

Cross-Sectional Financial Conditions, Business Cycles and The Lending Channel¹

Thiago Ferreira*

*Federal Reserve Board

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¹ Previously presented as “Stock Market Cross-Sectional Skewness and Business Cycle Fluctuations”. The views expressed in this paper are solely my responsibility and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System or of any other person associated with the Federal Reserve System.”

Long-Running Debate About Which Capital Markets ...

... best forecast/track business cycles (BCs)...

... and which economic fundamentals these markets signal

Recently: bond markets more informative than stock markets

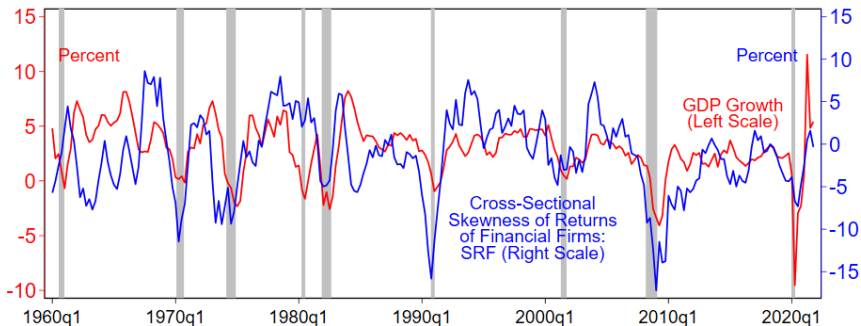
- ▶ Highlighting their predictive ability, and reflecting investor sentiment
- ▶ Phillipon (QJE-2009), GZ (AER-2012), Lopez Salido et al (QJE-2017).

I revisit this debate with **CS distributions**: credit spreads vs stock returns

- ▶ Many cross-sectional (CS) moments
- ▶ Financial vs Nonfinancial firms

SRF Stands Out in Forecasting Business Cycles

SRF: cross-sectional skewness of stock returns of financial firms



Best predictor of econ-activity among CS-moments and fin-indicators

SRF as a Barometer of Conditions in Lending Channel

SRF and the lending channel (Bernanke, Gertler, 1995)

“shifts in the credit supply beyond borrowers balance sheet conditions”

- ▶ Correlates with measures of risk bearing capacity and asset quality of fin sector
- ▶ Impacts *firm-level* investment beyond firms' balance sheet conditions
- ▶ Shocks to SRF in BVARs lead to downturns with tighter lending conditions

Consistent with CS state of fin-firms balance sheets important for BCs

- ▶ ...not just not just for financial crises (Boissay et al., 2016)
- ▶ I rationalize this argument with a BGG-type model that matches the VAR evidence.

Literature Review X Contributions of Paper

Asset prices and business cycles (BCs):

- ▶ Nfin credit spreads: Bernanke 1990, Friedman and Kuttner, 1992, Gertler and Lown, 1999, Gilchrist et al., 2009
- ▶ UST Yield Curve: Estrella and Hardouvelis, 1991
- ▶ Nfin options: Dew-Becker and Giglio, 2021. Fin systemic risk: Allen et al., 2012 and Giglio et al., 2016
- This paper: CS distributions returns/spreads and nfin/fin. SRF performs well.

Contribution of lending channel to BCs:

- ▶ Bank-firm lending data, Amiti and Weinstein (2018)
- ▶ Structural models Rampini and Viswanathan (2019) and Becard and Gauthier (2022)
- This paper: CS state of fin-firms is important

Cross-sectional higher moments of econ variables and BCs:

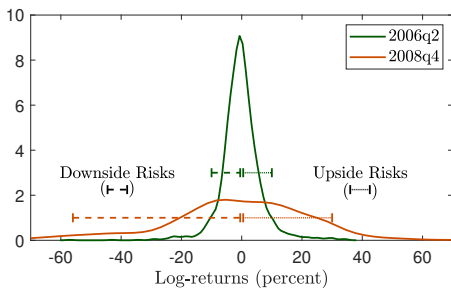
- ▶ Individuals' income: Guvenen et al., 2014, Busch et al., 2022
- ▶ nonfinancial firm sales, profit, and employment: Salgado et al., 2019
- This paper: Financial conditions. Metrics against which BCs theories may be tested.

Gameplan

- ▶ Data sources/definitions of CS moments of financial conditions
- ▶ SRF stands out in forecasting business cycles
- ▶ SRF reflects lending channel conditions
- ▶ SRF impacts firm-level investment
- ▶ VAR evidence and the model rationalizing it

Data

Data Sources and Cross-Sectional Moments



(a) Example: Log>Returns, Financial Firms

- ▶ Stock Returns: CRSP, $\ln_{-r}_t^{i,s} = 100 \cdot \ln(1 + R_t^{i,s}/100)$
- ▶ Credit Spreads: L/W+ML (GZ-AER), $\ln_{-z}_t^{i,s} = 100 \cdot \ln(1 + Z_t^{i,s}/100)$

$$\text{skewness}_t = \underbrace{\left(\ln_{-r}_t^{95th} - \ln_{-r}_t^{50th} \right)}_{\text{upside tail}} - \underbrace{\left(\ln_{-x}_t^{50th} - \ln_{-x}_t^{5th} \right)}_{\text{downside tail}}.$$

▶ Data Figures

Cross-Sectional Financial Conditions and Business Cycles

▶ Cross-Correlations

▶ In-Sample Regressions

Which Moment Best Predict $GDP_{t+h|t-1}$ Out-of-Sample?

Sample: 1973Q1 - [1986Q1...2020Q4]

For each variable X_t , I forecast GDP growth using regressions:

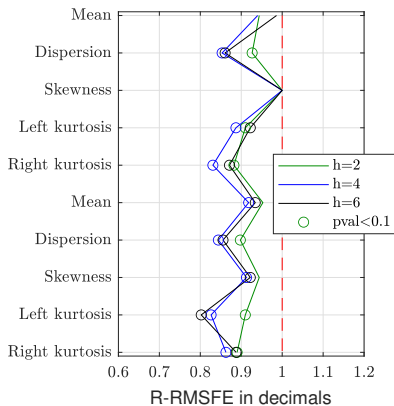
- ▶ Variable X_t and its lags + GDP lags

Performance of variable X_t is relative to SRF:

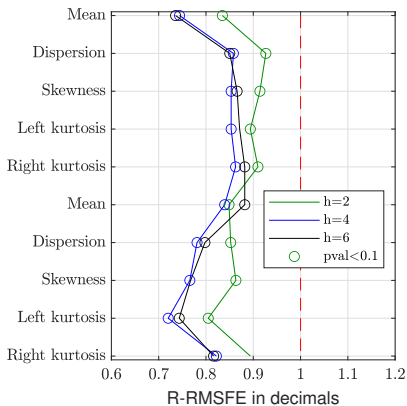
$$\text{R-RMSFE of Variable } X_t = \frac{\text{RMSFE of SRF}}{\text{RMSFE of Variable } X_t} \text{ (in decimals)}$$

Variables: CS Moments, Mac-Unc (*AER*), Fin-Unc (*AEJ*), EBP (*AER*),
CATFIN (*RFS*), BlueChip Forecasts

SRF Performs Best, Out-of-Sample

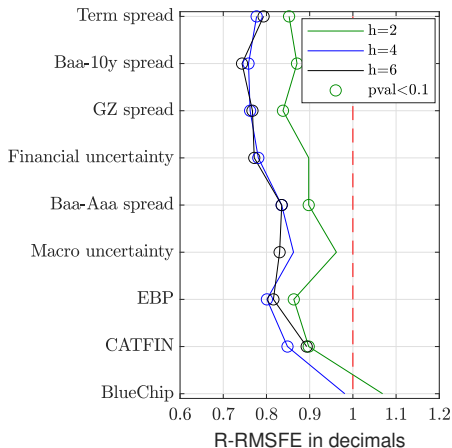


(b) Return Measures



(c) Spread Measures

SRF Performs Best, Out-of-Sample Comparable to BlueChip Forecasts



- ▶ Similar results with different subsamples, weighted measures, and normalized CS moments

SRF as a Barometer of Conditions in Lending Channel

SRF Correlates with Measures of Intermediaries' Balance Sheet Quality

Regressions of Economic Drivers on SRF, 1990–2019

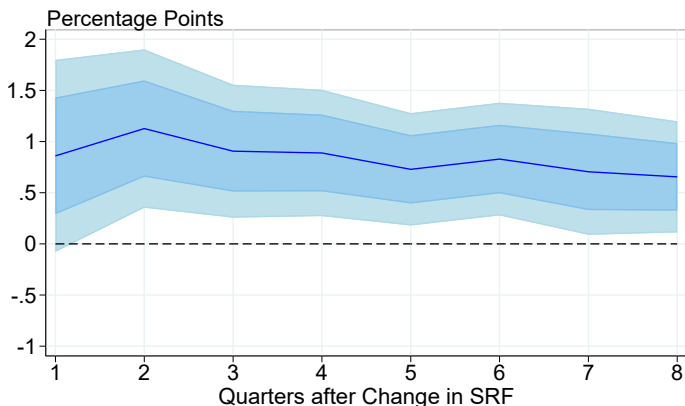
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ICRF	0.45***								0.43***	0.37***
ROA		0.50***							0.48***	0.40***
LS-SF			-0.47***							-0.29
LS-LMF				-0.43***						0.08
$\widehat{GDP}_{t t-1}$					0.09**					-0.09
$\widehat{GDP}_{t+4 t-1}$						0.05				0.09
EPU							-0.31***			-0.03
EPU-MP								-0.25***		-0.06
R ²	0.24	0.20	0.22	0.19	0.05	0.02	0.10	0.06	0.43	0.47

All variables are standardized, including SRF.

- ▶ ICRF: risk bearing capacity (He et al, 2017)
- ▶ ROA: balance sheet quality
- ▶ Macro conditions ($\widehat{GDP}_{t|t-1}$), policy uncertainty (EPU/EPU-MP)
- ▶ Robustness: variables \perp BCs, and pre/post 2008.

SRF Drives *Firm-Level* Investment Beyond Balance Sheet Conditions

In-Sample Forecast Regressions, h quarters ahead, 1973 - 2019



$$K_{i,t+h|t-1} = \sum_{k=1}^3 \beta(k) M(k)_t^{fin,ret} + \gamma' \mathbf{F}_t + \eta' \mathbf{Z}_{i,t} + \alpha + \alpha_i + \alpha_{cr} + e_{i,t+h},$$

► **Robustness:** sample restricted to the period pre 2008

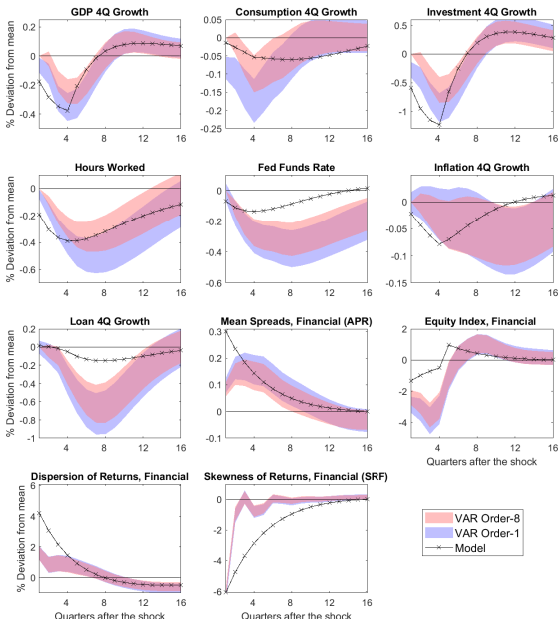
SRF Shocks Lead to Significant Macro Effects

As SRF ↓:

- ▶ Economic activity ↓
- ▶ Inflation ↓
- ▶ Policy rate ↓
- ▶ Loan growth ↓
- ▶ Spreads ↑
- ▶ Equity ↓
- ▶ Dispersion ↑

However:

- ▶ SRF quickly reverts
- ▶ Economic effects persists



SRF and the Cross-Sectional Lending Channel

Cross-Sectional Lending Channel

Adverse fluctuation in SRF:

- ▶ signals a cross-sectional deterioration of financial firms' balance sheets,
- ▶ leading these firms to adopt a more cautious lending strategy,
- ▶ reduces loan supply
- ▶ causes a contraction in economic activity

Rationalizing Cross-Sectional Lending Channel

I focus on widely-used BGG (1999)/CMR (2014)

Two changes relative to CMR (2014):

- ▶ Financial friction is btw fin-firms and HHs (as in GK 2011, GK 2015)
- ▶ Fin-firms' distribution of idio asset returns may become skewed

SRF shock as skewed *risk shocks*

- deplete the asset quality of some financial firms more than others,
- capture heterogenous exposition to aggregate (e.g., Lehman failure) and/or regional (e.g., Savings and Loans Crisis) shocks.

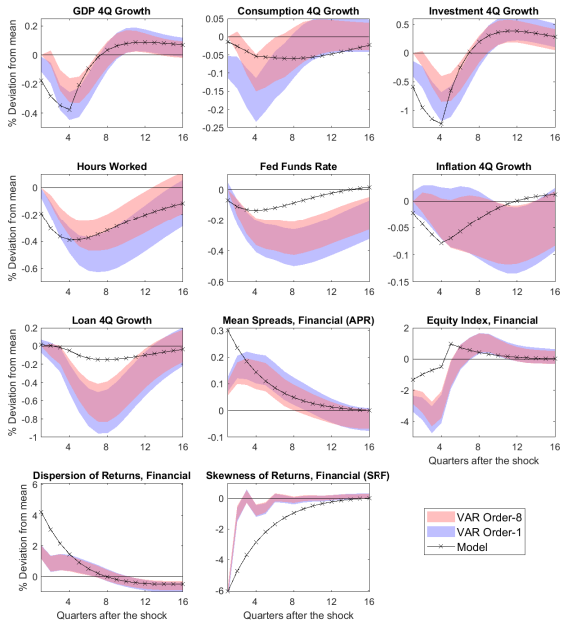
Other usual NK Features

IRF Match:

- qualitatively similar
- but lacks amplification

After low-mean CS-risk shock:

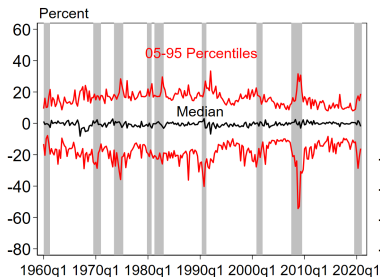
- ▶ Economic activity ↓
- ▶ Inflation ↓
- ▶ Policy rate ↓
- ▶ Loan growth ↓
- ▶ Spreads ↑
- ▶ Equity ↓
- ▶ Dispersion ↑
- ▶ SRF ↓



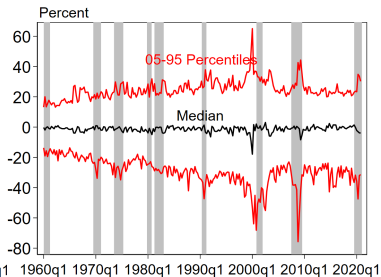
Conclusion:

- ▶ Study full CS distribution of Stock Returns vs Credit Spreads
 - ▶ SRF as strong antecedent indicator of business cycles
 - ▶ Data in my personal website
- ▶ SRF as a barometer of conditions in lending channel (Bernanke, Gertler, 1995)
- ▶ Cross-sectional lending channel: CS state of financial firms' balance sheets as important component of business cycles.
- ▶ Future research:
 - ▶ How economic fundamentals (e.g., monetary policy, productivity) affect the CS distributions of financial conditions.
 - ▶ Model fluctuations in (i) CS financial conditions, (ii) business, and (iii) financial cycles.

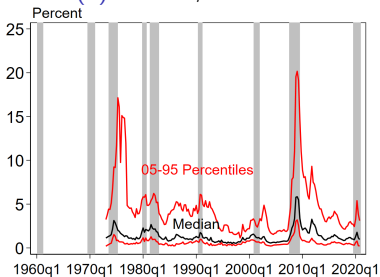
Appendix

[▶ Back](#)


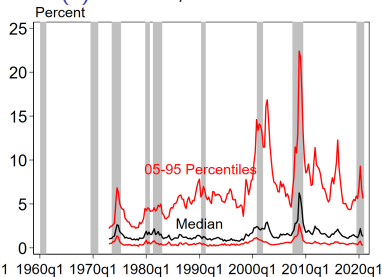
(d) Returns, Financial



(e) Returns, Nonfinancial



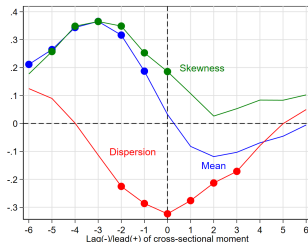
(f) Spreads, Financial



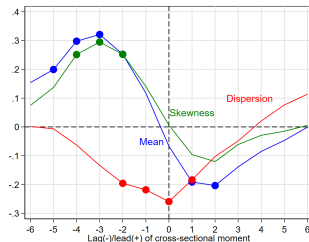
(g) Spreads, Nonfinancial

Which Moments Leads/Lags the Cycle? 4Q GDP growth, 1973-2020

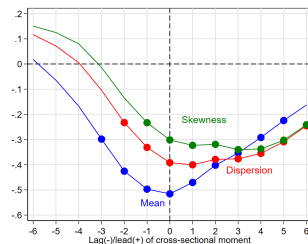
▶ Back



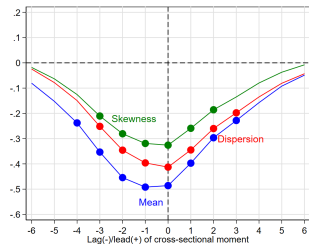
(h) Stock Ret, Financial Firms



(i) Stock Ret, Nonfinancial Firms



(j) Credit Spreads, Financial Firms



(k) Credit Spreads, Nonfinancial

Which Moments Adds Information to Leading Financial Indicators?

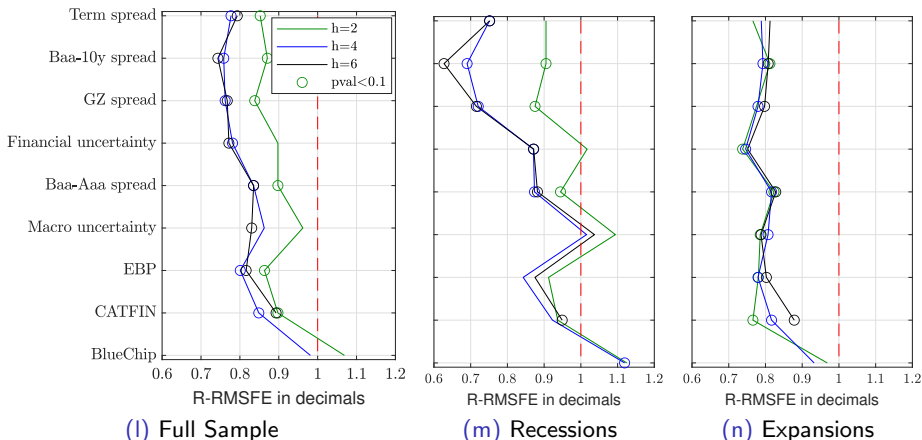
In-Sample GDP Forecast Regressions, 4 quarters ahead, 1973 - 2020

	Returns		Spreads	
	Financial	Nonfinancial	Financial	Nonfinancial
Mean	0.15	0.43*	-1.63	-2.32
Dispersion	0.56*	0.17	1.17	3.36
Skewness	0.68***	0.17	0.09	-1.83
Uncertainty	-0.19	-0.21	0.01	0.03
Real Fed Funds	0.23	0.33	0.41	0.16
Term Spread	0.82***	0.90***	0.86***	0.87***
EBP	-0.47*	-0.36	-0.24	-0.10
R ²	0.42	0.38	0.39	0.40

► Similar results with Cons, Inv, UR, and weighted measures.

► Back

SRF Performs Best, Out-of-Sample

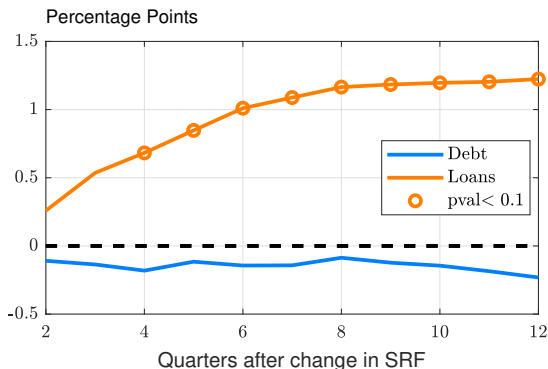


$$\text{R-RMSFE} = \frac{\text{RMSE of SRF}}{\text{RMSE of Other Variable}} \quad (\text{in decimals})$$

► Similar results with different subsamples, weighted measures, and normalized CS moments

SRF Anticipates Loan Growth, Not Debt Growth

In-Sample Forecast Regressions, h quarters ahead, 1973 - 2020



- ▶ Robustness: nfin credit spreads forecast debt growth, not loan growth