BEM 103

Class 1:
From claims to value
9-30-2013

What is Finance?
Your Finance
My finance
Objects of Study
The Problem of Value

What is Finance

- The study of
  - Investors (who buy and hold claims and get resources later)
  - Issuers (who sell claims and use resources now)
  - Intermediaries who organize the
    - Creation, transfer and valuation of claims
      - Market
      - Non Market
    - Collection and dissemination of information
      - Public
      - Private
- The study and valuation of Risk
  - An asset's return = riskless return + price of risk
- Not how to make money (it may be how to avoid loosing it)

Finance is old

- We know of speculative crises under the Roman Empire
- We know of written claims in the fertile crescent on cuneiform tablets
- Around 1500 Philip II of Spain borrowed money with contingent repayment option depending on the arrival of the fleet and where lenders could convert their short term claims into long term bonds at pre specified prices
- The earliest join stock companies are from the same period (though there is a claim that the mills in Toulouse are a medieval traded corporation)

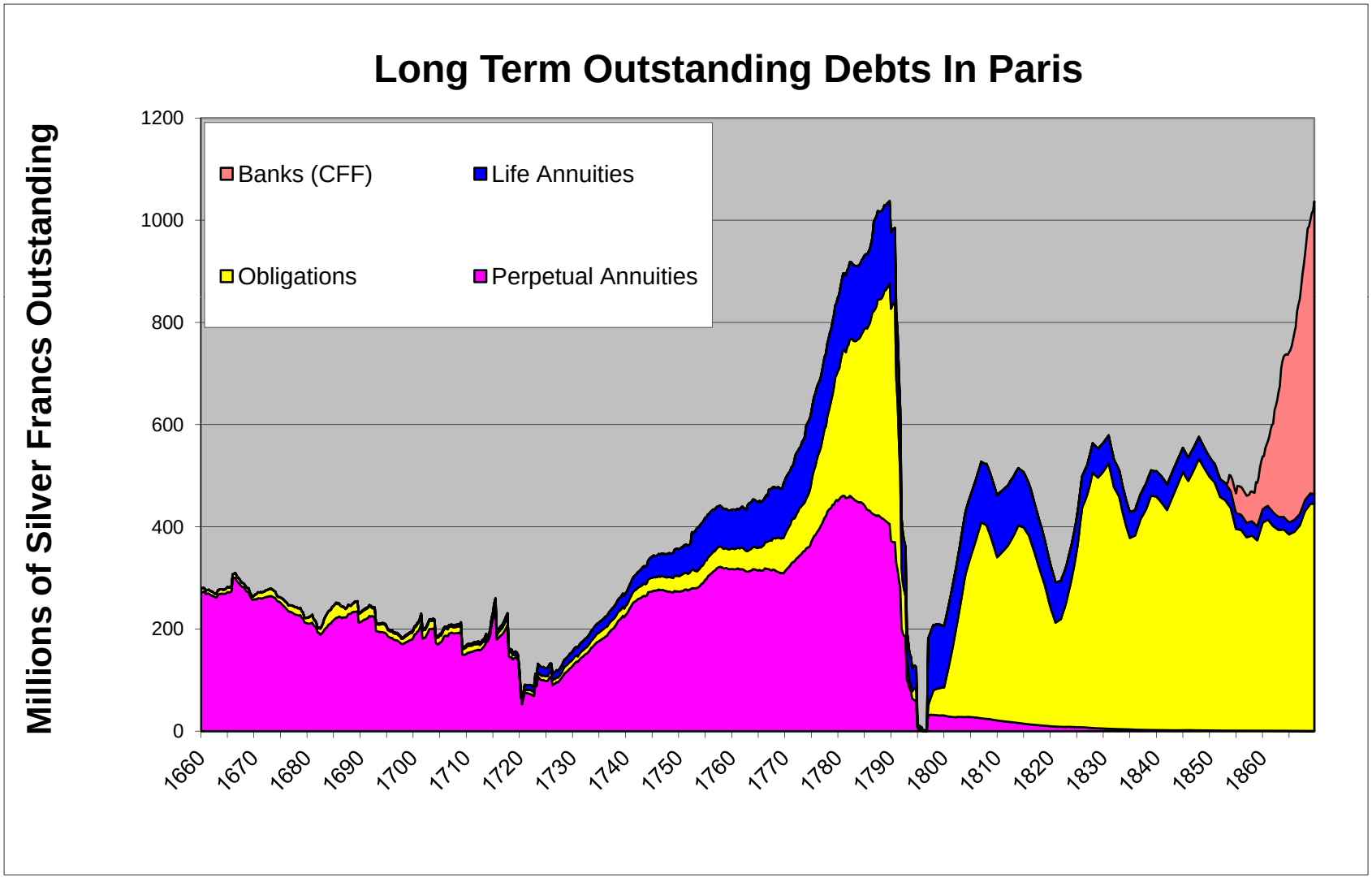
Finance is changing very fast

- Technology
  - Move to electronic markets
  - Attempts at crowd sourcing
- Data mining techniques and computer trading
- Changes in society are raising the demand for finance .
- Regulation

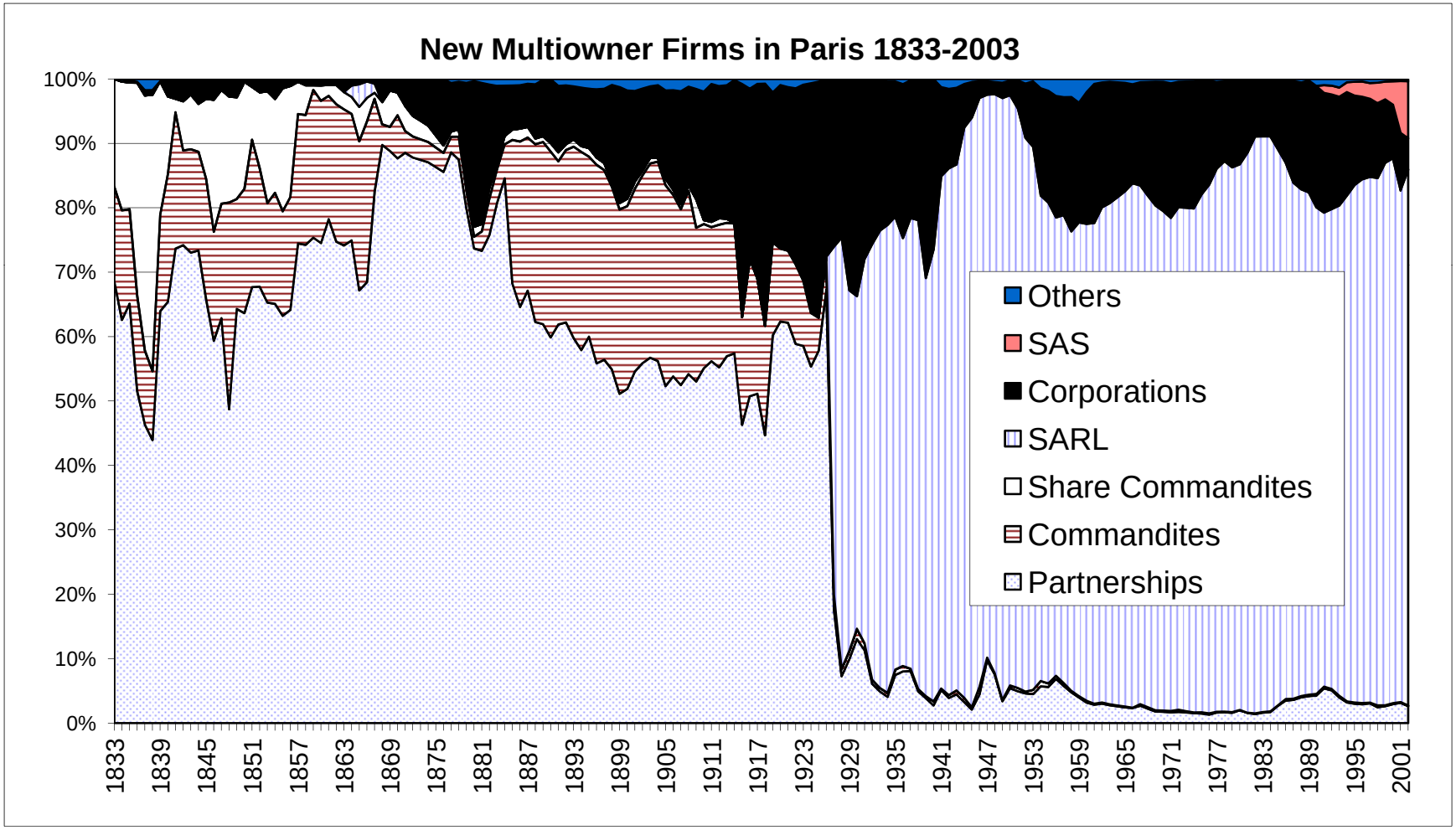
Your finance

- Why should you be in this class
- Most of you will be rich (I expect)
  - and you will save (I hope)
  - So some financial know how can be useful
- Some of you will be entrepreneurs or managers
- Some of you may work on wall street
- A very few of you may become financial economists
- For all these reasons finance matters to you.

My Finance (1)

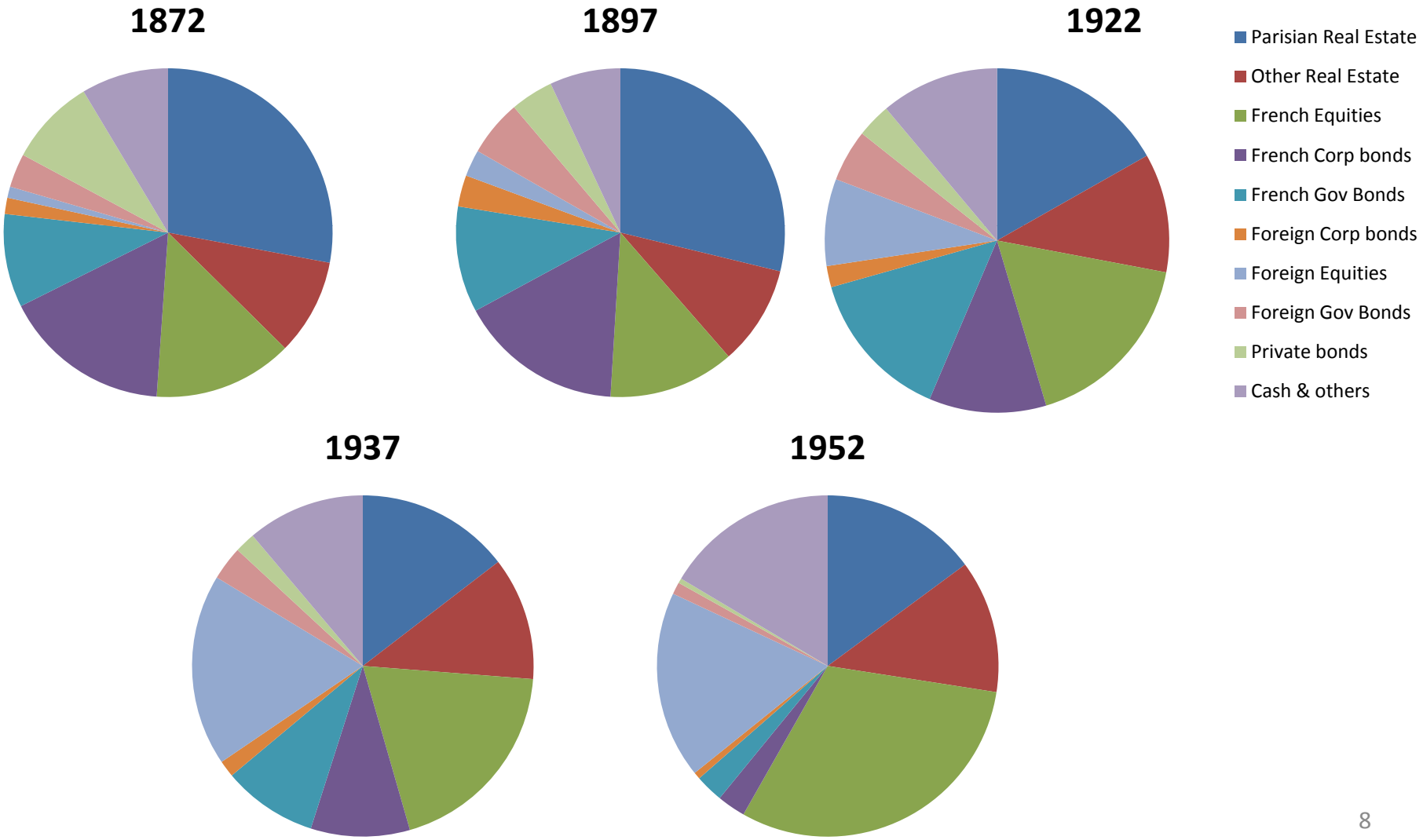

Long Term Outstanding Debts In Paris
Millions of Silver Francs Outstanding
Banks (CFF)
Life Annuities
Obligations
Perpetual Annuities
1200
1000
800
600
400
200
0
1660
1670
1680
1690
1700
1710
1720
1730
1740
1750
1760
1770
1780
1790
1800
1810
1820
1830
1840
1850
1860

My Finance (2)

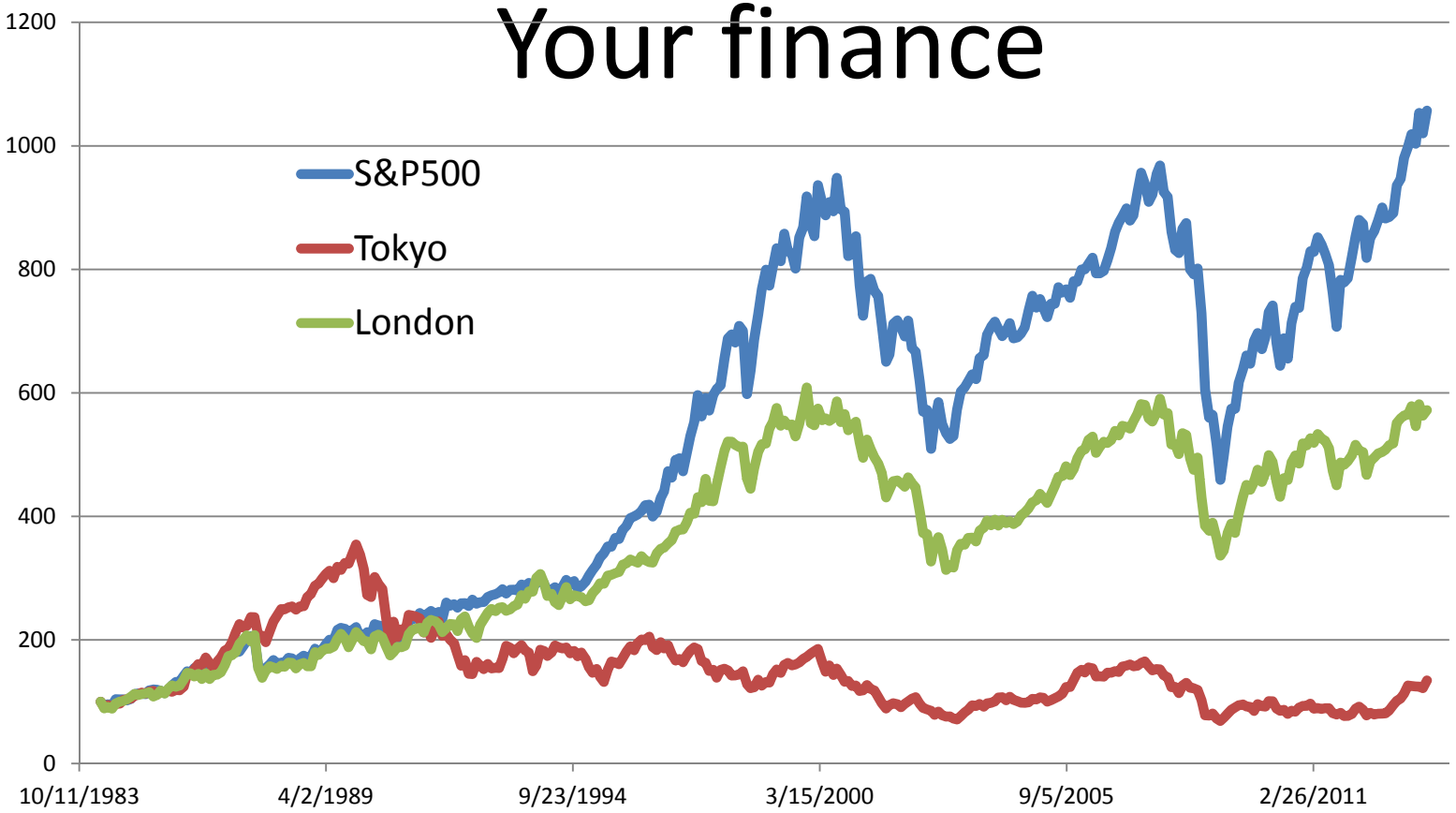

New Multiowner Firms in Paris 1833-2003
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1833
1839
1845
1851
1857
1863
1869
1875
1881
1887
1893
1899
1905
1911
1917
1923
1929
1935
1941
1947
1953
1959
1965
1971
1977
1983
1989
1995
2001
Others
SAS
Corporations
SARL
Share Commandites
Commandites
Partnerships

My Finance (3)

Distributions of portfolios in Paris

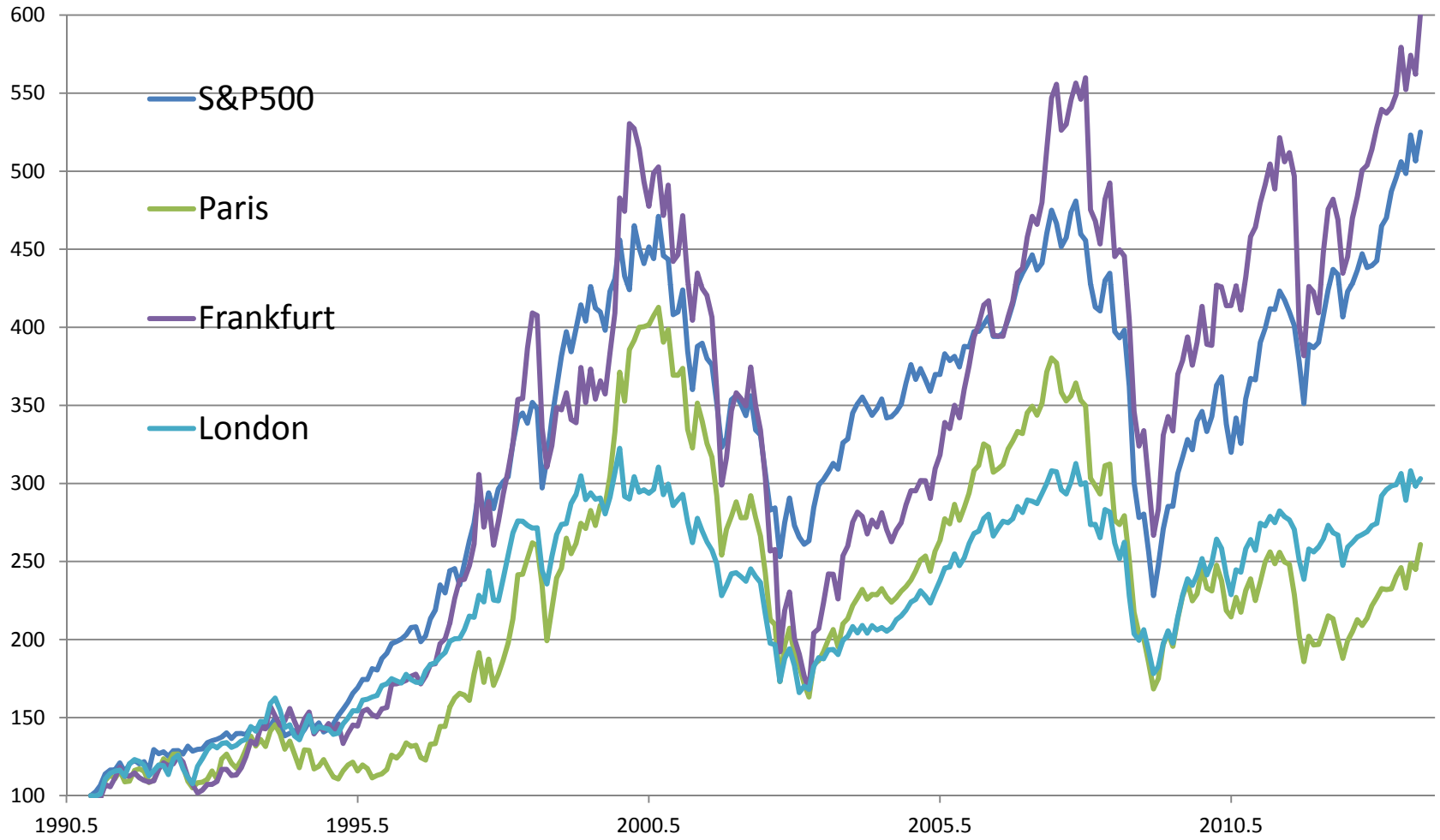


Your finance



Nikkei (Tokyo) at 38% of all time high (December 1989).
Footsie (London) at 268% of December 1989 and 99% of all time high (December 1999)
S&P500 at 478% of December 1989, 115% of December 1999 and at all time high. Returns since December 1999 1% per year (inflation 2%)

Your finance (different vantage pt)



Risk is out there!

Your Finance (3)

- If you save you will have to manage risk
  - Or plan on no living old
- If you are an entrepreneur you will have to manage capital market risk
  - Or face bankruptcy
- If you are in finance, employment (and bonuses) follow those graphs

A Road map for the Class

- Finance literacy
- Pricing riskless assets
- Pricing risky assets,
    - Single security
    - portfolios of risky assets
    - Time contracts
    - Options (and contingent contracts)
  - The problem of Known unknowns vs Unknown unknowns (risk vs uncertainty)
- Firm finance
- Financial intermediation and financial system design

How to go about it

- Each class
  - Some financial literacy
    - Today : what is a claim
  - Some basic ‘theory’
    - Today: Present value, net present value, discounting and interest rates
  - Some empirical evidence about the theory
  - Some ways these theories are implemented in the ‘real’ world
- Homework
  - Deals with financial literacy and theory
  - Read the press, finance is now everywhere
- Finance journals
  - Deals with the real world.

Finance journals

- You will chose assets and evaluate their performance over the course of the class.
  - Fantasy stock picks
  - A real world way to evaluate financial methods
  - And some consideration of the value and risks of stock picking.
    - Are you lucky or are you wise?
- Your return: extra credit.
- To start: pick a publicly traded bond.

Attendance

- Cost of attending Caltech nearly $60,000. In addition if you were in the labor force income $20,000.
- If you take 4 classes each quarter you will have just shy of 360 hours of class time (cost per hour $220). Not attending seems like you are throwing money away.
- But somehow lecture classes are poorly attended.
  - So we have in class quizzes, one a week and they cover the previous week's homework (so week 2 you are quizzed on the homework due that Monday).
  - You have to be in class to do the quiz.
- Moreover classes will be set up so that last part will be give and take.

Objects of Study (1)

Financial contracts: rights to income and control.

Claims (income rights)

- **Bonds- fixed income securities- debts**
  - Issuer promises a set of payments in the future
  - Buyer pays today
- **Equity-variable income securites- shares**
  - Issuer sells a stake in an entity (e.g. firm). Returns are a share of the net value of the entity or of its net income flows.
  - Buyer pays today
- **Contingent claims**
  - Can be bonds or equity, but their income flows depends on the realization of some event. (e.g. insurance payments depend on… inflation indexed bond payments depend on…futures contracts on wheat payments depend on….)
    - is equity a contingent claim?
- **Derivatives**
  - **Contracts whose values depend on other financial contracts.**
    - **S&P 500 futures, Mortgage backed securities (MBS & CDOs), Credit Default Swaps…**

Objects of Study (1b)

Control rights

- The right to make decisions about the use of the asset and its net income flows.
  - Decisions of net income flows are positive
    - Distribution of the net flows (to equity, management or investment)
    - Recall Apple's 100 billion cash position at end of 2012
    - Mergers….
  - Decisions of net income flows are negative (bankruptcy)
    - Reorganization
    - Dissolution
- Its all in the details of the financial contract
  - Does equity have all the decision rights if cash flows positive?

Pricing Claims

- **Christopher Columbus and the value of discovering the America's**
  - **CC thinks he knows how to get to India sailing west from Portugal. (So he gets the details wrong).**
  - **He wants to create a corporation and attract investors. And he travels around Europe 'selling' the project until Ferdinand and Isabella of Spain decide to invest.**
  - **But what is the value of 1% of Columbus enterprises and Co?**
- **1990 Europe**
  - **After the fall of the Berlin wall former Socialist countries (not the USSR) wanted to privatize their economies.**
  - **But what is the value of a Socialist factory in 1991?**
- **Today's Chrysler**
  - **Fiat owns 59% of Chrysler,**
  - **Labor Unions' trust fund owns 41%.**
  - **Fiat would like to buy the Trust fund out.**
  - **What is 41% of Chrysler worth?**

Pricing Claims

- What the market will bear!
  - But what if there is no market (you are the first investor)?
- What you expect the market will bear
  - But what if there will never be a market?
- Use fundamentals!
  - What is the value of a promise of $1,000 in a year?
  - It has to be related to the value of $1000 today

Assumptions for today

- Everyone is risk neutral
  - Only care about expected costs and expected revenues (or expected net resources flows from security)
- No asymmetric information
  - No need to worry as to whether your value is different from that of others
- There is a market interest rate
- We will progressively relax these assumptions later.

Discounting

- In most cases the value of future payments is less than the value of current payments.
- Because people are impatient (and the future is uncertain).
- Both experimental and field evidence suggests that discount rates vary across individuals and over time for given individuals
  - This creates a variety of complications that we can leave aside
- Suppose there is a common discount rate. Such that:
  - $U_L(dx)$ today $=U_L(x)$ next period.
- It allows us to measure how much people prefer the present for the future.
  - if the annual discount rate is 0.95, $1,000 in a year is worth $950 today.

Discounting and interest

Interest

- Fix how much you want to borrow ($1000 for a laptop). How much will you have to pay back in a year?
- The principal $1000 + enough interest to attract a lender.
  - $U_L(y)$ today = $U_L(y(1+r))$ next period
    - Interest and discounting
  - $U_L(y)$ today=$U_L(y(1+r))$ next period
- And
  - $U_L(dx)$ today =$U_L(x)$ next period.
- Now obviously if y=dx then y(1+r)=x
  - Take ratios $\frac{y}{y(1+r)} = \frac{dx}{x}$
- d=1/1+r
- As we shall see in equilibrium the discount rate anchors the interest rate

Next time

- **<u>10-02 Class 2: Value for Issuers</u>**
- **Raising capital allows**
  - **Acceleration and Evaluation of projects.**
  - **Varying cost of Capital and capital budgeting.**
- **But you need value**
  - **So Deciding value**
- **Modigliani Miller**
  - **capital structure does not matter**
- **Risk and taxes. (capital structure matters)**
- **Fallacy of sunk costs**