A Macroeconomic Model with Financially Constrained Producers and Intermediaries

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Introduction

- **Main goal**
  - Quantify the level of optimal capital requirements

- **Methodology**
  - Dynamic Stochastic General Equilibrium model
  - Builds on (some) financial frictions
  - Very thorough calibration (unfair to the paper)

- **Results**
  - Able to replicate some salient features observed in crisis
    - Persistency of slowdown (specially when productive + financial crisis)
    - Slow recovery in many aggregate variables: GDP, consumption ..
  - Current capital requirements (Basel II) are near optimal
  - Countercyclical capital buffers obtain much more that changes in level
My view

- Interesting and needed paper with a nice "macro - micro" approach
  - Talk about "macro - micro" approach next
  - Analysis of a set of financial frictions
    - Demand of safe assets
    - Government guarantees
    - Bankruptcy costs
    - Costly issuance of equity for banks

- Relevant piece of work on an interesting avenue of research
  - Other policies (for this paper):
    - Government spending? bailout for equity? only partial deposit insurance?
  - Other frictions (future research):
    - Risk taking and correlation on the asset side, runs (instead of safe asset?) ...
  - Some quibbles: Basel II regulation?
Finance Relevance - frictions

- Modigliani and Miller (1958) - Irrelevance Proposition
  - In a frictionless financial financing decisions irrelevant
    - Theoretical model already with deviations (Taxes)
- Economic fluctuations are not caused by financial issues
  - Analyzing finance is at best second order
    - At most could be auxiliary to other frictions
- 1958 onwards
  - Theoretical and Empirical literature on financial frictions
  - Compelling arguments that financial markets have frictions
    - Informational frictions, Adverse selection, moral hazard, coordination failures, risk taking incentives, etc
Financing with frictions

- Finance decisions can be relevant for economic outputs
- Two different approaches
  - With different objectives
- Microeconomic approach (Ant)
  - Understand different mechanisms (frictions)
  - Little focus on aggregate implications
  - Partial equilibrium models (and local identification in empirical work)
- Macroeconomic approach (Bird)
  - Focus on aggregate implications
  - Little focus on different frictions
  - General equilibrium models
Various frictions shape financial landscape
- Moral hazard problems (Holmstrom and Tirole, 1997)
  - From borrowers & from lenders
- Runs in demandable debt (credit lines) (Diamond and Dybvig, 1983)
- Many others

Not all financial frictions have the same implications
- Neither the same solutions - hint to policies

Financial Intermediaries are a KEY player
- Solve and generate economic problems
  - React to different economic conditions
- Risk is a fundamental element of the analysis
  - Exposure (creation) of risk by Financial Intermediaries
Micro Financial frictions (Ant) - caveats

- Main question is the Financial Sector
  - Not much analysis of spillovers to other sectors
  - Not much analysis of overall economic impact
- Effort to clarify the mechanism at play
  - Mickey Mouse models
  - Cost of not exploring all the ramifications
Focus on aggregate outcomes
  - DSGE Models as a benchmark (RBC)

Financial frictions have aggregate effects
  - Important role in amplifying shocks

Focus on borrower driven issues (subset of frictions)
  - Borrower moral hazard
    - Pledgeability Constraint (Kiyotaki and Moore (1997))
Macro Financial frictions (Bird) - caveats

- Low detail of the financial sector
  - Small possibility of risk origination in Financial Sector
  - Main role is to amplify crisis not to create them
  - Financial Industry = Parameter (in some cases)

- Disregard Financial Industry issues
  - Ad-hoc constraints
  - Frictionless financial markets
  - No (correlated) bank failures
The Bird (Macro) and the Ant (Micro) should talk

- The Ant (Micro) can be shortsighted
  - Not all frictions have implications for overall output
  - Some "nice" frictions could have little impact
  - Some of them could have important spillovers not analyzed

- The Bird (Macro) can miss relevant details
  - There can be other relevant frictions at play (not only one)
  - It can be really difficult to analyze them together
  - Different frictions mean different problems and solutions
A Micro-Macro Finance Approach

- After 2007-2009 in need a body of new research
- **Financial Intermediaries** should have a **prevalent role**
  - Different underlying issues
    - Maturity Mismatch, Moral Hazard, Safety Asset, Risk-taking
  - *Source* of economically significant issues
- **Aggregate implications should be important**
  - General equilibrium and multiple markets
- **This paper** is part of this new body of research
  - Building on the macro (Bird) approach
  - With a clear description and analysis of (some) financial frictions
Road Map

- Brief recap of the model - friction
- Comments
Ingredients of the model (frictions)

- 2 types of infinitely lived Households (patient and impatient)
  - Consumption, labour and savings decisions
  - Only impatient HH can fund firms and banks - friction
  - Patient HH have to invest in safe assets - friction

- Government: issues safe gov bonds (exogenously)
  - Collects taxes from firms and banks - friction
  - Guarantees debt of banks - friction

- Firms use factors of productions
  - Funded by HH equity and long term bank debt
  - In case of default bankruptcy costs - friction
  - 2 shocks: TFP (AR(1)) + Idiosyncratic (high and low variance regimes)

- Banks issue loans to firms and receive id. shocks
  - They have adjustment cost in their equity - friction
  - Subject to capital requirements - friction/policy
  - They issue safe deposits because of gov. guarantee
Role of Financial Intermediaries - Banks

- Why do Banks exist?
  - To exploit government guarantees on bank debt
    - Without them only firms would exist
  - No direct productive role
    - e.g. monitoring - Holmstrom and Tirole (1997)
  - No risk-sharing role
    - e.g. run based - Diamond and Dybvig (1983)

- What do they add to economy? Their role
  - Provide a safe asset
    - Crucial for patient HH problem
    - Deepen the safe market
What happens in a (negative) shock (nutshell)

- Firms default rate goes up
  - Banks default more and their equity goes down
  - There is a lower supply of the safe asset - tension
  - There is lower investment in loans

- Bank equity is costly to raise (persistent)
  - Takes time to generate enough equity
  - Persistency on variables that depend on bank equity (state variable)
  - Amplification and persistency

- By raising required equity
  - You reduce the investment done by banks (and safe assets)
  - But banks are more resilient to bad shocks as they have more buffers (less amplification effects)

- Trade-off: Less production vs more stability
  - No overinvestment problem (no need to control size)
Comment 1: Equity adjustment cost in banks

- The paper assumes an exogenous cost of bank recapitalization
  - When there is a negative shock banks do not raise enough equity
  - Less production than "optimal" (given the capital regulation)
  - Less safe assets than "optimal"

- The model analyzes a setup with no equity issuance friction
  - Similar to Brunnermeier and Sannikov (2014)
  - Relevance of decoupling banks from firms

- Equity adjustment costs are a relevant friction in this model
Comment 1: Equity adjustment cost in banks

- What if firms also have an equity issuance friction?
  - This could change HH trade-off of funding firms or banks
  - Firms can not absorb changes in equity so "cheap" - affect state variable of the economy
  - Should not be too difficult to introduce (in similar fashion as banks)

- Are this costs of recapitalization state independent?
  - Normally the microfundation of this cost (in banking) relates to informational asymmetries
  - I am not sure that such informational asymmetries are state independent
  - Can you calibrate them?
Comment 2: Safe asset and government guarantees

- Safe HH can only save through the safe asset - friction
- The paper assumes that all bank debt is insured by the government
- There is a role for bank debt to be insured by the government
  - Is there a role for government insurance of firm debt?
    - Banks exist to exploit the gov guarantee (equity issuance frictions)
    - Maybe a theoretical game but maybe not (General Motors?)
  - Is there a role for government bailout of bank equity?
    - Maybe a theoretical and empirically relevant question (more on this later)
- Does it make sense to analyze these two issues?
Comment 2: Safe asset and government guarantees

- Quibble...
- Safe HH can only save through the safe asset
- The paper assumes that all bank debt is insured by the government
  - However this is not the case in banks (or in insurance companies etc)
    - Paper: general bailouts (but CDS on bank debt is not equal to risk free rate)
- Some type of deposits in the utility function approach (Begenau and Landvoigt 2018)
  - Any role for Shadow banks? (Plantain 2014)
- Calibration to secured vs unsecured debt? (No bailout regime)
  - Change the role of bank capital?
CC requirements obtain much higher welfare gains than flat (Pareto)

It looks like the constraints in bad times are much tighter

- Bank equity is low (and banks have adjustment costs)
- Low supply of safe asset (partially offset by government bonds)
- Low investment from firms (as there is low bank debt)

Can the government do something more/better?

- Can the government be more countercyclical (issue more bonds in crisis)
- Relaxes the tension on safe assets
- Reduces the equilibrium risk free rates - higher bank profits
- Rapid accumulation of bankers wealth
- Relation to other strands of literature (government debt)
Quibble…

Does the transversality condition guarantee that government bonds always safe? (no clue)

If not could we have a problem of too big to safe? very important given assumption of HH only buying safe assets

This could be more of a theoretical quibble than of economic relevance (sorry for being an ant :( )
Comment 4: Capital Regulation calibration

- How to calibrate?
  - Base yourself in Basel II but ....
  - Banks do not hold all the corporate bonds in the economy
  - There are IRB vs Standardized
  - Market prices.

- Replicate the observed leverage of the whole financial sector?
  - It might be too heterogeneous...(but is it then market imposed)
  - Why not focus on the leverage of banks (commercial)
Why do firms default without selling their assets?
  - Might be against the creditors not worse off...

Bank specific dividend/profit shock?
  - What is it?
  - Banks have incentives to diversify no? (Equity adjustment cost)
  - They are owned by the HH so why create non diversified banks?
  - Recall that they exploit Gov Guarantees by being correlated

Deposit insurance charge
  - Very interesting results
  - Is the deposit insurance "fund" self sustainable in your economy?
Comment 5: Role of bank capital requirements

- Model with various frictions
  - Banks exist because of government guarantees
  - Bank (or firms) have no asset side risk - no change in the productive technologies
  - Bank equity as a way to absorb loses

- What is the (real) role of bank capital regulation?
  - For sure to absorb loses: See Basel Approach (LGD approach)
  - What about skin in the game incentives?
    - Equity bailouts are very bad
    - Surely not for this paper - we need more good papers like this one!
Conclusion

- Nice and carefully crafted paper
  - Paper is able to match persistency after financial crisis
    - Through (a couple) of financial frictions
  - Carefully calibrated
- I would recommend it for the (hopefully) new strand of micro-macro papers
  - There are more frictions to analyze and understand