Market-based finance and the business cycle

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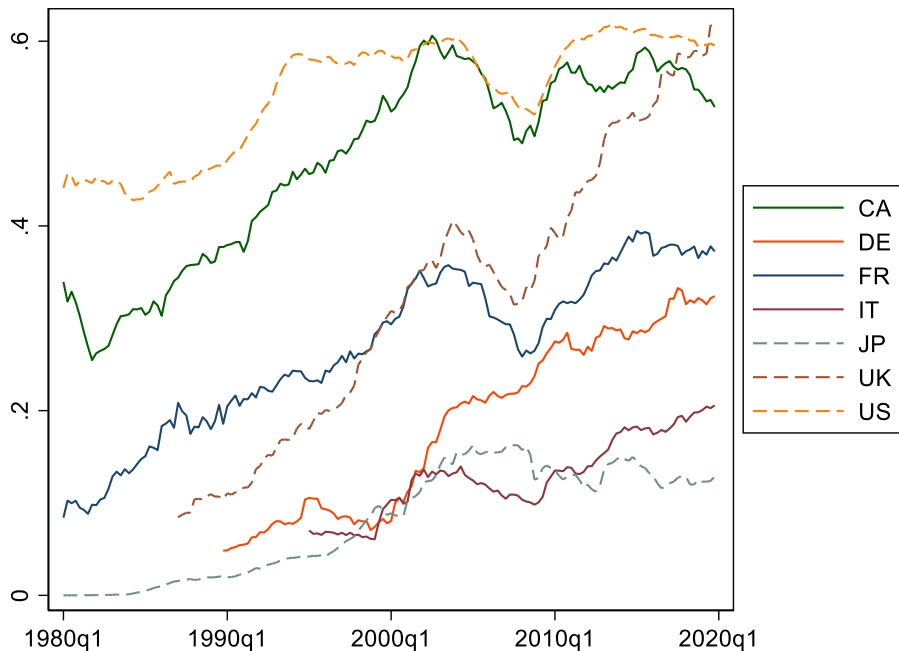
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*The views expressed are those of the authors and do not necessarily reflect those of the ECB or the Eurosystem.

Introduction

Growth of market-based finance – a global phenomenon, possibly affecting the real economy

<u>Share of market-based credit to NFCs in G7 countries</u>

Legend: CA, DE, FR, IT, JP, UK, US

Notes: defined as NFC debt securities in NFC debt securities and NFC bank loans.

- Market-based finance (MBF) helps diversify funding sources for NFCs

→ **What is the role of MBF in booms, busts and recoveries?**

In this paper…

1) We construct **a novel dataset of credit to NFCs** for 17 developed economies

- distinction between **NFC bank loans** and **NFC debt securities** (i.e. between market-based and bank-based NFC credit)
- accounts for **debt issued via foreign financing vehicles**

2) We examine empirically **the interplay between different types of credit** (distinguishing between market-based and bank-based NFC credit) **and the business cycle**

a. **role of credit components in the build-up phase** prior to the start of a recession
b. link between **pre-recession credit dynamics and subsequent economic recovery** after a recession starts

Preview of findings

B – Pre-recession credit growth and subsequent recovery:
Rapid growth of **market-based credit** prior to recessions is associated with a **stronger subsequent recovery** than growth in bank-based credit

A – Build-up phase:
Growth in **market-based credit** helps to predict
(i)   recessions unrelated to banking crises
(ii) all types of recessions in economies with a higher share of market-based credit
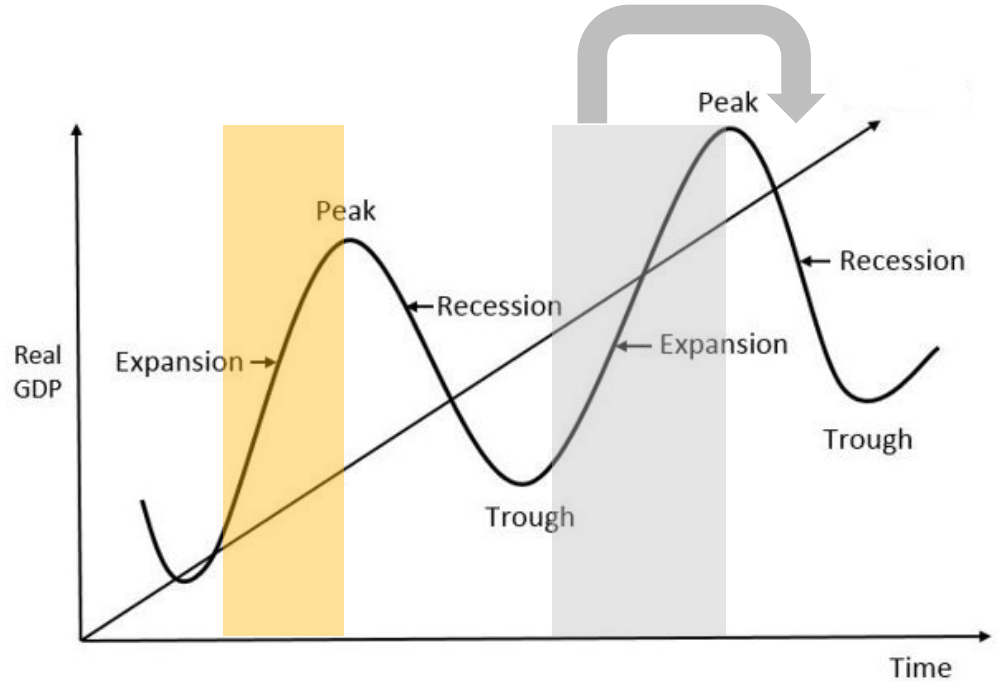
Our contribution

1. We provide a **long run data set on NFC external funding with split between bank-based and market-based credit** (accounting for debt issuance by **foreign financing vehicles**)

   → Existing cross-country datasets (e.g., BIS) with breakdown into credit to households and NFCs

2. We differentiate between **market-based and bank-based NFC credit in predicting recessions**

   → *Aggregate* credit (Fisher, 1933; Minsky, 1986; Schularick and Taylor, 2012; Jordà et al., 2013; Aikman et al., 2015)

   → Only few studies look at different credit components (Mian et al., 2017; Müller and Verner, 2023; Ivashina et al., 2024) and none at MBF

3. We show **bank-based NFC credit is a drag on the subsequent recovery, while market-based NFC credit is associated with a stronger subsequent recovery**

   → Jordà et al (2017, 2022) does not find evidence that *aggregate* NFC credit is a drag on recoveries, while emphasizing the role of pre-recession household and mortgage debt

   → Related to Kalemli-Özcan et al. (2022): firms with higher pre-crisis debt reduce their investment more after the crisis
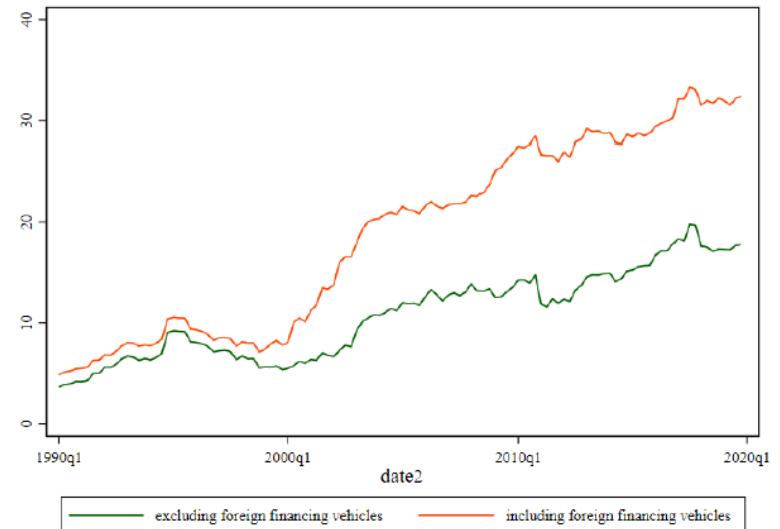
A novel NFC credit dataset

Overview
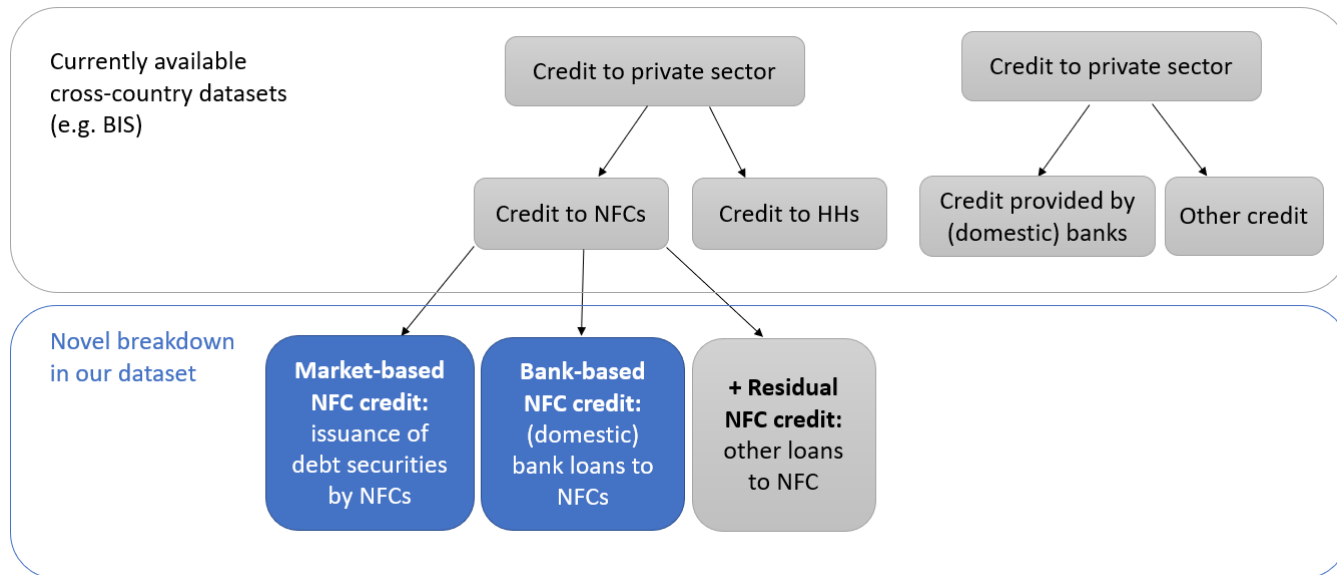
- **Sample:** 17 developed economies (AU, BE, CA, DE, DK, ES, FI, FR, IE, IT, JP, NL, NO, PT, SE, UK, US)

- **Quarterly data with a long time-span:** Reaching back to the late 80s in most cases (end in 2019 Q4)

- **Sources:** national and international official data sources (from BIS and central banks), augmented by commercial data from Dealogic

Issuance via foreign financing vehicles

- **In some countries, common practice** to issue debt securities via intra-group foreign financing vehicles (see also Coppola et al., 2021; Beck et al., 2023)

  → more material **after the introduction of euro**

- **Example:** "Deutsche Telekom International Finance BV" (a fully owned Dutch financing company of "Deutsche Telekom AG") issues debt securities and transfers funds back as internal loans*

- **Official statistics** usually exclude these 'foreign-issued' debt securities

- We use **Dealogic data** to capture such issuance (particularly relevant for DE, ES, PT)
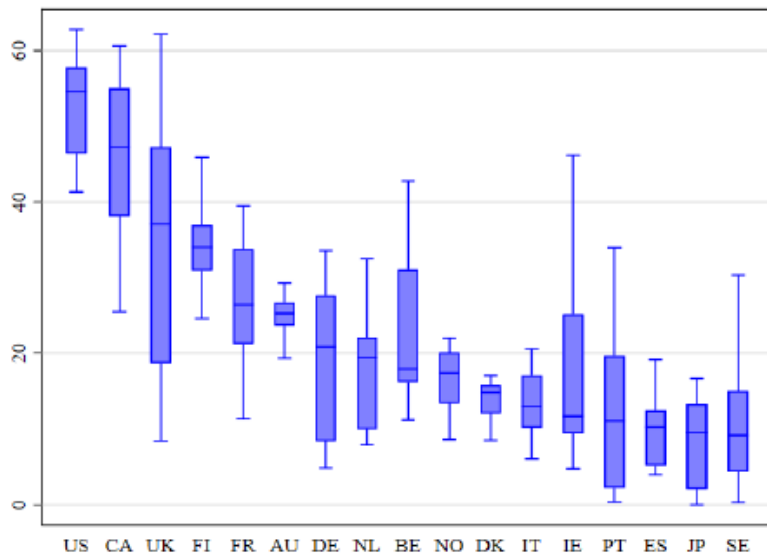
<u>Share of market-based in total NFC credit in Germany (%)</u>

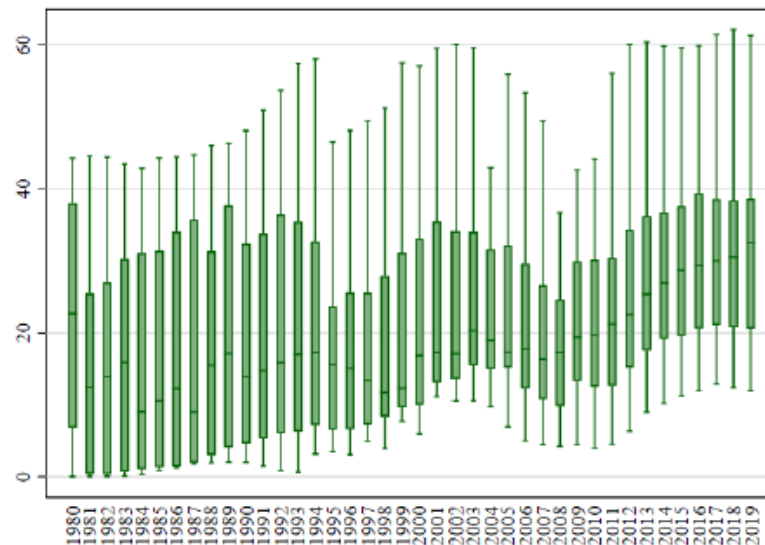Legend: excluding foreign financing vehicles — including foreign financing vehicles

* See https://www.telekom.com/de/investor-relations/fremdkapital/deutsche-telekom-international-finance-b-v-

# Share of market-based credit to NFCs

By country

Over time

Notes: 'Share of market-based credit' defined as share of NFC debt securities in NFC debt securities and NFC bank loans (in %).

Business cycle dates

- For most countries, we use **business cycle dates from NBER and ECRI**

- For 7 countries, we obtain peak and trough dates by applying the **Bry-Boschan algorithm**

  → **87 recessions**

- If it starts two years before or after a banking or systemic crisis → **financial recession**
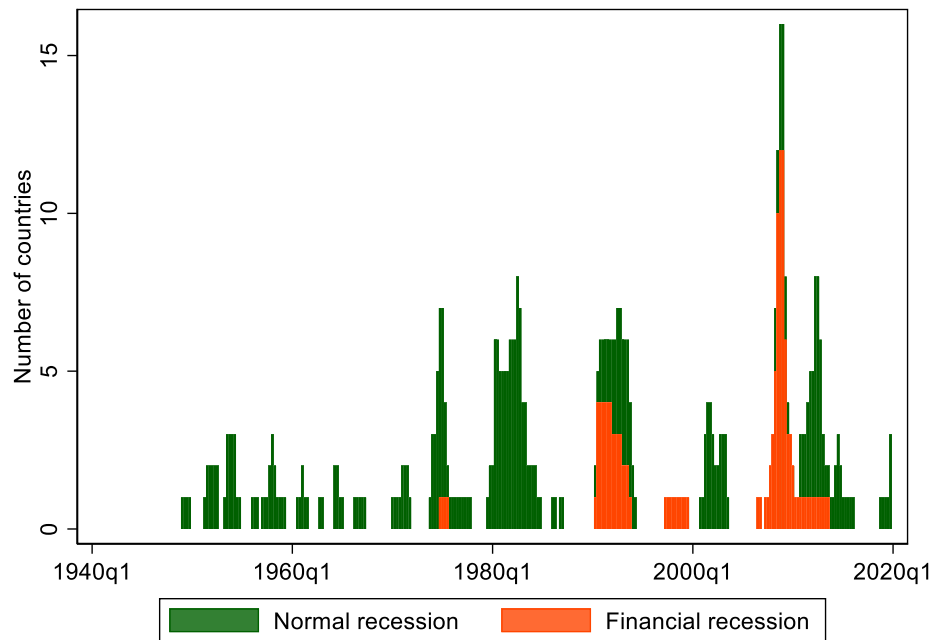
A – Build-up phase

Model

Binary response models to assess which credit types help predicting recessions:

$$P(Rec)_{i,t+h} \sim \alpha_i + \mathbf{\Delta\ NFC\_credit\ /GDP_{i,t}} + \Delta\ Household\_credit\ /GDP_{i,t} + Controls_{it} + \epsilon_{it}$$

$$\mathbf{\Delta\ NFC\_debtsecurities\ /GDP_{i,t}} + \mathbf{\Delta\ NFC\_bankloans\ /GDP_{i,t}} + \mathbf{\Delta\ NFC\_residual\_credit\ /GDP_{i,t}}$$

- $P(Rec)_{t+h}$: Recession starts within $t + h$ (baseline: 8 quarters; robustness: 4 and 12 quarters)
- $\Delta\ Credit\ /GDP_{i,t}$: Change in respective credit component to GDP between $t - 8$ and t
- Country fixed effects (α_i), controls (e.g., public debt, inflation, yield curve slope), private credit interactions

- Logit models with Driscoll-Kraay standard errors in the baseline (robustness: probit)
- Exclude recession period and recovery period to avoid post-crisis bias (Bussiere and Fratzscher, 2006)
- In-sample estimations

Results for all countries

Recession starts within eight quarters Model:	Total NFC credit All rec. (1)	NFC credit sub-components		
		All rec. (2)	GFC excl. (3)	Normal rec. (4)
Variables				
NFC credit	0.417* (0.098)			
NFC bank loans		1.157*** (0)	1.331*** (0.001)	1.67*** (0)
NFC debt securities		0.28 (0.168)	0.549** (0.018)	0.632* (0.059)
Residual NFC credit		-0.604* (0.071)	-0.871 (0.155)	-0.847 (0.195)
Household credit	0.499* (0.053)	0.674*** (0.002)	0.702** (0.02)	0.787** (0.016)
Interactions (private credit)	Yes	Yes	Yes	Yes
Country fixed-effects	Yes	Yes	Yes	Yes
Observations	1,802	1,571	1,294	977
Number of countries	17	17	14	11
Number of recessions	52	45	32	28
Pseudo R^2	0.253	0.357	0.373	0.338

Note: P-values in parentheses.

one SD above the mean growth in …

… bank loans ~ 19-29 pp…

… debt securities ~ 9-13 pp…

… higher probability that recession starts within the next two years

Results for market-based economies only

Recession starts within eight quarters Model:	Market-based economies		
	All rec. (1)	GFC excl. (2)	Normal rec. (3)
Variables			
NFC bank loans	0.125 (0.948)	0.227 (0.887)	0.74 (0.732)
NFC debt securities	1.351** (0.01)	1.743*** (0.007)	1.938*** (0.002)
Household credit	2.014*** (0.002)	2.256*** (0.001)	2.615*** (0.002)
Controls	Yes	Yes	Yes
Country fixed-effects	Yes	Yes	Yes
Observations	740	716	513
Number of countries	6	6	4
Number of recessions	18	15	13
Pseudo R^2	0.521	0.554	0.495

Note: P-values in parentheses.

Do the estimates change with the financing structure of the economy?

→ 'Market-based economies': countries with median share of MB credit > 25% (US, CA, UK, FI, FR, AU)

# B – Pre-recession credit growth and subsequent recovery

Model

In line with Jordà et al., 2022, we run **local projections** to assess economic growth h quarters after a business cycle peak p depending on pre-recession growth in different credit types:

$$(1)\ \Delta\text{GDP}_{h(p)} \sim \alpha_h + \alpha_{hi} + \boldsymbol{\Delta NFC\_credit_{it(p)}} + \Delta Household\_credit_{it(p)} + Controls_{it(p)} + \epsilon_{it(p)}$$

$$(2)\ \Delta\text{GDP}_{h(p)} \sim \alpha_h + \alpha_{hi} + \boldsymbol{\Delta NFC\_debt\_securities_{it(p)}} + \boldsymbol{\Delta NFC\_bank\_loans_{it(p)}} + \Delta Household\_credit_{it(p)}$$
$$+ Controls_{it(p)} + \epsilon_{it(p)}$$

- Cumulative log changes in real GDP
- Change in credit components (normalised to GDP) over 16 quarters before peak p (robustness: 12 and 20 quarters)
- Controls: residual NFC credit, the current and two lags of annual GDP growth, inflation and change in investment to GDP
- All regressors are de-meaned by their full-sample averages (by country)
- α_h is the average real GDP change in $t + h$, as α_{hi} are country fixed effects normalized to sum to zero
- Standard errors are clustered at the country level

Results – aggregate NFC credit
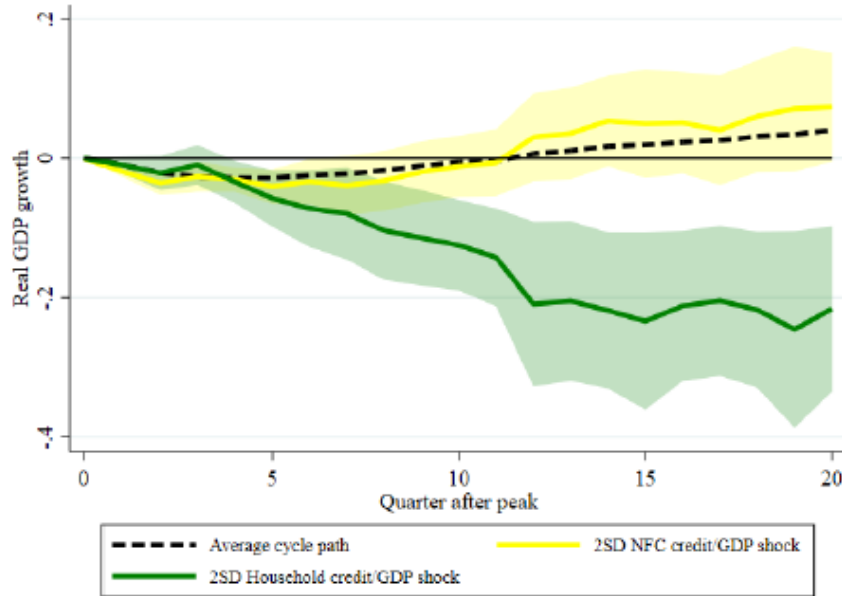
We confirm finding of Jordà et al., 2022:

- Strong increase in **NFC credit before business cycle peak has no significant impact** on subsequent GDP growth

- Strong increase in **household credit is associated with a slower subsequent economic recovery**

Notes: 16 quarters growth in credit components before recession start, clustered standard errors at country level, country FE, controls: residual NFC credit, current and two lags of annual GDP growth, inflation and change in investment to GDP, confidence bands are at a 10% level of significance

Results – NFC credit split
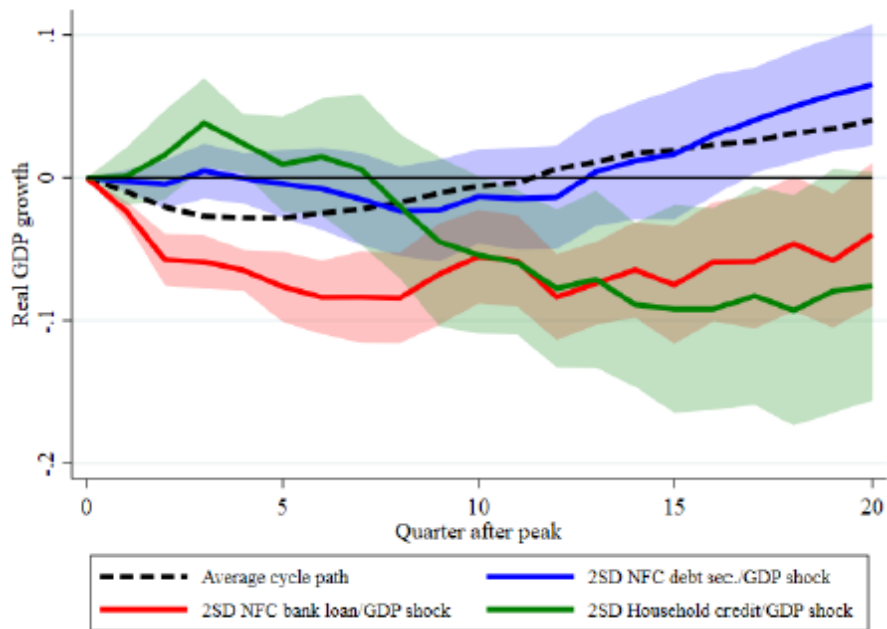
- In an extension of Jordà et al., we find that there is **a debt overhang problem also for corporates,** but only **when banks have been providing the funding**

- **Rapid growth of market-based credit prior to recessions is associated with a stronger subsequent recovery**

→ Costs of debt restructuring and liquidation likely to matter more for bank loans than debt securities

Notes: 16 quarters growth in credit components before recession start, clustered standard errors at country level, country FE, controls: household, credit residual NFC credit, current and two lags of annual GDP growth, inflation and change in investment to GDP, confidence bands are at a 10% level of significance

Conclusions and policy implications

- We show that **market-based credit (and more generally *sources* of NFC credit) matter for macro booms and busts**
    - In the build-up phase, rapid growth in **market-based credit helps to predict recessions** (particularly in economies with a genuine mix of bank-based and market-based financing)
    - Strong **pre-recession growth in NFC bank loans (debt overhang) acts as a drag on economic recovery**, while growth in NFC debt securities is associated with a stronger subsequent recovery
- → Important to assess / monitor **dynamics of both bank-based and market-based NFC credit**
- → Policies to ensure that both **market- and bank-based credit are resilient and support NFCs throughout the cycle**
    - Providers of bank-based credit (banks) – more regulated
    - Providers of market-based NFC credit (non-banks) – less regulated
    - → (macro)prudential policies that reduce procyclicality / avoid excessive risk taking in non-banks

Thank you for your attention!