

# Foundations of Financial Economics

## Introduction

Paulo Brito

<sup>1</sup>pbrito@iseg.ulisboa.pt  
University of Lisbon

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# The course webpage

<https://pmbbrito.github.io>

# The object of finance

- ▶ **What is finance ?**
- ▶ Going to the core:
  - ▶ finance deals with the **transfer of resources**;
  - ▶ the transfer is **valuable** (to a part or to the whole population);
  - ▶ the transfer process can **create or destroy resources**;
  - ▶ resources take the form of a capital;
  - ▶ any capital generates a flow of income;
- ▶ There are several types of transfers.

# Finance from a general equilibrium perspective

- ▶ **Transfer of resources at the micro level (individual saving):**
  - ▶ intertemporal transfer of resources:
    - for consumption smoothing: intertemporal reallocation of a given level of resources;
    - for consuming of durable goods: concentration of expenditure in time;
    - for investment purposes: increase in the future amount of resources;
  - ▶ transfer between contingencies:
    - insurance (hedging);
    - arbitrage
- ▶ Transfers only exist if they have value to agents (**individual** valuation)

# Finance from a general equilibrium perspective

- ▶ **Transfer of resources between people** takes place when there are differences in:
  - ▶ levels of resources (short or excessive);
  - ▶ time profiles of resource availability (present or future);
  - ▶ contingency profile of resources (bad luck or good luck);
  - ▶ types of behavior (patience, risk aversion, etc);
  - ▶ types and level of information;
  - ▶ functional roles: consumers, producers, intermediaries, pooling capacity;
  - ▶ locations;
  - ▶ etc
- ▶ Again there is a valuation for the transfer **at the aggregate** level (asset prices, rates of return)

# Finance from a general equilibrium perspective

The **general equilibrium perspective**, on the transfers of resources at the macro level:

- ▶ The transfers among people depend on the existence of a structure of **contracts** and/or **assets** and therefore on **markets** in which they are traded;
- ▶ Asset prices are determined from the characteristics of the **aggregate level of transfers** people are willing to make and can make (and their excess demand or supply);
- ▶ This feeds back at the micro level: micro decisions depend on the relationship between (micro) internal valuations and (macro) market valuations.

# The course: some topics

General equilibrium theory (dynamic and stochastic) on

- ▶ the determinants of the (risk free) **interest rate**
- ▶ the determinants of the **risk premium**
- ▶ **asset pricing** at an aggregate level

In particular we will deal with their **fundamentals**:

- ▶ behavior of agents
- ▶ processes for the resources at the micro and macro levels
- ▶ institutional framework in which contracts are done
- ▶ distribution of agents characteristics

But deviations from fundamentals can occur: financial friction, asset pricing **bubbles**

## The course: main questions

- ▶ How rational agents behave in intertemporal and uncertain environments ?
- ▶ How does saving (from the supply side) reacts to changes in interest rates ?
- ▶ What is the difference between individual and aggregate risk ?
- ▶ What is the effect of an increase in wealth on the equilibrium interest rate ?
- ▶ How can risk be priced at the macroeconomic level ?
- ▶ How does the aggregate price of risk relates to asset pricing ?
- ▶ Do asset market provide for insurance ?
- ▶ How do rates of return relate to distributional issues ?



# Main evidence:

there is a secular downward trend of the real interest rate

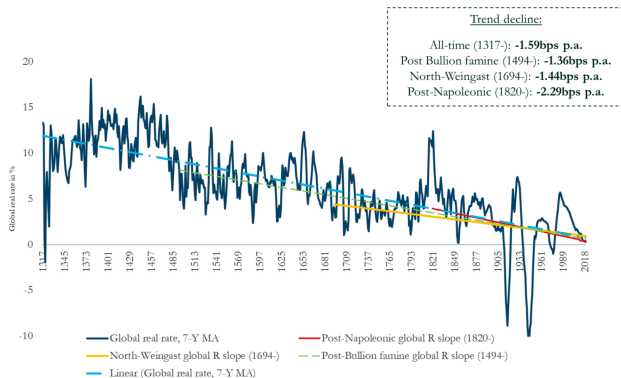


Figure IV: Headline global real rate, GDP-weighted, and trend declines, 1317-2018.

Figure: source: Schmelzing (2020)

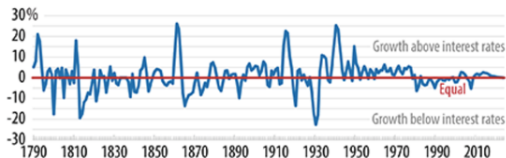
Can this trend be explained by the benchmark theories ?

# Main evidence:

the fundamental: rate of interest and rate of growth are closely related

## Economic Growth And Interest Rates Have Become More Closely Aligned

Growth rate relative to the interest rate



Source: CBPP analysis of data from OMB, CBO, *Historical Statistics of the United States*, and *MeasuringWorth.com*.

CENTER ON BUDGET AND POLICY PRIORITIES | CBPP.ORG

<http://www.cbpp.org/research/federal-budget/difference-between-economic-growth-rates-and-treasury-interest-rates>

Is this just for the US ? If you take the historical series is this still true ?

# Main evidence:

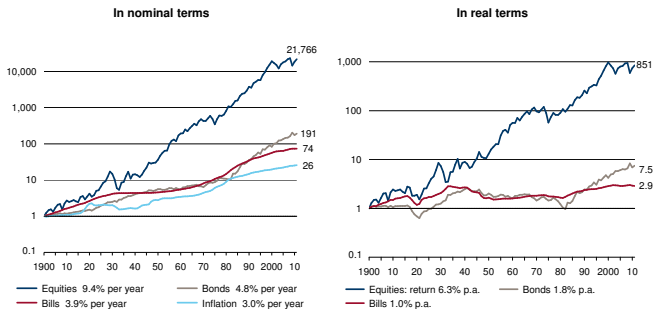
Historical series on RoR, GDP and financial crises

- ▶ Schmelzing (2020): historical downward trend in interest rates
- ▶ Jordà and all (2019): historical rates of return (see Figure XII and next) for most time  $r > g$
- ▶ Paul (2018): financial crises and productivity: "Rising top income inequality and low productivity growth are robust predictors of financial crises..."
- ▶ Blanchard (2019): recent evolution of interest rates and fiscal policy

# Other evidence

Equity premia: there is clearly a price for risk

Figure 1: Cumulative returns on US equities, bonds, bills and inflation, 1900–2010



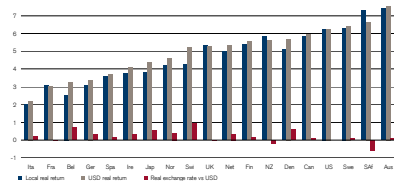
Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research

Figure 2: Real annualized returns (%) on equities versus bonds and bills internationally, 1900–2010

# Other evidence

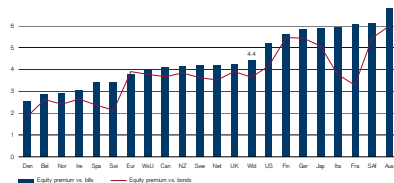
Equity premia: the price for risk is different for different countries

Figure 3: Real annualized equity returns (%) in local currency and US dollars, 1900–2010



Source: Shy Dimson, Paul Marsh, and Mike Skourton, *Triumph of the Optimist*, Princeton University Press, 2002, and subsequent research.

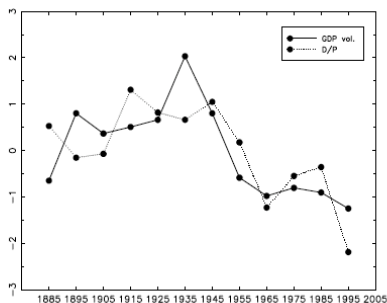
Figure 4: Worldwide annualized equity risk premium (%) relative to bills and bonds, 1900–2010



Source: Shy Dimson, Paul Marsh, and Mike Skourton, *Triumph of the Optimist*, Princeton University Press, 2002, and subsequent research. Premiums for Germany are based on 109 years, excluding hyperinflationary 1923–25.

# Other evidence

Fundamental: financial volatility is also closely related to real volatility



**Figure 3**  
**GDP volatility and the D/P ratio—Prewar evidence**

This figure plots the standard deviations of GDP growth and the mean D/P ratio by decade starting in 1880 until 2000. Both series are demeaned and divided by their standard deviation. The GDP data are from Ray Fair's website (<http://fairmodel.econ.yale.edu/RAYFAIR/PDF/2002DTBL.HTM>) based on Balke and Gordon (1989). The dividend yield data is from Robert Shiller's website ([http://aida.econ.yale.edu/~shiller/data/ie\\_data.htm](http://aida.econ.yale.edu/~shiller/data/ie_data.htm)).

Figure: US: dividend/price volatility and GDP volatility: in Damodaran (2012)

# The course's options

- ▶ Financial economics is a **HUGE** and difficult field;
- ▶ My aim is to bridge the gap between what you have learned in the 1st cycle and the research (and policy) literature on the field (which have high technical requirements)
- ▶ This justifies the choices made on this course:
  - ▶ we study (mostly) two-period and multi-period discrete-time versions of a **simple** benchmark model;
  - ▶ we try to get explicit solutions whenever possible
  - ▶ we compare the macroeconomic, microeconomic and finance perspectives
  - ▶ we deal (mostly) with endowment economies (i.e, output is given)
  - ▶ we compare theoretical results with the relevant stylized facts (when possible)
  - ▶ we provide an introduction to financial frictions and their aggregate effects (main concerns of the research literature post-2008)

# The course's options

**We do not deal thoroughly with**, but can cover simple cases, v.g :

- ▶ theory of decision making under uncertainty
- ▶ theory of intertemporal decision making under uncertainty
- ▶ contract theory applied to financial decisions
- ▶ corporate finance
- ▶ detailed pricing of financial instruments
- ▶ financial intermediaries (banks)
- ▶ monetary policy and fiscal policy
- ▶ open economies and international capital markets
- ▶ financial bubbles and financial crashes
- ▶ numerical computation of DSGE models
- ▶ specialized aspects: behavioral finance, game theory, inequality, environmental aspects, etc.



# Bibliography

- ▶ There is a large literature on the field, but is generally too specialized or too advanced, which means that this course has been specially tailored
- ▶ Some parts of the following books can be studied (for the strong at heart):
  - ▶ Finance and financial economics: Campbell (2017), LeRoy and Werner (2014), Altug and Labadie (2008), Lengwiler (2004),
  - ▶ Microeconomics: Varian (2010), Gollier (2001), Mas-Colell et al. (1995)
  - ▶ Macroeconomics: Ljungqvist and Sargent (2018)

## References

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- Lars Ljungqvist and Thomas J. Sargent. *Recursive Macroeconomic Theory*. MIT Press, Cambridge and London, 4th edition, 2018.
- Andreu Mas-Colell, Michael D. Whinston, and Jerry R. Green. *Microeconomic Theory*. Oxford University Press, 1995.
- Hal R Varian. *Intermediate microeconomics: a modern approach*. Norton, 8th ed edition, 2010.