China's Model of Managing the Financial System

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Contribution and Significance

- Government Intervention and Impact on Price Dynamics
  - Context of China's Financial System
  - Stock market crash in 2015.
  - Real, Important, and Timely.
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What Happened in China in 2015?

• A taxi-driver’s tale.

[Shanghai Stock Exchange Composite Index graph]

SOURCE: Bloomberg
What Happened in China in 2015?

- A taxi-driver’s tale.
Fund Managers’ Speculation

- All about interventions:

Shenzhen Composite

June 30: 13 major private fund managers voice bullish views on A shares
June 30: Easing of regulations and roles on margin financing
June 27: RRR cut and rate cut
June 29: Up to 30% of $570BN pension fund to be invested in stocks
July 1: Easing of regulations and roles on margin financing
July 1: Increase of shareholdings by listed companies
July 2: Reduction of equity trading transaction fee
July 3: China Securities Finance Corp. capital increase and share expansion
July 4: 21 major Chinese brokerage firms to invest CNY120 BN in blue chip ETFs
July 4: 28 approved IPOs got suspended
July 4: 25 major Chinese mutual funds to invest in equity funds managed by themselves
July 5: China HUIJIN’s investment in A-share ETFs
July 5: CSRC crack down against market manipulation and rumor distribution
July 6: CSI Index futures trading limit 1200 lots
July 7: Mass stock trading halts begin
July 8: Insiders barred from selling stakes for 6 months
July 8: Public security ministry threatens “malicious” short sellers with arrest

Source: Zero Hedge
Closed-door Round-Table Discussion

- “Anomalous Movements”, Reducing Volatility.

From "Saving China's Stock Market" by Yi Huang, Jianjun Miao, and Pengfei Wang
Important

• China’s Economy and Financial Markets.

• By the end of September 2015, 42 trillion RMB, daily volume of August 2015 was 514.8 billion RMB
Important

- New Investors Dynamics
Important

- International Ramifications

- Currency Devaluation August 2015
  Daily reference rate down 1.9 percent, largest since Jan 1994

- Implications for other countries
  Unconventional monetary policy in OECDs.
  Introduction of Euros (Gopinath et al. (2015))
  Economic stimulus after the global recession.

- Our understanding of business (credit) cycles and allocational efficiency.

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Timely

- Impact and unintended consequences of market interventions.

- Ongoing reforms of financial markets
  - “Reform Bull”: SOE reforms and transition from export-based to consumption-based
  - “Liquidity Bull”: China’s version of QE
  - “Capital Bull”: abundance capital and excessive shadow leverage
  - Registration-based IPO, Microstructure Reforms ($T + 1$, down limit, circuit breaker), internationalization of RMB

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Model Setup

- Grossman-Stiglitz REE with a large player and OLG agents

- Dividends $D_t = \theta_t + \sigma_D \epsilon_t^D$
  
  persistent component (fundamental) AR(1)
  
  $\theta_t = \rho \theta_{t-1} + \sigma \epsilon_t^\theta$

- Excess Payoff: $R_{t+1} = D_{t+1} + P_{t+1} - R^f P_t$

- Participants: noise traders, rational traders (OLG), government
Model Setup

• Noise traders: $N_t = \rho_N N_{t-1} + \sigma_N \epsilon_t^N$

• Investors:
  - $i \in [0, 1]$, live for one period
  - Endowed with wealth $\bar{W}$
  - CARA utility $U_t^i = \mathbb{E}[\exp(-\gamma W_{t+1}^i) | F_t]$

• Government
  - Minimizes price vol and deviation from fundamental
  - $\min \gamma_\sigma \text{Var}_t[\Delta P_t] + \gamma_\theta \text{Var}_t \left[ P_t - \frac{1}{R_f - \rho_\theta} \theta_{t+1} \right]$
  - $\gamma_\sigma$ risk aversion for price vol; $\gamma_\theta$ risk aversion for deviation.
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Key Results

- Benchmark: perfect information
  - No intervention, price vol explode, and market breakdown when $\sigma_N$ is large.
  - Noise trading + Investor myopia
  - Role for the government to reduce market vol and stabilize the market.
  - Intervention to reduce price volatility consistent with improving price efficiency (always the case?).
Key Results

- With information frictions: unobservable fundamentals
  - No intervention, reducing price volatility consistent with improving price efficiency.
  - Intervention introduces additional noise.
  - Speculation on gov noise.
  - Price vol reduced at the expense of price efficiency.
  - Gov-centric equilibrium has less gov trading
  - Gov pre-commitment and equilibrium multiplicity.
Comment 1: Government’s Objective

- Reducing both asset price deviation from fundamentals and price vol.
- Alternative 1: preventing crash
Comment 1: Government’s Objective

- Alternative 2: Favoring State-connected Firms
  - e.g., Song, Storesletten, & Zilibotti (2011); Cong & Ponticelli (2017)

- Alternative 3: Social Stability
  - Agents with imperfect signal $x_{it}$
  - Prior of economy fundamental $\theta_t$
  - Government intervention $m_t$
  - Market breaks down if too many run $A_t^{run} > m_t + \theta_t^*$
  - Government minimizes $Z(m_t, z, \theta_t)A_t^{stay} L + K(m)$ (or threshold), $L$ is loss upon failure.
  - Learning or info acquisition about $z$
  - Government-centric vs Fundamental-centric
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Comment 2: Minimization of Pricing Error

- Reducing both asset price deviation from fundamentals and price vol.

- The Bias-Variance Trade-off (Decomposition):
  \[ E(y_0 - \hat{f}(x_0))^2 = \text{Var}(\hat{f}(x_0)) + [\text{Bias}(\hat{f}(x_0))]^2 + \text{Var}(\epsilon) \]
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- Penalty for Pricing Errors

\[
E \left[ \left( \sum_t D_t - P_t(\nu^N,t) \right)^2 \right] \\
= \text{Var} \left( \sum_t D_t \right) + E \left[ \sum_t D_t \right]^2 + \text{Var} \left[ P_t(\nu^N,t) \right] \\
+ E \left[ P_t(\nu^N,t) \right]^2 - 2E \left[ \left( \sum_t D_t \right) P_t(\nu^N,t) \right] \\
= \text{Var} \left( \sum_t D_t \right) + \text{Var} \left[ P_t(\nu^N,t) \right] + E \left[ P_t(\nu^N,t) - E \left[ \sum_t D_t \right] \right]^2
\]

- Natural interpretation of the government’s objective.
- For equilibrium existence, Bias-Variance are qualitatively equivalent. But unclear in general.
Comment 3: Information Design and Intervention Costs

- Information Design vs Mechanism Design (Bergemann and Morris (2016))
- Information Structure Design & Symmetric Learning
  - Intervention impact uncertain, effectiveness less than expected.
  - Alteration of the informational environment.
  - Goldstein and Huang (2016), Cong et al (2017)
- Asymmetric Information and Learning
  - Footnote 11; Signaling (Angeletos et al (2006)); Reputation (Huang (2017))
  - Multiplicity and commitment
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  - Taxpayers’ money, and investment risks in interventions.
  - Political capital
  - Disrupted IPO reform and currency internalization
  - Firing of head of CSRC, Xiao Gang; imprisonment of Citic officials.

• Impact of Intervention Costs
  - Interior optimal intervention absent cost of intervention.
  - What is the welfare gains and losses in gov-centric vs fundamental-centric equilibrium?
  - Cost matters when there is dynamic information design.
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Comment 4: Cum Dividend Return and Variance

- By p7

\[ R_{t+1} = D_{t+1} + P_{t+1} - R_f P_t \]

\[ = (\theta_{t+1} + \sigma_D \epsilon^D_{t+1}) + (p_\theta \theta_{t+1} + p_N N_{t+1}) - R_f P_t \]

\[ = (1 + p_\theta)(\rho_\theta \theta_t + \sigma_\theta \epsilon^\theta_{t+1}) + \sigma_D \epsilon^D_{t+1} \]

\[ + (p_N(\rho_N N_t + \sigma_N \epsilon^N_{t+1})) - R_f P_t \]

- Conditional Variance

\[ Var_t(R_{t+1}) = (1 + p_\theta)^2 \sigma^2_\theta + \sigma^2_D + p^2_N \sigma^2_N \] \hspace{1cm} (1)

where \( p_\theta = 1/(R_f - \rho_\theta) \), which differs from the equation on p9.

- Conditional mean:

\[ (1 + p_\theta)\rho_\theta \theta_t + p_N \rho_N N_t - R_f (p_\theta \theta_t + p_N N_t) \]

\[ = ((1 + p_\theta)\rho_\theta - R_f p_\theta)\theta_t + p_N(\rho_N - R_f)N_t \]
Comment 4: Cum Dividend Return and Variance

- cum dividend?
- $D_t + P_t$ linear in $\theta_t$ and noise?

- No qualitative changes to the results.

- But should be consistent.
Other Comments

1 Uniqueness of $p_N$
   - Focus on less negative root of $p_N$ because it converges when $\sigma_N \to 0$
   - What about $\sigma_N \to \infty$? Is the other root more stable?

2 Microfoundation of government noise and investor learning.
   Footnote 11: Gov possesses private signals.
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Other Comments

1. Role of leverage and deleveraging-driven firesale.

2. Empirical predictions or evidence that the government intervention is indeed a priced factor.

3. Coordination failures among regulatory agencies. State Council, PBOC, CBRC, CSRC, and CIRC.

4. Online Appendix.
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Recap

1. Realistic, important, and timely.

2. More research on the effectiveness and unintended consequences of interventions.

3. Empirical studies and policy applications.
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