

Discussion of Elenev, Landvoigt and Van Nieuwerbergh 'A Macroeconomic Model with Financially Constrained Producers and Intermediaries'

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Representative Firm: Jermann and Quadrini (2012)

Heterogeneous Firms: Khan and Thomas (2013), Khan, Senga and Thomas (2015), Arellano, Bai and Kehoe (2012)

Heterogeneous Entrepreneurs: Bassetto, Cagetti and De Nardi (2015), Buera and Moll, Buera, Fattal-Jaef and Shin (2015), Shourideh and Zetlin-Jones (2016)

None of these models have banks

Elenev, Landvoigt and Van Nieuwerburgh

- Financial Intermediaries lend to Borrower-Entrepreneurs, may hold deposits (supply risk-free bonds)
- Savers hold risk free bonds (cannot borrow)
- Banks, Firms and Households; both banks and firms may default

Borrower-entrepreneurs (firms) and Intermediaries (banks)

- Large number of firms
 - Constant returns technologies, capital and labour allocated evenly.
 - Idiosyncratic shocks, uncorrelated over time, with **time-varying variance**.
 - Managerial effort and idiosyncratic shocks are unobservable.
- Partially pool consumption risk in a large family. Family finances capital using retained earnings and long-term debt
- Family borrowing: occasionally binding maximum leverage constraint.
 - Changes in the price of capital affect the tightness of this collateral constraint.
- Firms equally share in debt repayment, **low productivity default**.
- Firms and Banks: SCF households with more than 1% wealth in risky assets.

- Banks are working in Credit Intermediation or Securities, Investments. Borrowers-Entrepreneurs are the *remaining*.
 - Labour income shares calibrated from SCF
 - credit spreads and default rates calibrated using corporate bonds
- Are all of these remaining households entrepreneurs? Are they consistent with the entrepreneurs identified by De Nardi and Cagetti (2006)
- Banks, subject to a capital requirement, may default when liabilities exceed asset value.
 - The entire intermediary sector *defaults simultaneously*.
 - Depositors bailed out by government.
- Banks have a highly volatile stochastic discount factor, reproducing size, volatility and countercyclicality of credit spreads alongside empirically consistent default rates.
- Households' stochastic discount factor determines the risk free rate.

Banks in quantitative macroeconomic model, default, equilibrium real interest rate

First, *separate financial intermediaries from producers*, long-term debt.

Second, *banks default* (random utility cost).

Third, *endogenous real interest rate on safe assets*.

The time-varying equilibrium real interest rate dampens the effect of a financial shock. Households demand for safe assets grows. Reduced lending by banks lowers their demand for deposits. Both effects reduce the real interest rate, allowing banks to recapitalise faster.

Partly offset by carefully modelling counter-cyclical government spending, rise in debt dampens fall in the real rate.

Calibration of Corporate tax rate and TFP

Corporate tax rate is calibrated to reproduce tax revenue as a share of GDP. This leads to a tax rate of 20 percent, Jermann and Quadrini (2012) use 35 percent. As interest on debt is deductible, this affects incentive to borrow. Some sensitivity analysis would be interesting.

Following a long-standing tradition in Macro-Finance, TFP is calibrated without using data on measured TFP.

The model has occasionally binding constraints. It's solved using [global methods](#). There is no description of the actual algorithm, which would be of interest.

All idiosyncratic shocks are independent over time and there is no intra-sectoral heterogeneity. As a result there are three agents in the model.

Reproducing Business Cycles

evaluating the real success of the model

Great strides in delivering firm and intermediary default in a model consistent with credit spreads, default and loss rates on corporate debt.

Perhaps some cost in terms of real success. In Table 2, consumption is more volatile than output and almost acyclical.

Investment (which excludes housing) has almost no persistence in the model.

Would be interesting to understand why the model does not deliver the right levels of *macroeconomic* risk. Do differences in the stochastic discount factors of firms, investing in capital, and households play a role?

Some models without intermediaries, but with firm heterogeneity, seem more successful in reproducing business cycle quantities. They lack the rich, quantitative success of this model in balance sheet variables.

Financial recessions and Misallocation

The real success of the model

Detrended TFP fall relative to GDP was 39 percent in the 2007 recession (GDP fell 5.59 percent). In the model, appears roughly 70 percent.

Khan and Thomas (2013) reproduce this small TFP decline through misallocation. Only some firms borrow, their collateral constraints tighten following a credit shock. No real shock.

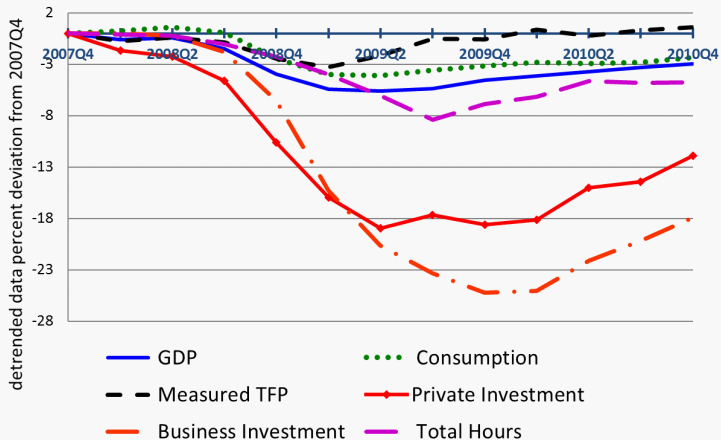
In the present work, firms are identical at start of period, equal provision of capital and labour. The financial shock does not affect TFP.

Financial recessions are deeper than real recessions. Rise in the dispersion of idiosyncratic risk increases default. DWLB increases from 2.5 percent to 9.2 percent of GDP. Is this real cost of default driving much of the deeper recession?

Would be interesting to see the financial shock without a concurrent TFP shock.

The Recent Recession

Data sources: Total hours worked from Cociuba et al 2012; BEA 28 February 2013



Consumption, Investment and Net worth

In the model, over a financial recession, consumption drops as much as output, and is more persistent (fell 73 percent relative to output in recession).

Investment is less persistent than in nonfinancial recessions. Driven by changes in the price of capital?

Net worth of firms recovers quickly in a financial recession as the price of capital falls sharply. Business fixed investment rebounds while leverage falls.

Large fall in bank net worth from loss in asset values. Their leverage rises.

Overall different from the typical financial accelerator mechanism.

Macroprudential Policy

Two experiments: raising banks capital requirement and limiting nonfinancial firms' leverage. (only first included in 18 September version.)

The second seems unfamiliar to financial regulatory authority.

There is a small welfare loss from increasing banks' capital requirement. While *banks gain*, households see a small welfare rise and firms suffer a loss.

The distribution of welfare gains from macroprudential policy, and thus the aggregate change in welfare, would be different if households (savers) owned shares in banks and firms (borrower-entrepreneurs).

Interested in transition following change in policy, whether or not in recession.

What if government capitalises intermediaries during financial crisis?