Discussion of "Bank Risk Taking and Twin Defaults" by C. Mendicino, K. Nikolov, J. Rubio-Ramirez, J. Suarez and D. Supera

Galo Nuño (Bank of Spain)

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Banking crises are typically characterized by bank defaults...

See, for instance, Laeven and Valencia (2018)

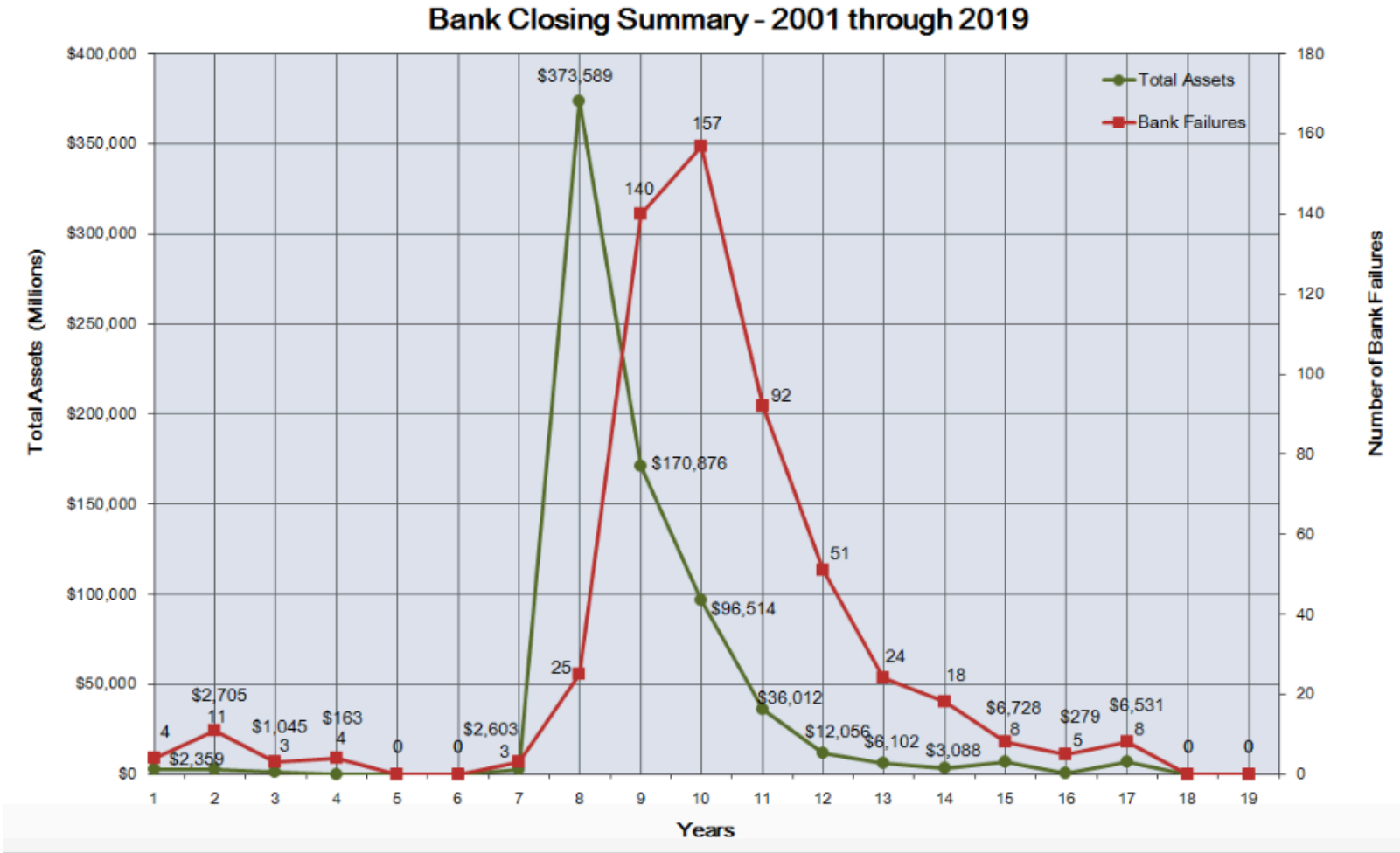

Figure: Bank Failures. Source: FDIC

... and bank defaults are progressively incorporated in quantitative models

- Some of the initial contributions did not include bank default
  - Gertler and Karadi (2011), Gertler and Kiyotaki (2013), He and Krishnamurthy (2012, 2013, 2019), Brunnermeier and Sannikov (2014), Di Tella (2017), ...
- But it gets more and more attention
  - Adrian and Boyarchenko (2015), Clerc et al. (2015), Boissay, Collard, and Smets (2016), Nuño and Thomas (2017), Corbae and D'Erasmo (2013, 2018), Martinez-Miera and Repullo (2017), Gertler, Kiyotaki and Prespitino (2017), Coimbra and Rey (2018), **this paper**

The model in a nutshell

- Two layers of **financial frictions**,
  - Firm-bank: defaultable debt and costly state verification (CSV) a la Bernanke, Gertler and Gilchrist (1999)
  - Bank-depositors: defaultable deposits fully guaranteed by a deposit guarantee scheme, exogenous capital requirement on loans

- Some additional assumptions for **tractability**
  - Island model: Banks live in islands with (island-specific) non-diversifiable risk surrounded by firms with insurable idiosyncratic risk
  - Household-bankers-entrepreneurs as in Gertler and Karadi (2011)
  - Households cannot invest in firms, only in bank deposits

The problem of the firm

CSV problem à la BGG (1999)

$$\max_{b,R_f} \left[\int_0^{\infty} \int_{\bar{\omega}(\omega_j)}^{\infty} \left(\overbrace{\omega_i \omega_j R^K k}^{\text{terminal assets}} - \underbrace{R_f b}_{\text{loans}} \right) dF_i(\omega_i)\, dF_j(\omega_j) \right]$$

subject to

$$\bar{\omega}(\omega_j) = \frac{R_f b}{\omega_j R^K k}, \text{ (Firm default threshold)}$$

$$k = b + EQ_f, \text{ (Firm balance sheet)}$$

$$\Pi_b \geq \rho_b EQ_b, \text{ (Bank participation constraint)}$$

Banks' profits

$$\Pi_b(d) = \int_{\bar{\omega}_j}^{\infty} \left\{ \overbrace{\left[\Gamma\left(\bar{\omega}\left(\omega_j\right)\right) - \mu_f G\left(\bar{\omega}\left(\omega_j\right)\right)\right] \omega_j R^K k}^{\text{terminal assets (loans)}} - \underbrace{R_d d}_{\text{deposits}} \right\} dF_j\left(\omega_j\right),$$

where

$$\Gamma(x) \equiv \int_0^x z dF_i(z) + x \int_x^{\infty} dF_i(z),$$

and

$$G(x) \equiv \int_0^x z dF_i(z).$$

The problem of the bank

$$\max_{d} \Pi_b(d)$$

subject to

$$\left[\Gamma\left(\bar{\omega}\left(\bar{\omega}_j\right)\right) - \mu_f G\left(\bar{\omega}\left(\bar{\omega}_j\right)\right)\right]\bar{\omega}_j = R_d d, \text{ (Bank default threshold)}$$

$$b = d + EQ_b, \text{ (Bank balance sheet)}$$

$$EQ_b \geq \phi b, \text{ (Regulatory capital constraint)}$$

The **solution** is $d = \frac{1-\phi}{\phi} EQ_b$.

Bank risk taking (partial equilibrium)

This is a result of the combination of the capital constraint and the non state-contingent deposit rate

Figure 3: Bank Risk Taking

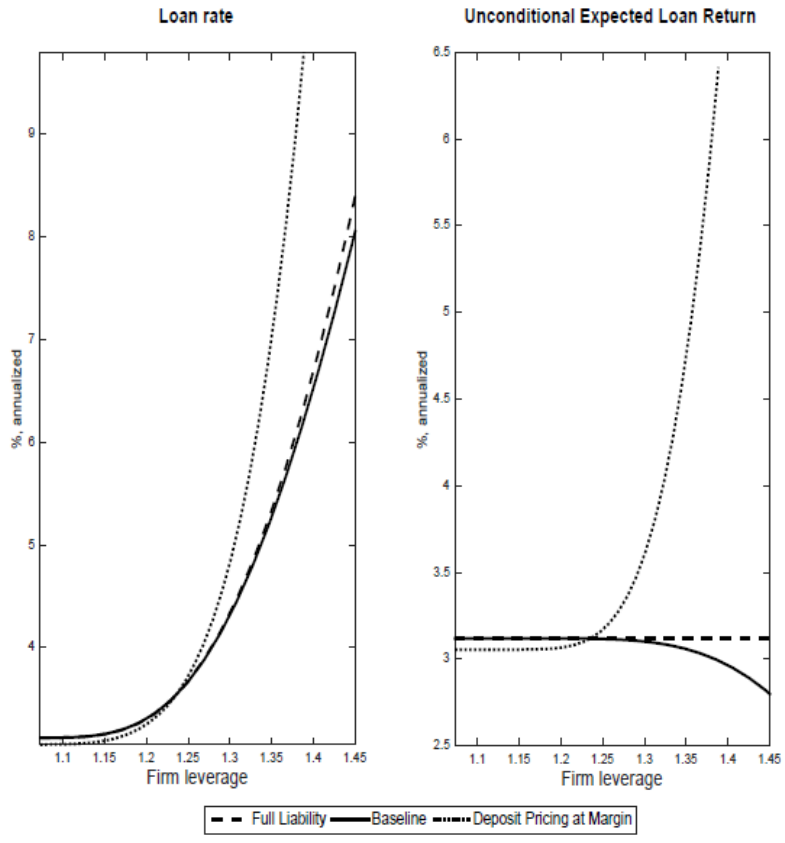

Figure: Source: Mendicino et al. (2019)

Inspecting the general equilibrium mechanism: island-specific risk shocks

- If a shock increases the variance of island-specific shocks ω_j, on impact there is an increase in bank defaults as $F_j(\bar{\omega}_j)$ increases ($\bar{\omega}_j$ constant).

- Firm default rate also increases (does it hold for any cdfs F_i, F_j?):

$$\int_0^{\infty} F_i\left(\frac{R_f b}{\omega_j R^K k}\right) dF_j(\omega_j)$$

- The combination of lower profits and higher default rates reduces bank capital EQ_b. The regulatory capital constraint, $b = EQ_b/\phi$, mechanically forces the banks to reduce loans.

- Firm defaults reduce firm equity. This, together with the decline in credit, activates the standard net worth channel à la BGG (1999).

Impulse responses

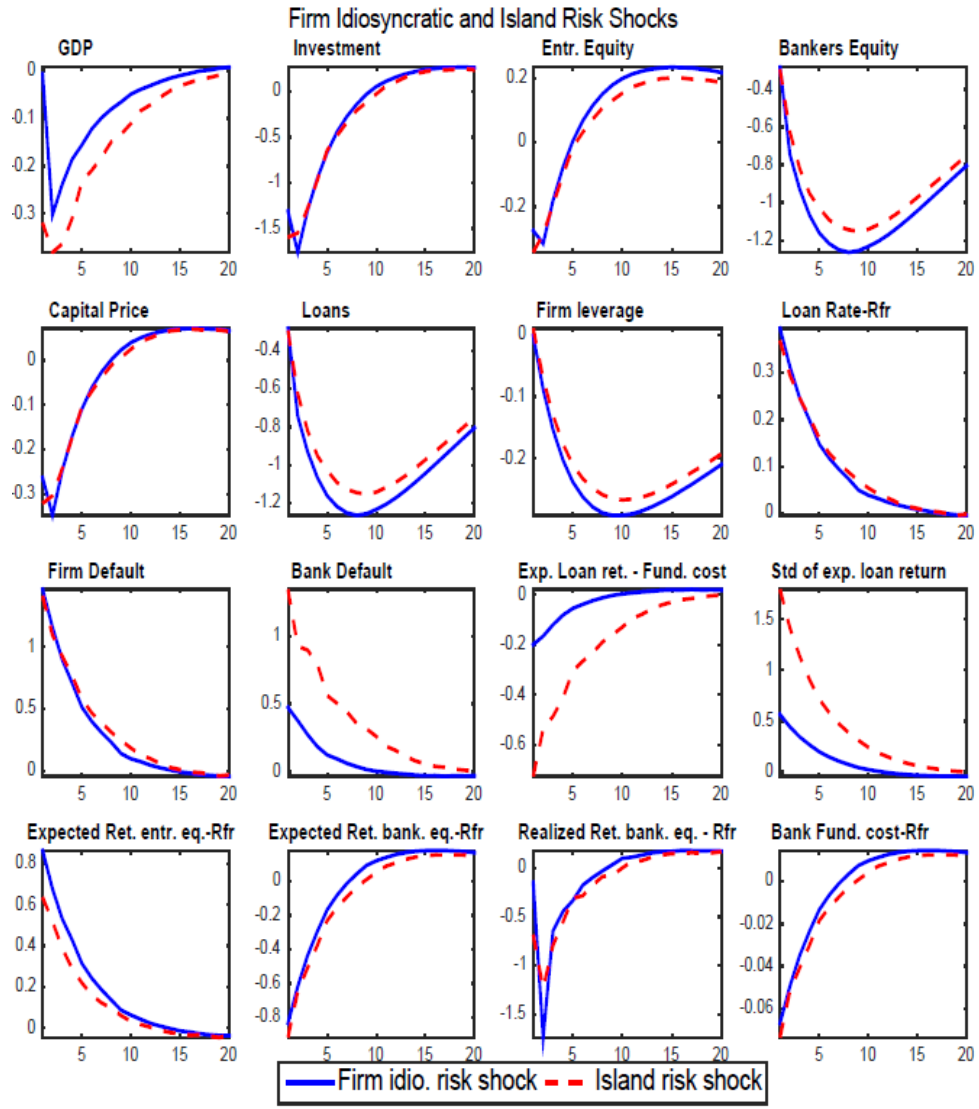

Figure: Source: Mendicino et al. (2019)

Comment 1. Banking crises are driven by non-diversifiable risk

First-moment shocks play no role. How empirically plausible is this mechanism?

Figure 9: Path to the crisis: baseline model

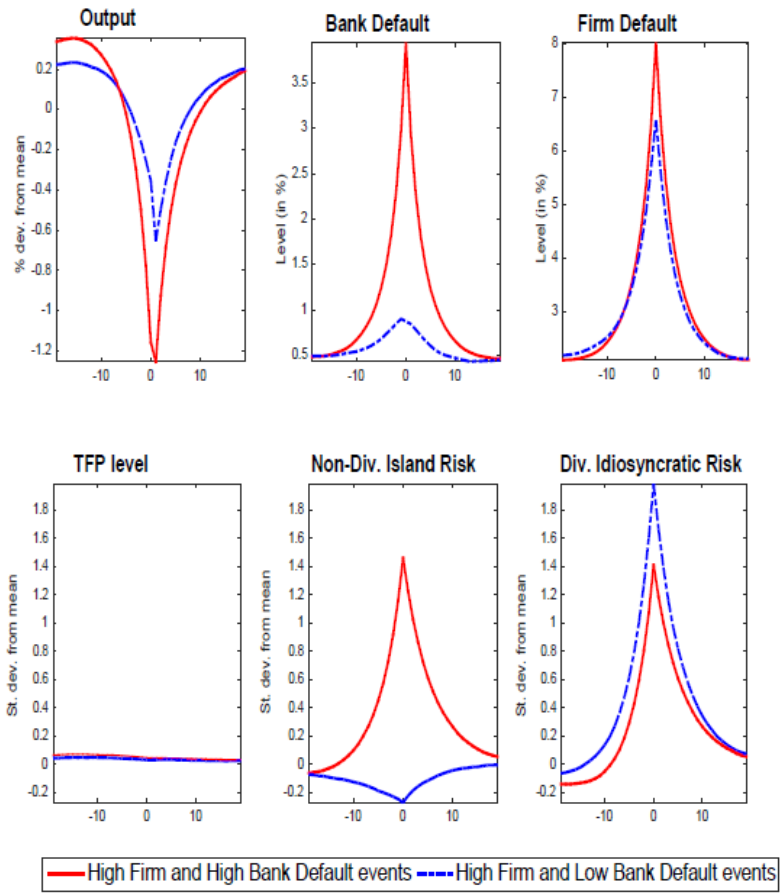

Figure: Source: Mendicino et al. (2019)

Comment 2. Is deposit insurance behind banking crises?

Deposit insurance schemes were introduced relatively late in most countries. Have there been any change in the frequency or severity of banking crises?

Country	Date enacted	Unlimited guarantee (1=Yes; 0=No)	Coverage limit (in US$)	GDP per capita (in US$)	Coverage limit to per capita GDP	Foreign deposits covered (1=Yes; 0=No)	Interbank deposits covered (1=Yes; 0=No)	Coinsurance (1=No; 0=Yes)	Payment (1=Per account; 0=Per depositor)	Funded (1=Yes; 0=No)	Risk-adjusted premiums (1=No; 0=Yes)	Public administration (1=Yes; 0=No)	Public funding (1=Yes; 0=No)	Compulsory Membership (0=No; 1=Yes)
El Salvador	1999	0	4,720	2,265	2.1	1	0	1	0	1	0	1	0	0
Estonia	1998	0	8,058	6,790	1.2	1	0	0	0	1	1	0	0	0
Finland	1969	0	31,863	31,034	1.0	1	0	1	0	1	0	0	0	0
France	1980	0	88,410	29,805	3.0	1	0	1	0	0	1	0	0	0
Germany	1966	0	25,260	29,602	0.9	1	0	0	0	1	1	0	0	0
Gibraltar	1998	0	25,260	n.a.	n.a.	1	0	0	0	0	1	0	0	0
Greece	1993	0	25,260	15,700	1.6	1	0	1	0	1	1	0	0	0
Guatemala	1999	0	2,487	2,074	1.2	1	1	1	0	1	1	1	0	0
Honduras	1999	0	9,297	996	9.3	1	1	1	0	1	1	0	0	0
Hungary	1993	0	14,429	8,209	1.8	1	0	1	0	1	0	0	0	0
Iceland	1985	0	29,455	35,905	0.8	1	0	1	0	1	1	1	0	0
India	1961	0	2,193	564	3.9	1	0	1	0	1	1	1	0	0
Indonesia	1998	1	Full	1,106	n.a.	1	n.a.	1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Ireland	1989	0	25,260	38,074	0.7	1	0	0	0	1	1	1	0	0
Isle of Man	1991	0	35,694	29,424	1.2	1	0	0	0	0	1	1	0	0
Italy	1987	0	130,457	25,471	5.1	1	0	1	0	0	0	0	0	0
Jamaica	1998	0	4,957	3,131	1.6	1	0	1	0	1	1	1	0	0
Japan	1971	0	93,371	33,637	2.8	0	0	1	0	1	1	0	0	0
Jordan	2000	0	14,104	1,979	7.1	0	0	0	0	1	1	1	0	0
Kazakstan	1999	0	2,774	2,068	1.3	1	0	0	0	1	0	1	0	1
Kenya	1985	0	1,313	459	2.9	1	1	1	0	1	1	1	0	0
Korea	1996	0	41,925	12,710	3.3	0	0	1	0	1	1	1	0	0
Kuwait	1982	0	Full	19,279	n.a.	1	n.a.	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Latvia	1998	0	5,545	4,810	1.2	1	0	1	0	1	1	1	0	0
Lebanon	1967	0	3,317	5,703	0.6	0	1	1	0	1	1	0	0	0
Liechtenstein	1992	0	25,260	n.a.	n.a.	1	0	1	0	0	1	1	0	0
Lithuania	1996	0	16,293	5,369	3.0	1	0	0[k]	0	1	1	1	0	0
Luxembourg	1989	0	25,260	60,092	0.4	1	0	0	0	0	1	0	0	0
Macedonia	1996	0	25,260	2,285	11.1	1	0	0[l]	0	1	0	0	0	1
Malaysia	1998	1	Full	4,254	n.a.	1	n.a.	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Figure: Source: Demirgüç-Kunt, Kane and Laeven (2008)

The trade-off between liquidity risk and insolvency risk

- Deposit insurance increases insolvency risk by encouraging reckless behavior by banks and reduces liquidity risk by removing the incentives of depositors to withdraw from banks when concerned about insolvency risk.
  - This paper only focuses on the increase in insolvency risk. (Adding banking panics as in Gertler, Kiyotaki and Prespitino(2017)?)
  - Large empirical literature suggesting that the risk-taking costs of deposit insurance have out-weighed its liquidity-risk-reduction benefits.
  - Ex. Demirgüç-Kunt, Kane and Laeven (2008), Beck and Laeven (2008), Laeven and Valencia (2013), Yan, Skully, Avram and Vu (2014), and Calomiris and Jaremski (2016).

- Deposit insurance is an explicit guarantee whereas lender of last resort policies (LOLR) are implicit.
  - LOLR exists since the mid-19th century (Bignon, Flandreau and Ugolini, 2012) and have been extensively employed (Laeven, 2011).
  - Can the model say something about how LOLR policies would affect risk taking compared to deposit insurance?

Comment 3: In reality, the procyclicality of bank leverage seems to play a major role in credit cycles

See, for instance, Adrian, Colla and Shin (2013) or Nuño and Thomas (2017). Can it be included in the model?

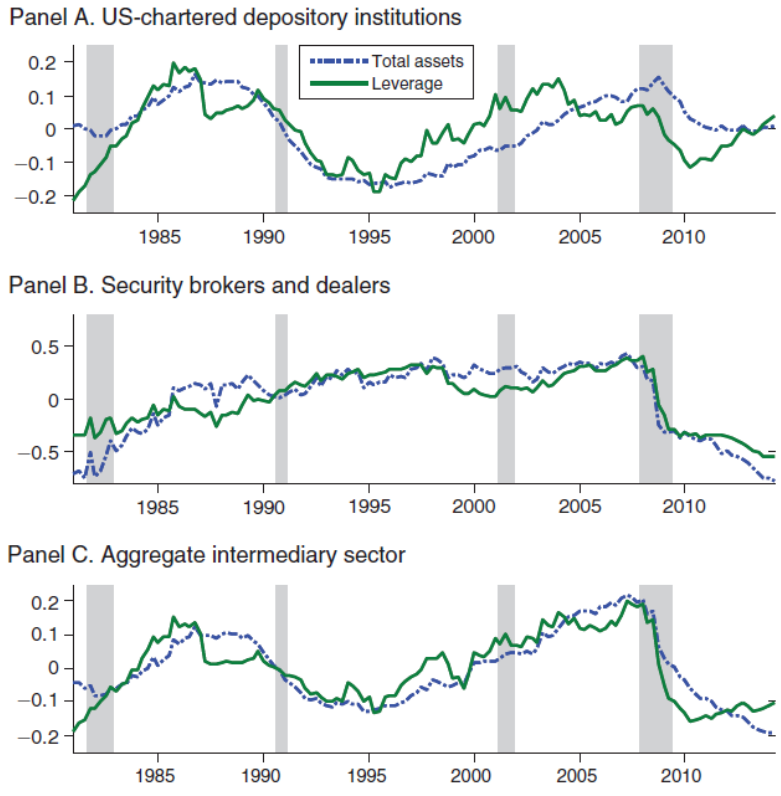

FIGURE 1. CYCLICAL COMPONENTS OF INTERMEDIARY LEVERAGE AND TOTAL ASSETS

Notes: Leverage and total assets have been logged and linearly detrended. Shaded areas represent NBER-dated recessions.

Source: US Flow of Funds. See online Data Appendix for details.

Figure: Source: Nuño and Thomas (2017)

Further suggestions for this line of research

- **Include monetary policy**: contribute to the debate about the coordination between monetary and macroprudential policy
  - Svensson (2014), Adrian and Duarte (2018)...
- **Explore the optimality of ex-ante and ex-post Government interventions**
  - Bail outs, countercyclical capital ratios....