Financial Economics: Class I

Introduction to Macro-Finance

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Overview

Introduction

Macro-Finance: Long Run Trends

Macro-Financial Crises: the 2008-09 GFC and the Covid Crisis

It's A Wonderful Life (1946)

- It's A Wonderful Life Bank Run: `https://www.youtube.com/watch?v=iPkJH6BT7dM`

- `https://www.npr.org/2023/01/10/1148144705/its-a-wonderful-life-bank-run-economics`

Dumb Money (2023)

- Dumb Money `https://www.youtube.com/watch?v=bmr8YmwnZ3w`

- It's in Netflix

Syllabus

- Syllabus
- Setup WRDS account
  - `https://wrds-www.wharton.upenn.edu/`
  - Contact Madjid Zeggane, zeggane@wustl.edu for help
- Groups for problem sets

Introduction

Macro-Finance: Long Run Trends

Macro-Financial Crises: the 2008-09 GFC and the Covid Crisis

Macro-Finance: Long Run Trends

- Macro-Finance trends, based on Farhi and Gourio (2018)
- Focus on the United States
- Consider the 1984-2015 period, which is associated with low and stable inflation with relative macroeconomic stability (the "Great Moderation").
- Later consider the 2008 Global Financial Crisis and the 2020 COVID Crisis.

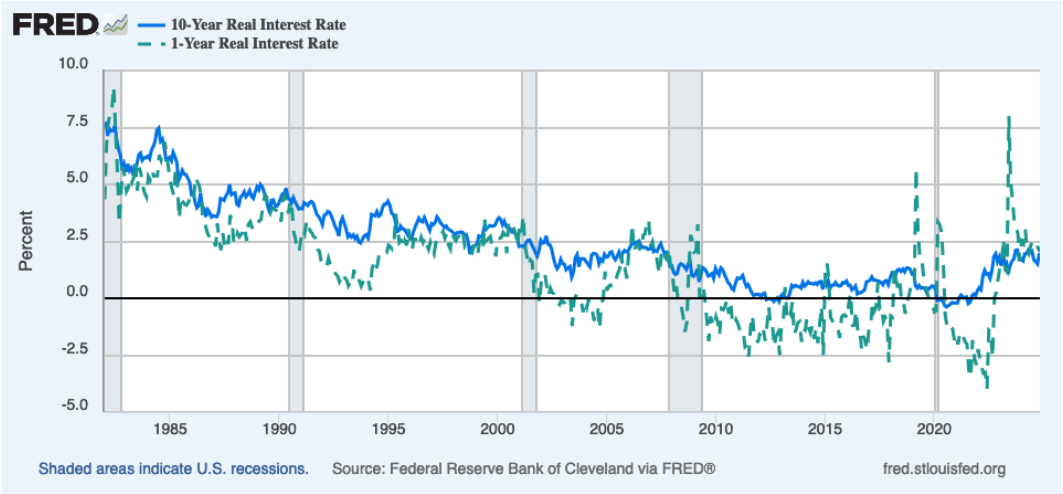
Fact 1: Real risk-free rate

- Risk-free: look at an asset without risk. Consider US Treasuries.
- Real: Control for inflation. Substract expected inflation from the nominal interest rate.

$$r_t = i_t - E_t[\pi_{t+1}]$$

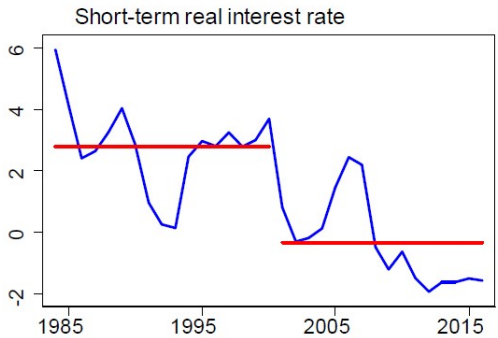
- Look at short (1 year) and long (10 year) interest rates.

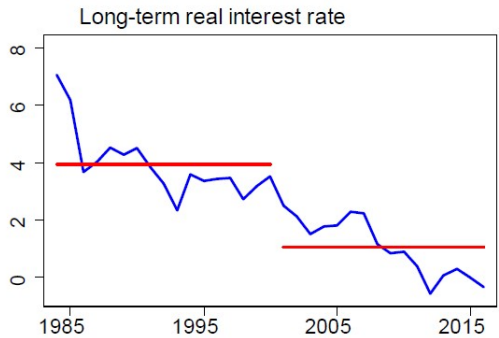
Fact 1: Real risk-free rate has fallen substantially



Source: `https://fred.stlouisfed.org/graph/?g=1BZEG`

Fact 1: Real risk-free rate has fallen substantially





- The horizontal lines represent the mean in the first and second half of the samples (1984-2000 and 2001-2016)

Real and Nominal rates in 2022-2023

- Short and long nominal rates in 2022-2023
- Long term date: 5-year, 5-year forward

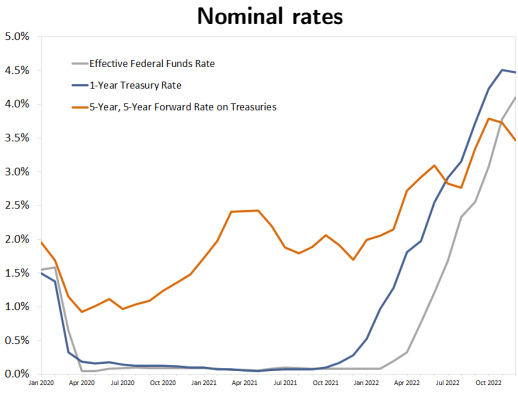
$$i_t^{5y5yf} = \left(\frac{\left(1+i_t^{10y}\right)^{10}}{\left(1+i_t^{5y}\right)^{5}} \right)^{1/5} - 1$$

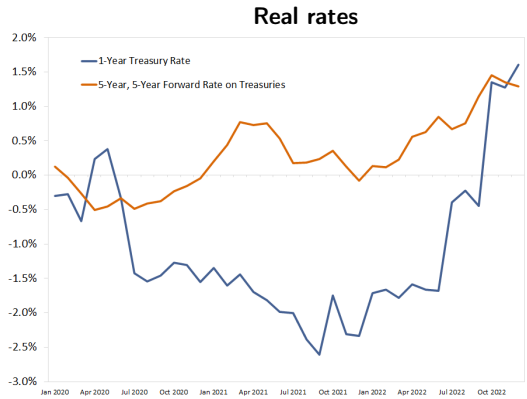
- Real rates: Substract expected inflation
- See `https://www.stlouisfed.org/on-the-economy/2023/jan/many-interest-rates-2022`

5-year, 5-year forward in FRED

- Use series DGS10, DGS5, EFFR, T5YIFR

Real rates in 2022



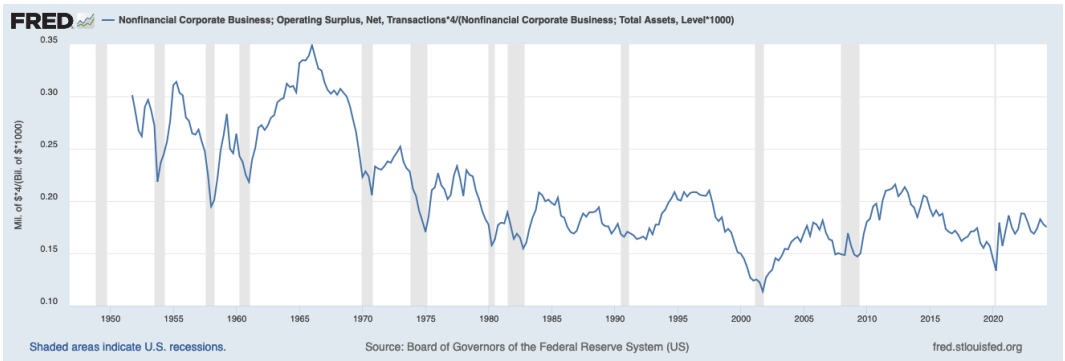


Fact 2: The profitability of private capital has remained stable or increased slightly

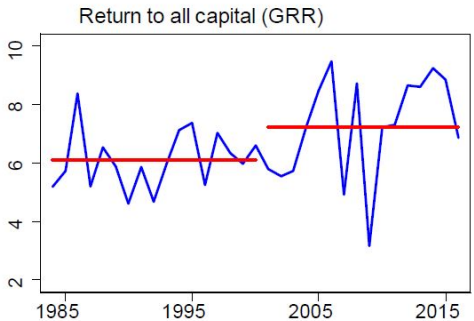
- Return on private capital is different from US Treasuries:
  - Risk
  - Liquidity
- Gomme, Ravikumar, and Rupert (2011) constructs from national income (NIPA) data a measure of aggregate net return on physical capital, roughly profits over capital.
- A simple approximation: ratio of operating surplus to capital for the nonfinancial corporate sector.

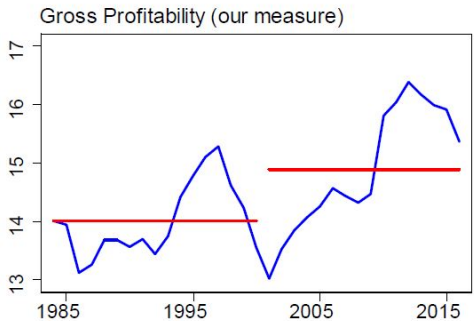
Fact 2: The profitability of private capital has remained stable or increased slightly

- Flow of Funds Z1 tables
- Nonfinancial Corporate Business; Operating Surplus, Net, Transactions, Millions of Dollars, Seasonally Adjusted Annual Rate (NCBOSNQ027S)
- Nonfinancial Corporate Business; Total Assets, Level, Billions of Dollars, Not Seasonally Adjusted (TABSNNCB)
- https://fred.stlouisfed.org/graph/?g=1BZF9


FRED
Nonfinancial Corporate Business; Operating Surplus, Net, Transactions*4/(Nonfinancial Corporate Business; Total Assets, Level*1000)
Mil. of $*4/(Bil. of $*1000)
0.35
0.30
0.25
0.20
0.15
0.10
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
Shaded areas indicate U.S. recessions.
Source: Board of Governors of the Federal Reserve System (US)
fred.stlouisfed.org

Fact 2: The profitability of private capital has remained stable or increased slightly





- Fact 1: Real risk-free rate has fallen
- Fact 2: Return on private capital has remained stable

Stocks: Rate of return

- Consider a stock that trades at price P_t and pays dividends d_t
- The return of a stock is

$$R_{t+1} \equiv \frac{P_{t+1} + d_{t+1}}{P_t}$$

$$R_{t+1} = \frac{P_{t+1} + P_t - P_t + d_{t+1}}{P_t}$$

$$R_{t+1} = 1 + \frac{\Delta P_{t+1}}{P_t} + \frac{d_{t+1}}{P_t}$$

- So the rate of return is

$$r_{t+1} = \frac{\Delta P_{t+1}}{P_t} + \frac{d_{t+1}}{P_t}$$

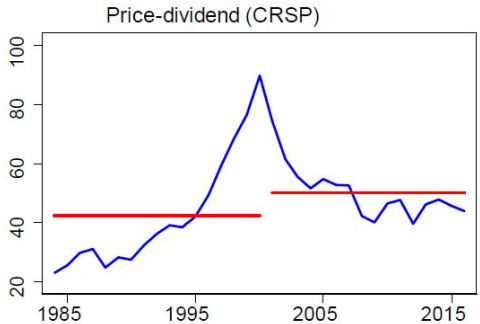
- The first term is a capital gain (or loss),
- The second term identifies the interest rate paid by the asset (because it corresponds to income received regardless of whether the asset is liquidated).
- If the price is constant then

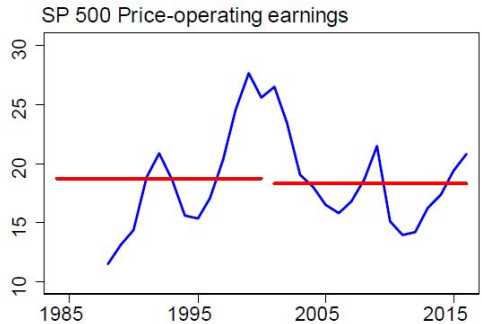
$$r_{t+1} = \frac{d_{t+1}}{P_t}$$

Hence the dividend-price ratio represents the return

Fact 3: Valuation ratios are stable or have increased moderately

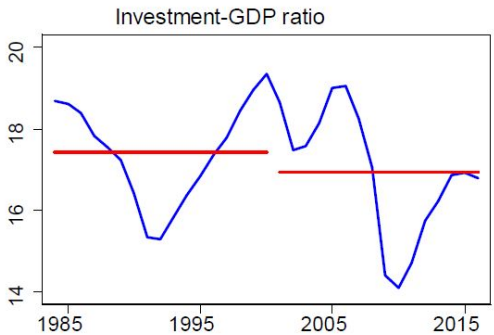
- Valuation ratios for the US stock market.
- Ratio of price to dividends from CRSP
- Price-operating earnings ratio for the SP500

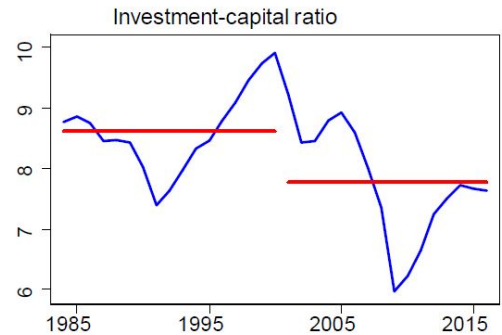




Fact 4: The share of investment in output or in capital has fallen slightly

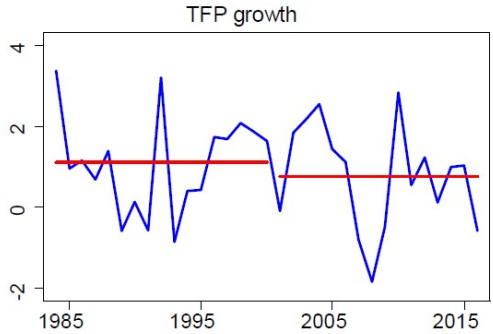
- Investment has been relatively low over the past decade.
- Left: Investment to GDP
- Right: Investment to capital
- Investment exhibits a strong cyclical pattern, increasing faster than GDP during expansions and falling faster than GDP during recessions, but overall both ratios appear to exhibit small to moderate declines across our two subsamples.

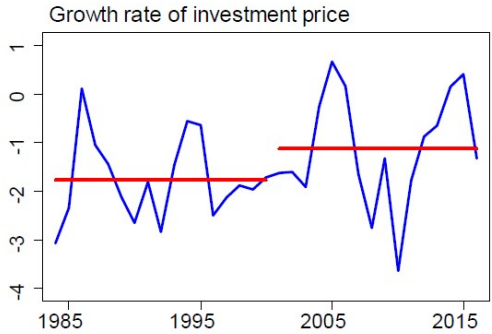




Fact 5: Total factor productivity and investment-specific growth have slowed down

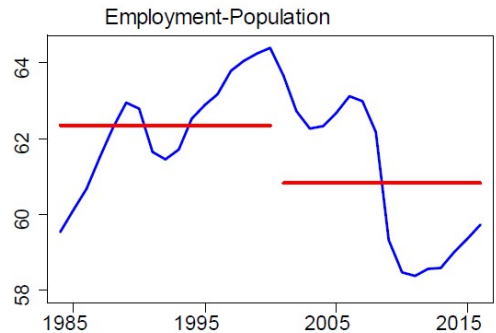
- Growth of total factor productivity (TFP) slowdown.
- Growth of the relative price of investment goods and consumption goods increased.





Fact 6: The labor share and the the employment-population ratio have fallen

- Labor share: ratio of labor compensation to gross value added for the nonfinancial business sector.
- employment-population ratio.



Introduction

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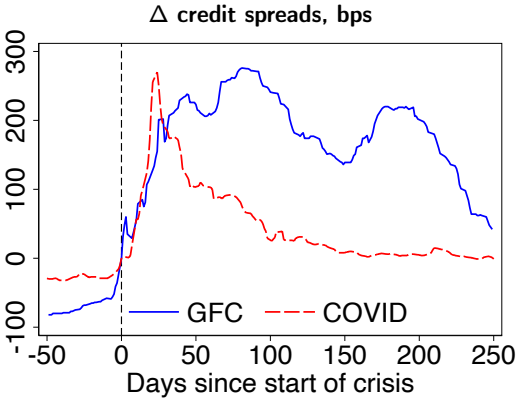
Macro-Financial Crises: the 2008-09 GFC and the Covid Crisis

The Global Financial Crisis and the Covid Crisis

- The previous facts are about long-run trends
- What happened during the Global Financial Crisis and the Covid Crisis?
- Ebsim, Faria-e Castro, and Kozlowski (2022); Kozlowski, Veldkamp, and Venkateswaran (2020)

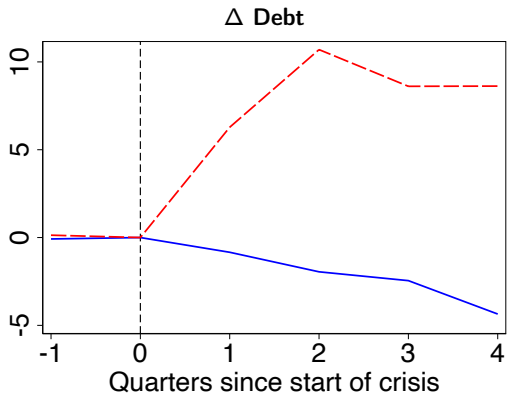
Credit Spreads

- Credit spread: the difference in yield between a corporate bond and a US Treasury of the same maturity
- This spread captures :
  1. Compensation for risk: corporate bonds are riskier than US Treasuries
  2. Compensation for liquidity: corporate bonds are more illiquid than US Treasuries
- Large increase during both crises



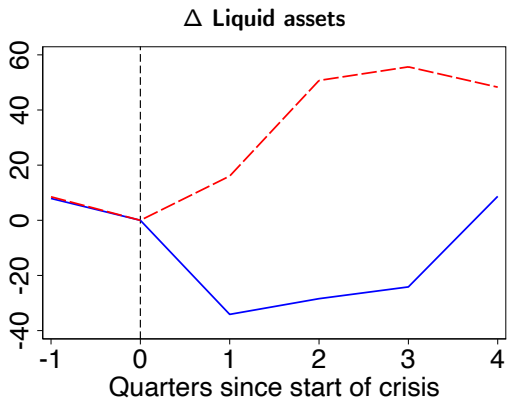
The Global Financial Crisis and the Covid Crisis: Debt

- Debt of nonfinancial corporate sector decreased during GFC but increased during COVID



The Global Financial Crisis and the Covid Crisis: Liquid assets

- Liquid asset holdings of nonfinancial corporate sector decreased during GFC but increased during COVID



Aggregate data

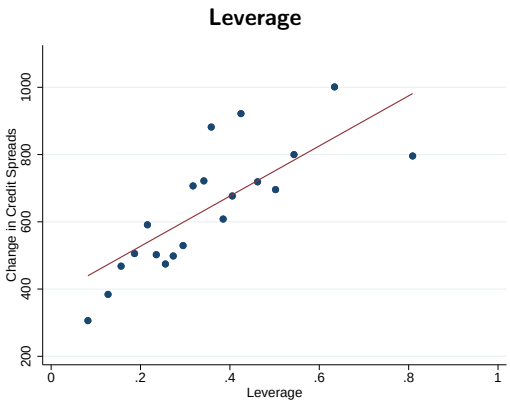
- **GFC**: negative comovement between (i) credit spreads and (ii) debt and liquid assets

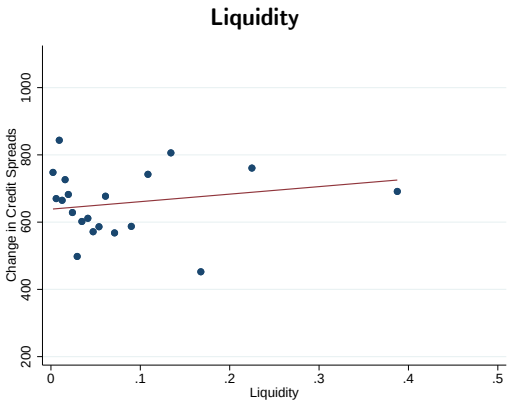
- **COVID-19**: positive comovement between (i) credit spreads and (ii) debt and liquid assets

Credit spread data

- Maturity-matched corporate bond spreads, following Gilchrist & Zakrajsek (2012)
- Data: Compustat, TRACE, FISD.
- $\sim$ 40k firm-quarter observations, June 2002 to December 2020

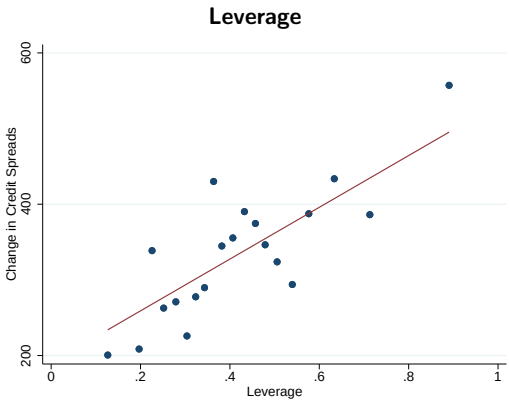
GFC

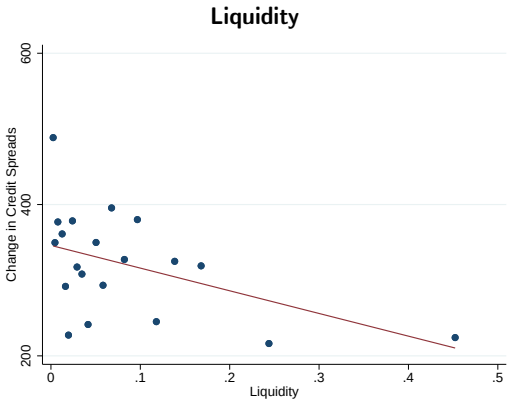




- Firms with higher leverage had a larger increase in spreads
- Liquidity does not seem to matter

COVID-19





- Both leverage and liquidity were important during COVID

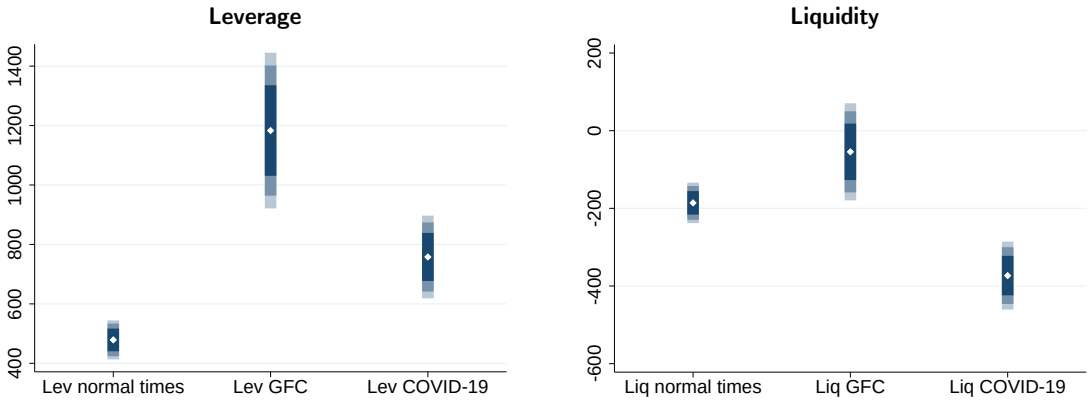
Credit spreads, leverage and liquid assets

- Estimate

$$\text{credit spreads}_{f,t} = \alpha_t + \gamma_f + \underbrace{\sum_{i \in \mathbf{E}} \beta_i \mathcal{I}_{t \in i} \text{liq}_{f,t-2}}_{\text{liquid assets}} + \underbrace{\sum_{i \in \mathbf{E}} \phi_i \mathcal{I}_{t \in i} \text{lev}_{f,t-2}}_{\text{leverage}} + \Gamma' X_{f,t} + \varepsilon_{f,t}$$

- E indicates if quarter t is:
  1. Normal times
  2. GFC (2008:Q2 - 2009:Q2)
  3. COVID-19 (2020:Q1 - 2020:Q2)
- $X_{f,t}$ includes other firm-time controls (size, etc.)

Credit spreads, leverage and liquid assets ▷ Regressions & robustness

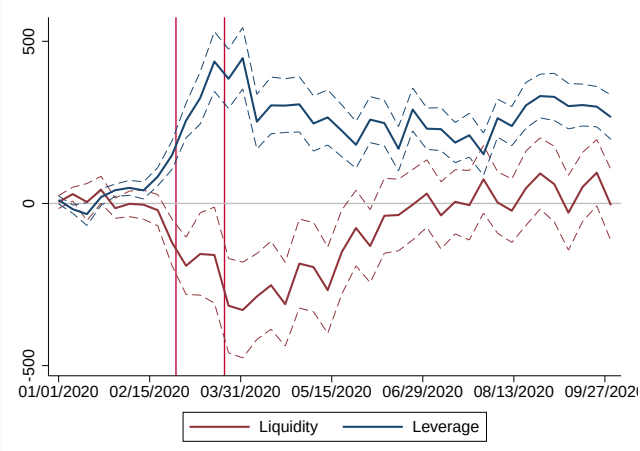


- Leverage: important determinant of credit spreads both during GFC and COVID
- Liquidity matters during COVID: firms with higher liquidity had lower increase in spreads

Event Study: Credit spreads during COVID

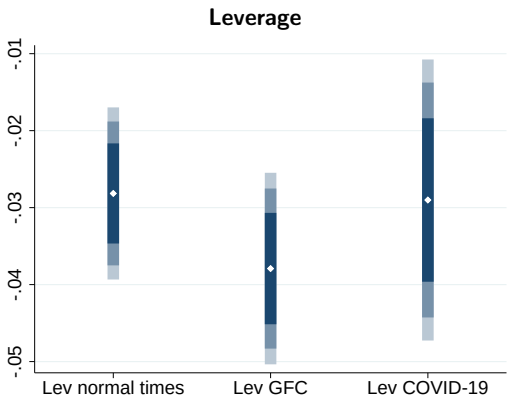
2020 weekly cross-sectional regression:

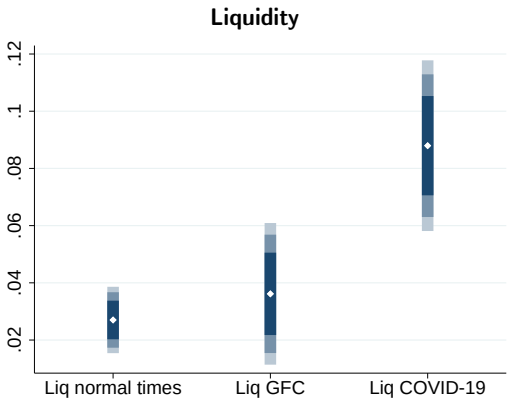
$$\Delta s_{f,t} = \alpha_s + \beta_t \text{liq}_f + \gamma_t \text{lev}_f + \Gamma' X_f + \varepsilon_{f,t}$$



Notes: The vertical lines correspond to the weeks of February 28th and March 23rd, respectively.

Investment





- Leverage: similar role both during GFC and COVID
- Liquidity matters during COVID: firms with higher liquidity had lower reduction of investment

Appendices

References I

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