

Credit booms, debt overhang, and leaning against the wind

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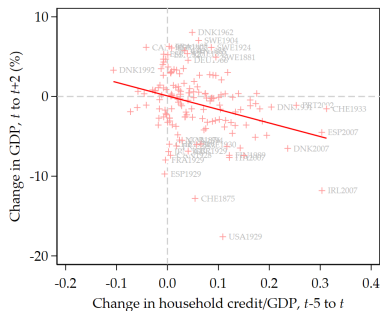
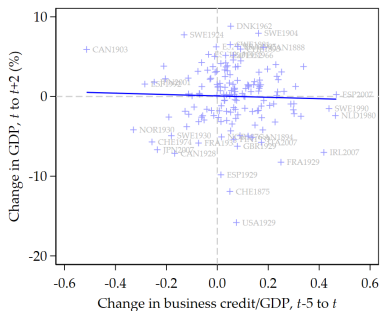
Remarks at Bank of Ireland conference

April 26, 2022

This talk

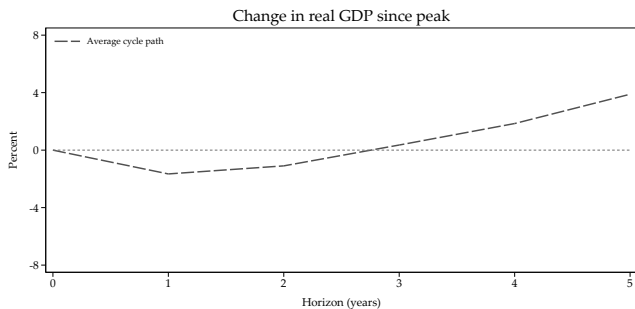
- Debt booms and their aftermath
- Monetary policy and financial fragility
- Leaning against the wind
- Data on **www.macrohstory.net/data**

Debt booms and GDP outcomes



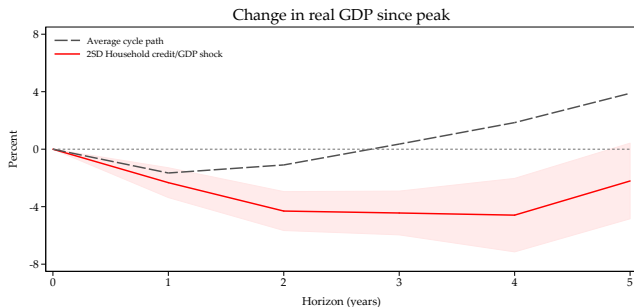
Source: Jordà, Kornejew, Schularick and Taylor (2021). Univariate correlation between past credit growth and future GDP. 18 economies since 1870.

Business cycles and debt dynamics: local projections



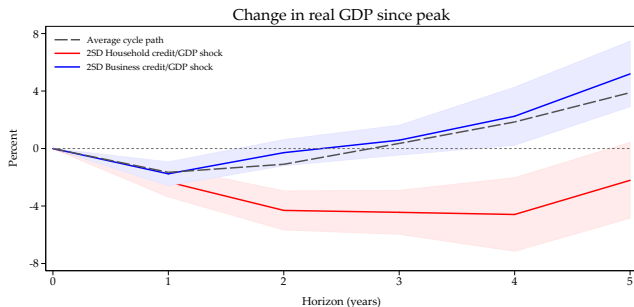
Notes: Average recession trajectory following a business cycle peak at $t = 0$. Panel local projections with following controls: contemporaneous plus 2 lags of real GDP growth, inflation, real investment growth, short-term interest rates, real household credit growth, real business credit growth.

Household debt booms followed by more severe recessions



Notes: Predictive effects on growth of a two-SD credit expansion in the five years preceding the recession for household credit booms. Standard errors clustered on countries. Shaded areas denote 95% confidence intervals. Panel local projections with following controls: contemporaneous plus 2 lags of real GDP growth, inflation, real investment growth, short-term interest rates, real household credit growth, real business credit growth.

Corporate debt booms do not leave traces

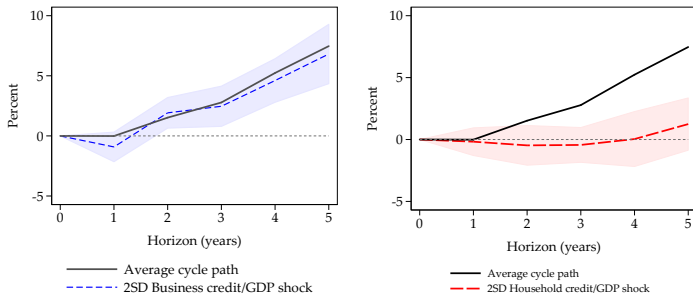


Notes: Predictive effects on growth of a two-SD credit expansion in the five years preceding the recession for business credit booms and household credit booms. Standard errors clustered on countries. Shaded areas denote 95% confidence intervals. Controls: contemporaneous plus 2 lags of real GDP growth, inflation, real investment growth, short-term interest rates, real household credit growth, real business credit growth.

► Coefficient estimates

Effects on macroeconomic aggregates

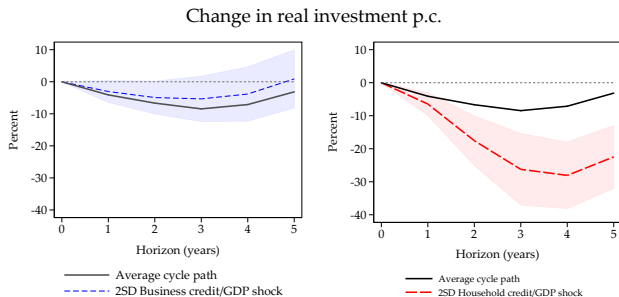
Change in real consumption p.c.



Notes: Standard errors clustered on countries. Shaded areas denote 95% confidence intervals.

▶ Back

Effects on macroeconomic aggregates

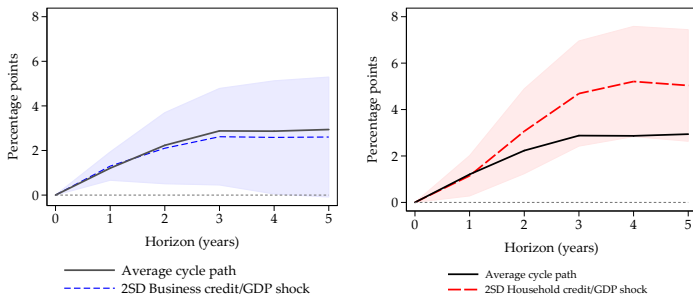


Notes: Standard errors clustered on countries. Shaded areas denote 95% confidence intervals.

► Back

Effects on macroeconomic aggregates

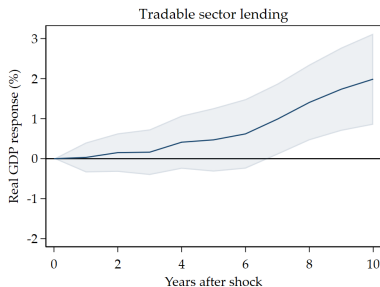
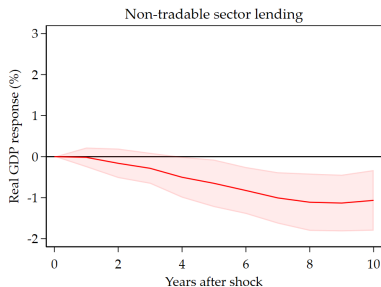
Change in unemployment



Notes: Standard errors clustered on countries. Shaded areas denote 95% confidence intervals.

► Back

The sectoral composition of corporate debt matters (Mueller and Verner 2021)



Notes: Reproduced from Mueller and Verner (2021). Impulse response functions for a +1 pp. increase in sectoral non-financial business credit/GDP. Shaded area mark 95% confidence intervals. Estimated by local projections on a sample of 116 emerging market and advanced economies over the time span 1940-2014.

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**Financial Stability Considerations for Monetary Policy: Empirical
Evidence and Challenges**

Nina Boyarchenko, Giovanni Favara, and Moritz Schularick

2022-006

Goal of the paper

Review of the empirical evidence on

- The link between financial vulnerabilities and the macroeconomy
- How monetary policy affects that connection

We summarize the findings from

- Time-series and historical cross-country analysis
- Microeconomic studies on the nexus between monetary policy and asset valuations, financial intermediaries, macro outcomes

Financial vulnerabilities over time

Financial vulnerabilities are generally procyclical and contribute to the amplification of real cycles

- Credit to nonfinancial firms (especially riskier firms)
- Lending to households
- Effects on the leverage of financial firms
- Asset valuations

e.g., Adrian and Shin (2009), Adrian and Boyarchenko (2013), Greenwood and Hanson (2013), Lopez-Salido et al. (2017), Krishnamurty and Muir (2017), Bartscher et al. (2021)

Financial vulnerabilities and real outcomes

Vulnerabilities that emerge from the interplay of credit growth and asset prices are most dangerous

- They forecast increased probability of financial crises
- Estimates suggest that the average crisis probability of 5% rises to 25% if 5-year credit growth is 2 SD above the mean
- Also forecasts a deterioration in the conditional distribution of real outcomes 1- to 3-years ahead
- Especially household credit booms predict increased real volatility and negative skewness of real outcomes

e.g., Schularick and Taylor (2012), Mian et al. (2017), Adrian et al. (2019), Greenwood et al. (2021)

Financial vulnerabilities and real outcomes

Financial vulnerabilities typically build up in benign macroeconomic environments

- Risk premiums in credit and equity markets tend to be abnormally low during credit and financial booms
- Potentially inconsistent with a positive price of risk in financial markets
- Scant evidence that being on target wrt to dual mandate reduces crisis risk

e.g., Minsky (1985), Kindleberger and Aliber 2005), Bordalo et al. (2018), Baron and Xiong (2017), Krishnamurty and Muir (2018), Fahlenbrach et al. (2018), Richter and Zimmermann (2020)

Monetary policy and financial vulnerabilities

Monetary policy may affect the buildup of financial vulnerabilities

- Evidence that it affects asset valuations, investor risk appetite, and leverage
- Some evidence that it contributes to vulnerabilities related to leverage of households, *and/or*
- Maturity and liquidity transformation of financial intermediaries

e.g., Bernanke and Kuttner (2005), Krishnamurty and Vissing-Jorgensen (2011), Adrian and Boyarchenko (2012), Diamond and Rajan (2012), Hanson and Stein (2015), Gerlter and Karadi (2015), Gilchrist et al. (2015), Di Maggio and Kacperczyk (2017), Coimbra and Rey (2020), Paul (2021)

Monetary policy and financial vulnerabilities

The evidence does not point to quantitatively meaningful effects of monetary policy on financial vulnerabilities

- Measured effects are typically small and event studies may not be well suited to evaluate how monetary policy affects the build-up of financial vulnerabilities over time
- Elasticities relating monetary policy to vulnerabilities typically do not usually account for asymmetries, nonlinearities and state dependence
- Tighter policy may increase vulnerabilities

e.g., Becker and Ivashina (2014), Di Maggio et al. (2020), Crouzet (2021), Schularick et al. (2021)

Gaps in the empirical literature

Fundamental gaps in our understanding of the interaction of monetary policy and financial vulnerabilities persist

- The literature often does not distinguish the financial stability implications of changes in monetary policy from those due to changes in r^*
- There is little research on keeping monetary policy accommodative to run a high-pressure economy and the buildup of financial vulnerabilities
- Little is known on whether monetary policy that stabilizes the economy and reduces economic volatility thereby invites more risk-taking

Leaning against the Wind and Crisis Risk[†]

By MORITZ SCHULARICK, LUCAS TER STEEGE, AND FELIX WARD*

Can central banks defuse rising stability risks in financial booms by leaning against the wind with higher interest rates? This paper studies the state-dependent effects of monetary policy on financial crisis risk. Based on the near-universe of advanced economy financial cycles since the nineteenth century, we show that discretionary leaning against the wind policies during credit and asset price booms are more likely to trigger crises than prevent them. (JEL E43, E44, E52, E58, F33)

How should a central bank react when it observes that a potentially dangerous credit and asset price boom is under way? Can policymakers defuse rising financial stability risks by leaning against the wind and increasing interest rates?

Effects of leaning against the wind

- 1870-2016, annual, 17 countries:
Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, U.K., U.S.
- Binary crisis indicators:
Jordà, Schularick & Taylor (2016)
Reinhart & Rogoff (2010)
Baron, Verner & Xiong (2018)
- Credit, house prices, stock prices, and macroeconomic variables:
Jordà-Schularick-Taylor Macrohistory Database
<http://www.macrohistory.net/data>
- Exchange rate regime indicators:
Jordà, Schularick & Taylor (2019)

Financial boom indicators

- Generate binary boom indicators:
 - Credit booms
 - Credit + Houseprice booms
 - Credit + Stockprice booms
- Boom indicators take value 1 if financial is above trend and growing:

$$B_{i,t} = I(y_{i,t}^{cyclical} > y_{i,t}^{trend} \wedge \Delta y_{i,t} > 0)$$

- Different one-sided filtering methods:
 - HP filter (baseline)
 - CF filter
 - Hamilton filter

Trilemma Instrumental Variable

- Fixed exchange rate & capital mobility \Rightarrow local policy rate moves with base country rate (**Relevance**)
- Base country rate changes exogenous to peg countries' economies (**Exogeneity**)
- Remove predictable component from base rate changes (**Anticipation**)¹
- **Trilemma IV:**

$$z_{i,t} \equiv (\Delta r_{b(i,t),t} - \Delta \hat{r}_{b(i,t),t}) \times PEG_{i,t} \times PEG_{i,t-1} \times KOPEN_{i,t}$$

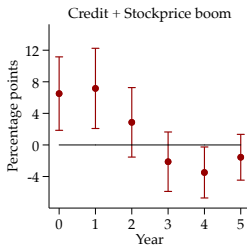
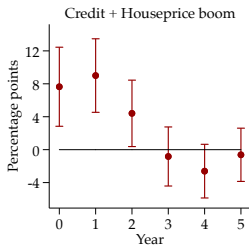
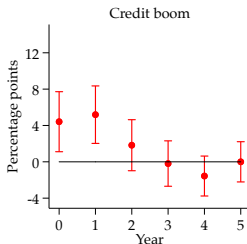
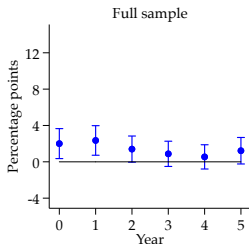
$(\Delta r_{b(i,t),t} - \Delta \hat{r}_{b(i,t),t})$ Unanticipated base country rate change

$PEG_{i,t}$ Peg dummy

$KOPEN_{i,t}$ Capital account openness indicator

\Rightarrow Local average treatment effect for pegs: $IRF_{LATE} = (\beta_0^{IV}, \dots, \beta_{10}^{IV})'$

Effect of a +1ppt policy rate increase on crisis risk



⇒ **Crisis risk increases in the short-term**