Aggregate Implications of Corporate Leverage

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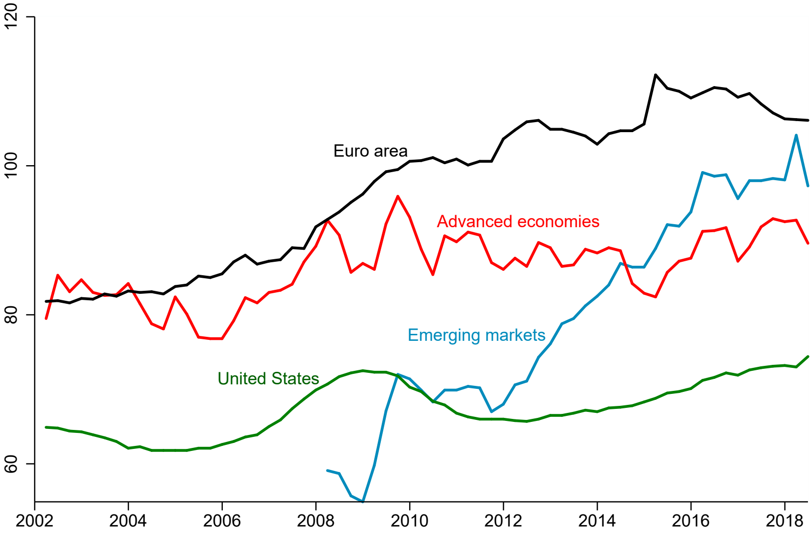
Banco De Portugal Conference on Financial Stability

Corporate Debt/GDP: Advanced and Emerging Countries



Source: Data from BIS. Figure from Kalemli-Ozcan, Liu, Shim, 2019.

Questions

1. What causes corporate leverage to increase during booms?
2. Is corporate leverage an important propagator of aggregate boom-bust cycles?
3. How does corporate leverage relate to growth?

A key theme: Importance of granular big data for identification and for macro implications

Outline

- I will start with Europe
- Then discuss the United States
- If I have time, highlight few important points for Emerging Markets

Research Agenda: Credit Booms and Busts under Global Financial Markets

Today's talk will be based on:

1. **Debt Overhang, Rollover Risk, and Corporate Investment: Evidence from the European Crisis** (with Luc Laeven, David Moreno)

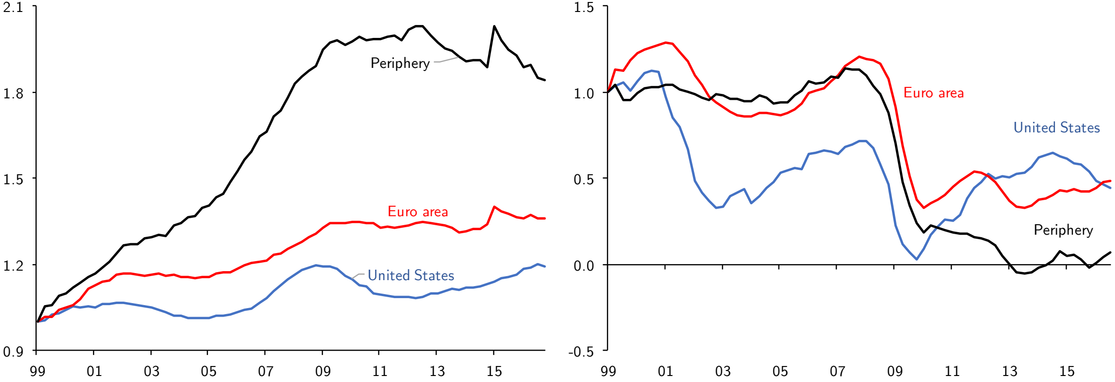
2. **Capital Allocation and Productivity in South Europe**, *QJE, 2017* (with Gopinath, Karabarbounis, Villegas-Sanchez)

3. **Leverage over the life cycle of U.S. Firms** (with Dinlersoz, Hyatt, Penciakova)

4. **Exchange Rate Appreciations and Corporate Risk Taking**, *prepared for IMF ARC November 2019* (with Liu, Shim)

5. **U.S. Monetary Policy and International Risk Spillovers**, *written for Jackson Hole Symposium, August 2019*

Corporate Debt and Investment to GDP: Europe and US



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

Understanding Investment Bust in Europe

- **Big Data:** Match firms to their banks and banks to their sovereigns in Euro area countries (2m+ observations), 2000–2015
- Firm-level datasets that are nationally representative covering SMEs; mimic official size distribution—less than 250 employee firms account for 60+ percent of economic activity.
- Account for all the explanations for low investment in Europe:

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  1. Low aggregate demand/high future uncertainty/high sovereign risk (affects all firms in a given country)
  2. Low bank credit supply (affects all firms who borrowed from bad banks)
  3. Firm leverage and rollover risk (affects firms differentially as a function of their short-term debt based leverage)

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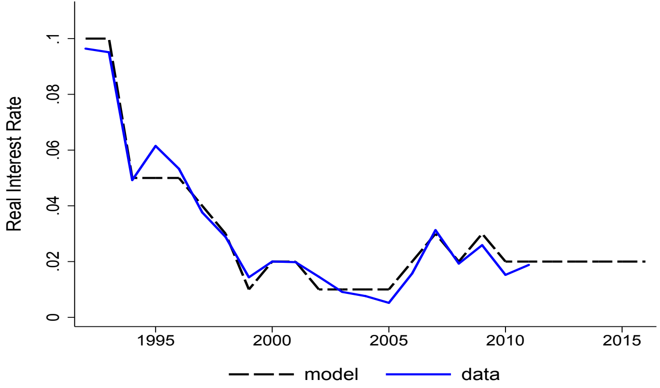
Policy Implication: Expansionary monetary policy, bank recapitalization and dealing with legacy debt will help but not completely solve the sluggish investment and anemic growth problem until firm de-leveraging process is complete.

Why firms accumulated debt and increased leverage during the boom in Europe?

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



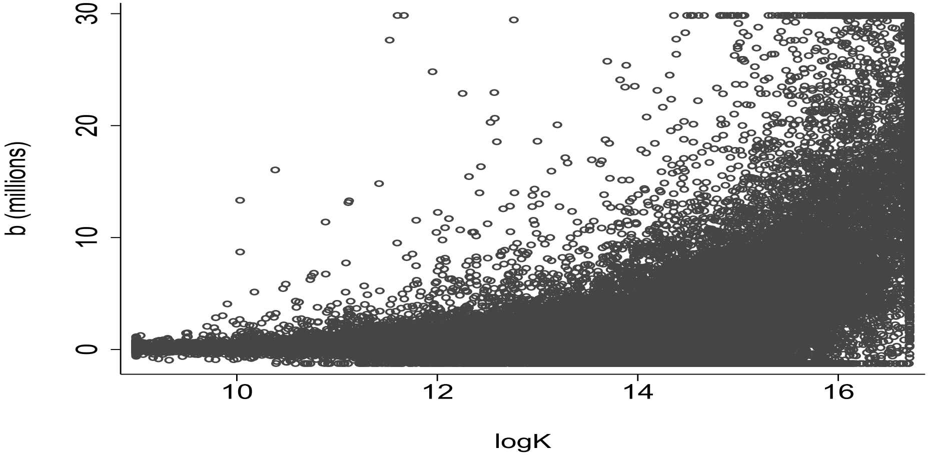
Source: Data from Eurostat. Figure from Gopinath, Kalemli-Ozcan, Karabarbounis, Villegas-Sanchez.

Differential response of firm leverage to $\downarrow$ interest rates can lead to $\downarrow$ aggregate 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 $\Longrightarrow \uparrow$ 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.

Is Europe unique?

Similar picture in the US for firm size and firm leverage..

..but one needs data on small firms to get a meaningful variation in firm size

Problem: Lack of data in the US on private firms financial positions

- Extensive literature on employment/growth dynamics of U.S. firms
- Far less is known about how these firms finance their growth
- **What is known about firms' financing behavior derives primarily from publicly-listed firms in Compustat:**

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  - 26 percent of domestic employment
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  - 26 percent of domestic employment
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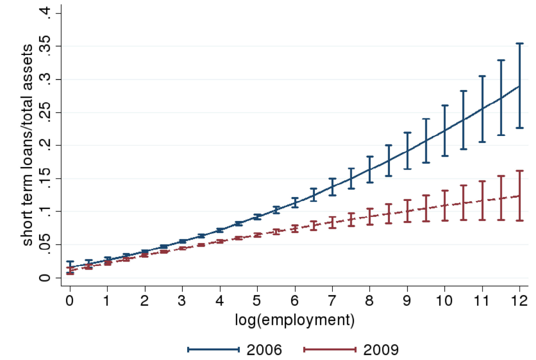
- Non-Compustat firms' financial conditions must have important macroeconomic implications:
  - They account for over half of economic activity
  - Most susceptible to the effects of financial shocks

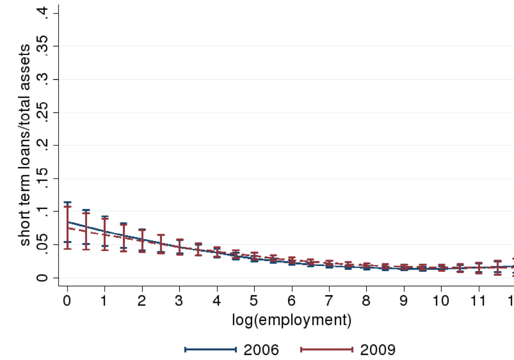
WE BUILD: **LOCUS Data:**
LBD from Census + **O**rbis from Moody's + **C**ompustat from S&P, **US**

Leverage and Firm Size in US

Private Firms



Public Firms



Leverage and Growth: From micro to macro

- 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

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4. Larger firms can borrow more, and such heterogeneity in access to finance has implications for aggregate productivity and growth

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   Additional channel for emerging market firms:

   - Capital flows and exchange rate fluctuations have an additional role in increasing corporate leverage in emerging markets by reducing borrowing costs and decreasing the value of FX debt on the balance sheet (higher net worth)
   - During booms, both local currency and FX borrowing will increase, leaving corporates vulnerable to both exchange rate shocks and funding shocks

Implications

- Large literature that says: credit booms predict busts (macro data from many countries)
- Debate in the US: household and bank leverage more important than firm leverage
- Our work shows that firm leverage-growth dynamics are consistent with boom-bust cycles
- Focusing only on public/large firms leverage and growth dynamics will miss this since such firms may not be financially constrained to start with

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