Foundations of Financial Economics
1-Introduction

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The course: Foundations of Financial Economics

- **Finance** (see a definition here)

  $$\text{finance} \iff \text{transfers of resources (of a particular type)}$$

  they have an associated return/cost relationship
- **Financial economics**

  financial economics $\iff$ returns, level and composition of wealth

  at the macro level they are endogenous variables
- **Foundations**

  $$\text{foundations} \iff \text{mathematics}$$

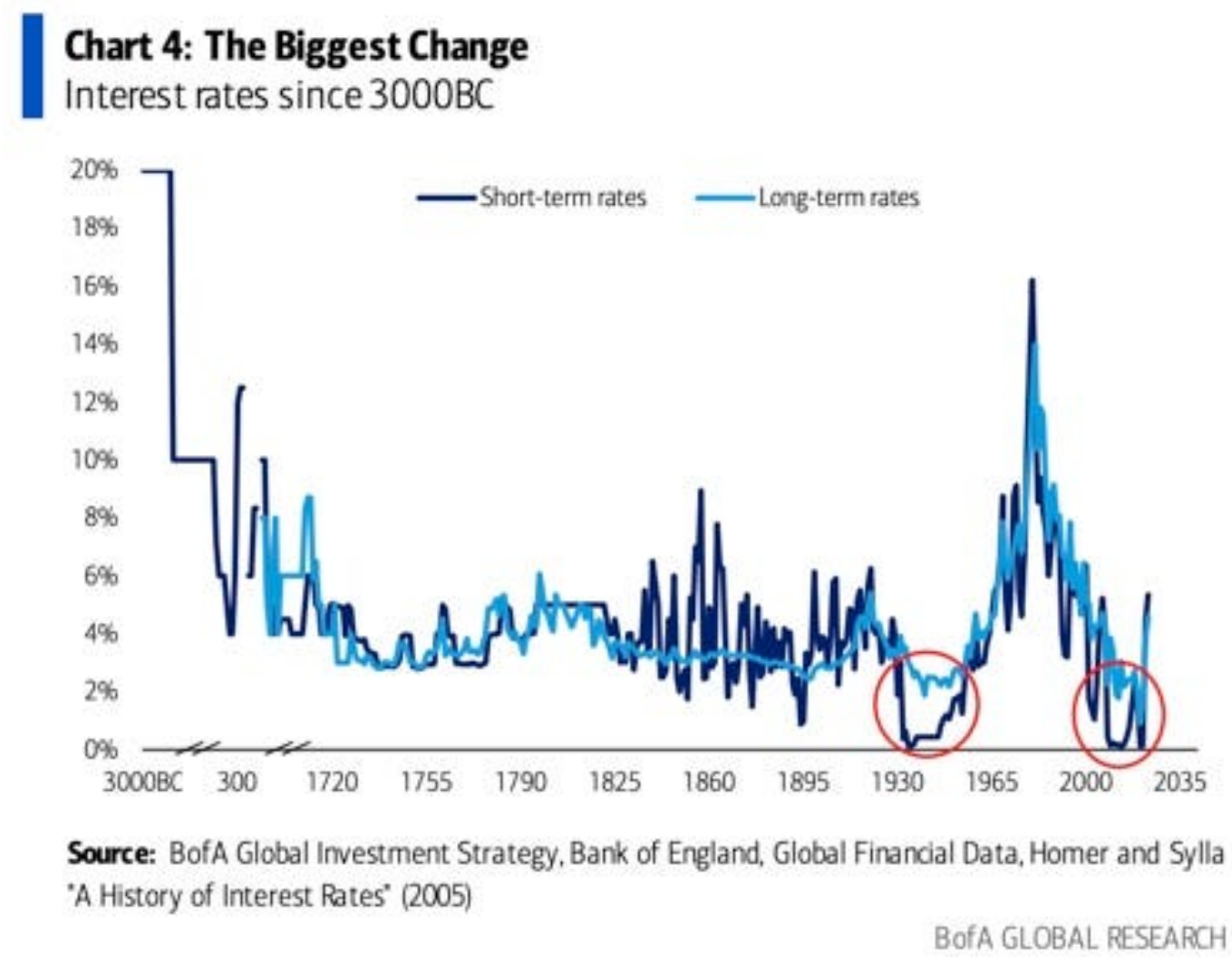
  this is a good and a bad thing: clear, explicit, and logical thinking, but suffers the curse of tractability (excess simplification ?)

Focus of the course

- Behavior of the variables
  - risk-free interest rates
  - rates of return of risky assets
  - valuation of risk: risk premia
- In their relation with the fundamentals:
  household's behavior and information, aggregate variables (GDP)
- Consequences of heterogeneity: existence of trade, insurance, etc

Data:

No secular trend in the safe nominal interest rates



Data:

Secular downward trend of the real interest rate

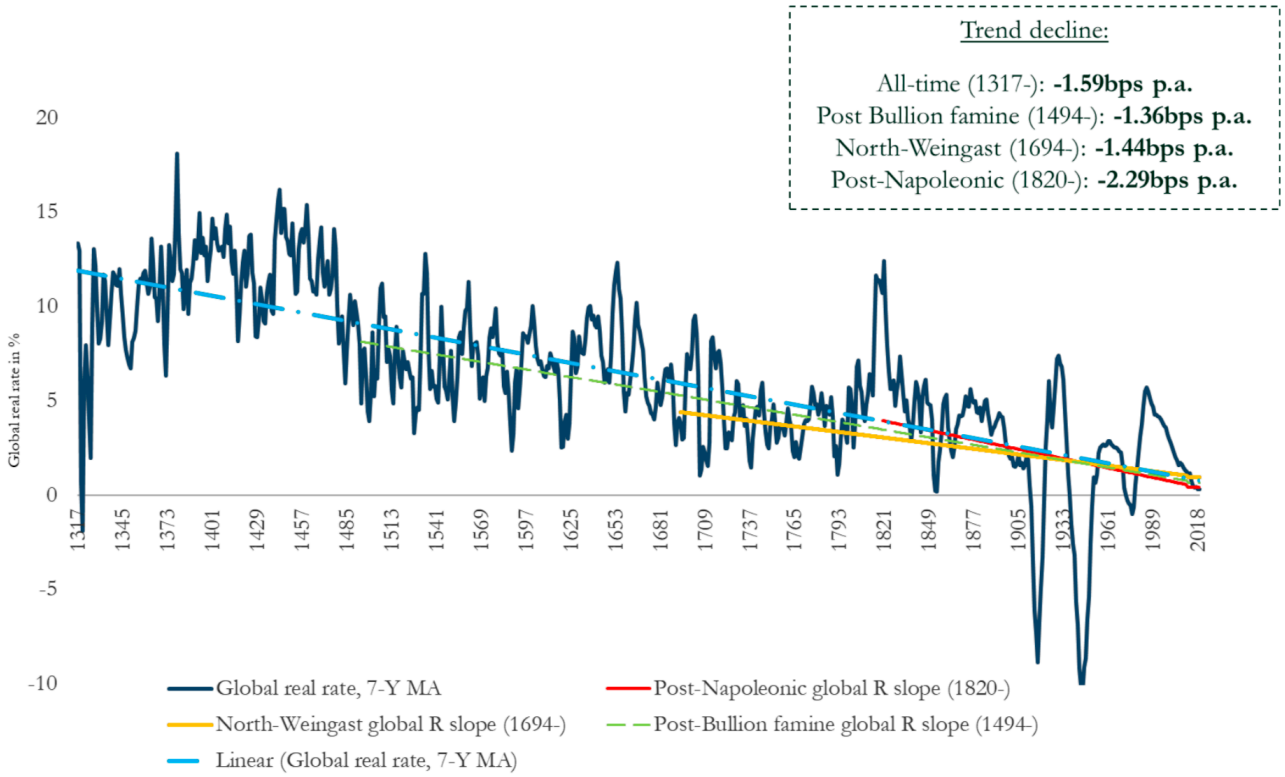


Figure IV: Headline global real rate, GDP-weighted, and trend declines, 1317-2018.

Figure: source: Schmelzing (2020)

Data:

Equity premia: financial crises are not all alike

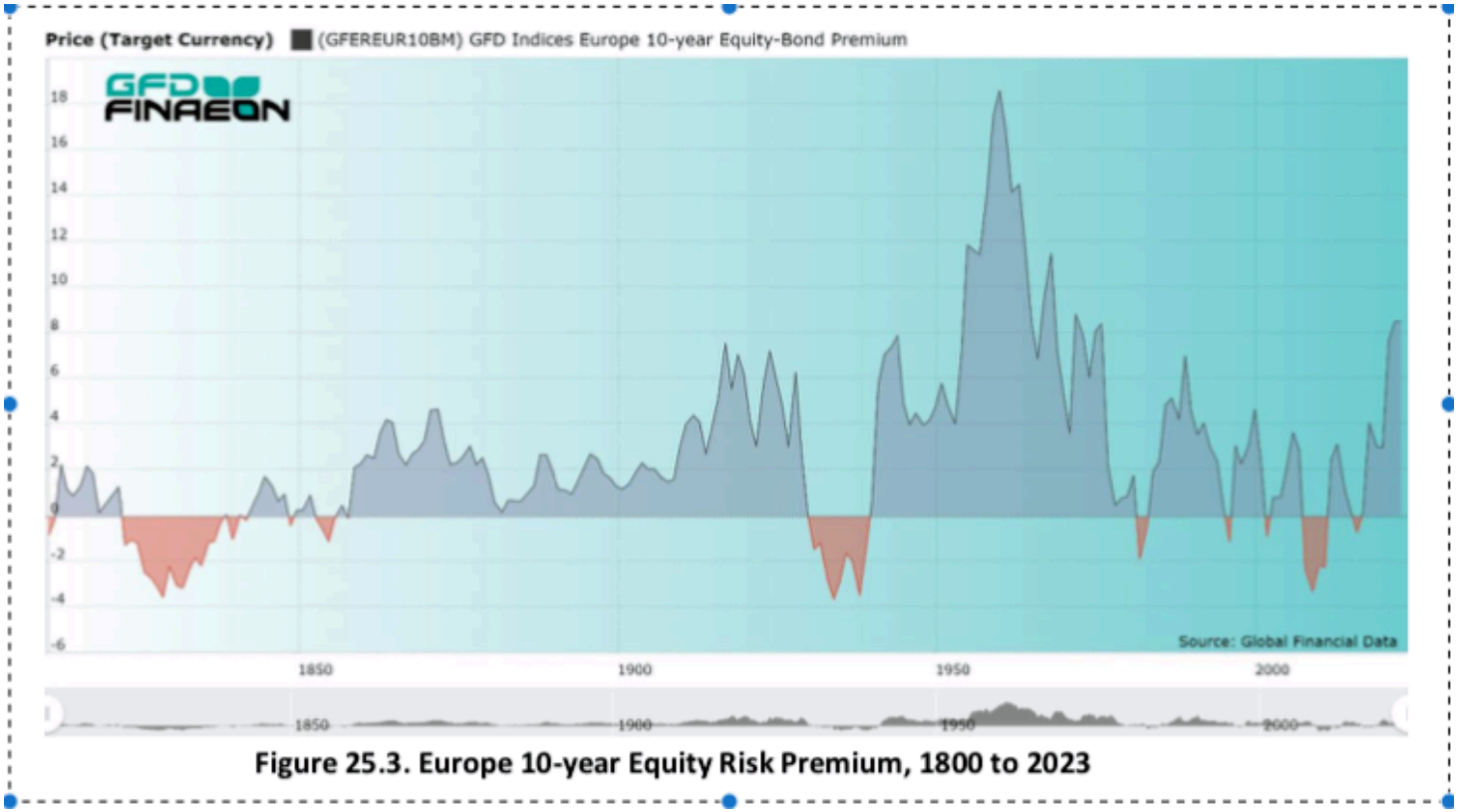
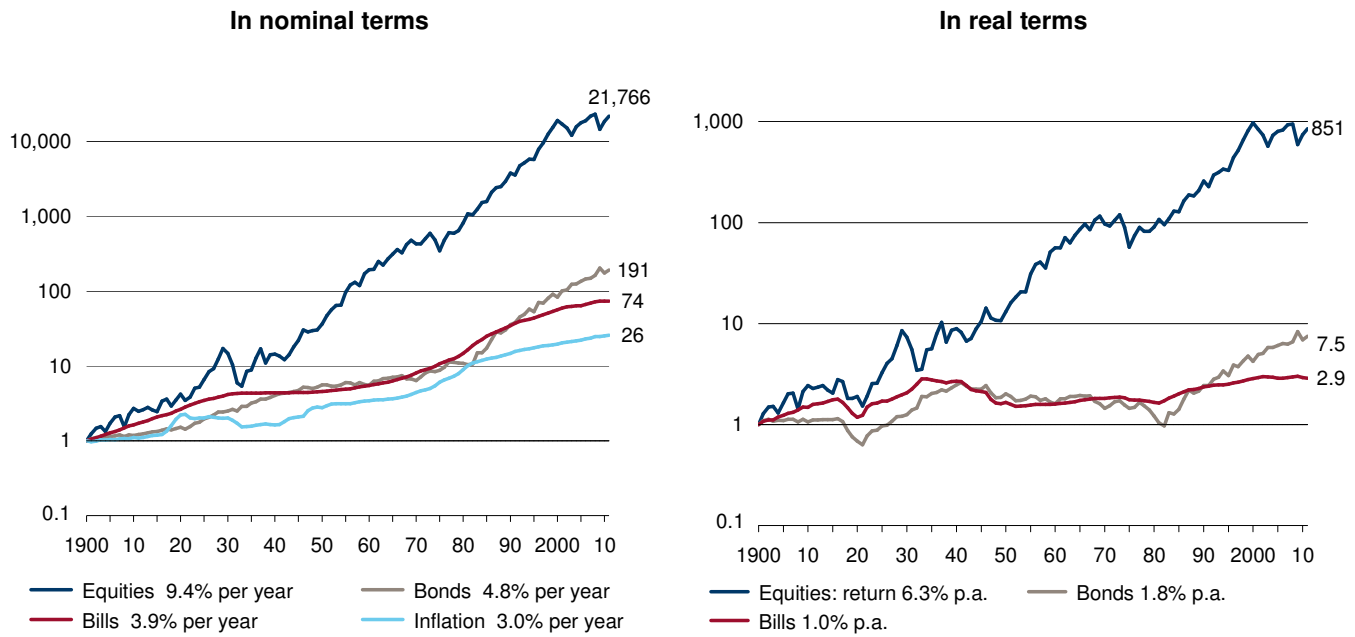


Figure 25.3. Europe 10-year Equity Risk Premium, 1800 to 2023

Data:

Equity premia: there is clearly a price for risk

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



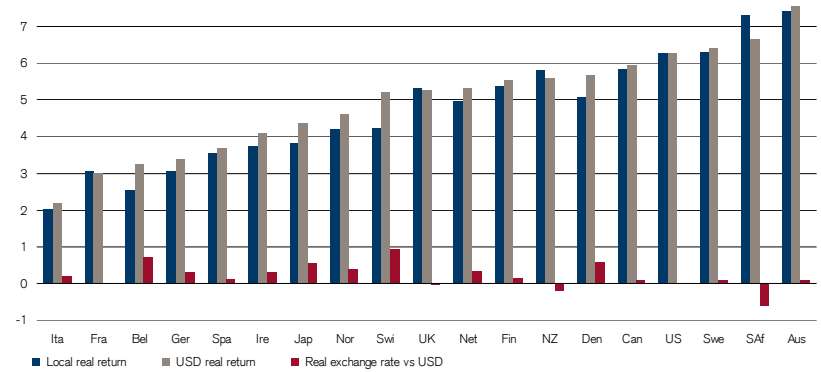
Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research

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

Data:

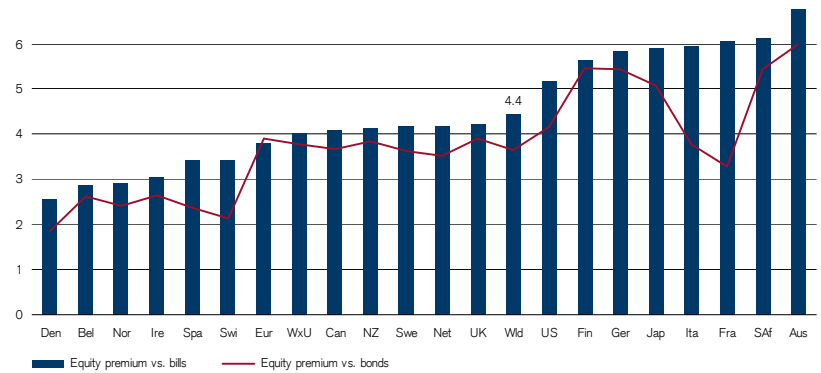
Equity premia: the price for risk is different for different countries

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



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

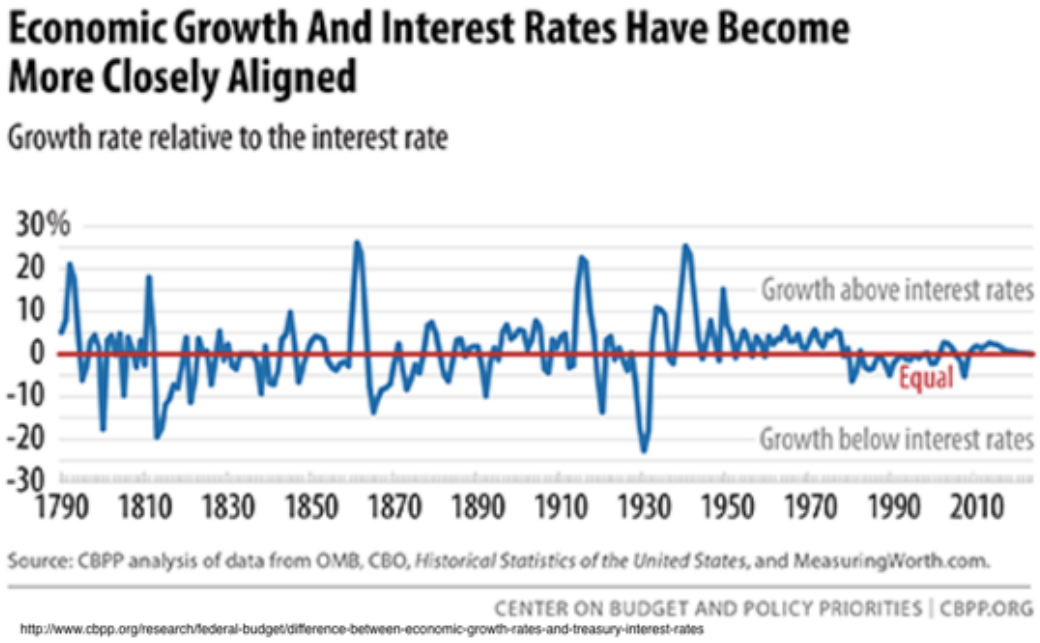
Figure 4: Worldwide annualized equity risk premium (%) relative to bills and bonds, 1900–2010



Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research. Premiums for Germany are based on 109 years, excluding hyperinflationary 1922–23.

Data:

Fundamentals: the rate of interest and rate of growth trends seem to be closely related



Data:

Fundamental: financial volatility is also closely related to real volatility

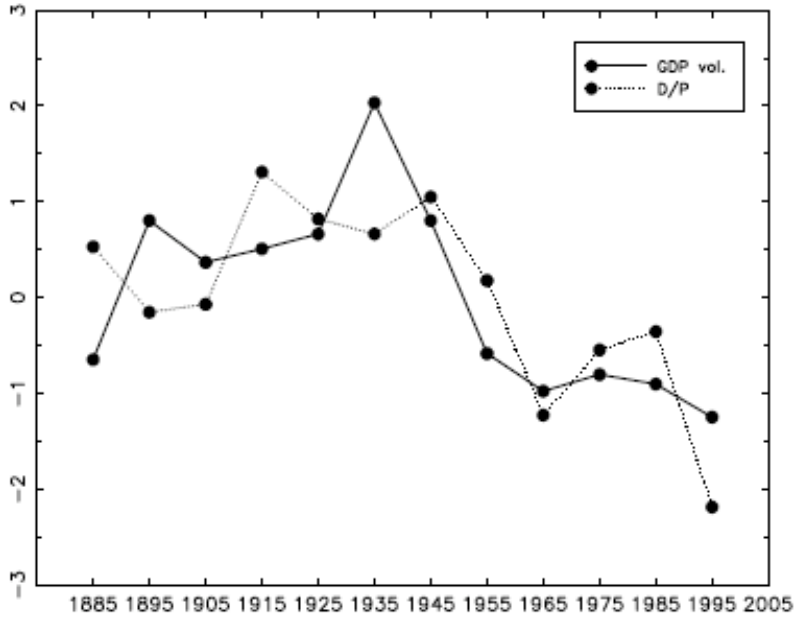


Figure 3
GDP volatility and the D/P ratio—Prewar evidence
This figure plots the standard deviations of GDP growth and the mean D/P ratio by decade starting in 1880 until 2000. Both series are demeaned and divided by their standard deviation. The GDP data are from Ray Fair's website (http://fairmodel.econ.yale.edu/RAYFAIR/PDF/2002DTBL.HTM) 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).

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

Data:

Wealth composition by level of wealth: heterogeneity and inequality

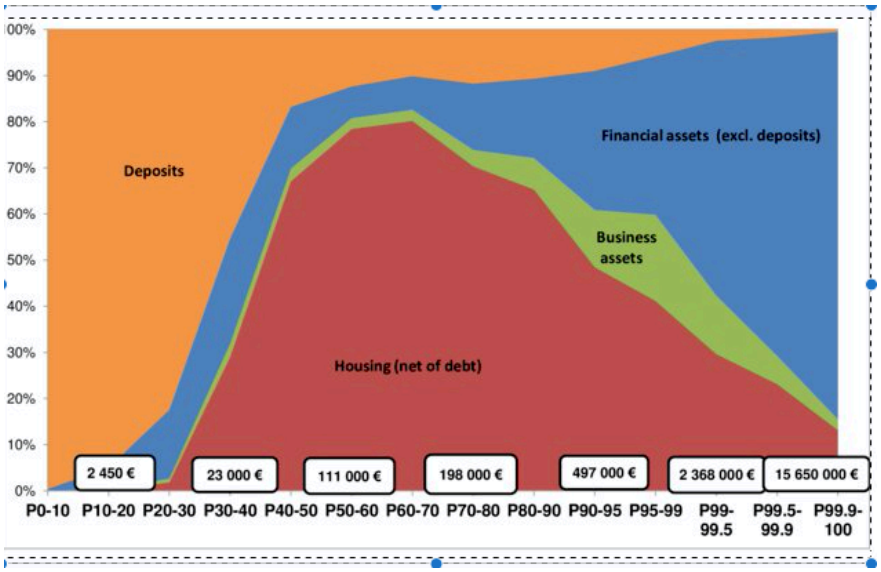


Figure: France:Garbinti, Groupille-Lebret and Piketti (2020)

Low wealth: investment in deposits; Middle wealth: investment in housing; Higher wealth: equity

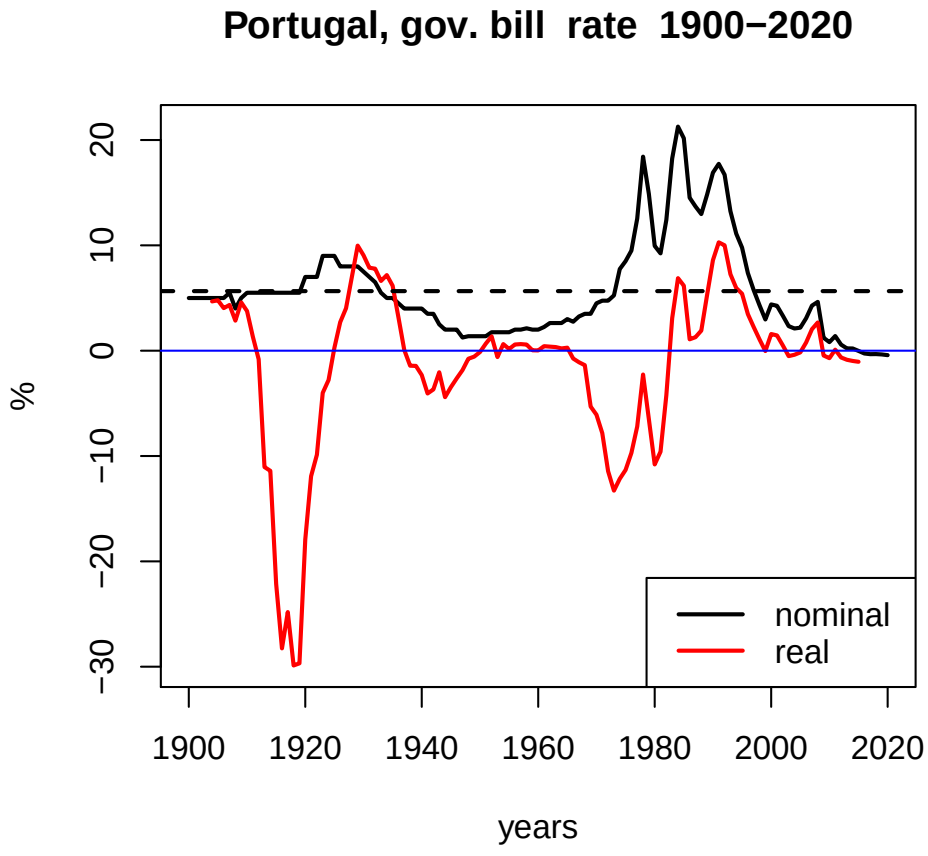
Main evidence:

Historical series on RoR, GDP and financial crises

- Schmelzing (2020): historical downward trend in real short run interest rates
- the Piketty controversy does it makes sense ?
  - Jordà and all (2019) and historical rates of return (see Figure XII and next) for most time $r > g$;
  - Blanchard (2019): recent evolution of short run interest rates is such that $i < g$, but we have $r > g > i$;
  - most economic growth theories establish that $g > 0$ and $r > g$;
  - is there a trade-off between growth and inequality ?
- finance and the real fundamentals: Paul (2018) "Rising top income inequality and low productivity growth are robust predictors of financial crises..."

Portugal: some data

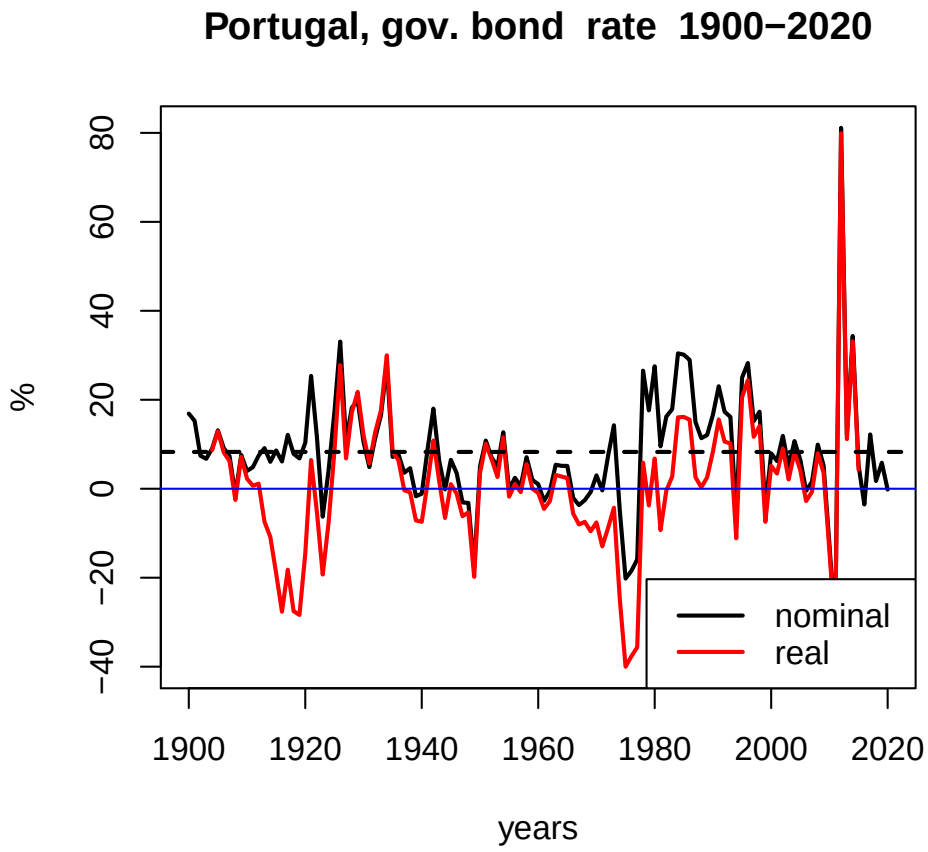
Bills rate or return



Source:Macro-financial historical data. Inflation rate: cpi data smoothed (10 year moving average)

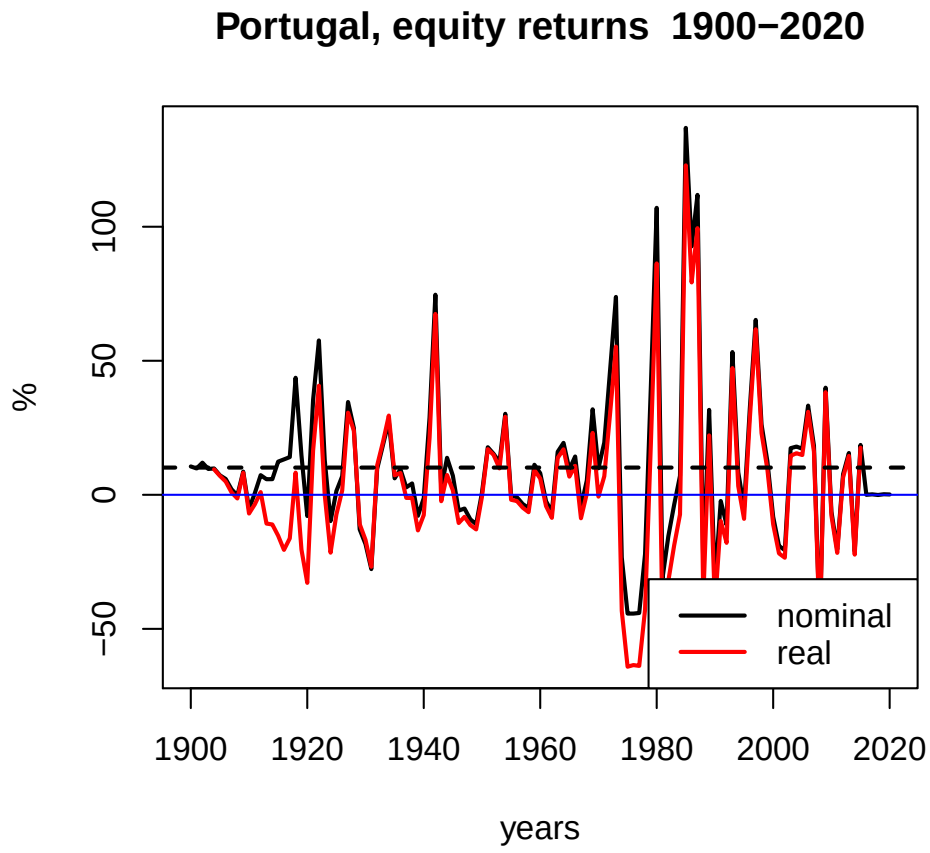
Portugal: some data

Bonds rate of return



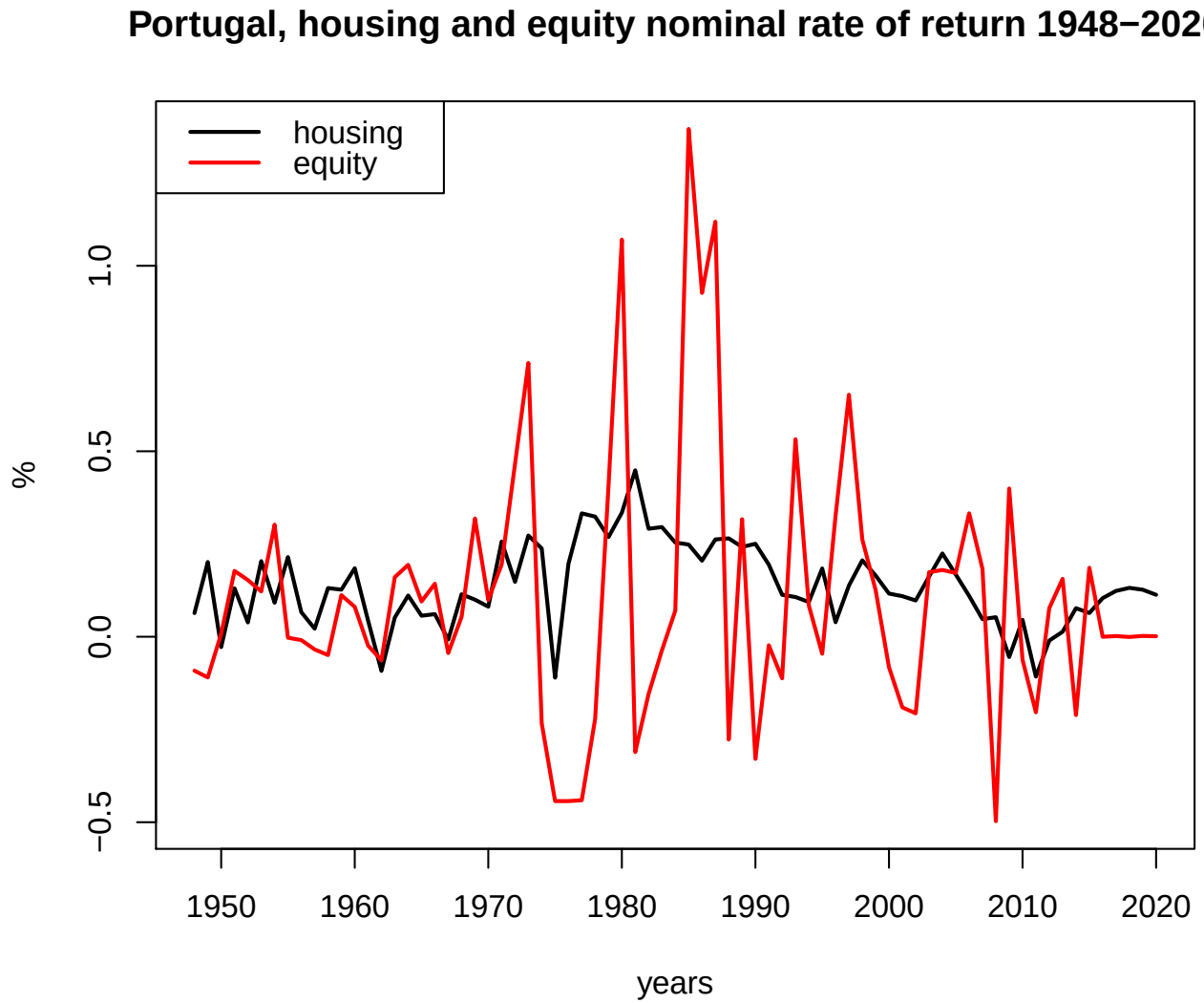
Portugal: some data

Equity rate of return: dividends + change in market price



Portugal: some data

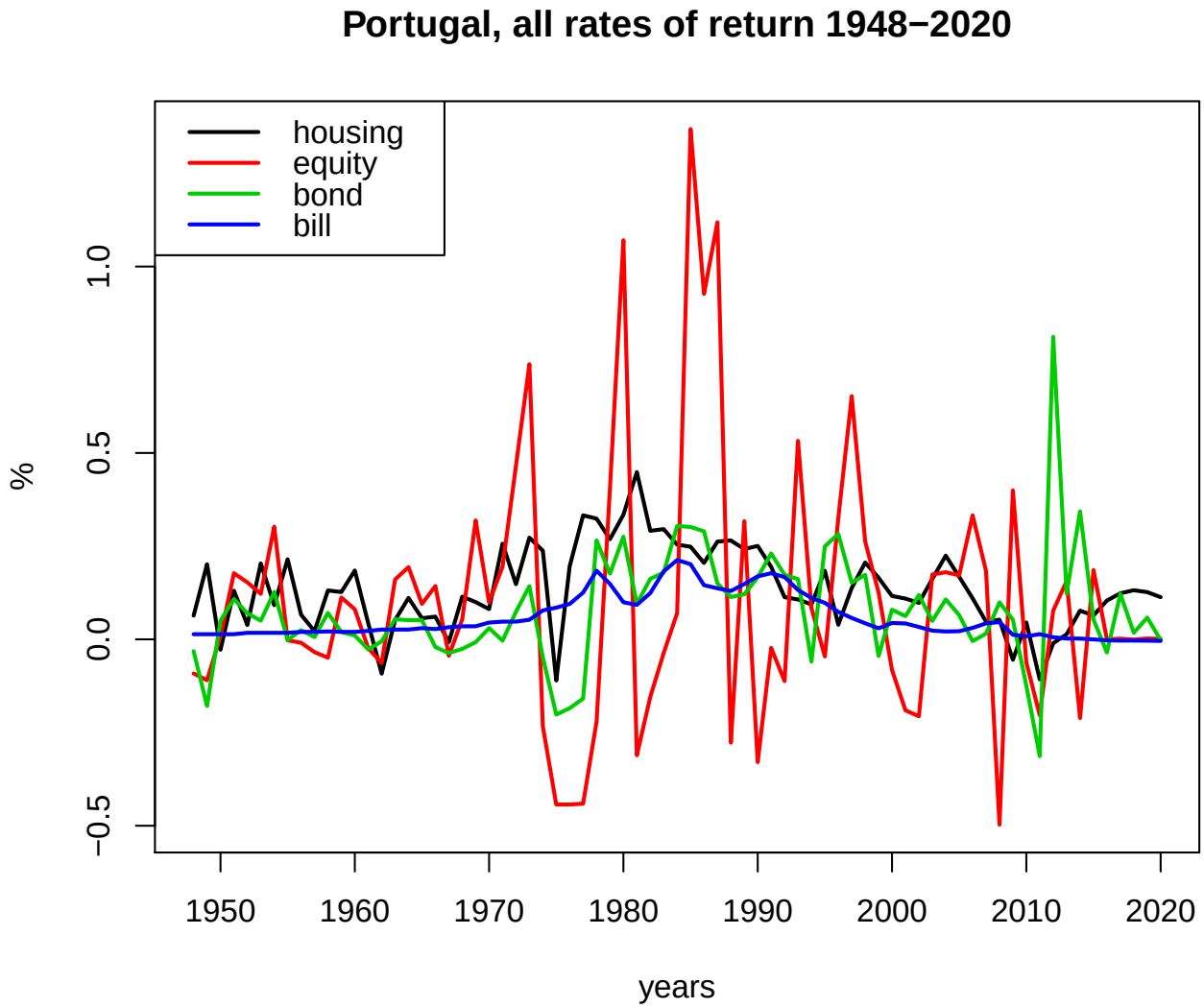
Equity and housing rates of return



Housing rate of return: rents (or imputed rents) + change in value

Portugal: some data

All asset rates of return



Portugal: some data

Rates of return and growth rate

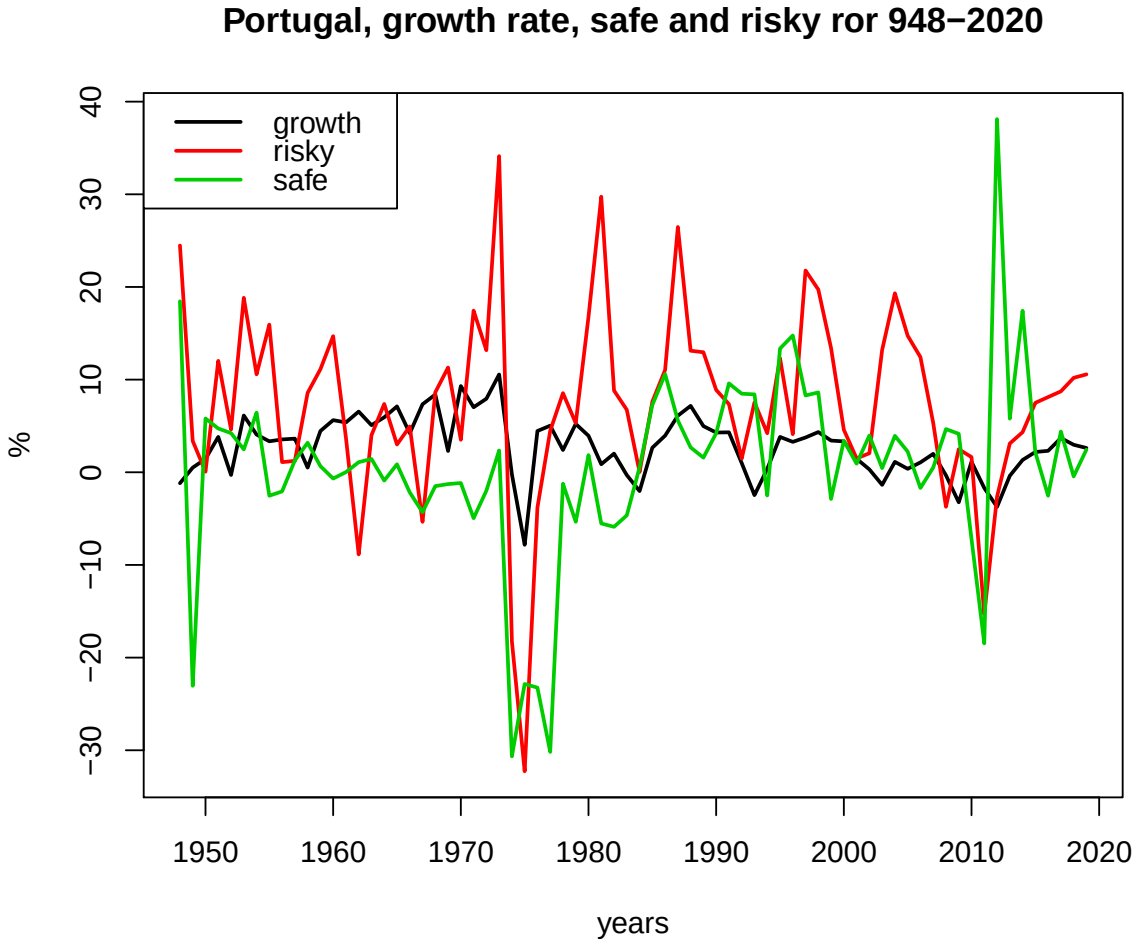


Figure: Correlations $cor(g, r) = 0.42,\ cor(g, s) = -0.01,\ cor(r, s) = 0.37$

Finance

- In 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 financial capital (there are other forms of capital: human capital, physical capital, social capital, natural 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 (precise or ambiguous, private of common);
  - functional roles: consumers, producers, intermediaries, pooling capacity;
  - locations;
- 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 ?

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 versions of a **simple** benchmark model;
  - we try to get explicit solutions whenever possible;
  - we compare the macroeconomic, microeconomic and finance perspectives (when relevant);
  - we deal (mostly) with endowment economies (i.e, output is exogenous)
  - 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 taylored
- Some parts of the following books can be studied (for the strong at heart):
  - Finance and financial economics: Campbell (2018), LeRoy and Werner (2014), Altug and Labadie (2008), Lengwiler (2004),
  - Microeconomics: Varian (2010), Gollier (2001), Mas-Colell et al. (1995)

References

Sumru Altug and Pamela Labadie. *Asset Pricing for Dynamic Economies*. Cambridge University Press, 2008.

John Y. Campbell. *Financial Decisions and Markets: A Course in Asset Pricing*. Princeton University Press, 2018. ISBN 1400888220,9781400888221.

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Yvan Lengwiler. *Microfoundations of Financial Economics*. Princeton Series in Finance. Princeton University Press, 2004.

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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.