

# Climate Stress Testing

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**Disclaimer: The views and opinions expressed here are those of the authors and do not necessarily reflect the official position of the Central Bank of Chile**

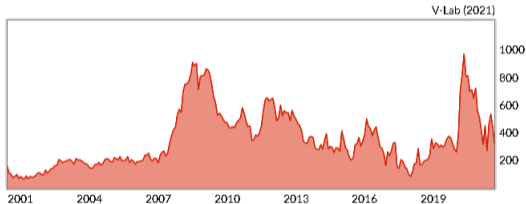
- Very interesting, timely and relevant since the authors propose a novel methodology to quantify systemic risks upon the financial sector due to climate change
- **Objective:** to test the resilience of financial institutions to climate-related risks
- **Main contribution:** a clever variation upon an existing technique (SRISK), called CRISK or systemic climate risk. Defined as the amount of capital that a financial institution would need to raise in order to function normally in a climate stress scenario
- **Main findings:** CRISKS for some banks are economically substantial. In 2020 Citigroup would have needed to raise 73 billion US dollars under the climate stress scenario to restore a prudential capital ratio
- **Very convenient new tool:** CRISK can be computed using publicly available balance sheet data and market information! (i.e. Compustat and Bloomberg)

- Main ingredients are size, leverage and risk. Firms can reduce CRISK by reducing size, leverage or risk. Stress scenario is a 50% drop in the return on stranded asset portfolio over six months
- If the stress scenario materializes, then all banks with positive CRISK will try simultaneously to raise capital which can be difficult under such stress. The bigger CRISK, the more serious the threat to financial stability
- This leads to the causality question usually posed in the SRISK literature. If enough banks have high CRISK they will recognize their vulnerability and will begin to delever and derisk, thereby impacting the real economy
- Since part of the stress scenario has turned into baseline, maybe look for causality evidence between CRISK and macro variables (unemployment, industrial activity) or stranded asset prices

# Commonalities between SRISK and CRISK

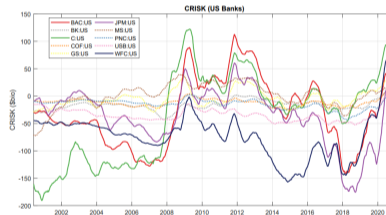
United States Financials - Total SRISK (US\$ billion)

Plot Capacity



Sources: V-Lab and Jung et al. (2021)

Figure 7: CRISK of U.S. Banks



- The banking sector plays a central role in intermediating funds to corporates and is thereby exposed to firms' transition risk via both credit and market risk.
- The analysis carried out by the ECB (2021) suggests limited but concentrated transition risks for the banking system, stemming predominantly from credit risk.
- Is CRISK picking up some of this credit risk element or is solely market risk?

# Some final comments/questions

- Climate risk factor as a function of stranded asset portfolio returns, which is a proxy measure for transition risk. Some robustness checks with other measures such as carbon footprint, exposure to industries with indirect linkages to oil and gas
- Sensitivity of the CRISK rankings to the choice of the parameters for computing the climate factor:  $CF^{Str} = 0.3XLE + 0.7KOL - SPY$
- How good is CRISK picking up inter-bank lending and cross exposures to climate risk?
- How much of the CRISK increase in 2020 is due to increased uncertainty due to the pandemic?
- How is CRISK affected by changes in regulation aimed towards preventing solvency problems stemming from other sources? Can banks kill two birds with one stone?

**Thank you!**

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