From Banks' Macrofinancing to Endogenous Money Creation under Flexible Prices

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Abstract

Two most celebrated rules in monetary economics, the Friedman rule and the Taylor rule, provide contradictory policy prescriptions. We argue neither of these rules offers a sufficient theoretical foundation for the role of interest rate and fiat money. Closely related to Kumhof, Tsomocos and Wang (KTW 2017), this paper builds a novel Dynamic Stochastic General Equilibrium model to integrate endogenous liquidity creation with financial intermediation under flexible prices, simply by recognising money creation as an outcome of bank financing. Without appealing to nominal rigidities and the Taylor rule, we achieve both short-term and long-term money non-neutrality, and shed light on price level determinacy. We find that, to improve welfare, monetary policy needs to be active while bank capital regulation needs to be accommodative. We find that the first-best allocation under the Friedman rule can not be achieved because banks need a positive interest rate to establish the commitment power of fiat money.

Fiat Money Creation Credibility Price-level determinacy Zero Lower Bound Money and Banking

Introduction

- **The Great Recession has taught us that price stability does not guarantee financial stability (Fig1)**

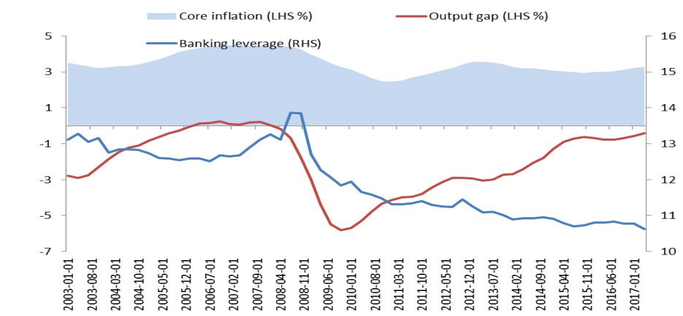


Figure 1. Output, inflation and banking leverage (US)

- **After the crisis, despite trillions of base money injected into the financial system, money supply has not kept up and inflation remains subdued while output gap is closing. Conventional DSGE models with financial accelerators find such phenomena puzzling (Fig1)**
- **Mainstream monetary models tends to ignore the microfoundation of money through banks and use ad-hoc restrictions to refine equilibria – see critiques by John Cochrane (JPE 2011) and Chris Sims (AER 2013). Financial intermediaries are wrongly modelled as channels of loanable funds, see critiques and correction by Michael Kumhof (2014)**
- **Given such, this papers builds on KTW (2017) and microfound money creation, i.e. banks creating fiat money through a double-counting operation, or loans creating deposits – a known fact for over a century (Fig 2)**

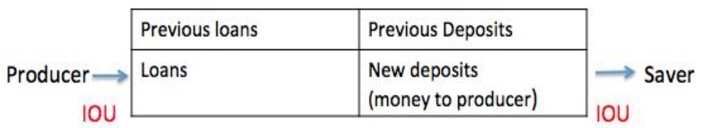
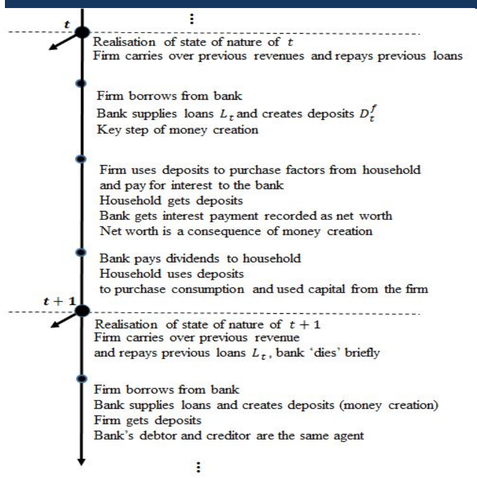


Figure 2. Loans creating deposits

Methods



- **Every transaction leads to a change on banks' balance sheet - Deposits-in-Advance**
- **Firms cannot issue a 'promise' to buy labour before production**
- **While banks can issue such a promise because positive monetary interest establishes banks' credibility via an IC constraint**

Results

- **Loans creating deposits and bank capital (default) are key to money non-neutrality and price-level determinacy with flexible prices**
- **Microfoundation of monetary interest rate rule derives from the commitment power of money and the credibility of the banking system**
- Friedman rule (r=0) obtains only if we assume away moral hazards, first-best is obtained, i.e. frictionless barter economy equilibrium (eq1)
- We argue (r>0) is needed to ensure the credibility of money creation entity in reality, and the resulting welfare loss is justified (eq2)

$$U_t'(c_t) = E_t\beta[U_{t+1}'(c_{t+1})(\sigma A_{t+1}n_{t+1}^{(1-\sigma)}K_{t+1}^{\sigma-1}) + 1 - \delta)]$$

$$\chi = U_t'(c_t)(1-\sigma)A_t\ K_t^{\sigma}n_t^{-\sigma-1}$$

Eq1. Barter equilibrium

$$U_t'(c_t) = E_t\beta[U_{t+1}'(c_{t+1})(\sigma A_{t+1}n_{t+1}^{(1-\sigma)}K_{t+1}^{\sigma-1}) + 1 - \delta)(r_t\ /(1-r_t) + \delta) + 1 - \delta)]$$

$$\chi = U_t'(c_t)(1-\sigma)A_t\ K_t^{\sigma}n_t^{-\sigma-1}(1-r_t)$$

Eq2. Monetary equilibrium

- **Investigates the perils of a prolonged period of Zero Lower Bound (ZLB)**
- Conventional theory tends to discuss ZLB only as a constraint of monetary policy (Fig 3)

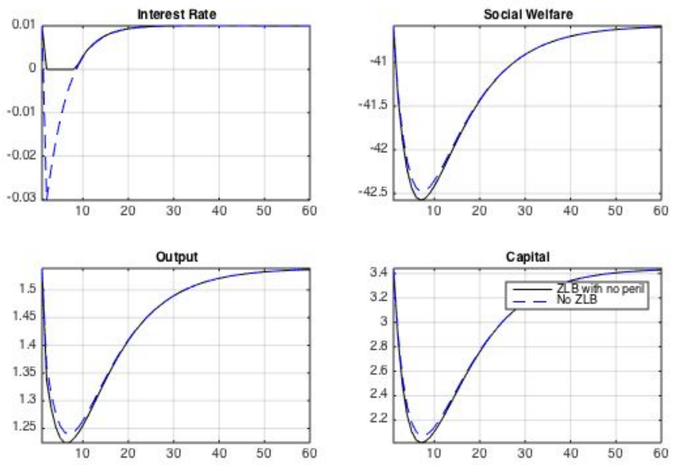


Figure 3. Zero Lower Bound with no perils

Results continued

- We argue further that prolonged ZLB is harmful to the real economy, because it reduces banks' profit margin, in turn their franchise value, potentially violating banks' IC constraint and resulting in capital misallocation (Fig 4)

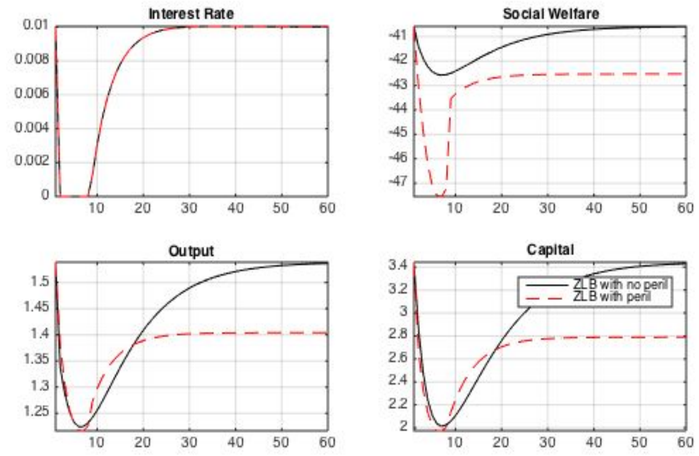


Figure 4.. Zero Lower Bound with perils

- **We further extend the model to incorporate bank capital regulation such that positive monetary interest rate, fixed fees and equity market are all means of raising bank capital and we design two policy regimes - PMAB and AMPB. We find that AMPB is superior to PMAB in stabilising the economy facing negative shocks**
  - PMAB: Passive monetary policy and active bank capital requirement. Bank capital requirement follows a countercyclical rule and monetary policy is determined in equilibrium via banks' IC constraint
  - AMPB: Active monetary policy and passive bank capital requirement. Monetary policy follows a countercyclical Taylor rule and bank capital requirement is determined in equilibrium via banks' IC constraint

Conclusion

- **First try to bridge finance and monetary theory**
- **Friedman rule does not obtain in the presence of moral hazards**
- **Long period of ZLB is detrimental to growth**
- **Monetary policy should be active whereas banking regulation accommodative**

References

Prototype of this paper: Kumhof, Tsomocos, and Wang (KTW2017), Goodhart, Shubik and Tsomocos (2013), Dubey and Geanakoplos (2003), Bloise, Dreze and Polemarchakis (2003)

Recent advances in money creation: Jakab and Kumhof (2015), Peiris and Polemarchakis (2017), Bigio and Bianchi (2017), Paure and Gersbach (2017), Piazzesi and Schneider (2017)

Inside money, outside money and default: Gurley & Shaw (1960) , Tsomocos (2003), Lin, Tsomocos and Vardoulakis (2014), Martinez and Tsomocos (2015)

Loans creating deposits: Macleod, Schumpeter, Wicksell, Minsky...

Other insightful references: Sims (2013 AER), Cochrane (2011 JPE)

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