China's Model of Managing the Financial System

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China's Distinct Economic Structure

- Central planning is still largely mixed with free markets
  - Dual tracks (market & planning tracks) are present in many sectors
  - The state sector, while much improved, is still less efficient than the private sector, and is large and will likely remain large

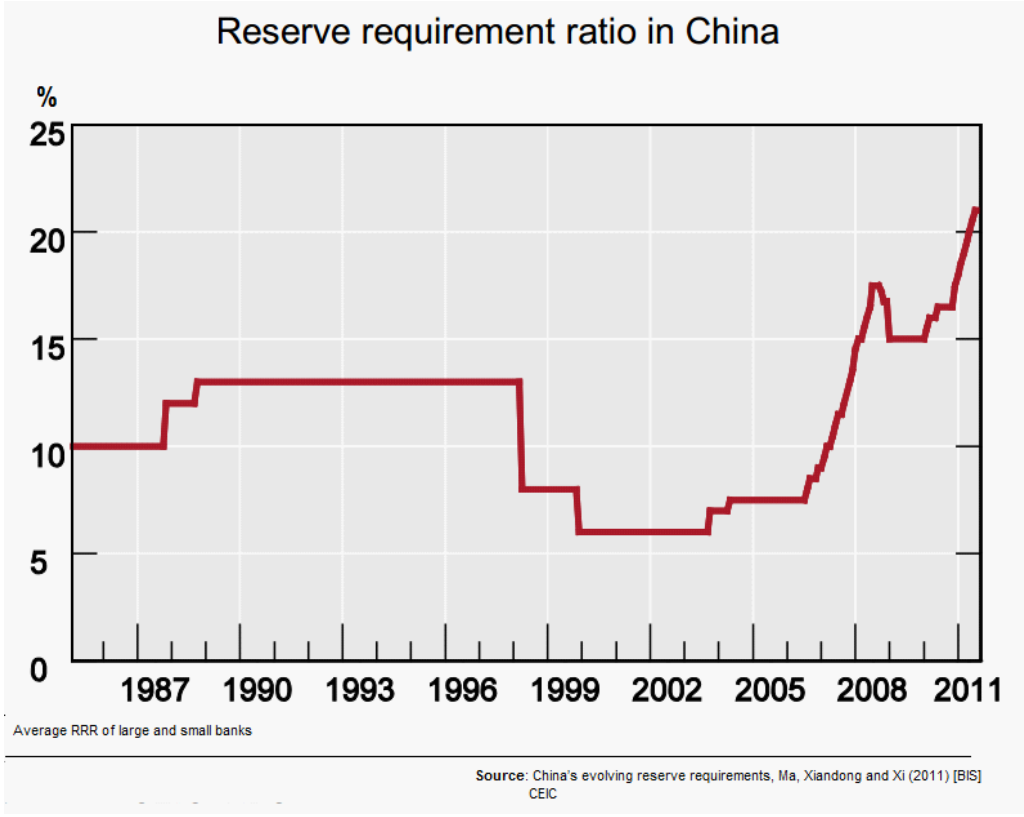
- The government still plays a central role in many aspects
  - Sets agenda for policy reforms
  - Has strong influence on allocation of key resources
    - fiscal spending, credit, land, ...
  - Provides soft budget constraints to state firms and implicit guarantees to various sectors

Government Interventions in China's Financial System

- History of **policies and regulations**
  - bank required reserve ratio (36 changes 2003-2011)
  - suspension of IPO issuance (8 times 1994-2014)
  - stamp tax on stock trading (10 changes 1997-2009)
  - mortgage rate and first payment requirement
  - installation of circuit breakers (2016)
- **Direct trading** in stock markets
  - "national team" directed to bail out stock market in summer 2015
- Government policy, intended or unintended, impacts asset prices
  - ongoing housing market boom
  - controls on international capital flows
  - expansion of shadow banking system
  - stock market turmoil in 2015
  - exchange rate crash in 2015
  - breakdown of circuit breakers in 2016
- Extreme **uncertainty** surrounding timing and scale of intervention

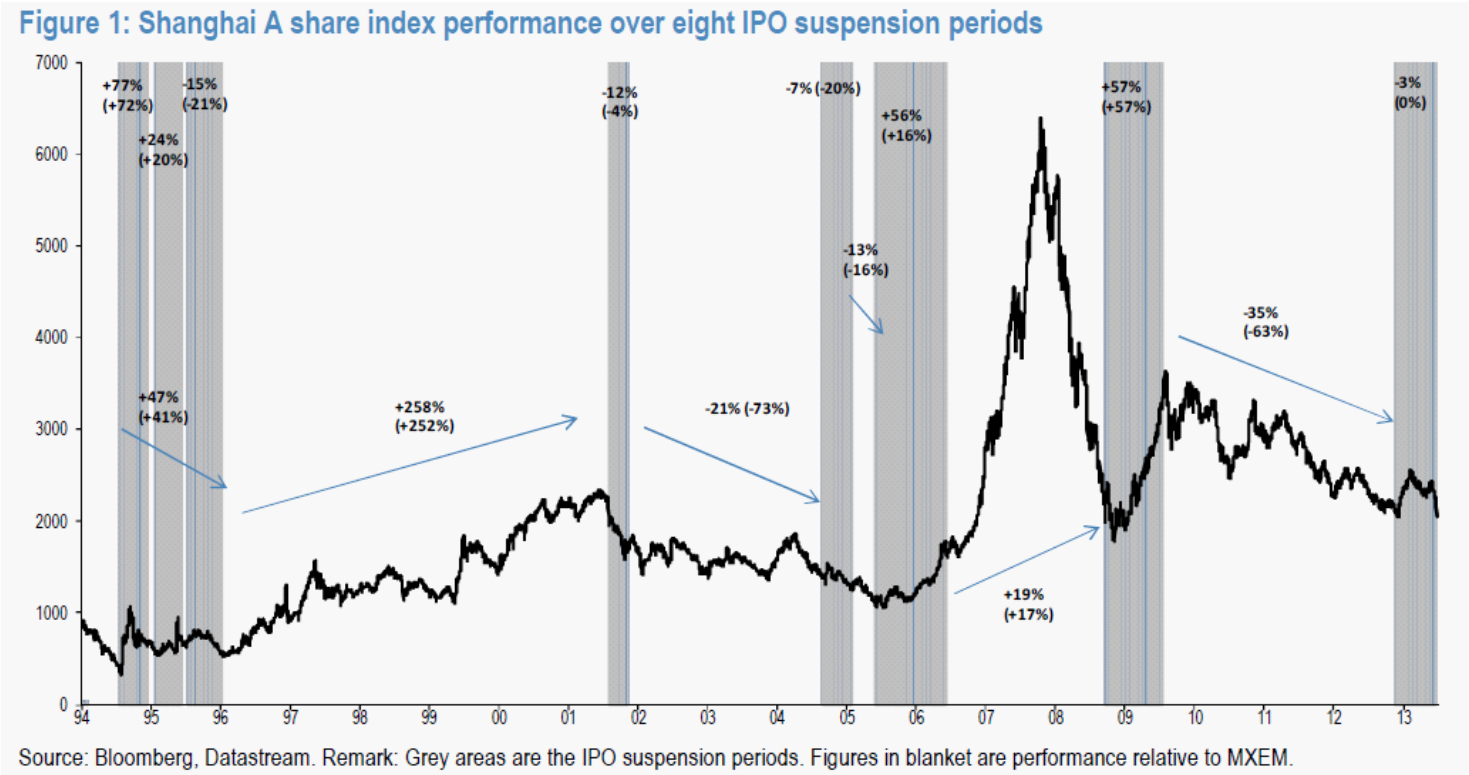
Required Reserve Ratio in China

- Active monetary policy: up 32 times, down 4 times from 2003-2011
- Powerful and direct impact on credit supply, money multiplier



IPO Issuance in A-Share Markets

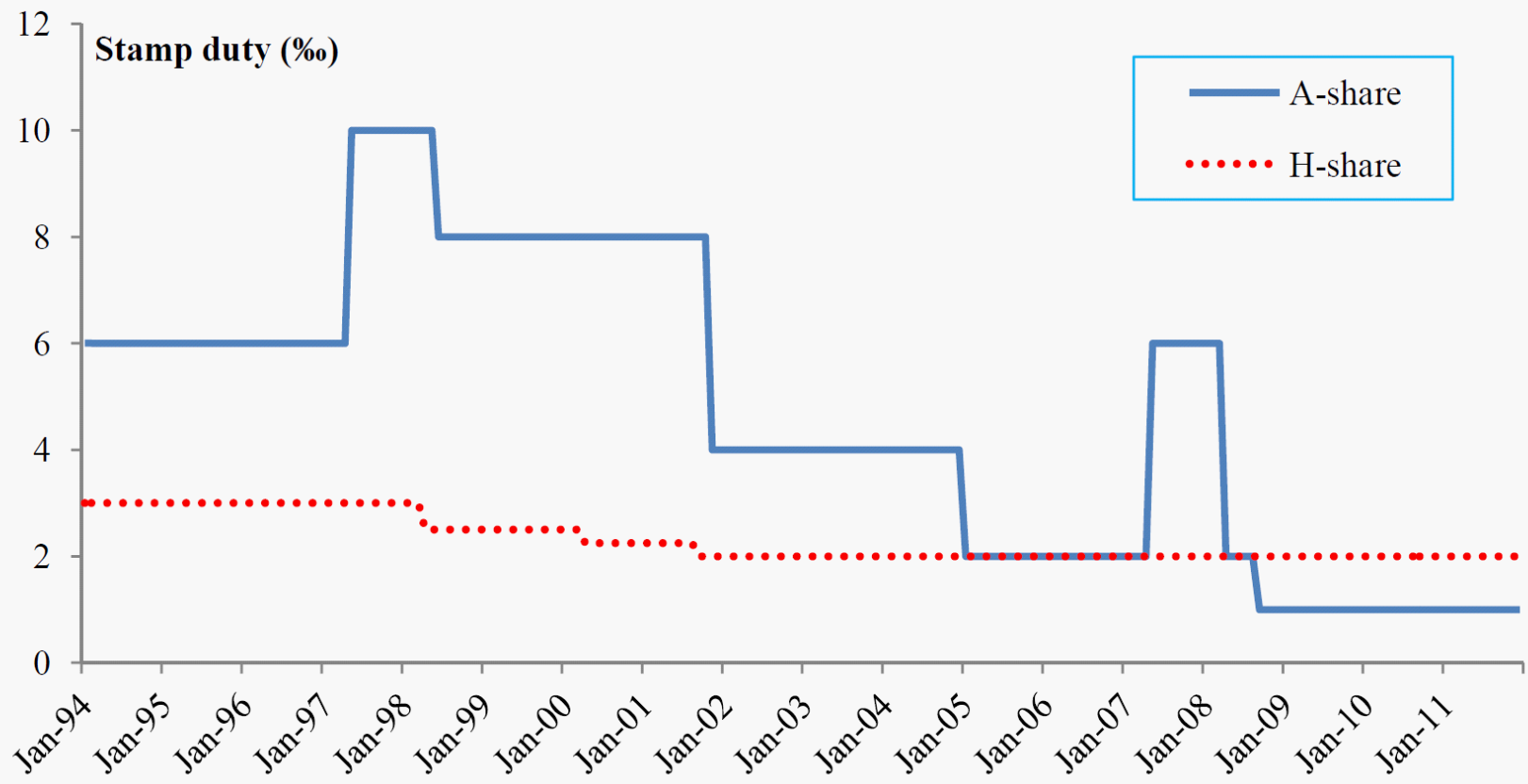
- The government (CSRC) directly controls IPO issuance
  - had suspended IPO issuance 8 times
  - quantity and allocation of quota



Stamp Tax in Stock Trading

Figure 1 Evolution of Stamp Duties in China and Hong Kong

The figure shows the evolution of trading stamp duty (sum over buyers and sellers) in A-share and H-share markets. Y-axis shows the absolute level of stamp duty in ‰.



Government's Paternalistic Philosophy

- Large population of **inexperienced retail investors**
  - hold 50% of tradable shares and contribute to 90% of trading volume
- Large price **volatility** in China's stock markets and heavy turnover
  - highest turnover rate among major stock markets
- Asset prices often **deviate from fundamentals**
  - large price differentials between A-B and A-H stock pairs, e.g., Mei, Scheinkman and Xiong (2009)
  - dramatic warrant bubble in 2005-2008, e.g., Xiong and Yu (2011)
- **CSRC's mission**: protect retail investors and stabilize markets

Policy Risks in Financial Development

- Intensive and uncertain intervention entails unavoidable policy risks
  - complex financial instruments and interconnected financial markets
  - largely new to policy makers
- Speculation by market participants about government policy may reinforce, and even trigger, policy errors
- As a result, intensive government intervention
  - makes noise in policy making a pricing factor
  - government noise attracts market speculation and may get amplified
- Implications for real allocative efficiency

Conceptual Questions

- How does government intervention impact market dynamics?
- How do market participants react to this intervention?
  - do they trade along with or against the government?
- What is the right objective of government intervention?
  - reduce price volatility or improve informational efficiency?

Overview

- Perfect-Information Benchmark
  - justify need for government intervention
- Extended Setting with Informational Frictions
  - show that intense intervention makes **uncertainty about policy errors** a factor in asset prices
    - this factor gets **magnified by market speculation**
    - it distracts market participants from analyzing economic fundamentals by focusing their attention on future policies
- Potential tension between
  - **reducing price volatility**
  - **improving information efficiency**

A Setting with Perfect Information

- Single risky asset, which pays a stream of **dividends**
  - dividend driven by time-varying but predictable fundamental
  - for now, fundamental is known to market participants
- Subset of investors every day trade for noninformational reasons
  - price insensitive orders, capturing unstable market forces
- Noninformational "noise" traders represent inexperienced retail investors

Market Breakdown

- Prices reflect both the asset fundamental and the aggregate position of noise traders
- **Volatility explodes** and **market breaks down** if noise trading becomes too intense
  - investors ineffective in trading against noise trader risk
  - noise trading today is an arbitrage opportunity because of mispricing, but noise trading tomorrow is a risk that can be severe
- Potential for market dysfunction introduces a role for government intervention

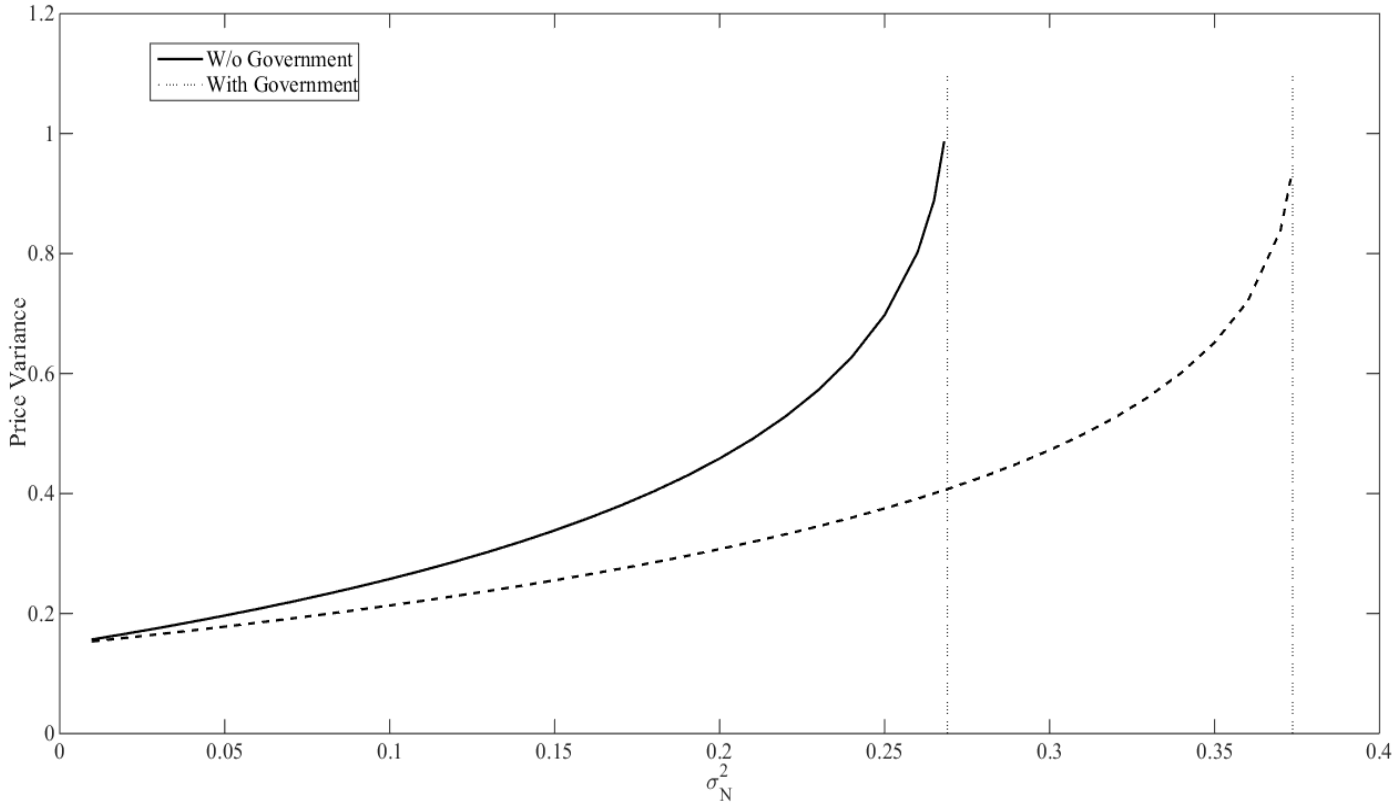
Government Intervention

- Assume now government can participate in financial markets and trade against these noise traders
  - trading, however, contains policy errors
- Leaning against noise traders consistent with paternalistic philosophy of CSRC to protect retail investors and stabilize markets
- Government has two objectives:
  - Minimize (conditional) price volatility,
  - Minimize price deviation from fundamental (1 / informativeness)

  - often treated as equivalent in policy discussions
  - reducing price volatility is more convenient & widely adopted in practice, e.g., in US monetary policy - Stein and Sundarem (2016)
- China's financial markets often characterized by large price **volatility** and **deviation of prices from fundamentals**
- Government internalizes the market failure by taking a sufficiently large position to **mitigate** region of market breakdown

Volatility Explosion

- Government intervention can slow down volatility explosion
  - σ_N^2 measures intensity of noise trading



Government Impact on Asset Prices

- To understand how government affects asset prices, useful to decompose holding period returns as

$$\begin{aligned} \text{return} &= \text{dividend yield} + \text{capital gain} \\ &\approx \underbrace{\text{expected cash flow}}_{\text{focus of literature}} + \underbrace{\text{discount rate}}_{\text{our focus}} \end{aligned}$$

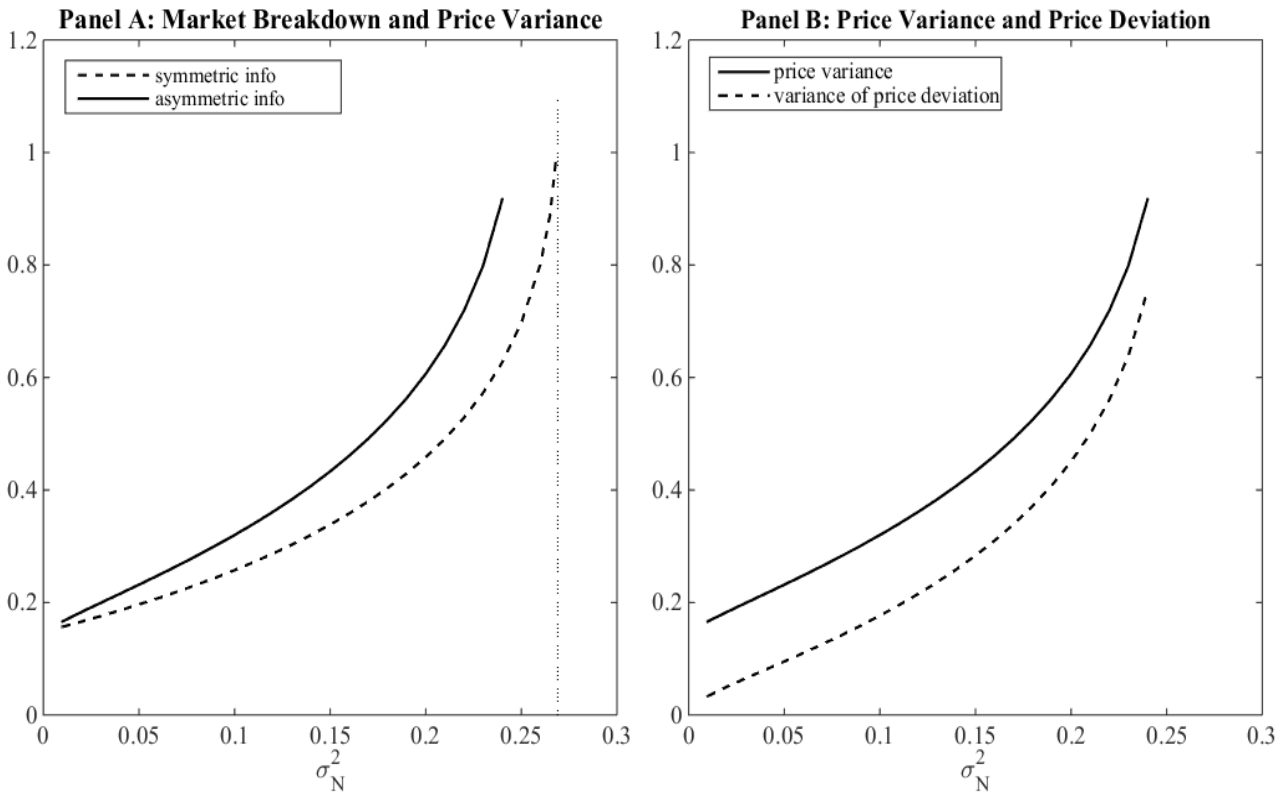
- Intervention here affects discount rates not cash flows
  - Chinese government has targeted investor transaction costs, bank lending rates, mortgage payment requirements
  - distinct from Pastor & Veronesi (2012) and Bond & Goldstein (2015), which focus on interventions that affect cash flows

Extended Model with Information Frictions w/o Gov.

- Assume now asset fundamental is **unobservable**
- **no government**
- Investors now acquire private information about fundamental
- Prices now reflect
  - fundamental given market expectations
  - noise traders' price impact
  - information of investors aggregated into price (new)

Volatility Explosion with Information Frictions w/o Gov.

- With asymmetric information
  - price variance is higher
  - breakdown occurs sooner
- Reducing noise trading lowers **both** price variance and deviation
  - ignoring investor attention, one would naívely conclude that policies that target one objective also accomplish the other



Extended Model with Information Frictions & Gov.

- Asset fundamental is **unobservable**
- **Government** trade intervention
  - no private information
  - trades to reduce price volatility and improve informativeness
- Investors now choose to acquire private information about asset fundamental or future government policy errors

Equilibria with Government Intervention

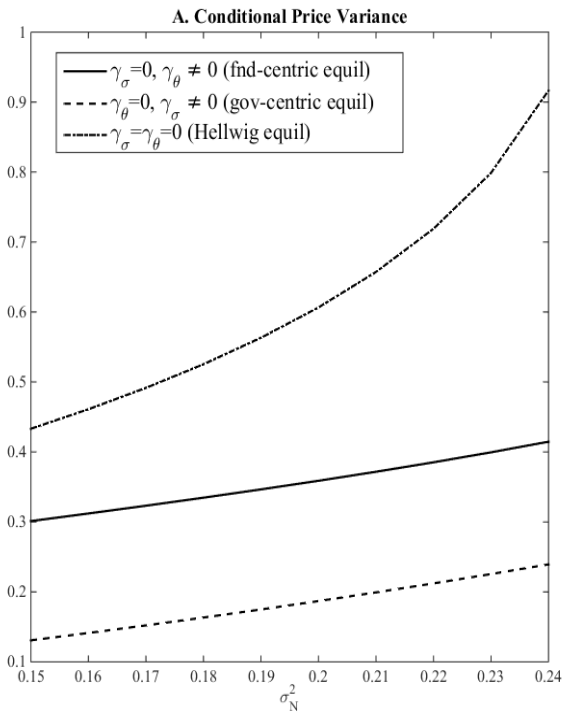
- A **fundamental-centric** equilibrium
  all investors acquire signals about fundamental
  - investor trading makes price more informative about fundamental
  - investors may trade against government, depending on signals

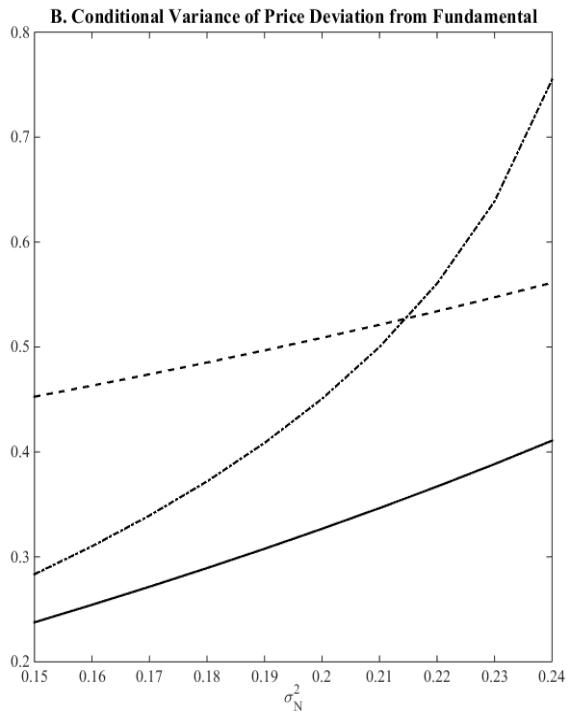
- A **government-centric** equilibrium
  all investors acquire signals about future government policy errors
  - occurs when the government intervention is sufficiently intensive
  - price may be less informative about fundamental
  - investors all trade along the government, making price volatility lower and allowing government to trade less

- A **mixed** equilibrium
  some investors acquire signals about fundamental, others about government policy errors

Market Equilibrium with a Single Government Objective

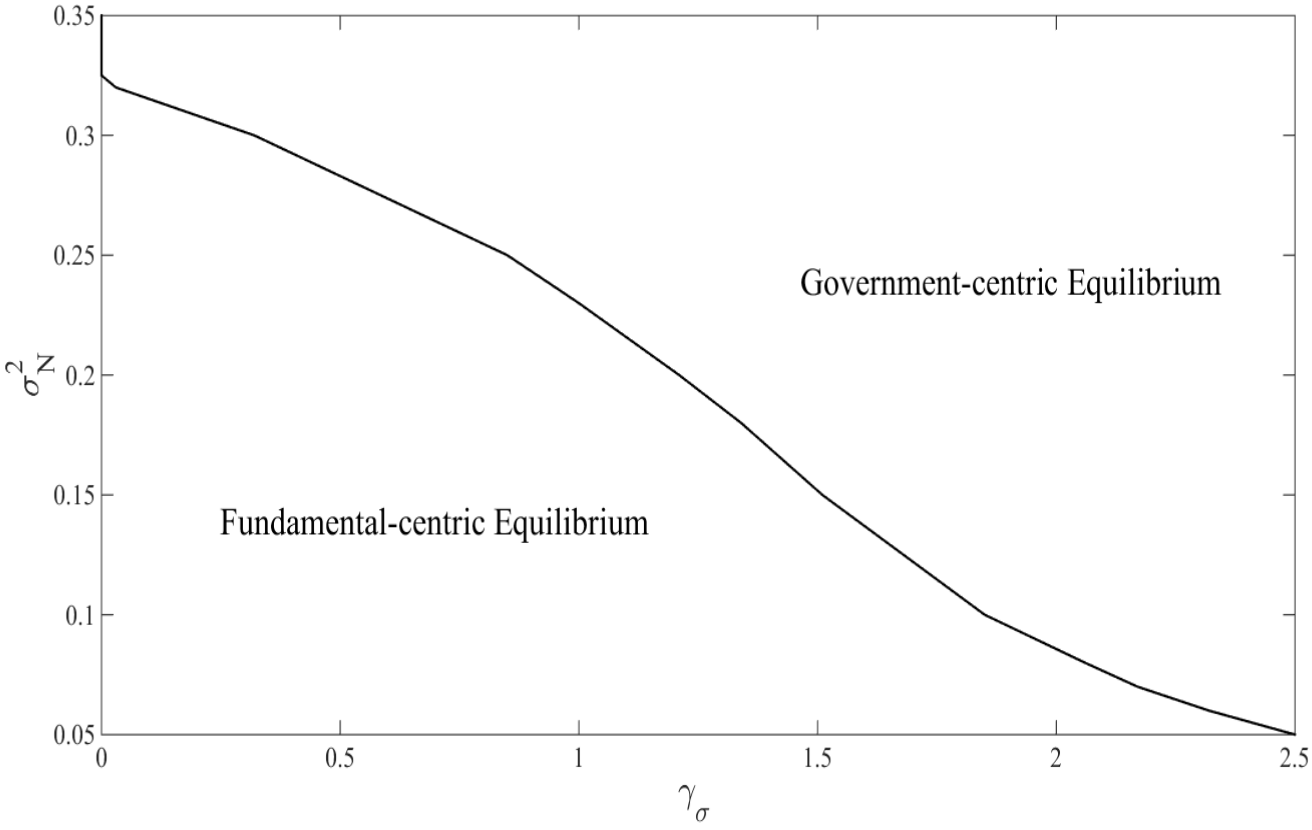
Three cases: (1) Government focus on informativeness, (2) Government focus on price volatility, (3) No intervention





Boundary btw Govt- & Fundamental-centric Equilibria

- Government-centric equilibrium more likely the larger the
  - intensity of noise trading σ_N^2
  - weight on reducing price volatility γ_σ



Summary

- Government intervention helps to stabilize financial markets
  - unregulated markets can be highly volatile and might break down when noise trader risk is sufficiently large
- Adverse effects:
  - active government intervention renders noise in government policy **a pricing factor**
  - intervention can cause investors to **speculate on government noise** rather than fundamentals, which amplifies effects of policy errors
- Tension between objectives
  - reducing **price volatility**
  - improving **informational efficiency**
  - while price volatility is lower with intervention, informational efficiency can be worse

Adding Time-consistency Problem

- So far, government could commit to a trading strategy ex-ante
  - commit not to trade too aggressively to ensure investors collect fundamental information
- Without commitment & investors choose what information to acquire
  - pretend not to trade too aggressively
  - after investors collect fundamental information, trade aggressively
  - time inconsistency problem
    a la Kydland & Prescott (1977), Barro & Gordon (1983), ...
- Reputational Games
  - Developed vs. emerging economies

"China's Gradualistic Approach and Financial Markets" (AER P&P)

"Crossing river by touching the stone" may not work with finance

Two ingredients

1. Policy maker uses private agents' investment decisions to extract useful information about firm productivity (economic fundamentals), and gradual policy changes reduce the information noise
2. With financial markets, private agents have the flexibility and capacity to invest before the policy maker's policy announcement
   - If policy maker cannot pre-commit to a policy rule, a time-inconsistency problem arises

Risks in China's Financial System

- Commonly concerned risks
  - Noise trader risk created by inexperienced retail investors
  - Rising leverage across the nation
  - Overheating housing markets
  - Surging capital outflow
- More important risk: policy errors **magnified** by market speculation
  - the stock market turmoil in summer 2015
  - the breakdown of the circuit breaker in January 2016
  - the exchange rate crash in August 2015
- Government intervention can stabilize, but
  - new risk factor
  - shifts investor information acquisition incentives
- Time-inconsistency problem