Credit and Macro Fluctuations: Müller-Werner Work and New Insights from Europe and United States

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Extensive literature linking credit cycles to business cycles

- Household credit is key in advanced economies: Jorda, Schularick, and Taylor, 2014; Mian et al., 2017
- Firm credit is key in emerging markets: Crisis literature, recently: Kalemli-Ozcan, 2019; di Giovanni, Kalemli-Ozcan, Ulu, Baskaya, 2021
- New literature (micro/census data): **Firm credit also has a role in advanced economies:** Giroud and Mueller, 2020; Kalemli-Ozcan, Laeven, Moreno, 2019; Dinlersoz, Hyatt, Kalemli-Ozcan, Penciakova, 2020

Müller-Werner: Household and non-tradeable sector (where most firms are) credit are equally important in boom-bust cycles.

Channels

- Consumption boom story: For households and non-tradeable sectors, credit finance consumption/demand (well known in EM crisis literature)

- Financial friction story: These sectors have tighter financial constraints

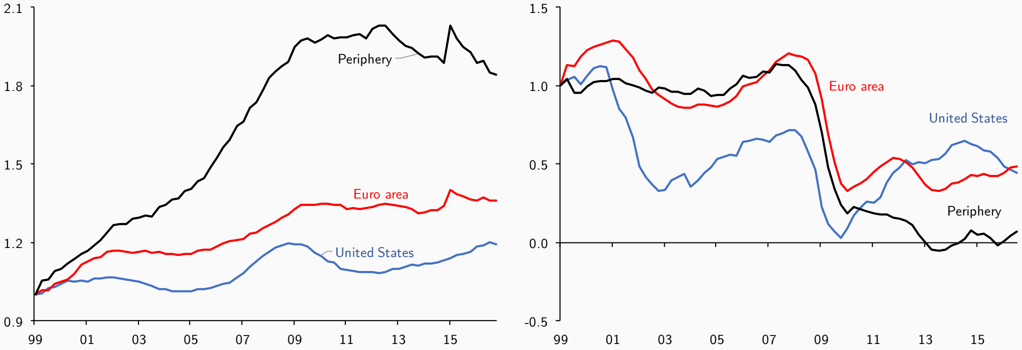
- Misallocation story: These sectors are less productive

Müller-Werner: Connects the different pieces in the literature—negative effects of corporate debt overhang on aggregate outcomes might come 'more' from firms in non-tradeable sectors.

Very impressive and policy relevant work

- I have nothing but praise for this amazing work by Müller-Werner
- Great service to profession: Construction of a new historical database at sector level: where does credit go?
- I will present some results from firm level data based literature to bridge the policy implications.
  $\Rightarrow$ State of the art in this literature focuses on where does credit go: Credit Registry Datasets (ECB-Anacredit, a good start)

Corporate Debt and Investment to GDP: Europe and U.S.



Source: Data from BIS. Figure from Kalemli-Ozcan, Laeven, Moreno, 2018.

Firm Debt Overhang and Investment in Europe–No recovery after 5 years

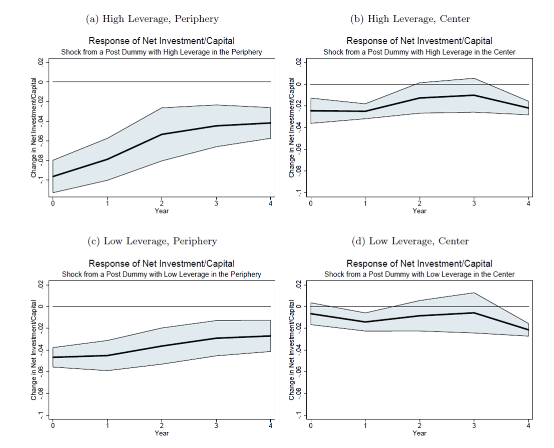
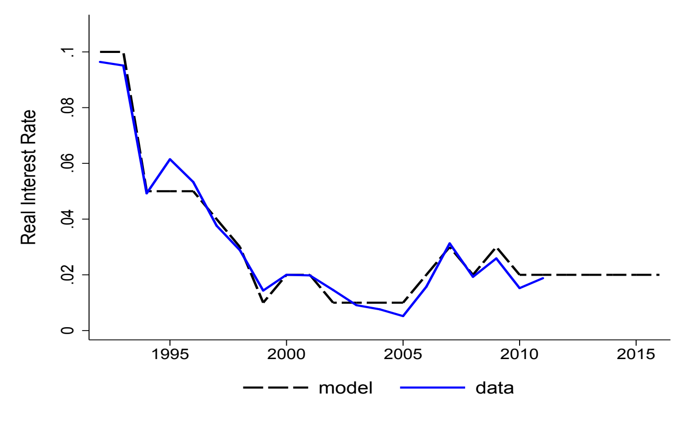


Figure from Kalemli-Ozcan, Laeven, Moreno, 2019

- Leveraged firms in periphery countries decrease investment more and do not recover.

Why European firms accumulated debt during the boom?

Declining interest rates with the EU integration incentivized firms to finance investment with short-term debt



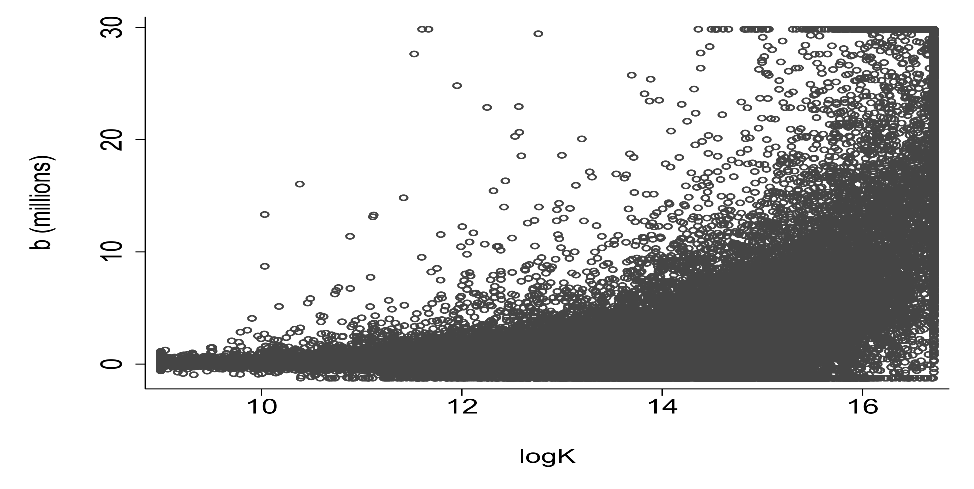
Source: Data from Eurostat. Figure from Gopinath, Kalemli-Ozcan, Karabarbounis, Villegas-Sanchez.

How firm leverage affects productivity?

Firm-level heterogeneity in accessing finance have implications on aggregate productivity when all firms face a lower interest rate

- $\downarrow$ in real interest rate $\implies \uparrow$ in desired capital (K) **for all firms**
- Firms with high net worth: $\uparrow K$, face $\downarrow$ returns to K
- Firms with low net worth: cannot expand K, face $\uparrow$ returns to K
- Dispersion of capital returns $\uparrow$ within a 4-digit sector and aggregate TFP $\downarrow$
- Importance of size-dependent borrowing constraint for aggregate outcomes, **evidence?**

Leverage and Firm Size in Europe



Source: Data from ORBIS. Figure from Gopinath, Kalemli-Ozcan, Karabarbounis, Villegas-Sanchez.

Taking Stock

Evidence for Müller-Werner story on misallocation even for tradable sector, can be worse for other sectors

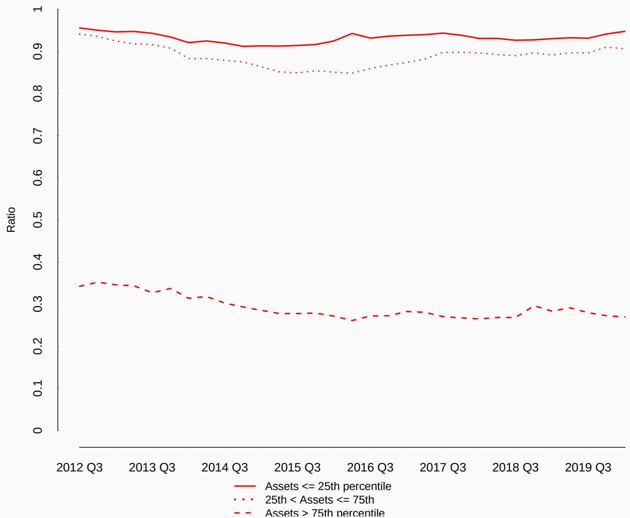
Evidence for Müller-Werner story on financial frictions for all sectors, can be worse for non-tradeable sectors

$\Rightarrow$ Policy Implication 1: regulate by firm (on top of households), on top of sector regulation

$\Rightarrow$ Policy Implication 2: Hard to regulate firms, but most firms are bank dependent in Europe so can regulate banks

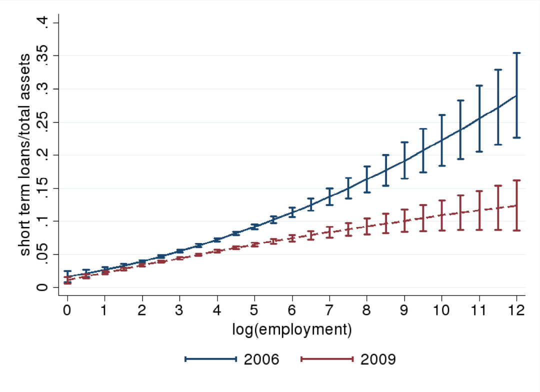
What about U.S.?

Share of Bank Debt in Private Firms' Financing in FR-Y-14 (U.S. Credit Registry)

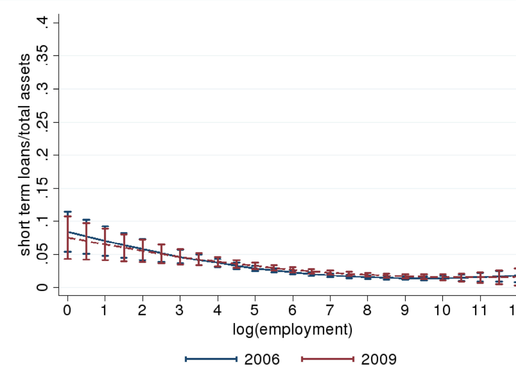


Leverage and Firm Size in U.S.: Same convex relation as in Europe

Private Firms



Public Firms



Firm Leverage and Growth: From micro to macro boom-bust

- Private firm leverage and growth are positively related in normal times, but leverage affects firm growth negatively during the crisis.
- Leverage and sector growth are positively related in normal times, negatively during and after the crisis.

SECTOR:	(1) Employment Growth	(2) Revenue Growth
$STLEV_{st-1}$	0.71**	1.7**
	(0.35)	(0.73)
$STLEV_{st-1} \times CRISIS_t$	-0.73***	-2.1***
	(0.26)	(0.62)
$STLEV_{st-1} \times POST_t$	-0.93***	-0.55
	(0.34)	(0.82)
Sector FE	Y	Y
Year FE	Y	Y
Obs	1029	1029
R2	0.9919	0.9752

Implications for Policy

- Importance of macro-prudential regulation for leverage
- Importance of collecting regulatory credit data for every agent (extend Anacredit to firms in Europe/Y-14 in U.S.)
- Müller-Werner: Need to watch household leverage and non-tradeable sector leverage
- More granular look: Need to watch leverage of non productive large firms and financially constrained smaller firms

Policies that aim to promote growth, and limit boom-bust cycles should limit leverage on households and low productivity firms, and make sure high productivity firms have access to finance, especially during periods of low interest rates.