

Stress-ridden finance and growth losses: Does financial development break the link?

Matias Ossandon Busch José Manuel Sánchez-Martínez

Anahí Rodríguez-Martínez Ricardo Montañez-Enríquez

Serafín Martínez-Jaramillo Manuel Ramos Francia

November 11, 2021

— *XXVI Meeting of the Central Bank Researchers Network* —

C-GARP Project

This paper is part of the C-GARP Project, which provides an open-source platform to estimate Growth-at-Risk models (see Beta website: <https://cgarp.cemla.org/>).

The background of the banner features a dark-themed financial chart with various data series in green, red, and blue. Text overlays on the chart include "Declining 2619", "New Low 306", and "Stocks".

CEMLA Growth at Risk Project (C-GARP)

**This website contains the material related to
CEMLA's Growth at Risk Project (C-GARP).**

CONSULT THE RESULTS OF OUR FINANCIAL CONDITIONS INDEX.

Financial development and growth

Financial development has been long associated with a lower volatility of GDP growth.

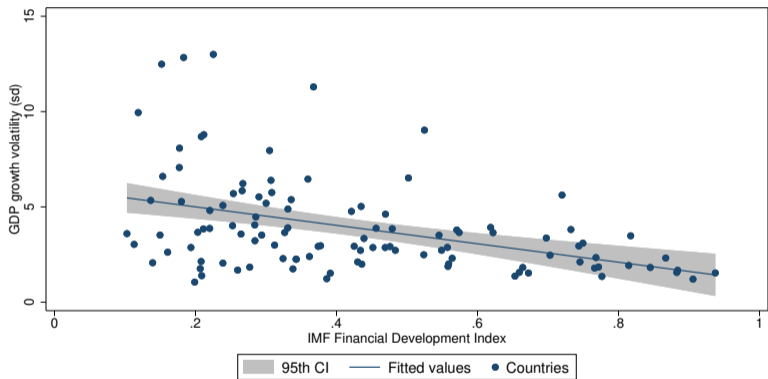


Fig.1: Relationship between GDP growth volatility in S.D. and financial development for the period 1990-2018 in Emerging Market Economies. The unconditional correlation coefficient equals 0.43. Source: IMF, own calculations.

Financial development and growth

FD can be linked to smaller negative deviations from GDP growth trends.

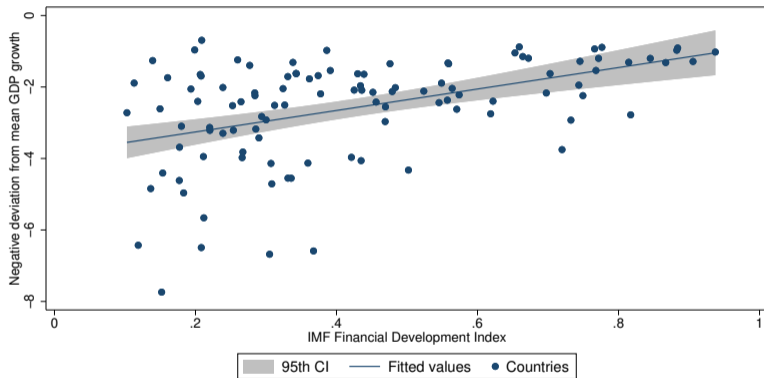


Fig.2: Relationship between negative deviations from country-specific GDP growth trends and financial development for the period 1990-2018 in Emerging Market Economies. The unconditional correlation coefficient equals 0.47. Source: IMF, own calculations.

Motivation

Eyeballing the finance-growth nexus

- This descriptive evidence reflects stylized facts in the literature:
 - ▶ FD spurs growth via higher productivity (Beck et al., 2000; Gopinath et al., 2017).
 - ▶ The effect reflects a more efficient capital allocation (Wurgler, 2000; Moll, 2014).
- However, more evidence is needed to interpret this relationship...
 - ▶ Is the effect of FD symmetric for left vs. right tails of GDP growth?
 - ▶ Through which channels does FD operate to affect output volatility?

Research question

Explaining the link between FD and growth.

- Conjecture: FD can mitigate the link between financial stress and negative growth.
 - ▶ Rationales: efficient capital allocation & capital flows' composition.
- **This Paper:** Does FD affect the relationship between financial stress and the expected distribution of GDP growth?
 - ▶ Novelty: Exploring the financial stability growth nexus conditional on the stance of FD.

Research design

- We follow a research design based on **three building blocks**.
 - ▶ A database on macro-financial variables for 28 European countries.
 - ▶ A Financial Stress Index following [Duprey et al. \(2017\)](#).
 - ▶ A Growth-at-Risk model differentiating according to countries' stance of FD.

Contribution to the literature

Closer to our approach are studies exploring the link between FD and output volatility.

- Most studies find that FD reduces output volatility via a reduction in financial market imperfections, a better sectoral capital allocation, and improved firm survival rates. See: [Acemoglu et al. \(2003\)](#), [Braun and Larraín \(2005\)](#), [Manganelli and Popov \(2015\)](#), [Iwasaki et al. \(2020\)](#), [Levine and Warusawitharana \(2021\)](#).
 - Other studies suggest, however, that output volatility may increase with FD via creative destruction dynamics ([Kerr and Nanda, 2009](#)) or even that the effect is negligible ([Beck et al., 2006](#); [Campos et al., 2012](#)).
- ⇒ This paper: Shift the focus to how FD can mitigate left-shifts in expected growth when financial stress hits.

Econometric model

Panel quantile regression model.

- Baseline specification estimates quarterly GDP growth for country i , at time $t + h$ and for a quantile τ :

$$Q^{(\tau)}(\Delta GDP_{i,t+h}) = \alpha_h^{(\tau)} + \beta_{1,h}^{(\tau)} \Delta GDP_{i,t} + \beta_{2,h}^{(\tau)} FCI_{i,t} + \beta_{3,h}^{(\tau)} VIX_t + \mu_i^{(\tau)} + \varepsilon_{i,t}^{(\tau)} \quad (1)$$

Econometric model (cont'd)

Financial development enters the model in an interaction term with financial stress proxies.

- Interaction model estimating quarterly GDP growth for country i , at time $t + h$ and for a quantile τ :

$$\begin{aligned} Q^{(\tau)}(\Delta GDP_{i,t+h}) = & \alpha_h^{(\tau)} + \beta_{1,h}^{(\tau)} \Delta GDP_{i,t} + \beta_{2,h}^{(\tau)} FCI_{i,t} + \beta_{3,h}^{(\tau)} VIX_t \\ & + \beta_{4,h}^{(\tau)} FD_{i,t} + \beta_{5,h}^{(\tau)} (\Delta GDP_{i,t} * FD_{i,t}) \\ & + \beta_{6,h}^{(\tau)} (FCI_{i,t} * FD_{i,t}) + \beta_{7,h}^{(\tau)} (VIX_t * FD_{i,t}) \\ & + \mu_i^{(\tau)} + \varepsilon_{i,t}^{(\tau)} \end{aligned} \quad (2)$$

Econometric model (cont'd)

Addressing identification challenges

- We face three main challenges that difficult the identification of the effect of FD on growth:
 - ▶ **Reverse causality:** focus on the non-linear effect financial stress along the (lagged) FD distribution.
 - ▶ **Omitted variables:** explore an intuitive channel through which FD may affect growth.
 - ▶ **Left vs. right-tail effects:** we explore effects across the expected GDP growth distribution.

Econometric model (cont'd)

Data description

- Our sample spans from 1990Q1 to 2018Q4 and consists of 28 European countries.
 - ▶ 16 advanced economies, 12 emerging market economies.
- Main variables of interest:
 - ▶ Quarterly GDP at current prices in US\$ (Eurostat).
 - ▶ VIX Index (Yahoo Finance).
 - ▶ CLIFS indices, orthogonalized with respect to the VIX index to absorb domestic financial conditions (ECB).
 - ▶ IMF Financial Development Index to measure countries' stance of financial development (IMF).

Results

Results

Baseline results

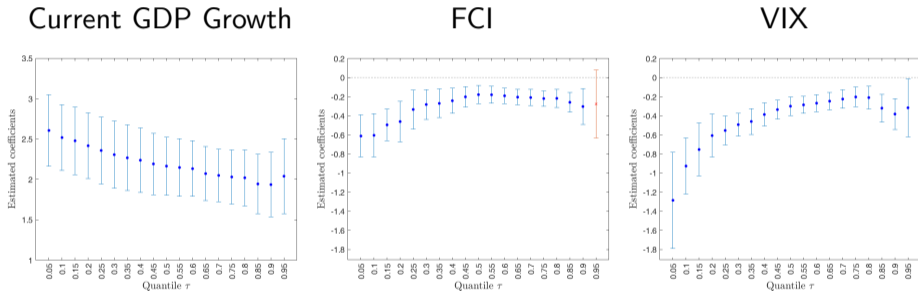
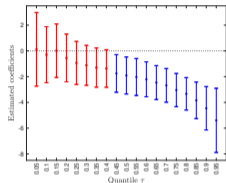


Fig.3: This panel reports the results from estimating Eq. 1 using a panel quantile regression approach. Reported coefficients represent lagged GDP Growth (left), a domestic financial conditions index, FCI (center), and the VIX Index (right).

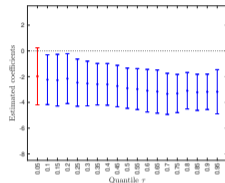
Results

Interaction model with financial development

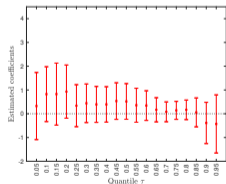
Financial Development



Interaction: GDP Growth



Interaction: FCI



Interaction: VIX

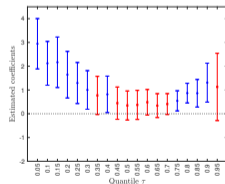


Fig.4: This panel reports the results of estimating Eq. 2 (with a one quarter horizon, $h = 1$), focusing on the interaction terms between our macrofinancial variables of interest and a measure of financial development. Reported coefficients represent lagged GDP Growth (upper-right), a domestic financial conditions index, FCI (bottom-left), and the VIX Index (bottom-right).

Results

Interpretation and implications.

- Our main results suggest that developed financial markets contribute to a higher resilience against foreign financial shocks.
 - ▶ Why FD interacts with foreign financial factors — in contrast to domestic ones — in buffering against financial shocks?
- First, as financial markets expand and the enforcement of contracts improve, foreign investors will find it easier to find proper collateral ([Martin and Taddei, 2008](#)).
- Second, easing capital market imperfections can also tip the balance in favor of more stable FDI ([Desai et al., 2021](#)).

Results

Results survive an extensive list of robustness tests.

- Results vanish when replacing FD by potential confounders.
 - ▶ Economic and institutional development, capital controls, regulatory quality.
- We explore reverse-causality concerns by fixing FD in $t = 0$, finding similar results.
- Conclusions apply to both crisis/non-crisis periods and do not reflect mere size effects.
 - ▶ No 'size effect', results vanish when replacing FD by measures of financial sector size.
 - ▶ Results hold when excluding crises periods.

Final remarks

- We unveil a channel linking FD with the expected GDP growth distribution.
 - ▶ The effect operates via a moderation of the financial stability - growth nexus.
 - ▶ FD moderates the effect of foreign shocks.
 - ▶ The effect of local shocks remains unaltered with higher FD.
- Next steps include exploring the **banking dimension** of financial stability and exploring results over **different horizons**.

Appendix

Contribution to the literature

Growth-at-Risk applications: policy lessons. [Back](#)

- Some results suggest that macroprudential policies can reduce the GaR at the cost of narrowing the whole GDP distribution ([Sánchez and Röhn, 2016](#), [Franta and Gambacorta, 2020](#)).
- The effect of macroprudential policies on GaR depends on the timing of their implementation over the cycle, as they can take more than 1 year to have an effect ([Galán, 2020](#)).
- 2% more of bank capitalization can reduce up to 20% the downside risk posed by credit and house price booms in a 3 to 5 years horizon ([Aikman et al., 2019](#)).
- There is an intertemporal trade-off whereby some policies might improve GaR at medium and long horizons but at the cost of damaging GaR (or expected growth) at shorter horizons ([Adrian et al., 2019](#)).

Literature

Literature I

- D. Acemoglu, S. Johnson, J. Robinson, and Y. Thaicharoen. Institutional causes, macroeconomic symptoms: volatility, crises and growth. *Journal of Monetary Economics*, 50(1):49–123, 2003.
- T. Adrian, N. Boyarchenko, and D. Giannone. Vulnerable growth. *American Economic Review, American Economic Association*, 109:1263–1289, 2019.
- D. Aikman, J. Bridges, S. Hacioglu Hoke, C. O'Neill, and A. Raja. Credit, capital and crises: a gdp-at-risk approach. *Bank of England working papers 824*, Bank of England, 2019.
- T. Beck, R. Levine, and N. Loayza. Finance and the sources of growth. *Journal of Financial Economics*, 58(1-2):261–300, 2000.
- T. Beck, M. Lundberg, and G. Majnoni. Financial intermediary development and growth volatility: Do intermediaries dampen or magnify shocks? *Journal of International Money and Finance*, 25(7): 1146–1167, 2006.
- M. Braun and B. Larraín. Finance and the business cycle: International, inter-industry evidence. *Journal of Finance, American Finance Association*, 60(3):1097–1128, 2005.

Literature II

- N. F. Campos, M. G. Karanasos, and B. Tan. Two to tangle: Financial development, political instability and economic growth in argentina. *Journal of Banking & Finance*, 36(1):290–304, 2012.
- M. A. Desai, C. F. Foley, and J. R. Hines. Capital controls, liberalizations, and foreign direct investment. *Review of Financial Studies, Oxford University Press*, 19(4):1433–1464, 2021.
- T. Duprey, B. Klaus, and T. Peltonen. Dating systemic financial stress episodes in the eu countries. *Journal of Financial Stability*, 32(C):30–56, 2017.
- M. Franta and L. Gambacorta. On the effects of macroprudential policies on growth-at-risk. *Economics Letters*, 196(C), 2020.
- J. E. Galán. The benefits are at the tail: uncovering the impact of macroprudential policy on growth-at-risk. *Journal of Financial Stability*, 2020.
- G. Gopinath, c. Kalemli-Özcan, L. Karabarbounis, and C. Villegas-Sanchez. Capital allocation and productivity in south europe. *The Quarterly Journal of Economics, Oxford University Press*, 132(4): 1915–1967, 2017.

Literature III

- I. Iwasaki, E. Kocenda, and Y. Shida. Institutions, financial development, and small business survival: Evidence from European emerging markets. *CESifo Working Paper Series 8641*, CESifo, 2020.
- W. R. Kerr and R. Nanda. Democratizing entry: Banking deregulations, financing constraints, and entrepreneurship. *Journal of Financial Economics*, 94(1):124–149, 2009.
- O. Levine and M. Warusawitharana. Finance and productivity growth: Firm-level evidence. *Journal of Monetary Economics*, 117(C):91–107, 2021.
- S. Manganelli and A. Popov. Financial development, sectoral reallocation, and volatility: International evidence. *Journal of International Economics*, 96(2):323–337, 2015.
- A. Martin and F. Taddei. International capital flows and credit market imperfections: A tale of two frictions. *Journal of International Economics*, 89(2):441–452, 2008.
- B. Moll. Productivity losses from financial frictions: Can self-financing undo capital misallocation? *American Economic Review, American Economic Association*, 104(10):3186–3221, 2014.
- A. C. Sánchez and O. Röhn. How do policies influence GDP tail risks? *OECD Economics Department Working Papers 1339*, OECD Publishing, 2016.

Literature IV

J. Wurgler. Financial markets and the allocation of capital. *Journal of Financial Economics*, 58(1-2): 187–214, 2000.