_{it}^B) + \varepsilon_{it}$$



## Previous Studies on A-B Share Premia

- Differential discount rates and risk premia: Fernald and Rogers (2002) and Eun, Janakiramanan and Lee (2002)
- Information asymmetry and differential demand curves: Stulz and Wasserfallen (1995), Sun and Tong (2000), Chakravarty, Sarkar, and Wu (1998), Chui and Kwok (1998), Chen, Lee and Rui (2001), and Chan, Menkveld and Yang (2003)
- Liquidity: Chen and Xiong (2002) and Chen, Lee and Rui (2001)

## Theory on Speculative Trading and Asset Prices

- Keynes (1931) and Williams (1938): speculative motive is an important determinant of asset prices.
- Harrison and Kreps (1978): heterogeneous beliefs and short-sales constraints generate a speculative component in prices.
- Scheinkman and Xiong (2003)
  - Investor overconfidence as a source of heterogeneous beliefs
  - **Hypothesis I:** *There is a positive relationship between the speculative component in asset prices and the turnover of shares.*

## Differential Implications from Liquidity Trading

- Hong, Scheinkman and Xiong (2003)
  - **Hypothesis II:** *When investors are risk averse, the speculative component and the turnover of shares decrease with asset float. The speculative component is especially sensitive to changes in asset float when float is small.*
- Duffie, Garleanu and Pedersen (2003), Vayanos and Wang (2003) and Weill (2003):
  - **Hypothesis III:** *When investors trade for liquidity reasons, the turnover rate of shares increases with asset float.*



## Institution of Chinese Stock Markets

- Stringent short-sales constraints.
  - It is illegal to short-sell.
  - Equity derivatives markets are not developed yet.
- Chinese firms do not have the freedom to access the capital markets in response to market valuation.
- Most participants in the A-share markets are individuals with little investment experience, and investment institutions were still in early stage of development. Thus, it is reasonable to assume that Chinese investors were more likely to display overconfidence.
- The float (tradable shares) is small, with the majority of shares held by the state.

- Chinese stock markets provide a unique data to study the effect of non-fundamental component in stock prices.
  - Special market institutions fit well with the speculative trading theory based on heterogeneous beliefs and short-sales constraints.
  - Identical payoffs between A-B pairs allow us to control for asset fundamentals.
  - Relative large sample makes statistical analysis possible.
- Earlier studies in behavioral finance have tried to analyze the price difference between assets with identical or similar fundamentals.
  - Lamont and Thaler (2003): 6 cases of carveouts in the internet bubble period.
  - Froot and Dabora (1999): 3 examples of twin shares.

## Speculative Trading and A-B Share Premia

- Cross-sectional Regression of A-B Premia:

$$\rho_{it} = c_{0t} + c_{1t}\tau_{it}^A + c_{2t}\tau_{it}^B + c_{3t}z_{it}^A + c_{4t}z_{it}^B$$

where

- $\tau_{it}^A = \log(1 + \textit{turnover}_{it}^A)$
- $\tau_{it}^B = \log(1 + \textit{turnover}_{it}^B)$
- $z_{it}^A$  is the fraction of no-price-change days in a month for a firm's A-shares
- $z_{it}^B$  is the fraction of no-price-change days in a month for a firm's B-shares

A. Turnover Only (April 1993-Dec.2000)						
	$c_{0t}$	$c_{1t}$	$c_{2t}$	$c_{3t}$	$c_{4t}$	Average Adj.R <sup>2</sup>
Average Coefficient	3.442	3.756	1.600			0.255
FM t-Stat	21.14	6.956	1.190			
Average Marginal R <sup>2</sup>	-	0.203	0.046			
B. Turnover and No-price-change Days (Jan. 1995-Dec.2000)						
	$c_{0t}$	$c_{1t}$	$c_{2t}$	$c_{3t}$	$c_{4t}$	Average Adj.R <sup>2</sup>
Average Coefficient	3.386	4.273	1.834	1.922	3.341	0.270
FM t-Stat	21.563	6.260	1.231	1.346	6.821	
Average Marginal R <sup>2</sup>	-	0.157	0.032	0.027	0.044	
C. No-price-change Days Only (Jan. 1995-Dec.2000)						
	$c_{0t}$	$c_{1t}$	$c_{2t}$	$c_{3t}$	$c_{4t}$	Average Adj.R <sup>2</sup>
Average Coefficient	4.432			2.033	4.201	0.091
FM t-Stat	22.52			1.350	7.917	
Average Marginal R <sup>2</sup>	-			0.029	0.060	

Table 3. Cross-sectional Regression of A-B Share Premia

*A. Summary Of Average Cross-Sectional Regressions for A shares*

$$\tau_{it}^A = \alpha_{0t} + \alpha_{1t} \text{Log}(\text{MarketCap}_{i,t}^A) + \varepsilon_{it}$$

	$\alpha_{0t}$	$\alpha_{1t}$	Average Adj.R <sup>2</sup>
Average Coeff.	1.338	-0.051	0.125
FM t-Stat	7.022	-5.260	

*B. Summary Of Average Cross-Sectional Regressions for B shares*

$$\tau_{it}^B = \alpha_{0t} + \alpha_{1t} \text{Log}(\text{MarketCap}_{i,t}^B) + \varepsilon_{it}$$

	$\alpha_{0t}$	$\alpha_{1t}$	Average Adj.R <sup>2</sup>
Average Coeff.	-0.058	0.006	0.067
FM t-Stat	-1.458	2.949	

Table 4. Cross-Sectional Relation between Turnovers and Asset Float (April 1993-December 2000)

## Other Determinants of A-B Share Premia

- Cross-sectional regression with

$$\begin{aligned}\rho_{it} = & c_{0t} + c_{1t}\tau_{it}^A + c_{2t}\tau_{it}^B + c_{3t} \log(\text{MarketCap}_{1,t}^A) \\ & + c_{4t} \log(\text{MarketCap}_{i,t}^B) + c_{5t} \text{Cov}(R_{Bi}, R_F) \\ & + c_{6t} \text{Cov}(R_{Bi}, R_B) + c_{7t} \text{Cov}(R_{Ai}, R_C) + c_{8t} \text{Var}(R_{Ai}).\end{aligned}$$

	c <sub>0t</sub>	c <sub>1t</sub>	c <sub>2t</sub>	c <sub>3t</sub>	c <sub>4t</sub>	c <sub>5t</sub>	c <sub>6t</sub>	c <sub>7t</sub>	c <sub>8t</sub>	Average Adj.R <sup>2</sup>
Average Coefficient	27.83	2.145	5.105	-1.034	-0.195					0.509
FM t-Stat	14.67	6.367	3.500	-11.02	-5.084					
Average Marginal R <sup>2</sup>	-	0.127	0.068	0.255	0.065					
	c <sub>0t</sub>	c <sub>1t</sub>	c <sub>2t</sub>	c <sub>3t</sub>	c <sub>4t</sub>	c <sub>5t</sub>	c <sub>6t</sub>	c <sub>7t</sub>	c <sub>8t</sub>	Average Adj.R <sup>2</sup>
Average Coefficient	20.759	2.060	5.532	-0.600	-0.232	23.420	-36.34	9.079	0.021	0.503
FM t-Stat	11.816	6.195	4.669	-7.954	-6.246	3.000	-12.24	2.637	0.968	
Average Marginal R <sup>2</sup>		0.148	0.041	0.286	0.217	0.011	0.036	0.040	0.032	

Table 5. Cross-Sectional of A-B Premia with More Controls  
(April 1993-December 2000)

$$\rho_{it} = \frac{P_{it}^A - P_{it}^B}{P_{it}^B} = u_i + c_{0t} + c_1 \tau_{it}^A + c_2 \tau_{it}^B + \varepsilon_{it}$$

		c <sub>1</sub>	C <sub>2</sub>	Adjusted R <sup>2</sup>
I. Time effects and firm effects	Coeff.	1.608	-1.108	0.797
	t-Stat	9.989	-1.701	
II. Time effects and random firm effects	Coeff.	1.631	-1.085	.*
	t-Stat	10.04	-1.651	
	Economic Significance	0.22	0.04	
	Specification Test against A: $\chi^2= 1.46$			Not Rejected
III. Firm effects and random time effects	Coeff.	1.564	-1.082	.*
	t-Stat	9.592	-1.638	
	Specification Test against A: $\chi^2= 3.23$			Not Rejected**
IV. Time effects only	Coeff.	2.756	0.168	0.590
	t-Stat	12.62	0.187	
	Specification Test against B: $\chi^2= 76.3$			Rejected
V. Firm effects only	Coeff.	-0.019	0.681	0.229
	t-Stat	-0.087	0.717	
	Specification Test against C: $\chi^2= 117.4$			Rejected

Table 6. Panel Regression of A-B Premia (April 1993-December 2000)



**Table 7. Explaining the Time Variation of  $c_{0t}$**   
**(March 1994-December 2000)**

This table presents the following time-series regression  $c_{0t}$

$$c_{0t} = \mathcal{G}_0 + \mathcal{G}_1 r_{China} + \mathcal{G}_2 r_{world} + \mathcal{G}_3 i_{ChinaSprd} + \eta_t$$

where  $c_{0t}$  is the time-effect coefficient from the panel regression in Table 7 (specification II) of A-B share premium on A and B share turnovers,  $r_{China}$  is the Chinese 3-month deposit rate,  $r_{world}$  is the U.S. 3-month treasury rate, and  $i_{ChinaSprd}$  is the spread between Chinese long-term bond and U.S. 10-year treasury bond. The t-statistics are computed using Newey-West autocorrelation-consistent standard errors with 6 lags.

	$\mathcal{G}_0$	$\mathcal{G}_1$	$\mathcal{G}_2$	$\mathcal{G}_3$	Adj. R <sup>2</sup>
Coefficient	-1.866	-0.683	0.187	2.473	0.851
t-Stat	-1.355	-11.02	1.020	9.806	

## The Opening of B Shares to Domestic Investors in February 2001

- Right after the liberalization of B-shares, A-share prices were merely affected, but the B-share prices increased by an average of 63% and a cross-sectional standard deviation of 22%.
- The monthly turnover rates of B-share increased from 12.3% to 44.4%, similar to A-share turnover rates.
- We also repeat the cross-sectional regressions between A-B premia and share turnovers and between share turnovers and asset float for the period after the liberalization of B shares.
  - B-share turnover now has a significantly negative effect on A-B premia.
  - B-share turnover is also negatively related to B-share float.
  - These evidence suggests that speculative behavior might have appeared in B-share markets after the rule change.

## Conclusions

- Our study supports the view that speculative trading can contribute a significant non-fundamental component to asset prices.
- Our results adds a new mechanism to the international finance literature that has used capital controls, information asymmetries, corporate governance, liquidity, as well as price discrimination to explain price differences between shares that are exclusive to foreign or domestic investors.
- Our results are also relevant for understanding the difficulty faced by Chinese government in improving the governance of public firms.
  - Dominance of state owned shares is viewed as an obstacle.
  - In July 2001, the government announced a plan to reduce state ownership in public firms.
  - However the stock markets reacted strongly and negatively, forcing the government to abandon the plan.