The Economic Psychology of Stock Market Bubbles in China 2005-08

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Key Issues:

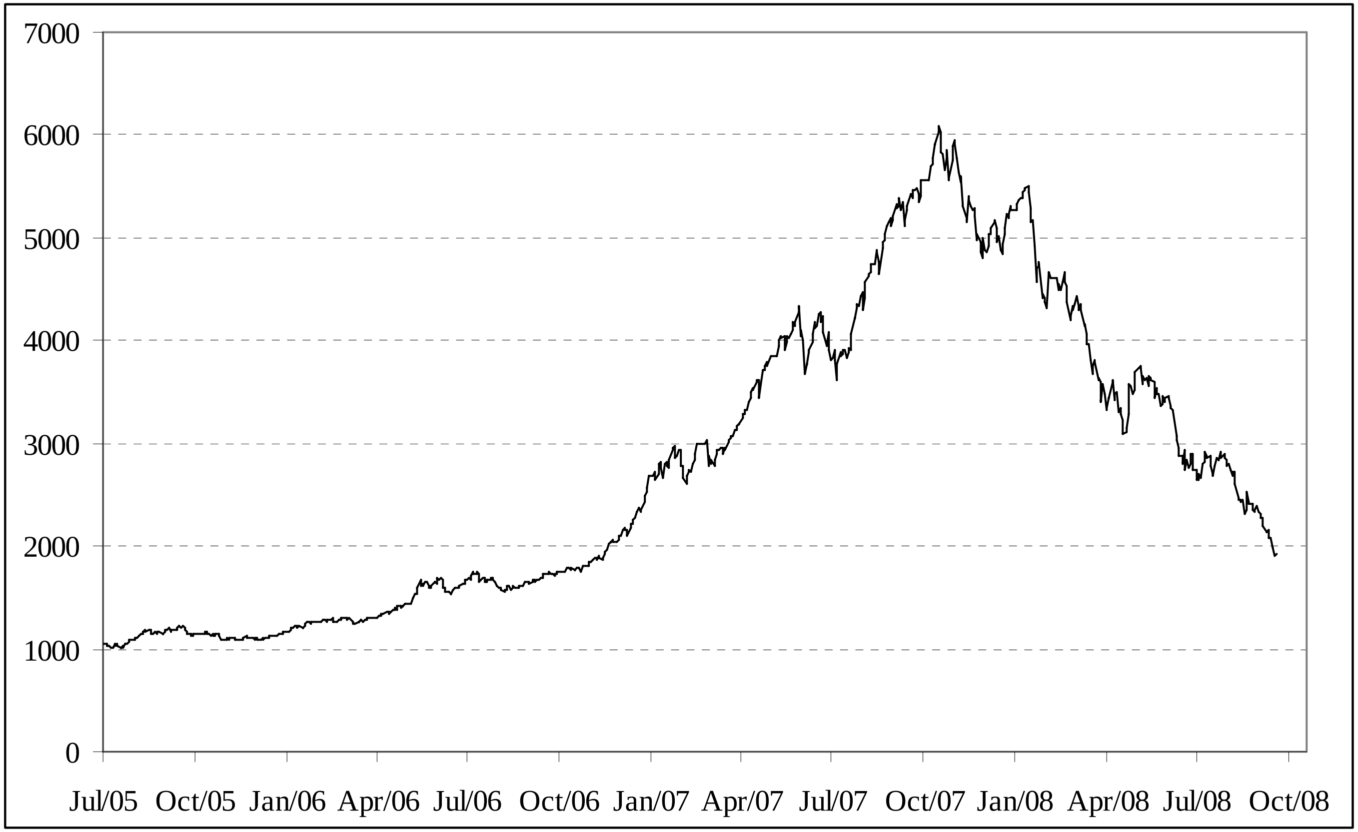
- Extreme volatility of Chinese share prices 2005-08

- Stock market bubbles
  - Key characters
  - Stock market valuation

- Evolution of Chinese stock market bubble and crash
  - External Factors: worldwide financial crisis
  - Economic psychology of Chinese investors

- Role of government and policy implications

Extreme volatility of Chinese share prices 2005-08



SSE Composite Stock Index:

1,012 → 6,124 → 1,809

(July 2005) (October 2007) (September 2008)

Determination of share prices

-‘Real’ value of a stock market index y*:

$$y^{*} = F(P/E; LM; SS; \tilde{Z}) \qquad (1)$$

P/E: price/earning ratio;

LM: macro-economic business cycles;

SS: short-term economic shocks (changes in interest rate, trade balance, exchange rate, employment and inflation);

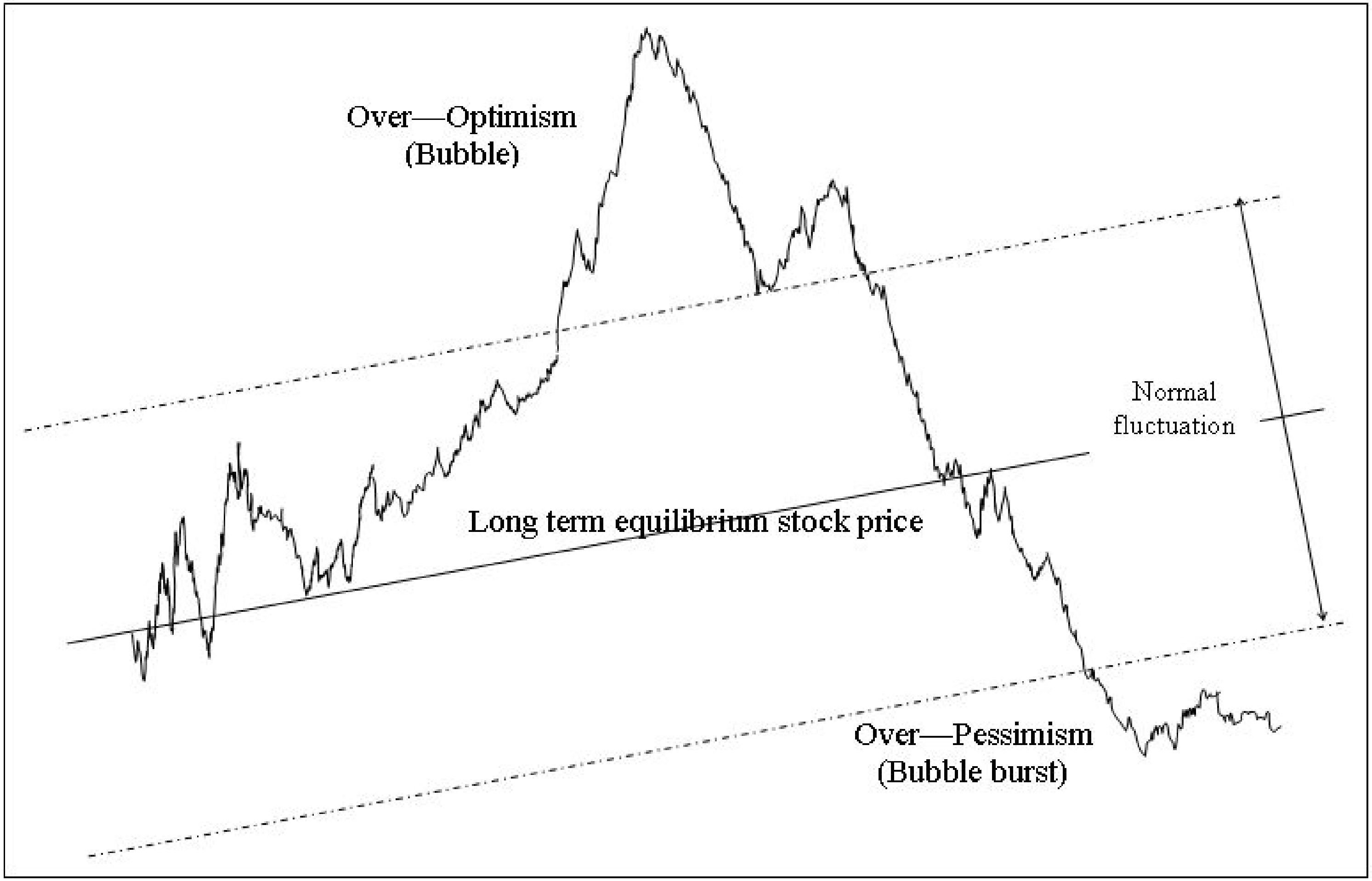
$\tilde{Z}$: white noise under ‘rational’ market behaviour

-when ‘irrational’ factors occurs,

$$\tilde{Z} = F(Greed, envy, speculation, \tilde{V}) \qquad (2)$$

$\tilde{V}$: pure white noise

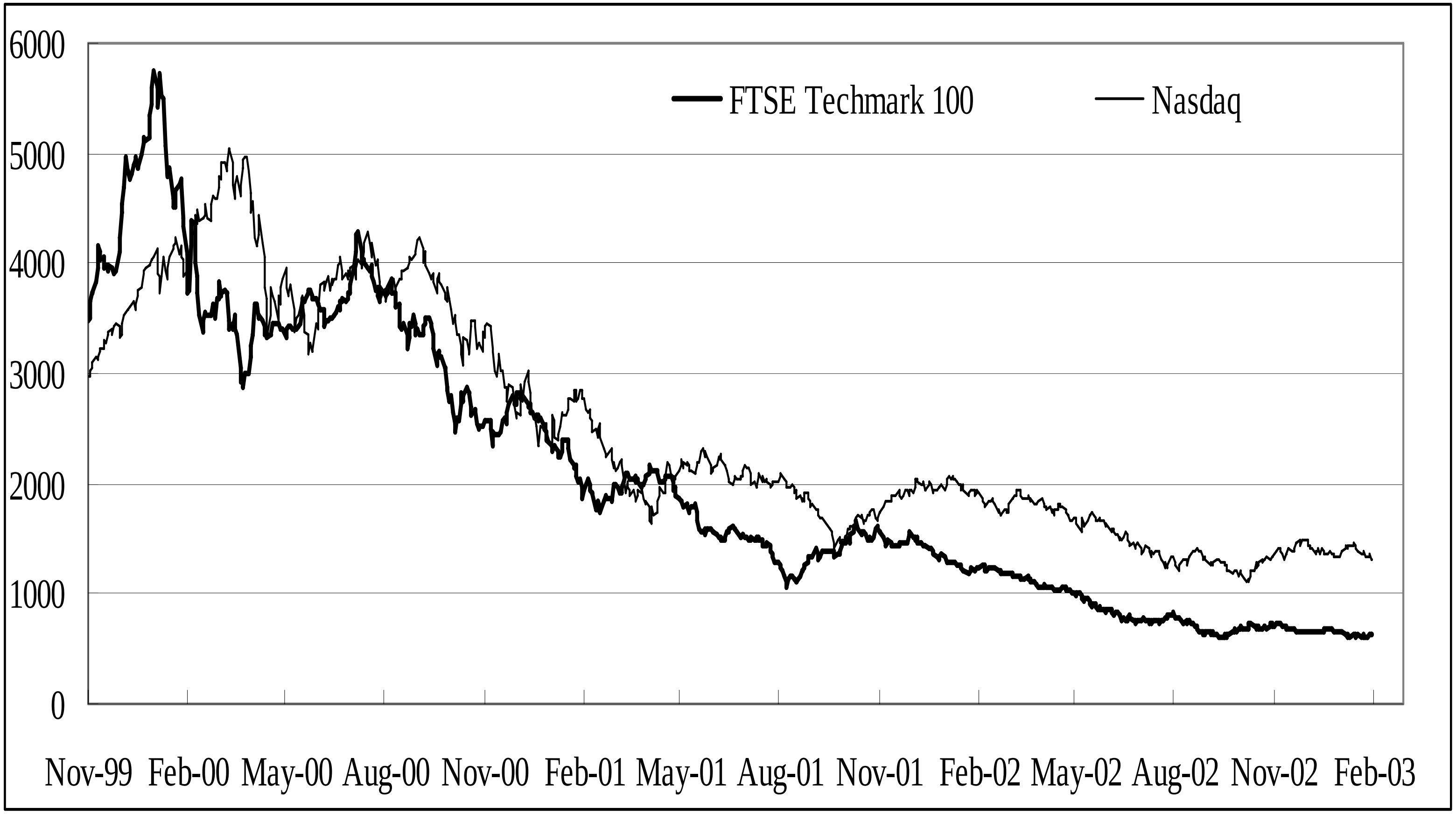
Stock Market Bubble and Crash



Key characteristics of stock market bubble

- Prices rise sharply/continuously for a certain period of time
- Unusually high P/E ratios of companies
- After peaking, prices decline sharply
- Gap between peak/trough is unusually large (>50%)
- Time lag between peak/trough is short (<1 year)
- It takes a long time (>2 years) to recover to previous peak

Dot. com Bubble:



TECHMARK 100 Index:	3,495 (Jan 2000) →	5,719 (Mar 2000) →	597 (Mar 2003)
NASDAQ Index:	1,499 (Aug 1998) →	4,572 (Mar 2000) →	1,330 (Oct 2002)

Stock Market Valuation

- Stock Price P_0: present value of all the expected future dividends

$$p_0 = \sum_{t=1}^{\infty} \frac{E_0[d_t]}{(1+k_e)^t} + \tilde{U} \qquad (3)$$

$E_0[d_t]$: expected dividend at time t;

k_e : investors' required rate of return (cost of capital);

$\tilde{U}$: white noise

- P/E Ratio:

$$\frac{p_0}{E_0[e_1]} = \frac{1}{k_e}\left[\frac{g_2 - (\gamma - 1)}{k_e - (\gamma - 1)}\right] \qquad (5)$$

g_2 : short term growth rate

(γ -1) : long term growth rate

Estimated P/E Ratio of Chinese Stock Market

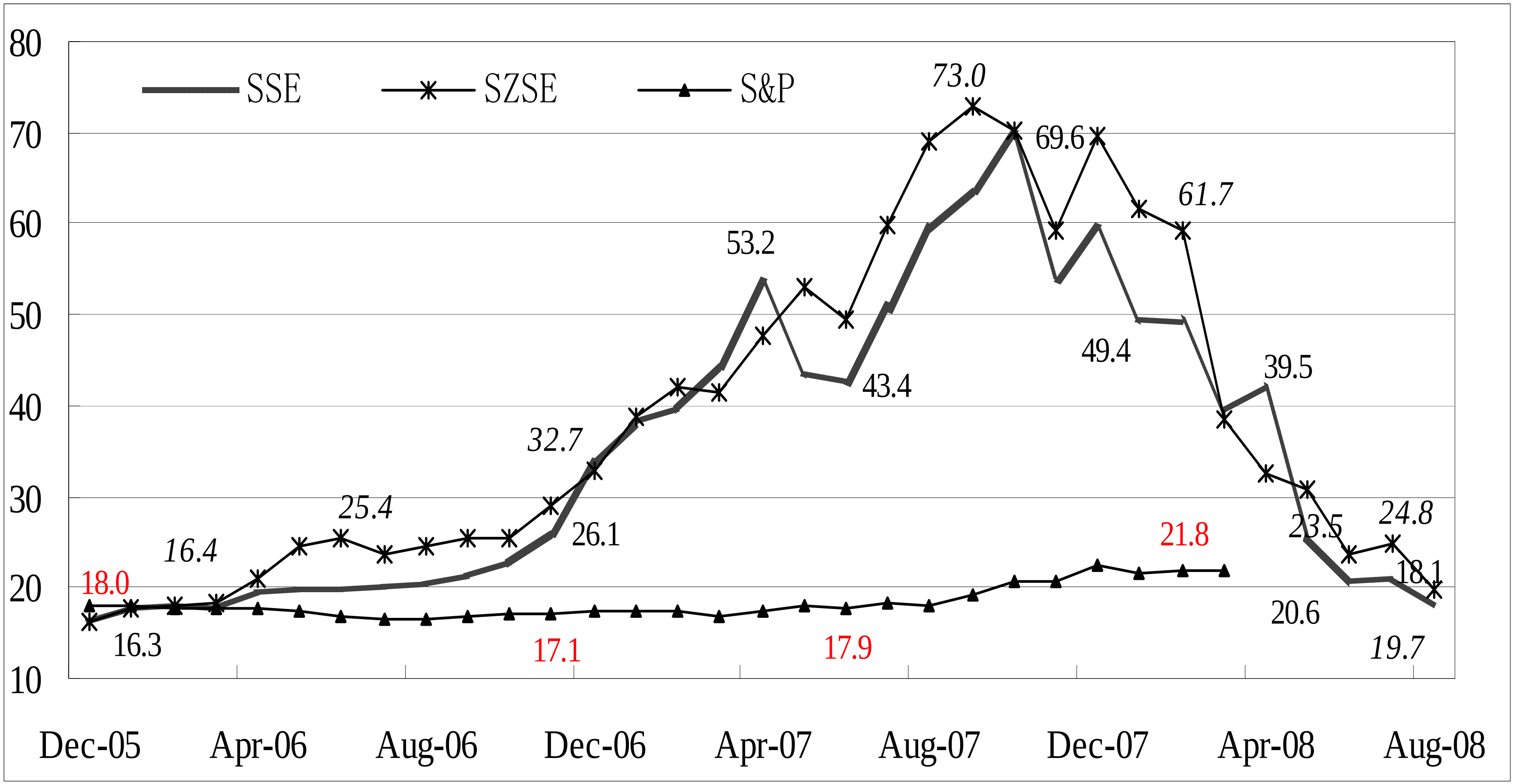
$(\gamma\ -1) = 3\%$:

Scenario A: k_s =12.5%							
g_2 (%)	20	30	40	50	60	70	80
P/E	14	23	31	40	48	56	65
Scenario B: k_s =14%							
g_2 (%)	20	30	40	50	60	70	80
P/E	12	18	24	31	37	44	56

$(\gamma\ -1) = 5\%$:

Scenario A: k_s =12.5%							
g_2 (%)	20	30	40	50	60	70	80
P/E	16	27	37	48	59	69	80
Scenario B: k_s =14%							
g_2 (%)	20	30	40	50	60	70	80
P/E	12	20	28	36	44	52	60

P/E Ratio of the US, SSE and SZSE: Dec 2005-Aug 2008



Factors driving Chinese stock market volatility

- **External:**

  - The US housing crisis and credit crunch

  - Worldwide financial turmoil

- **Internal:**

  - Strong performance of the Chinese economy

  - Recovery from a long bearish market (2000-05)

  - State's support to SOCBs and SOEs

   (ICBC, BOC, CCB, PetroChina, Sinopec, China Life, etc.)

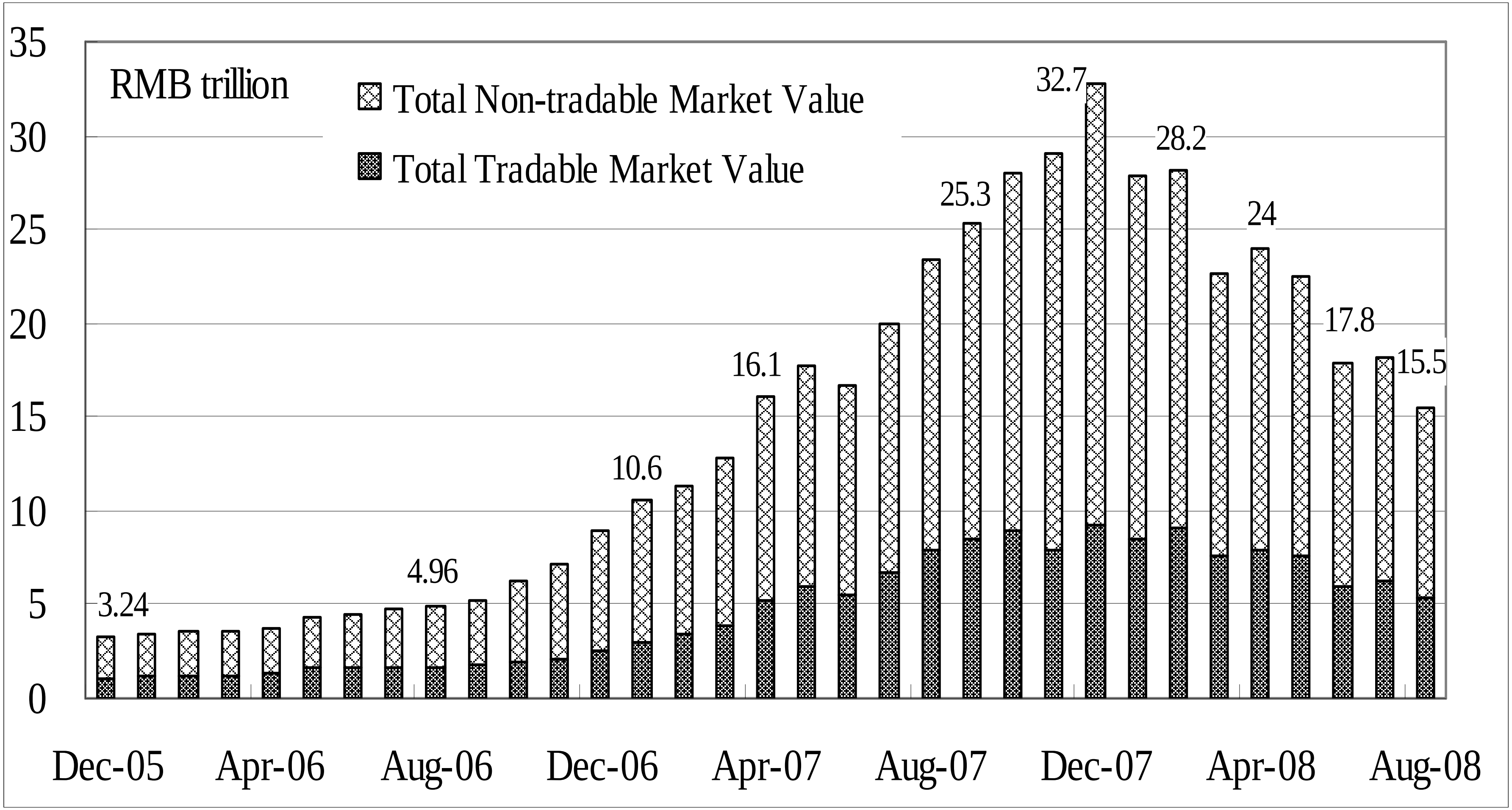
  - Beijing 2008 Olympic Games

  - *Intrinsic economic psychology of Chinese investors*

Non-Performing Loans of the Big Four, 1999-2005 (billion yuan and %)

	ICBC		BOC		ABC		CCB	
Year	NPL ratio %	Total NPL	NPL ratio %	Total NPL	NPL ratio %	Total NPL	NPL ratio %	Total NPL
1999	39.5	958.0	37.4	605.5	45.0	680.0	23.0	281.0
2000	34.4	831.0	27.2	409.6	33.2	493.4	15.7	218.2
2001	29.8	792.0	27.5	436.0	42.1	693.4	19.4	291.4
2002	25.7	759.9	22.5	408.5	36.7	701.1	15.2	268.0
2003	21.2	720.8	16.3	351.7	30.7	695.5	9.1	193.5
2004	19.0	703.6	5.1	109.9	26.7	692.3	3.9	87.3
2005	4.5	210.0	9.6	195.0	23.5	701.0	3.5	86.1
2006	3.8	134.3	4.0	935.1	23.3	726.7	3.3	92.3
2007	2.7	106.9	3.1	853.9	23.5	807.1	2.6	82.8

Market Values of SSE and SZSE: Dec 2005-Aug 2008



Plummet of the Chinese Financial Sector Stocks

Economic psychology of Chinese investors responsible for market bubble

- **‘Greed’:** impatient to become rich

- **‘Envy’**
  - fear of missing opportunity to make easy money
  - ‘Herding Effect’

- **‘Speculation’**
  - lack of investment channels

Burst of Stock Market Bubble

- **Lack of further investment capital**

  - total tradable market value in Dec 2007: RMB 9.31 trillion;

  - total urban and rural residents bank deposit: RMB 17.6 trillion;

  - more than 1/3 savings were in stock market (2005: 7%; 2006: 15%)

- **Over valuation and low efficiency of listed companies**

  - five China's SOEs were among 'world's largest 10 companies';

  (PetroChina, ICBC, Sinopec, China Life Insurance, China Mobile)

  - low productivity: (eg: profit of PetroChina is less than 1/3 of Exxon's)

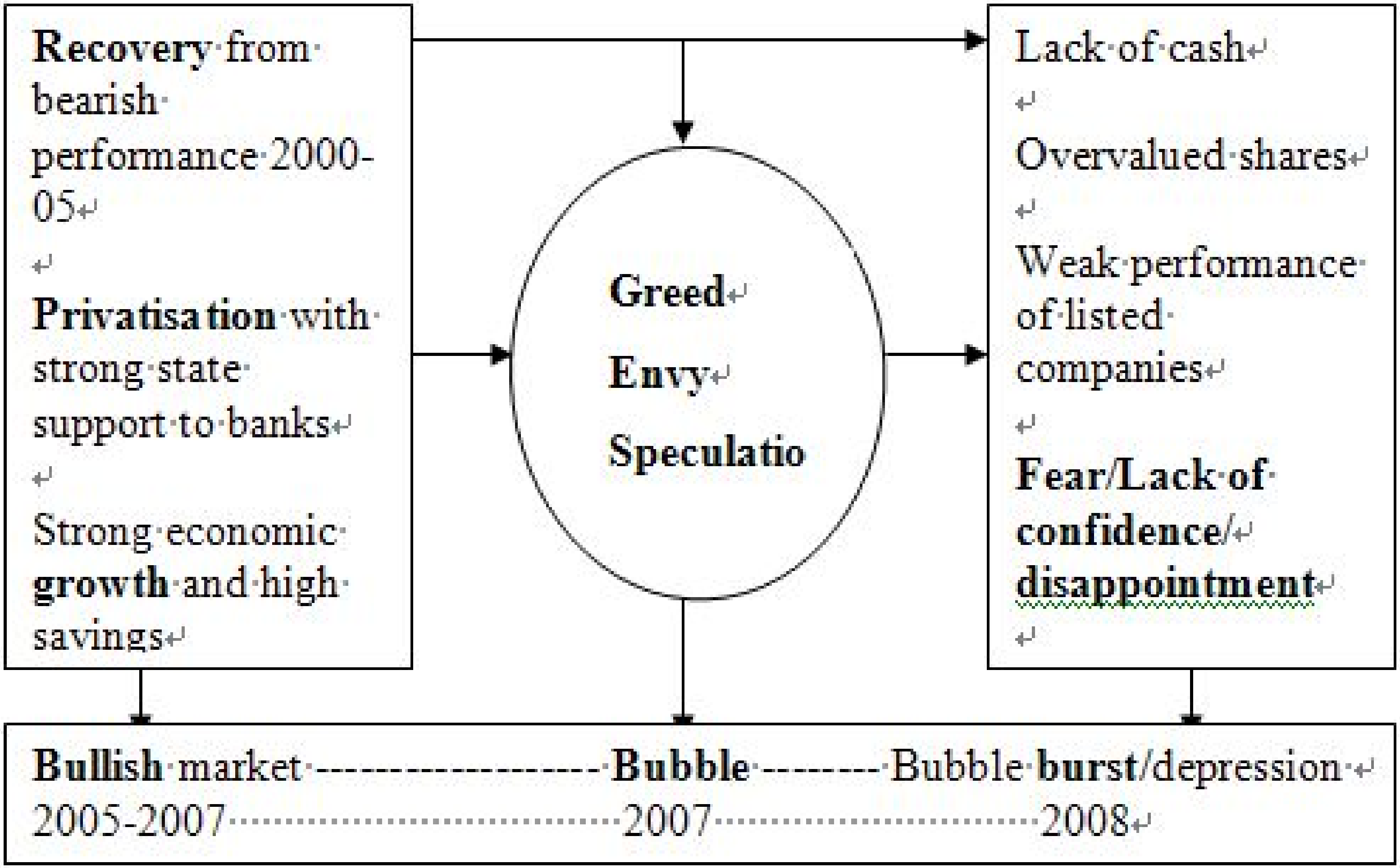
- **Lost of Confidence of the Investors**

  - fearful and disappointment

World's 10 Largest Companies by Market Value: 5 Nov 07

Company	Market value	P/E Ratio	Revenue (2007)	Profit (2007)	Labour (2007)
	US$billion		US$million	US$million	(persons)
PetroChina	1,079.40	52.33	129,798	14,925	1,117,345
Exxon	484.69	12.82	372,824	40,610	107,100
GE	412.92	18.61	176,656	22,208	327,000
China Mobile	365.39	32.55	47,055.2	8,426	146,844
ICBC	371.49	34.54	51,525	10,717	387,713
Microsoft	344.84	23.10	51,122	14,065	79,000
Gazprom	307.79	11.93	98,641	19,269	436,096
Sinopec	301.87	34.71	159,259	4,165	634,011
Shell	268.30	9.41	355,782	31,331	104,000
CLI	257.78	69	43,439	2,936	110,268
China 5	2,375.93	--	431,076.2	41,169	2,396,181
China 5/Exxon	4.90	—	1.16	1.01	22.37

Evolution of Stock Market Bubble/Crash



Conclusions and Policy Implications

- Psychology factors associated with stock market bubble:

  - Generation of bubble: ‘greed’, ‘envy’ and ‘speculation’
  - Burst of bubble: ‘disappointment’, ‘lack of confidence’ and ‘fear’

- Consequence: wealth re-distribution and social injustice

- Government’s role in future:

  - Providing more information of the listed companies;
  - Protecting the interests of small investors