

# Discussion of Kiley and Sim "Intermediary Leverage, Macroeconomic Dynamics, and Macroprudential Policy"

Matteo Iacoviello  
Federal Reserve Board

FRB Boston Conference, November 30, 2012

## What is in this paper

This paper beautifully blends together three elements that are necessary to think about macroprudential regulation

1. A dynamic model of the financial structure of a bank

## What is in this paper

This paper beautifully blends together three elements that are necessary to think about macroprudential regulation

1. A dynamic model of the financial structure of a bank
2. A realistic business cycle model that speaks to recent events

## What is in this paper

This paper beautifully blends together three elements that are necessary to think about macroprudential regulation

1. A dynamic model of the financial structure of a bank
2. A realistic business cycle model that speaks to recent events
3. A rich analysis of alternative macroprudential rules

It is a great effort, which complements earlier work by authors on the same topic.

## Main Results of the Paper

1. Procyclical buffers (Leverage taxes that are rise when credit or asset prices are high, or when spreads are low) work well in response to financial shocks.

These Pigouvian taxes can close the time-varying gap between social and private costs of funds over the business cycle.

## Main Results of the Paper

1. Procyclical buffers (Leverage taxes that are rise when credit or asset prices are high, or when spreads are low) work well in response to financial shocks.  
These Pigouvian taxes can close the time-varying gap between social and private costs of funds over the business cycle.
2. Procyclical buffers do not work well in response to more fundamental (like TFP) shocks.

## Main Results of the Paper

1. Procyclical buffers (Leverage taxes that are rise when credit or asset prices are high, or when spreads are low) work well in response to financial shocks.  
These Pigouvian taxes can close the time-varying gap between social and private costs of funds over the business cycle.
2. Procyclical buffers do not work well in response to more fundamental (like TFP) shocks.
3. A leverage tax that respond to credit spreads seems to work well across a variety of shocks.

# My Main Comments

- Overall, it is a great paper



## My Main Comments

- Overall, it is a great paper
- However, there are three some dimensions where I think it can improve

# My Main Comments

- Overall, it is a great paper
- However, there are three some dimensions where I think it can improve
  1. What is a bank in this paper?

# My Main Comments

- Overall, it is a great paper
- However, there are three some dimensions where I think it can improve
  1. What is a bank in this paper?
  2. How large are the externalities that require policy intervention?

# My Main Comments

- Overall, it is a great paper
- However, there are three some dimensions where I think it can improve
  1. What is a bank in this paper?
  2. How large are the externalities that require policy intervention?
  3. How well does the model fit the variables that enter the macroprudential rule?

# The Model Key Structure

ASSETS	LIABILITIES
$Q(t)S(t)$ <p>Assets held by bank. Can be invested in projects that return <math>\epsilon(1+r_A)</math>. <math>\epsilon</math> is idiosyncratic risk, its variance follows a Markov process</p>	$(1-m(t)) Q(t)S(t)$ <p>Debt position. <math>m(t)</math> "imposed" by HH to satisfy no-arbitrage condition given default risk</p>
	<p>Equity position. Internal funds realized after aggregate shock. Raising outside equity costs <math>\phi</math> per issuance</p>
	<b>EQUITY</b> <p><math>N(t)-D(t)+\phi\min(0,D(t))</math></p>

Household stochastic discount factor

$$1 = \mathbb{E}_t \left\{ M_{t,t+1} \frac{\mathbb{E}_{t+1}^c[\lambda_{t+1}]}{\mathbb{E}_t^c[\lambda_t]} \cdot \frac{1}{m_t} \left[ \frac{\mathbb{E}_{t+1}^c[\lambda_{t+1} \max\{e_{t+1}, e_{t+1}^D\}]}{\mathbb{E}_{t+1}^c[\lambda_{t+1}]} - e_{t+1}^D \right] (1+r_{t+1}^A) \right\}$$

Expected shadow value of funds. Can be high if raising equity is costly (e.g. when uncertainty is high), thus causing underaccumulation of K

Option value of default. As uncertainty rises, lend more since can ignore tail risks, thus causing overaccumulation of K

Higher uncertainty, higher cost of outside equity  $\phi$ , cause a rise in  $r$  and a decline in investment

## What is a bank in this paper?

1. An institution that would like to finance itself with debt rather than equity (because debt is tax deductible and outside equity is costly)

## What is a bank in this paper?

1. An institution that would like to finance itself with debt rather than equity (because debt is tax deductible and outside equity is costly)
2. An institution that prefers internal equity because external equity comes at a premium

## What is a bank in this paper?

1. An institution that would like to finance itself with debt rather than equity (because debt is tax deductible and outside equity is costly)
2. An institution that prefers internal equity because external equity comes at a premium
3. An institution that invests in long-term projects whose risks cannot be diversified away and faces limited liability

You can search and replace "bank" with "firm" throughout the paper, and you have a standard financial accelerator model. Is that all that banks are about?

**Systemic risk, too big to fail issues are sidestepped in this version of the model. What would happen with a large bank? Would the large bank internalize the externality?**



## What are the Key Frictions?

1. The model needs a more accurate distinction between steady state inefficiencies and dynamic inefficiencies.  
In steady state, bank leverage constraints produce an inefficiently low level of output.  
Over the cycle, the pecuniary externalities create too much volatility.  
Should macroprudential address both, or only the second? Can we think of one disregarding the other?

## What are the Key Frictions?

1. The model needs a more accurate distinction between steady state inefficiencies and dynamic inefficiencies.  
In steady state, bank leverage constraints produce an inefficiently low level of output.  
Over the cycle, the pecuniary externalities create too much volatility.  
Should macroprudential address both, or only the second? Can we think of one disregarding the other?
2. Other papers find that pecuniary externalities are not a large quantitatively [ more on this below ]  
This paper asserts the contrary. Yet it is hard to see a quantitative metric of their importance.  
Most of the large effects of shocks in the paper are a convolution of shocks, nominal rigidities and propagation mechanism, and would arise even if banks were not present or were just a veil.

# The Role of Pecuniary Externalities

1. We all love the idea and the insight behind the pecuniary externalities

# The Role of Pecuniary Externalities

1. We all love the idea and the insight behind the pecuniary externalities
2. Yet their quantitative importance is very much model specific

# The Role of Pecuniary Externalities

1. We all love the idea and the insight behind the pecuniary externalities
2. Yet their quantitative importance is very much model specific
3. Bianchi (via Lorenzoni and Korinek): pecuniary externalities matter and cause overborrowing → need to have preventive policies that limit leverage both ex ante (in good times) and ex post (when the economy faces a sudden stop).  
Nikolov : Policies preventing leverage reduce volatility but tax productive activities. Society faces a choice between high but unstable consumption in the free borrowing world and low but stable consumption in the regulated world.  
Benigno et al.: no overborrowing in production economies.

# The Role of Pecuniary Externalities

1. We all love the idea and the insight behind the pecuniary externalities
2. Yet their quantitative importance is very much model specific
3. Bianchi (via Lorenzoni and Korinek): pecuniary externalities matter and cause overborrowing → need to have preventive policies that limit leverage both ex ante (in good times) and ex post (when the economy faces a sudden stop).  
Nikolov : Policies preventing leverage reduce volatility but tax productive activities. Society faces a choice between high but unstable consumption in the free borrowing world and low but stable consumption in the regulated world.  
Benigno et al.: no overborrowing in production economies.
4. So, why are externalities so large here?

## Why are Pecuniary Externalities important here?

1. Models above have constraints that bind only occasionally:
  - a. the crisis (when constraint binds) is an endogenous event that depends on agents' decisions, policy regime, and state of the economy.
  - b. the scope for policy intervention arises from the existence of a pecuniary externality (atomistic agents fail to internalize the aggregate impact of their borrowing decisions on some asset price). This paper only analyzes (*b*). How does this affect the results?

## Why are Pecuniary Externalities important here?

1. Models above have constraints that bind only occasionally:
  - a. the crisis (when constraint binds) is an endogenous event that depends on agents' decisions, policy regime, and state of the economy.
  - b. the scope for policy intervention arises from the existence of a pecuniary externality (atomistic agents fail to internalize the aggregate impact of their borrowing decisions on some asset price). This paper only analyzes (b). How does this affect the results?
2. Here, the best rule is a leverage tax that leans against credit spreads. This is similar to the Curdia-Woodford model, where there are no pecuniary externalities. Does this mean that in models without (a) pecuniary externalities are not large? Pecuniary externalities were present in BGG too, but Bernanke/Gertler and Gilchrist/Leahy found no benefit in responding to asset prices.



## How Realistic is the Model?

1. To better assess the benefit of different rules, one needs a model where key financial aggregates – credit, asset prices, spreads – move in line with the data, especially since the various policies depend on the nature of the shocks.  
If model does not fit the financial aggregates well, what is the purpose of evaluating simple rules that respond to particular shocks that may not be important after all?

## How Realistic is the Model?

1. To better assess the benefit of different rules, one needs a model where key financial aggregates – credit, asset prices, spreads – move in line with the data, especially since the various policies depend on the nature of the shocks.  
If model does not fit the financial aggregates well, what is the purpose of evaluating simple rules that respond to particular shocks that may not be important after all?
2. Credit=capital in this model  
[C]apital itself ... becomes purely a basis for the superstructure of credit  
(Marx, 1867 )

## How Realistic is the Model?

1. To better assess the benefit of different rules, one needs a model where key financial aggregates – credit, asset prices, spreads – move in line with the data, especially since the various policies depend on the nature of the shocks.  
If model does not fit the financial aggregates well, what is the purpose of evaluating simple rules that respond to particular shocks that may not be important after all?
2. Credit=capital in this model  
[C]apital itself ... becomes purely a basis for the superstructure of credit  
(Marx, 1867 )
3. Responding to credit works simply because rules that respond to state variables (credit und capital) typically perform better than rules that respond to jump variables (asset prices), simply because they mimic some form of commitment.

# What Caused the Recession?

1. Pre-financial crisis: typical shocks were **TFP shocks, monetary shocks, G shocks**

## What Caused the Recession?

1. Pre-financial crisis: typical shocks were **TFP shocks**, **monetary shocks**, **G shocks**
2. Aftermath of financial crisis: **preference shock** (people become more patient), **deleveraging shock** (credit becomes tighter)

## What Caused the Recession?

1. Pre-financial crisis: typical shocks were **TFP shocks, monetary shocks, G shocks**
2. Aftermath of financial crisis: **preference shock** (people become more patient), **deleveraging shock** (credit becomes tighter)
3. Banking models after Gertler and Karadi: **capital quality shock** (rocket ships overnight some of our factories to the moon, where they disappear). Questionable GE interpretation

## What Caused the Recession?

1. Pre-financial crisis: typical shocks were **TFP shocks, monetary shocks, G shocks**
2. Aftermath of financial crisis: **preference shock** (people become more patient), **deleveraging shock** (credit becomes tighter)
3. Banking models after Gertler and Karadi: **capital quality shock** (rocket ships overnight some of our factories to the moon, where they disappear). Questionable GE interpretation
4. Banking model of Kiley and Sim: **risk premium shock** makes short-term government debt attractive relative to investing in firms. Such a shock is unlikely to be policy invariant (CKM), and has a dubious structural interpretation (it is like a tax on investment).





# Conclusions

1. Most models with leverage and financial frictions exhibit two key frictions:
  - (1) underinvestment ex ante (due to a borrowing constraint);
  - (2) excessive volatility ex post (due to fire-sale externalities).

# Conclusions

1. Most models with leverage and financial frictions exhibit two key frictions:
  - (1) underinvestment ex ante (due to a borrowing constraint);
  - (2) excessive volatility ex post (due to fire-sale externalities).
2. The core question to clarify is how important the fire-sale/pecuniary externalities are and what are their social costs.

# Conclusions

1. Most models with leverage and financial frictions exhibit two key frictions:
  - (1) underinvestment ex ante (due to a borrowing constraint);
  - (2) excessive volatility ex post (due to fire-sale externalities).
2. The core question to clarify is how important the fire-sale/pecuniary externalities are and what are their social costs.
3. If they are important, then the main issue is regulation ex ante vs regulation ex post. Besides addressing the performance of several variants of a Taylor rule, the authors could work more on clarifying the quantitative importance of the fire-sale externalities.