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# Interaction of Macro- prudential and Monetary Policies: Discussant's comments

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# Do macro prudential policies add value?

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- ❖ Remit: Evaluate the three papers from a policy perspective
- ❖ Analysis is mainly theoretical and utilises a diversity of modelling approaches
  - ❖ Only one of the papers contains empirical evidence
- ❖ By and large the answer all three papers come up with is YES, with the exception of the case in which monetary policy is chosen optimally in the DSGE analysis
- ❖ The papers offer considerable scope for macro prudential policy, although are not necessarily very good guides for policy analysis
  - ❖ instruments studied chosen for their analytical tractability (understandable) but this has implications for policy relevance

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# What are policy makers looking for?

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- ❖ Results that are relevant and well grounded in economic theory but are not highly sensitive to model specificities and assumptions
- ❖ Predictions that are robustly supported by empirical evidence
- ❖ Modelling that recognises key financial frictions, stylised facts in financial markets and limitations of monetary policy
  - ❖ The mere existence of debt markets stems from frictions arising from information imperfections, incompleteness of contracts etc
  - ❖ Debt contracts cannot be understood without explicitly modelling default
  - ❖ Representative agent models have no room for financial frictions

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# Why are we interested in macro prudential policies?

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- ❖ Micro prudential policies not sufficient to address systemic risk
- ❖ Systemic risk arises from financial risk externalities (e.g. contagion), bubbles etc.
- ❖ Macro prudential policies intended to reduce systemic risk
- ❖ Monetary policy can reduce macro risks but, almost by definition, unlikely to target all types of market failure
- ❖ What does this imply for theory?
  - ❖ Unless the true underlying sources of systemic risk are modelled, one is unlikely to find room for macro prudential policy
  - ❖ DSGE models unlikely to be the ideal modelling vehicle, even if they contain some frictions

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# “Monetary policy, financial regulations and industry growth”

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- ❖ Authors ask all the right questions from their model:
  - ❖ Can capital adequacy rules dampen or amplify the effects of interest rate policy on growth?
  - ❖ Can counter-cyclical capital buffers provide another source of macro stability?
  - ❖ How does the supply of credit influence the effect of cyclical interest rates?
- ❖ The paper contains both theory and empirical evidence (industry data from 14 OECD countries), it's a very ambitious undertaking

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# Analytical model

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- ❖ Single good economy with a unit mass of entrepreneurs and financiers which lasts for three periods: 0, 1 and 2.
- ❖ All agents consume in period 2, entrepreneurs are risk neutral and derive utility from expected consumption while financiers are risk averse and have max-min preferences over date 2 consumption
  - ❖ Max-min preferences make analysis tractable but not clear the extent to which they drive the results
  - ❖ financiers have access to what is in effect a central bank deposit facility paying a state contingent deposit rate that is known in advance (in reality most CB's don't pre-commit).

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# Entrepreneurs

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- ❖ Have access to productive long-term technology that produces a state dependent output in period 2, project can be liquidated at date 1
- ❖ Output from long term project cannot be fully pledged to financiers
- ❖ There are two types of entrepreneurs:
  - ❖ Those who have highly pledge-able projects and others have low pledge-able projects
  - ❖ This distinction drives most of the results, at the back of authors' mind there is a shirking model to motivate it (footnote 8), however the distinction remains exogenous, moral hazard is not modelled
  - ❖ Deleveraging occurs in period 1 and project size drops as entrepreneurs liquidate the necessary portion of their project

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# Financial constraints

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- ❖ Entrepreneurs agree a repayment schedule at date 0 that is state contingent (observation: very strong assumption, standard loan contracts are not state contingent because of costly state verification)
- ❖ A fraction of the project is liquidated to pay state contingent instalment to financiers
- ❖ A fraction of the project not liquidated is pledged to guarantee the final payment to financier in date 2, although in equilibrium we never observe default
- ❖ Financiers break even (no bankruptcy) but face a capital constraint in period 0 (exogenous) - can be interpreted as a capital requirement

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# Equilibrium

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- ❖ In the low state the CB can reduce the interest rate to a level that allows high tangibility entrepreneurs not to downsize
- ❖ The model is then embedded into an OLG framework where entrepreneurs and financiers live for two periods which allows authors to study growth
- ❖ a countercyclical interest rate policy affects growth through the downsizing carried out by low tangibility entrepreneurs; the lower the interest rate the lower the downsizing and the higher investment and growth
  - ❖ differential effect of interest rate on different types of entrepreneurs which is amplified when lending capacity is higher
  - ❖ means that differential effect of interest rate policy is more muted under tighter credit conditions (nice result)
  - ❖ pro-cyclical credit cuts growth disproportionately more for low tangibility entrepreneurs

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# Big jump from theory to empirical evidence

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- ❖ Manufacturing data from 40 (?) industries in 14 OECD countries
- ❖ Dependent variable: growth in value added over 1999-2005
  - ❖ Why throw away so many observations? See Baltagi et al JDE 2009
- ❖ Regressor of interest: interaction between industry characteristics cyclicalcy of real short term interest rates term
- ❖ Controls: industry and country fixed effects aimed at controlling unobserved heterogeneity (does it succeed?), log of initial share of industry in manufacturing value added (insignificant in all specs)
- ❖ Cyclicalcy of interest rates estimated as marginal change in real interest rate following a change in output gap (lacks transparency)
- ❖ Similar analysis for labour productivity, using asset tangibility

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# Effect of financial regulations

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- ❖ ‘financial sector regulations’ interacted with liquidity/ credit constraints, following the Rajan-Zingales (1998) methodology (US industry characteristics transplanted to other countries; too strong even for OECD countries)
- ❖ Measure of financial regulations: average bank capital to asset ratio for each country from bankscope
  - ❖ banks may hold a lot of capital but may hide bigger skeletons in balance sheets
  - ❖ cyclicalities of credit estimated from auxiliary regression
  - ❖ asset tangibility used as proxy of borrowing constraints and share of labour costs to total sales as proxy of liquidity constraints
  - ❖ Estimated effects rather large
- ❖ Least persuasive part of the paper (measurement and estimation method issues)

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# “Liquidity trap and excessive leverage”

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- ❖ Examines usefulness of macro prudential policies in mitigating liquidity traps driven by deleveraging
  - ❖ Relevant for post-crisis US, UK and Eurozone because these economies are either close to or at the lower bound of monetary policy rates
- ❖ Paper is silent on the broader question of whether macro-prudential policies can help to prevent other types of crises
  - ❖ Let's say policy ensures economy doesn't get stuck in a liquidity trap
    - ❖ Does this mean that we can avoid a crisis altogether?
      - ❖ No, but monetary policy would be more effective to mitigate the downturn

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# Aggregate demand externality

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- ❖ Borrowers who behave rationally as individuals undertake excessive leverage from a social point of view because of an aggregate demand externality
  - ❖ Deleveraging transfers liquid wealth from borrowers to lenders but borrowers have a much higher MPC than lenders
    - ❖ deleveraging reduces aggregate demand and lowers everyone's income
- ❖ The externality (inefficiency) is greater the greater the wedge between the two MPCs
  - ❖ This is a key assumption in the model that seems to drive all the subsequent results. It's plausible but it would strengthen the case of the paper if some evidence to support it is provided

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# Monetary policy ineffectiveness

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- ❖ Monetary policy is ineffective, even in preventing the economy entering a liquidity trap
  - ❖ a higher interest rate reduces incentives to borrow but it also creates a temporary recession which increases incentives of borrowers to borrow to smooth consumption
  - ❖ even if raising the interest rate lowers leverage, the authors show that the interest rate is an inferior tool to macro prudential policy which can address more directly the source of the inefficiency
  - ❖ The authors show that introducing collateral if anything strengthens their main findings

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# A dynamic model

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- ❖ Infinite, discrete time model with a single consumption good
  - ❖ Two types of households, borrowers and lenders, who differ in terms of discount factors
  - ❖ Households subject to a borrowing constraint from date 1 onwards, a reduction in this limit generates deleveraging
  - ❖ There is an exogenous lower bound of zero on the real interest rate (ad-hoc but apparently evidenced in US and Japan, how about elsewhere?)
  - ❖ The equilibrium is characterised by rationing in the goods market which occurs when the lower bound on the real interest rate binds (follows fixed price models of 1970s)
    - ❖ Similar rationing outcome to new Keynesian models with monopolistic firms, although the latter do not imply downward price rigidity in a liquidity trap

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# Plausible results

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- ❖ The equilibrium is characterised by a recession anticipated by households (inefficient) that can be Pareto-improved with simple macro prudential policies that reduce leverage:
  - ❖ debt write-downs (wisely abandoned due to considerations outside the model)
  - ❖ prevent excessive leverage from happening in the first place by choosing the debt limit endogenously (how easy is it to implement this in practice?)
- ❖ Authors extend the model to analyse uncertainty, by assuming that borrowers are weakly more impatient and more optimistic than lenders (plausible)
  - ❖ A deleveraging recession with under-insurance exists if agents are sufficiently optimistic, this can be corrected through macro-prudential limits on debt, that are equivalent to self-insurance
  - ❖ Contractionary monetary policy leads to increased debt levels
  - ❖ Collateral exacerbates depth of the recession due to fire sale externalities

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## “Optimal monetary policies: gains and pitfalls of a macro prudential approach”

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- ❖ Using a DSGE model authors find that “an optimal monetary policy is sufficient to ensure efficiency, even in presence of financial shocks”
- ❖ However, a simple rules based approach to monetary policy creates space for welfare gains from macro prudential policy *even in a DSGE model*, with limited frictions
- ❖ Macropprudential instruments examined are a tax on intermediary leverage and a reserve requirement

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# Model set up

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- ❖ Model consists of a representative household, a representative firm, continuum of monopolistically competitive retailers, a representative firm producing investment goods and a continuum of financial intermediaries
- ❖ Household saves by holding debt and equity claims on intermediaries
- ❖ Key financial friction: raising equity from external funds is costly
- ❖ Intermediaries face short-run funding risks (maturity mismatch)
- ❖ No long-term assets, however period is split into two sub-periods, in second half of the period there is idiosyncratic shock but lending and borrowing decisions made in first half cannot be reversed
  - ❖ Generates liquidity risk and generates precaution in lending

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# Realistic debt contract

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- ❖ Households invest in the debt and equity of the intermediary; debt is collateralised
- ❖ In the event of the financial intermediary defaulting, the investor/ household liquidates the collateral at distressed price
- ❖ Intermediary's project has a stochastic gross return after tax such that first moment is time-invariant but second moment follows Markov process
  - ❖ a default occurs when the realised asset return is lower than the debt obligation
  - ❖ households take the possibility of default into account when optimising and have stochastic discount factors
  - ❖ household's participation constraint takes the possibility of default into account i.e. the lending rate includes a default risk premium

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# Equity finance

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- ❖ Households own the equity in intermediaries and are entitled to the profits
- ❖ Intermediaries may find themselves short of cash => either go bankrupt or raise more equity
  - ❖ raising equity involves a discount and reduces value of existing shares (exogenous dilution cost assumed constant per unit)
    - ❖ story given is one of insiders and outsiders, however this is NOT consistent with a representative household model
    - ❖ Results in endogenous cash-flow constraint that takes into account impact of limited liability (nice)

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# Calibration

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- ❖ This is where artificial realities are created!
- ❖ Parameter values assigned to functional forms to solve the model, some of these are 'standard' in the DSGE literature
- ❖ However, how about the (novel) financial frictions or nominal rigidities? How plausible are they? How sensitive are the results to these choices?
- ❖ Alluring graphs

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# Conclusion

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- ❖ Overall, the three papers advance our analytical understanding of the interaction between financial frictions, monetary policy and macro prudential regulation
- ❖ There is ample scope for macro prudential policies to play a complementary role to monetary policy, improving welfare
- ❖ However, results not necessarily a useful guide for policy makers
  - ❖ More empirical evidence needed, better measurement, estimation methods, data, robustness checks etc
  - ❖ Remain skeptical about DSGE approach, although introduction of financial frictions and particularly default an important step forward