ECON 747 - LECTURE 1: INTRODUCTION

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 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



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



FIRM DEBT AND EQUITY FLOWS AS MOTIVATION IN JERMANN AND QUADRINI, (2012)



Motivation 1/4: cyclical patterns

HOUSEHOLD MORTGAGE DEBT



Motivation 1/4: cyclical patterns

HOUSE PRICES



- 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?

- 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, ...?

- 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

- 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

• Example from Covas and Den Haan (2011):

	level approach correlation coefficients					
size classes	Δ	equity a	nd	Δ equity [*] and		
	GDP_{t-1}	$\tilde{\mathbf{G}}\mathbf{D}\tilde{\mathbf{P}}_t$	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

TABLE 3-CYCLICAL BEHAVIOR OF EQUITY ISSUANCE - ALL FIRMS

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

- 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:

 $b \leq \theta \pi$

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



A NEWS CONTRACTOR CONTRACT

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

**** \$2.00

DHA 10917.51 ¥ 504.48 -4.45 NASDAD 2179.91 ¥ 3.65 NIKOUI Closed(12214.26) DJ STOXX 50 2764.81 ¥ 4.05 10-WE TREAS 4.2 3/32, viold 3.4825. OIL 595.71 ¥ 55.47 GOLD 578.10 4 522.00 EURO 51.4310 WIN 104.00

AIG, Lehman Shock Hits World Markets

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

The convulsions in the U.S. fi- ing. For much of the day, the manancial system sent markets jor U.S. market indexes were across the globe tumbling, as down 2%, which, while a goodtwo of Wall Street's biggest sized decline, was smaller than firms looked set to exit the scene many had thought would be the and insurance tites American Ining, a wave of selling hit, driven

By Susanne Ceala Jeffrey McCracken Jon Hilsenrath and Deborah Solomon

low of 10917.51, down 18% on the ternational Group Inc. turned to year. Of the Dow industrials' 30 the Federal Reserve and the components all but one--Cocastate of New York for assistance. Cola Co .- fell, led by a 60.8% The U.S. stock market suf- plunge in AIG.

ferred its worst daily point plunge since the first day of trading after 100 index dropped 3.9%. Several the Sent 11 2001 terrorist at: Asian markets including Japan tacks. Einancial markets were rate and China, were closed Monday. tled by the rushed sale Sunday of Merrill Lynch& Co. and the bank-kyo shares were down 5.2% in ruptcy-court filing of Lehman early trading, and Hong Kong's Brothers Holdings Inc., which Hang Seng index was down 6.1%. scrambled Monday to sell its most-prized businesses before est fallout in a widening finantoomany amployees and custom- cial crisis that began a year ago ers walk out the door (Please see with the fall of American bousrelated article on Page CL)

All day Monday, ton Lehman the U.S. financial system. Steps officials were huddled in Man-unveiled by the Federal Reserve hattan at their Seventh Avenue to expand its emergency lendhardousrtars provinting a sale ing arranal did little to snan the of the U.S. issuestment herk-the sense of eloom.

core part of Lehman-to Bar-Plenty of potential land clays PLC of the U.K. People in- mines remain. Banks are increasvolved in the discussions were increasingly honeful late Monday lending at a time when the econthat a deal would be struck.

In stock markets from Sydney starting to dump assets to raise to London to New York, the news capital. A mass sale of assets by was greeted with immediate sell-Bease turn to note 42













raders around the world react to sharp selects after one of the most turbulent days in Wall Street's history

~ *



By MATTHEW KARNITSCHNEG LIAM PLEVEN AND SEBENA NO.

American International Group Inc. was facing a severa cash crunch last night as rating parencies out the firm's credit ratraise \$14.5 billion to cover its ob

With AIG now tottering, a crisis that haven with falling home Street has reached one of the world's largest insurance comma nies, threatening to intensify the financial storm and greatly complicate the accomment's efforts to contain it. The company such a big player in insuring risk for institutions around the world that its failure could shake the elobal financial system AIG has been scrambling

raise as much as \$75 billion to weather the crisis, and people close to the situation said that it the insurer doesn't secure fresh

In Europe, London's FTSE due to holiday. By Tuesday, To-Monday's action was the lat-

ing prices and is now reordering

omy is slowing. They are also

AIG. The Dow Jones Industrial Av-

ersge ended down 504.48 points

on Monday, off 4.4%, at its daily

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)











Share of Essential Workers Non-White and Ability to Work From Home



From Kearney and Pardue (Brookings Report, May 2020)

- ▶ 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."

- 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).



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).



Fig. 5. Real house prices, 1870–2013



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

MOTIVATION 3/4: TRENDS FROM FARHI AND GOURIO (2018)



- 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

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



► The authors explain this with another fact:



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

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

and

 $b \le \theta k_T$

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! → 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

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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