# Discussion of Di Tella & Kurlat

## "Why are Bank Exposed to Monetary Shocks"

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# Motivation in Paper

- Bernanke and Gertler: "Inside the Black-Box"
  - Interest-Rate, Credit Channel, and Balance-Sheet
  - Inflation Tax Channel
  - **DT-K:** balance-sheet channel applied to banks
- Study:
  - **Complete Markets Theory:** why wouldn't banks insure against shock?
  - **Quantitatively:** how big are effects on spreads and net worth?
- Theoretical lesson in relation to work by Di Tella:
  - aggregate risk shared, "taxation-gov spending risk" not shared

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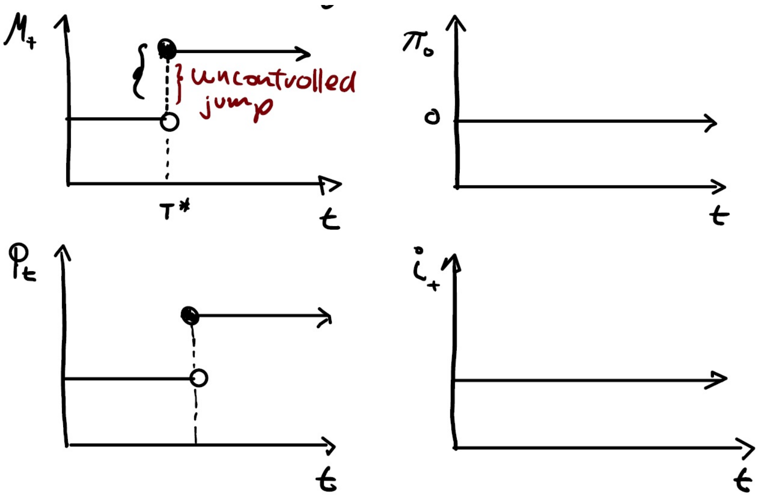
# Model with Poisson Shock

- Consider for simplicity Poisson monetary shock
  - arrives only once
  - intensity $\theta$
  - $M$ constant before shock
  - $\Delta M$ after shock
- Poisson shock exogenous, but Fed chooses $\mu$ after shock s.t.:

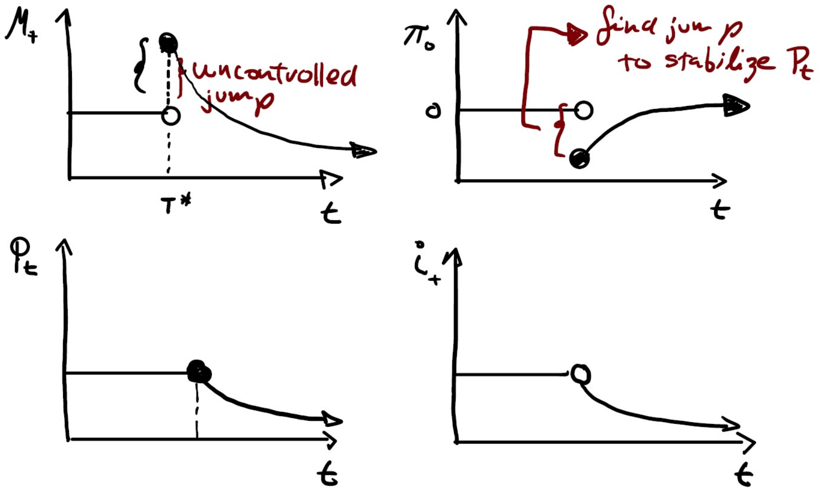
$$\dot{M} = \mu M.$$

- Two policies:
  - Price Jumps - No Inflation: $\mu = 0$ after shock
  - No Price Jump - Inflation: $\mu$ such that no jump upon shock

# Price Jump - No Inflation



# No Price Jump - Inflation Jump



# Stationary Equilibrium

- First: Incomplete Market
- Consider the stationary equilbirium prior to the shock
- Observations:
  - real rate constant $r$
  - Price of capital constant $q = (\rho\beta)^{-1}$
  - wlog $Ak = 1$
- Steady state n/w pinned down by $\tau$

# Banks Problem

## Banks

$$0 = \rho(1-\gamma)V(n)(log(x) - \frac{1}{1-\gamma} log((1-\gamma)V(n)) + V_n(\dot{n})...$$
$$+\theta[V(n_+,+) - V(n)]$$

where

$$\frac{\dot{n}}{n} = (r - \chi(i,s)x_t + s\phi + T(n) - \tau^n)$$

Value instant after the shock:

$$V(\cdot,+) \text{ and } n^+ = n + \Delta T(n)$$

- In paper, I think missing: $T(n)$ monetary transfers
  - turns out to be VERY important

# Household Problem

## Household

$$0 = \rho(1-\gamma)U(w)(log(x) - \frac{1}{1-\gamma} log((1-\gamma)U(w)) + U_w(\dot{w})...$$

$$+\theta[U(w_+,+) - V(w)]$$

where

$$\frac{\dot{w}}{w} = (r - \chi(i,s)x_t + s\phi + T(w) - \tau^w)$$

with same notation:

$$w^+ = w + \Delta T(n)$$

# Stationary Equilibrium - No Inflation

No inflation benchmark, before the shock:

$$T(w) = T(n) = 0$$

Replacing optimal conditions for consumption:

$$0 = \frac{\dot{n}}{n} = (r - \rho + s\phi - \tau^n)$$

$$0 = \frac{\dot{w}}{w} = (r - \rho + \tau^n z)$$

$$\rho(1-\alpha)(1-\beta)\iota(i,s)^{\varepsilon-1}s^{-\varepsilon} = \underbrace{\phi z}_{deposit\ supply}$$

$$\underbrace{\frac{M}{P}}_{money\ supply} = \frac{1}{\rho\beta}\rho\alpha(1-\beta)\iota(i,s)^{\varepsilon-1}s^{-\varepsilon}$$

Given $i = r + \pi$, got to solve for $\{s, z, P, \tau^n\}$.
(total wealth=market clearing: $\frac{1}{\rho\beta}$)

# Policy Experiment I

- (Different from Paper) Price Jumps - No Inflation: $\mu = 0$ after shock
- Critical: how do we introduce money?
- Case 1: Proportional transfers
  - $T(n) = \Delta M/M \cdot n$
  - Rescales everything by $P$
  - Real wealth unchanged/nominal jumps
- Case 2: Lump-Sum transfers
  - Redistributive Effect
    - Incomplete markets: has effects
    - Complete markets: should wash out
- Case 3: (like in paper) G jumps
  - Ricardian Equivalence logic (DiTella JMP)

# Policy Experiment - II

- **(Like Paper) No Price Jump - Inflation: $\mu$ such that no jump upon shock**
- Logic is very different. Incomplete markets easier to understand
- Since price doesn't jump, and no contingent condtracts, z same
- To contain prices, upon $\Delta M$, need to promise inflation:

$$\rho(1-\alpha)(1-\beta)\iota(i,s)^{\varepsilon-1}s^{-\varepsilon} = \underbrace{\phi z}_{deposit\ supply}$$

$$\underbrace{\frac{M(1+\Delta)}{P_o}}_{money\ supply} = \frac{1}{\rho\beta}\rho\alpha(1-\beta)\iota(i,s)^{\varepsilon-1}i^{-\varepsilon}$$

Non-Linear but unique solution $i$ and $s$!

Produces Change in Wealth Distribution:

$$0 > \frac{\dot{n}}{n} = (r-\rho+s\phi-\tau^n)$$

and

# Policy Experiment - II

- Critical: how do we introduce money?
- Case 1: Proportional transfers
  - No redistribution effect after the shock
- Case 2: Lump-Sum transfers
  - Redistributive Effect
- Case 3: (like in paper) G jumps

# Completing Markets with a Long-Term Bond

- Back to paper
- Long-Term nominal asset can provide "Hedge"
  - If short term bond can drop, long-term bond will jump in value
- Changes price upon shock: value jump
- With Poisson - able to find condition:

$$\frac{\xi_+}{\xi}\left(\frac{n}{n_+}\right)^{\gamma}=\frac{\zeta_+}{\zeta}\left(\frac{w}{w_+}\right)^{\gamma}$$

- Marginal utility $\xi_+/\xi$ for banker will JUMP, because less $s$ drops
  - hold long-term asset if $\gamma > 1$

# Comments 1 - 2

- Comment 1: Run Friedman Rule setting $i = 0$, then $P = 0$, and utility not defined
- Comment 2: Bianchi-Bigio model credit channel and balance-sheet channel
  - Balance sheet channel is small
  - Liquidity produces endogenous risk-averse behavior on banks
  - Depends on Policy

# Numbers for Quantities seem too large!

- Comments 3: Effects seem too large:
  - Can effect by large? Back of Envelope

$$\Delta n = leverage * DurationRiskLoan - (leverage - 1) DurationRiskDeposit$$

$$DurationRisk \sim Maturity$$

$$\Delta n \sim 11 * 4 - (10 - 1)1 = 34$$

  - This is close to number reported in the paper...it's HUGEComments on Theory

# Interest-Rate Exposure Sub-Cat of Trading Revenue

- Comment 3: From Begenau, Bigio, Majerovitz:

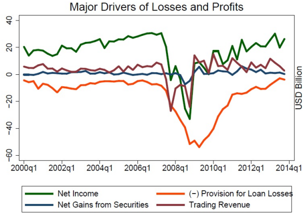
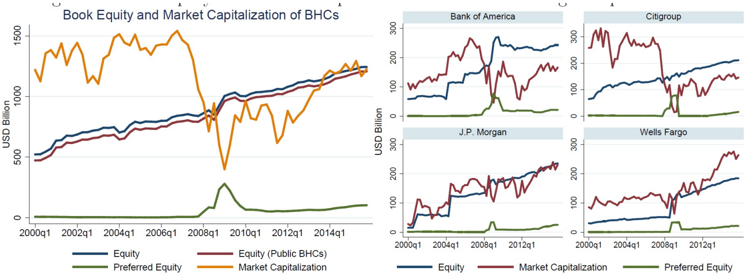



Figure 1: Main Drivers of Losses

- Why only this source of risk?

# The Numbers




- Book-based assets don't move!
    - Model predicts yes! Model predicts huge swings in deposit ratio!

# Also: few banks at constraints