ECON 747 – LECTURE 1: INTRODUCTION

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Spring 2024

OVERVIEW OF TODAY

- This course is about the role of imperfect capital markets (financial frictions) for fluctuations in the macroeconomy

- Today's class will provide:
  1. Motivation for **why** we study this subject
  2. A preview of **how** we study it in this course

PART I: WHY?

WHY STUDY "MACRO-FINANCE"?

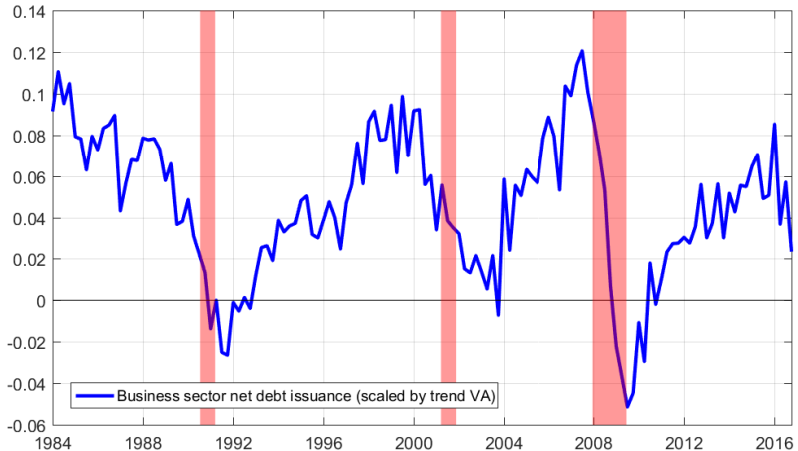
4 DIFFERENT ANGLES

1. Financial variables comove with the business cycle
2. The experience with two crises: 2008/09 and 2020
3. Macro-financial trends
4. Do financial variables predict recessions?

Note: these motivational angles are neither exhaustive nor without overlap!

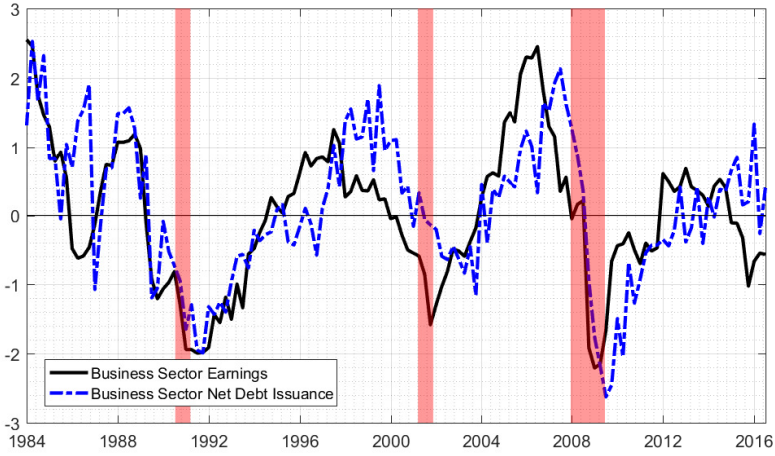
MOTIVATION 1/4: CYCLICAL PATTERNS

FIRM DEBT ISSUANCE IN THE UNITED STATES



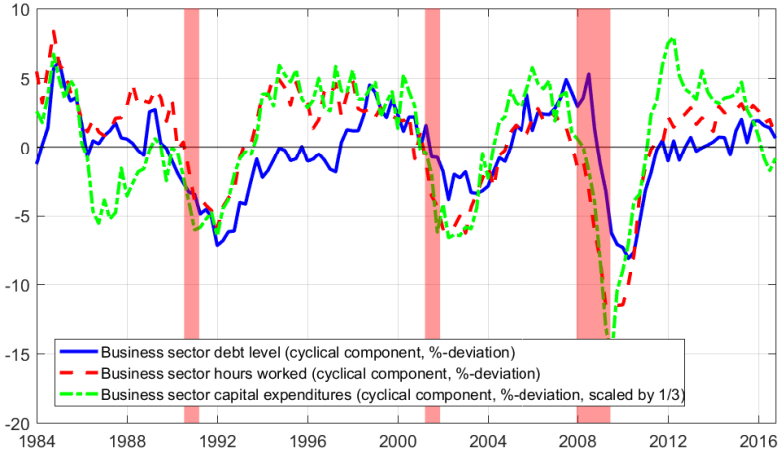
MOTIVATION 1/4: CYCLICAL PATTERNS

FIRM DEBT ISSUANCE AND FIRM EARNINGS



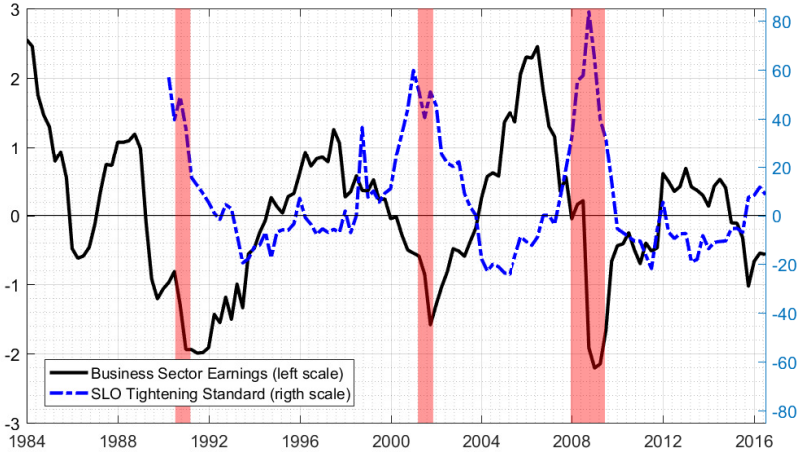
MOTIVATION 1/4: CYCLICAL PATTERNS

FIRM DEBT, HOURS AND INVESTMENT



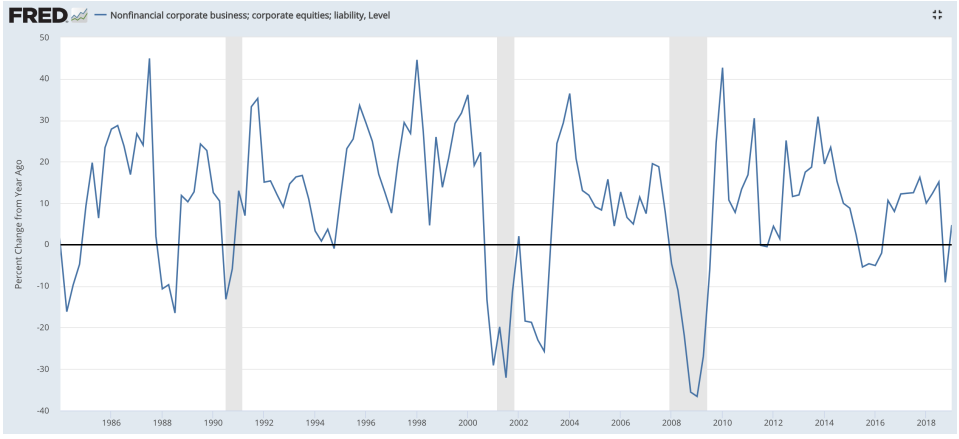
MOTIVATION 1/4: CYCLICAL PATTERNS

FIRM EARNINGS AND CREDIT "CONDITIONS"



MOTIVATION 1/4: CYCLICAL PATTERNS

FIRM EQUITY



motivation 1/4: cyclical patterns

firm debt and equity flows as motivation in Jermann and Quadrini, (2012)

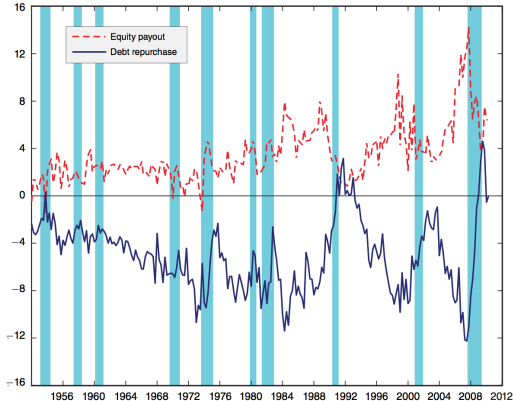
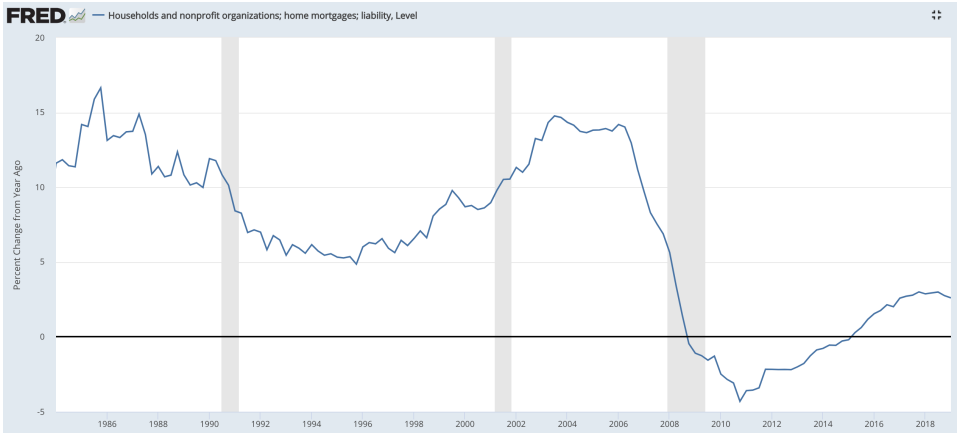


Figure 1. Financial Flows in the Nonfinancial Business Sector (*Corporate and Noncorporate*), 1952:I–2010:II

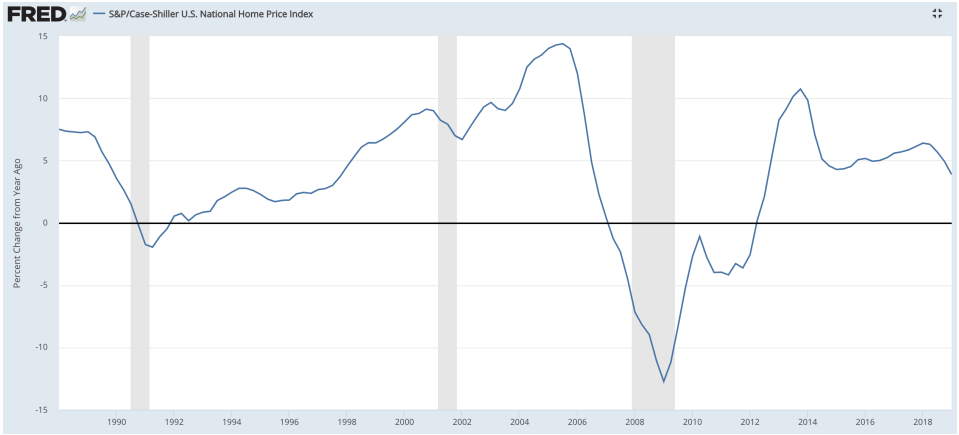
MOTIVATION 1/4: CYCLICAL PATTERNS

HOUSEHOLD MORTGAGE DEBT



MOTIVATION 1/4: CYCLICAL PATTERNS

HOUSE PRICES



MOTIVATION 1/4: CYCLICAL PATTERNS

- We study business cycles because we observe *fluctuations of* and *comovement between* different macroeconomic variables
- See Kehoe, Midrigan, and Pastorino (2018) for a nice retrospective on business cycle research
- Age-old question: why are there some periods in which employment, investment and production are flourishing and others in which they are stagnant?
- This questions extends naturally to financial variables
- The previous charts show that debt, equity and asset prices strongly comove with the business cycle, with employment, investment and so forth. **Why?**

MOTIVATION 1/4: CYCLICAL PATTERNS

- Let us refine the "**why?**" on the previous slide:

- *Can we understand business cycles without looking at financial variables? Are financial variables just an outcome variable that does not feed back to output, employment, investment, ...?*

Motivation 1/4: cyclical patterns

- Let us refine the "**why?**" on the previous slide:
- *Can we understand business cycles without looking at financial variables? Are financial variables just an outcome variable that does not feed back to output, employment, investment, ...?*
- Most of what we will see in this course answers "no!" to these questions
  - But as you will learn, this is not immediately clear at all
  - We need to be more specific about the nature of the "no!"
  - Models will help us to be specific
  - Data can help us to reject models

MOTIVATION 1/4: CYCLICAL PATTERNS

- Documenting cyclical facts is usually **challenging**
- This is true generally, and for financial variables specifically
- Besides technical issues (e.g. correct filtering), aggregate data may mask a lot of what is going on in the economy
- For example, financing patterns can be different for large vs. small firms

MOTIVATION 1/4: CYCLICAL PATTERNS

- Example from Covas and Den Haan (2011):

TABLE 3—CYCLICAL BEHAVIOR OF EQUITY ISSUANCE - ALL FIRMS

size classes	level approach correlation coefficients					
	Δ equity and			Δ equity* and		
	GDP_{t-1}	GDP_t	GDP_{t+1}	GDP_{t-1}	GDP_t	GDP_{t+1}
[0, 25%]	0.41	**0.53**	**0.45**	0.39	**0.53**	**0.47**
[25%, 50%]	**0.56**	**0.57**	**0.36**	**0.52**	**0.59**	**0.42**
[50%, 75%]	**0.48**	**0.43**	0.23	0.32	**0.45**	**0.39**
[75%, 90%]	**0.50**	**0.41**	0.20	0.08	**0.37**	**0.61**
[90%, 95%]	**0.51**	**0.30**	0.03	0.30	0.06	-0.17
[95%, 99%]	0.24	0.13	0.02	**0.26**	-0.00	-0.26
[99%, 100%]	-0.00	**-0.36**	**-0.39**	0.03	**-0.30**	**-0.39**
[0, 95%]	**0.54**	**0.46**	0.23	-0.20	0.07	**0.40**
[0, 99%]	**0.44**	**0.35**	0.16	**0.42**	0.16	-0.16
All firms	0.36	0.17	0.01	**0.35**	0.06	-0.22

- Equity issuance procyclical for small firms, countercyclical for very large firms, therefore weak patterns at the aggregate level

MOTIVATION 1/4: CYCLICAL PATTERNS

- Documenting cyclical facts is usually **insufficient** to understand the underlying economic mechanisms
- Example: the starting point of my JMP (see Drechsel, 2020):
- Existing theory for firm borrowing limits:

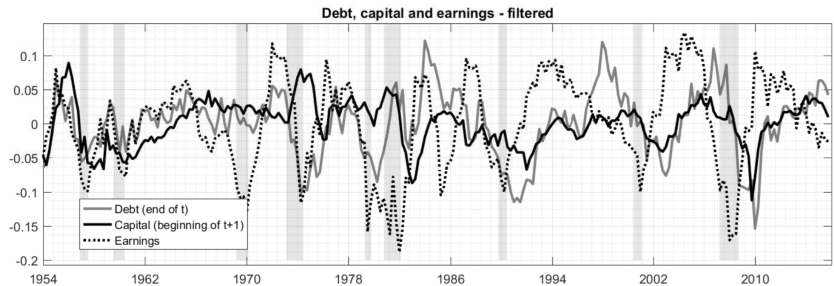
$$b \leq \theta k$$

- Looking at corporate loan contracts, it appears that:

$$b \leq \theta \pi$$

MOTIVATION 1/4: CYCLICAL PATTERNS

- Suppose we just document cyclical behavior of b, k and π:



- All three variables highly procylical so cannot disentangle the competing theories with the cyclical patterns alone
- Strategy in my JMP: guided by a model, look at comovements *conditional on a shock*, in macro and micro data (more on this in a few weeks)

MOTIVATION 2/4: THE EXPERIENCE WITH TWO CRISES

THE 2008/09 GLOBAL FINANCIAL CRISIS

THE WALL STREET JOURNAL.

DOWJONES A NEWS CORPORATION COMPANY ★★★★★

TUESDAY, SEPTEMBER 16, 2008 - VOL. CCLII NO. 65

★★★★ $2.00

DJIA 10917.51 ▼504.48 -4.4% NASDAQ 2179.91 ▼3.65 NIKKEI Closed(12214.76) DJ STOXX 50 2794.81 ▼4.0% 10-YR TREAS ▲2 3/32, yield 3.482% OIL 595.71 ▼$5.47 GOLD $783.10 ▲$22.80 EURO $1.4310 YEN 104.88

AIG, Lehman Shock Hits World Markets

Focus Moves to Fate of Giant Insurer After U.S. Allows Investment Bank to Fail; Barclays in Talks to Buy Core Lehman Unit

The convulsions in the U.S. financial system sent markets across the globe tumbling, as two of Wall Street's biggest firms looked set to exit the scene and insurance titan American In-

By Susanne Craig, Jeffrey McCracken, Jon Hilsenrath and Deborah Solomon

ternational Group Inc. turned to the Federal Reserve and the state of New York for assistance.

The U.S. stock market suffered its worst daily point plunge since the first day of trading after the Sept. 11, 2001, terrorist attacks. Financial markets were rattled by the rushed sale Sunday of Merrill Lynch & Co. and the bankruptcy-court filing of Lehman Brothers Holdings Inc., which scrambled Monday to sell its most-prized businesses before too many employees and customers walk out the door. (Please see related article on Page C1.)

All day Monday, top Lehman officials were huddled in Manhattan at their Seventh Avenue headquarters negotiating a sale of the U.S. investment bank—the core part of Lehman—to Barclays PLC of the U.K. People involved in the discussions were increasingly hopeful late Monday that a deal would be struck.

In stock markets from Sydney to London to New York, the news was greeted with immediate selling. For much of the day, the major U.S. market indexes were down 2%, which, while a good-sized decline, was smaller than many had thought would be the case. But in the final hour of trading, a wave of selling hit, driven by concerns about the fate of AIG. The Dow Jones Industrial Average ended down 504.48 points on Monday, off 4.4%, at its daily low of 10917.51, down 18% on the year. Of the Dow industrials' 30 components, all but one—Coca-Cola Co.—fell, led by a 60.8% plunge in AIG.

In Europe, London's FTSE 100 index dropped 3.9%. Several Asian markets, including Japan and China, were closed Monday due to holiday. By Tuesday, Tokyo shares were down 5.1% in early trading, and Hong Kong's Hang Seng index was down 6.1%.

Monday's action was the latest fallout in a widening financial crisis that began a year ago with the fall of American housing prices and is now reordering the U.S. financial system. Steps unveiled by the Federal Reserve to expand its emergency lending arsenal did little to snap the sense of gloom.

Plenty of potential land mines remain. Banks are increasingly hoarding cash, curbing lending at a time when the economy is slowing. They are also starting to dump assets to raise capital. A mass sale of assets by

Please turn to page A3

Traders around the world react to **sharp selloffs** after one of the most turbulent days in Wall Street's history.

AIG Faces Cash Crisis As Stock Dives 61%

By Matthew Karnitschnig, Liam Pleven And Serena Ng

American International Group Inc. was facing a severe cash crunch last night as ratings agencies cut the firm's credit ratings, forcing the giant insurer to raise $14.5 billion to cover its obligations.

With AIG now tottering, a crisis that began with falling home prices and went on to engulf Wall Street has reached one of the world's largest insurance companies, threatening to intensify the financial storm and greatly complicate the government's efforts to contain it. The company, whose stock fell 61% yesterday, is such a big player in insuring risk for institutions around the world that its failure could shake the global financial system.

AIG has been scrambling to raise as much as $75 billion to weather the crisis, and people close to the situation said that if the insurer doesn't secure fresh

MOTIVATION 2/4: THE EXPERIENCE WITH TWO CRISES

THE 2008/09 GLOBAL FINANCIAL CRISIS

Motivation 2/4: the experience with two crises

the 2008/09 global financial crisis

- Massive expansion in private credit in the 2000's, in particular in mortgages
- US economy slumps into recession in 2007:Q4, house prices contract
- Freeze in credit markets sends financial institutions into turmoil, culminating in the bankruptcy of Lehman Brothers in September 2008
- *Can* be interpreted as a "classic" bank run, but in short-term funding markets (used by financial institutions)
- Prolonged recession and slow recovery across the world
- A "reader's guide" on the GFC provided by Gorton and Metrick (2012)
- Ben Bernanke's autobiography "The Courage To Act" is a nice and sober read on what happened in the financial crisis (recommended for your next holiday)

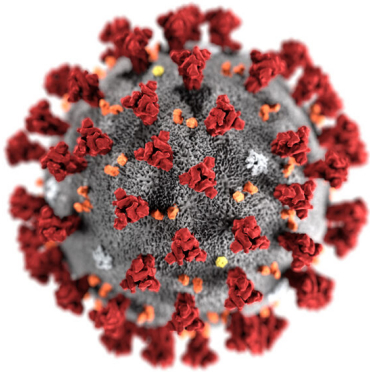
Motivation 2/4: the experience with two crises

the 2008/09 global financial crisis

- GFC had strong influence on the economics profession
- Renewed interest in studying financial frictions
- You will see: many of the tools we study actually predate the crisis, and but became more timely than ever before
- Note that economists are still working on parsing the evidence and debating what are the most suitable narratives around the GFC:
  - For an insightful illustration, have a look at Mian and Sufi (2009) vs. Albanesi, De Giorgi, and Nosal (2017)

MOTIVATION 2/4: THE EXPERIENCE WITH TWO CRISES

THE COVID-19 PANDEMIC AND RECESSION



MOTIVATION 2/4: THE EXPERIENCE WITH TWO CRISES

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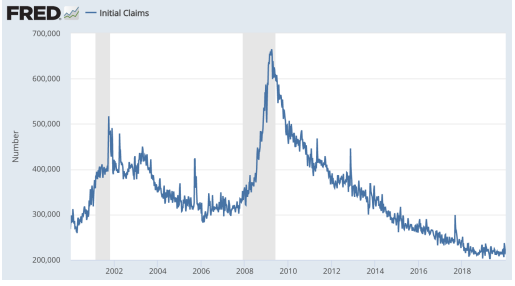
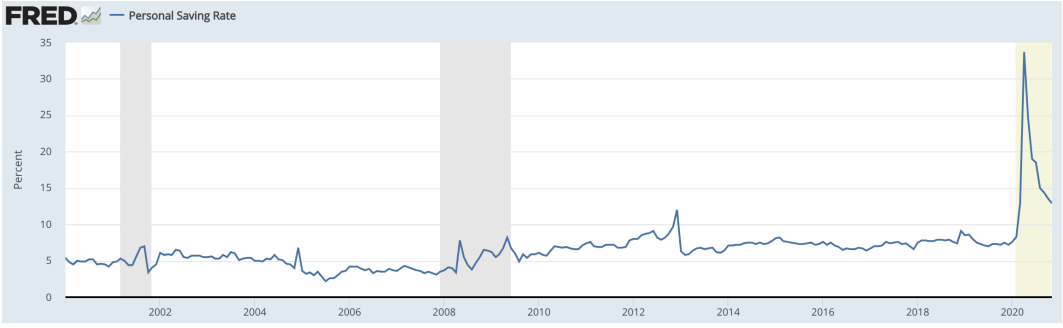


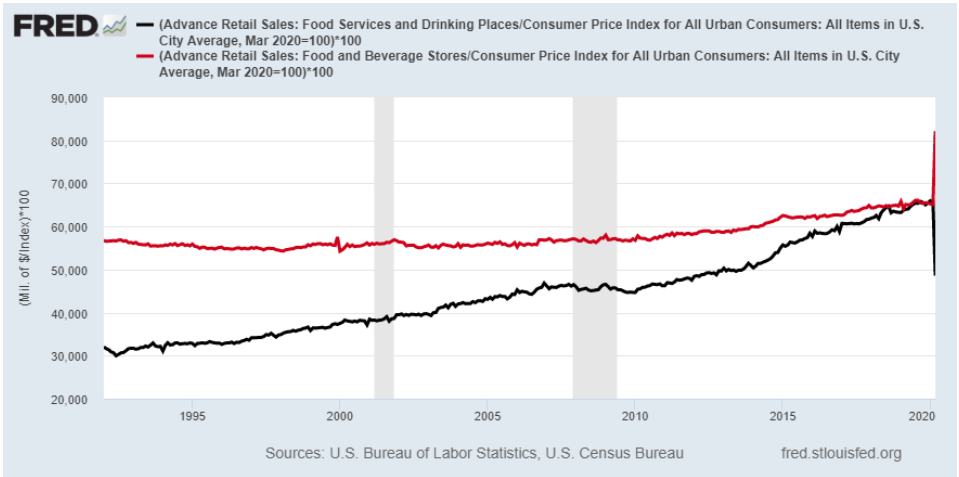
MOTIVATION 2/4: THE EXPERIENCE WITH TWO CRISES

THE COVID-19 PANDEMIC AND RECESSION



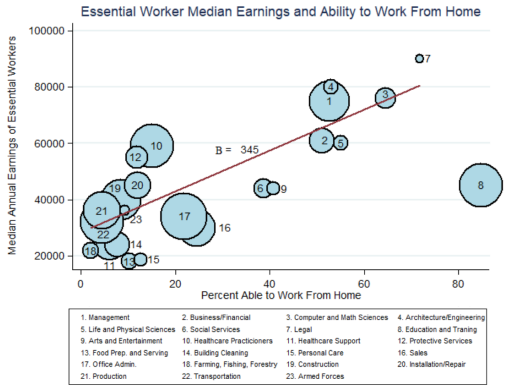
MOTIVATION 2/4: THE EXPERIENCE WITH TWO CRISES

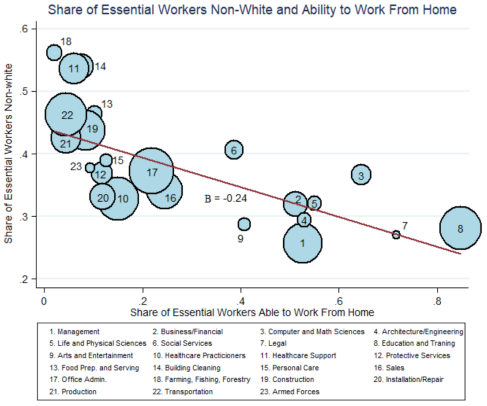
THE COVID-19 PANDEMIC AND RECESSION



MOTIVATION 2/4: THE EXPERIENCE WITH TWO CRISES

THE COVID-19 PANDEMIC AND RECESSION





From Kearney and Pardue (Brookings Report, May 2020)

Motivation 2/4: the experience with two crises

the COVID-19 pandemic and recession

- The recession of 2020 was not primarily a "financial crisis"
- Does it make thinking about financial frictions relevant? Definitely!
- For example, understanding financial frictions is crucial for designing policies:
  - *Should the government support businesses?*
  - *Should the government support small or large businesses? Or both?*
  - *Should the government support businesses directly or through financial institutions?*
  - *If the government supports businesses directly, should it give loans or transfers?*
  - *Should the Fed buy corporate bonds?*
  - *...*
- Research on these questions has grown since 2020

MOTIVATION 2/4: THE EXPERIENCE WITH TWO CRISES

- Were either of these crises "special"?
- Food for thought from Mitchell (1913):

"First may be put the view that crises are "abnormal" phenomena, produced by some disturbing event such as the introduction of revolutionary inventions, the development of new means of transportation which alter old trade-routes, wars, the revision of tariffs, fluctuating monetary standards, crop failures, the unexpected bankruptcy of some conspicuous business enterprise, changes in fashion, and the like."

"As business cycles have continued to run their round decade after decade in all nations of highly developed business organization, the idea that each crisis may be accounted for by some special cause has become less tenable. On the contrary, the explanations in favor today ascribe the recurrence of crises after periods of prosperity to some inherent characteristic of economic organization or activity. The complex processes which make up business life are analyzed to discover why they inevitably work out a change from good times to bad and from bad times to good. The influence of special conditions is admitted, of course, but rather as a factor which complicates the process than as the leading cause of crises."

MOTIVATION 3/4: TRENDS

- Above we looked at business cycle frequency fluctuations
- There are important trends related to finance that happen at lower frequencies
- While we will generally focus on business cycles, some tools we learn in this class also help understanding trends
- In addition, what happens at lower frequency may influence how business cycles transmit (and vice versa)

MOTIVATION 3/4: TRENDS

FROM JORDA, SCHULARICK, AND TAYLOR (2016)

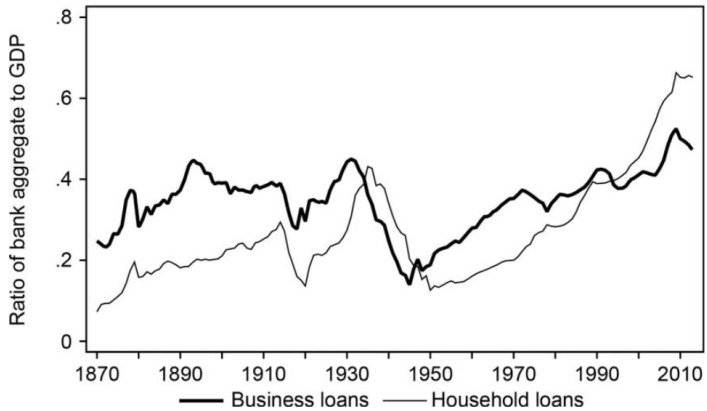


Fig. 2. Bank lending to business and households

Note: *Business loans* and *household loans* are expressed as a ratio to GDP averaged over the 17 countries in the sample (see text).

MOTIVATION 3/4: TRENDS

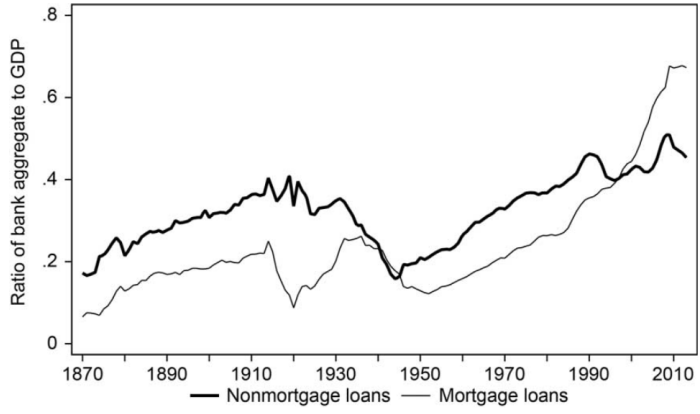


Fig. 3. The great mortgaging

Note: *Mortgage loans* and *nonmortgage loans* are expressed as a ratio to GDP averaged over the 17 countries in the sample. Mortgage lending is to households and firms. Nonmortgage lending is unsecured lending primarily to businesses (see text).

MOTIVATION 3/4: TRENDS

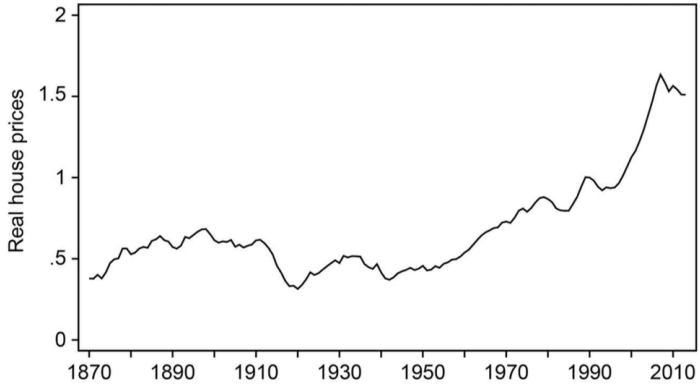


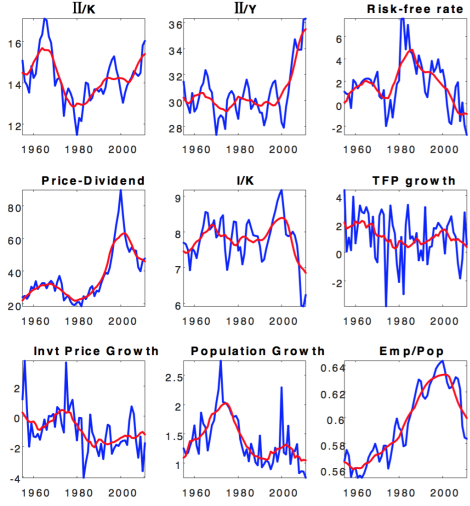
Fig. 5. Real house prices, 1870–2013

Source: Knoll, Schularick, and Steger (2015).

Note: Average CPI-deflated house price index for 14 advanced countries.

MOTIVATION 3/4: TRENDS

FROM FARHI AND GOURIO (2018)

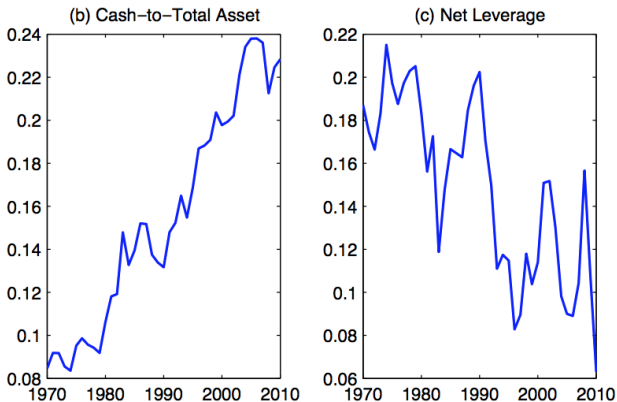


MOTIVATION 3/4: TRENDS

- *Do lower-frequency trends in financial markets affect real outcomes?*
  Do lower-frequency trends in the real economy change financial markets?
- An example of a paper that I really like is Falato, Kadyrzhanova, and Sim (2013)
- The authors explain a trend in firm financing with a technological (macro) trend
- They use ingredients you will have mastered in just a few weeks from now

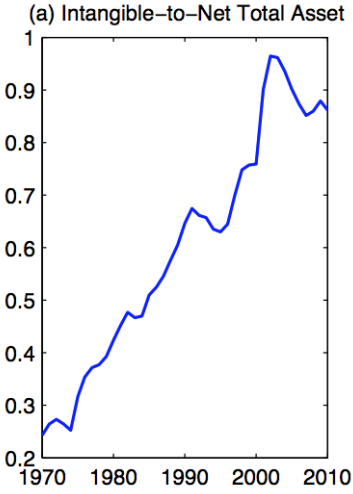
MOTIVATION 3/4: TRENDS

- Observation that nonfinancial firms hold increasing amounts of cash (liquid assets), a phenomenon sometimes dubbed the "corporate cash puzzle"



MOTIVATION 3/4: TRENDS

- The authors explain this with another fact:



MOTIVATION 3/4: TRENDS

- How do they link these trends? A simple theory that uses building blocks we will learn in this course:

$$y \leq z k_T^{\alpha_T} k_I^{\alpha_I} n^{1-\alpha_T-\alpha_N}$$

and

$$b \leq \theta k_T$$

- What happens is that

$$\alpha_T \downarrow, \alpha_I \uparrow$$

and therefore

$$b \downarrow$$

MOTIVATION 4/4: PREDICTION?

- *Can we use financial variables to predict recessions?*
- Some general words about forecasting illustrate why this course is insightful
- My take on macro forecasting in general:
  - Forecasting cyclical macroeconomic activity more than a few quarters out is essentially impossible
  - Plenty of charlatans claim otherwise (and sometimes get it right...)
  - But huge progress in techniques to forecast macroeconomy *within* 0-2 quarters ahead! $\rightarrow$ practice of "nowcasting"

Motivation 4/4: prediction?

- Idea of "nowcasting" GDP: make use of indicators that are more timely and frequent than GDP (which is quarterly and released one month after quarter ends)
- Extract information about the economy that is contained in a list of variables, such as consumption, employment, production, housing data, survey data, ...
- See for example Antolin-Diaz, Drechsel, and Petrella (2017)
- So should financial variables be added to this list?
  - Stock and Watson (2003): asset prices can help, but predictive power is unstable
  - Faust, Gilchrist, Wright, and Zakrajsek (2013): credit spread indexes are predictive
  - Adrian, Boyarchenko, and Giannone (2019): financial conditions predictive of left tail of GDP growth

MOTIVATION 4/4: PREDICTION?

- We could potentially consider thousands of indicators. How to select?
- What can be helpful: dimension reduction techniques / machine learning
  - Nice recent example: Bianchi, Ludvigson, and Ma (2022)
- What is definitely already helpful: economic theory!
- In a few weeks we will build a consistent theoretical framework telling us **why** credit spreads are informative about macroeconomic conditions

PART II: HOW?

APPROACH OF THIS COURSE

- Beware: "macro-finance" means slightly different things to different people
- This course is probably best described as a course covering financial frictions in business cycle (mostly DSGE) models
- This course will come back to the motivational angles presented above
- This course will aim to make you get into practical work

- The material covered in this course will mostly be
  - focused short-run macroeconomic phenomena
  - concerned with advanced economies (the US), thinking of the economy as closed
  - using models with rational expectations
  - using models in discrete time
- The toolkit you will acquire is applicable to loosening any of the above!

HOW MATERIAL IS BROADLY ORGANIZED

1. Complete markets benchmark
2. Models with constraints on risk-free debt
3. Models with risky debt
4. Other topics: financial intermediation, banks, bubbles, ...

- Quadrini (2011) provides an excellent review paper on financial frictions in macro, which is organized similar to 1, 2, 3 above
- For each topic, the course syllabus lists some interesting readings
  - Remember the final course project

WRAPPING UP

INSIGHTS TO TAKE HOME

- Remember key questions:

  Do financial variables matter for the business cycle? How do they matters?

- Remember key take-away:

  Theory is needed to understand mechanisms behind patterns in the data, and to understand which data to look at!

OUTLOOK FOR NEXT LECTURES

- Lecture 2 is a refresher on business cycle models
- Lecture 3 is an introduction to Dynare
- These will gear you up for the first assignment

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