

International Finance

Session 4 — Securities Markets: Stocks, Mortgages, Currencies and Derivatives

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KEDGE Business School

Two bonds, one required return

1. What is the **coupon yield** on a bond with face value \$1,000, current price **\$1,043.70** and a coupon rate of **8.25%**?
2. What is the **price** of a three-year, **6%** coupon bond paying **semi-annually**, face value \$1,000, if the required return is **8%**?
3. One of these trades **above** par and the other **below**. Which, and why?

Where we are

One chapter, two sessions. Last session established the **money market** and the **bond market**: the instruments, the rate conventions, and how a price and a yield are two statements of the same thing.

Today, in order:

3. **Stock markets** — common and preferred shares, ADRs
4. **Mortgage markets** — fixed-rate, adjustable-rate and the mortgage-backed securities built from them
5. **Foreign exchange** — spot and forward contracts on bank deposits
6. **Derivatives** — forwards, futures, options, swaps, credit derivatives
7. **Reading discussion** — Sartzetakis (2021)

The same two questions apply to every market we open today: **what contractual claim does the instrument represent**, and **what determines its price**.

3 · The stock market

The residual claim

A bondholder has a **contractual claim** to specified payments. A shareholder owns a **residual claim**: whatever remains after the firm's obligations to creditors and other senior claimants have been satisfied.

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- This payoff structure can create conflicts between **shareholders and creditors**, particularly over **risk-taking**.
- Separately, because shareholders delegate day-to-day decisions to managers, an **agency problem** arises: managers may pursue objectives that differ from those of shareholders.

3 · The instruments: common, preferred, foreign

Common stock — the right to vote for directors and on certain issues, and to receive dividends if the board declares them.

Preferred stock — usually **no vote**, but a **fixed dividend** paid before common. Closer to a bond than most students expect.

Foreign stocks — shares in a firm listed abroad. Useful for diversification, but awkward to buy when they are not listed locally.

- **American depository receipts (ADRs)** are the usual way to hold one: a bank buys the foreign shares and issues receipts against them that trade in dollars on a U.S. exchange.

3 · Where the trading happens

Organised exchanges

- NYSE trades roughly 4 to 7 billion shares a day.
- “Organised” once meant a physical floor; electronic networks have largely replaced that idea.
- **Listing requirements** exclude small firms.
- Auction market with floor specialists; around 25% of trades filled directly by the specialist.

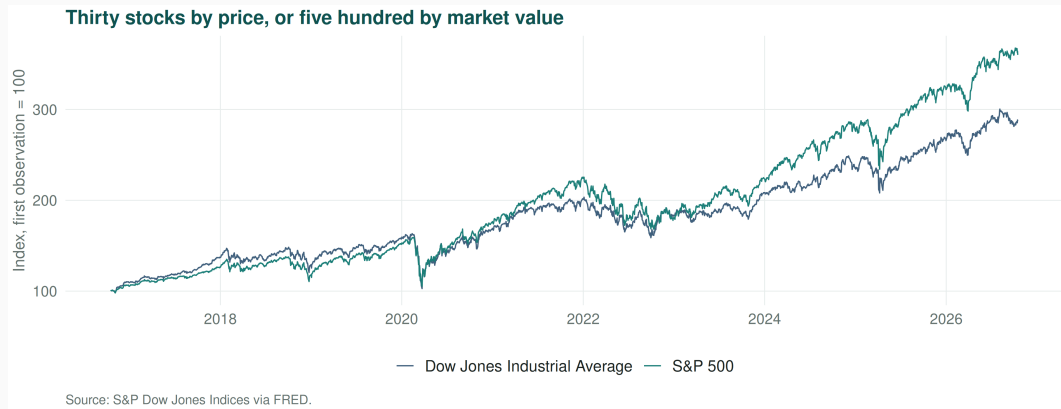
Over the counter

- NASDAQ is the obvious example, with roughly 3,000 securities listed.
- **Dealers** stand ready to make a market — without one, the equity would be hard to trade at all.
- Multiple market makers post bid and ask prices for the same security.

Dealers quote a **bid-ask spread** and profit from it. Competition constrains that spread — but a spread of zero would not be sustainable either. What costs must the spread compensate the dealer for, and what happens to liquidity when those costs rise?

3 · Price-weighted versus value-weighted

An index is a **measuring instrument, not an asset**: one number tracking a set of securities over time. The **DJIA** is price-weighted across 30 stocks; the **S&P 500** is value-weighted across 500.



3 · What a share is worth

Three formulas, three jobs: **value** the share from forecasts, **estimate** one of the inputs, or value it **without forecasting at all**.

1 · Value it. The **Gordon growth model** — the dividend discount model with dividends growing at a constant rate g forever, and $k_e > g$:

$$P = \sum_{t=1}^{\infty} \frac{Div_t}{(1 + k_e)^t} = \frac{Div_1}{k_e - g}$$

2 · Estimate g . Geometric growth, from two observations n periods apart:

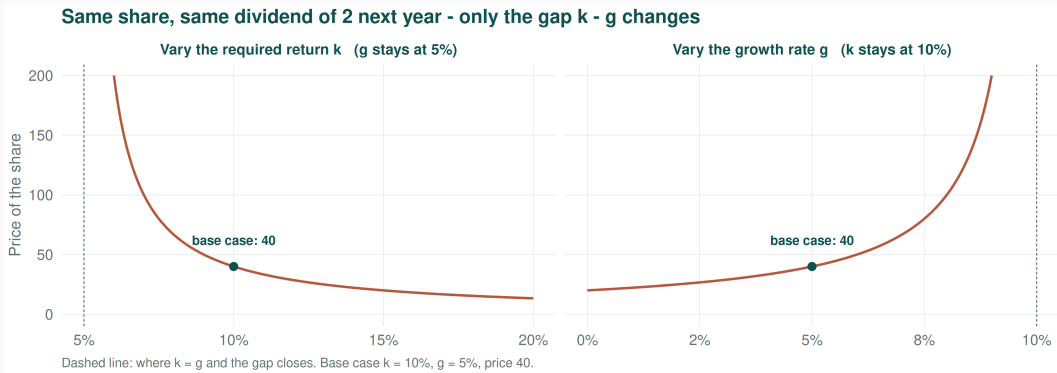
$$g = \left(\frac{\text{final}}{\text{initial}} \right)^{1/n} - 1$$

3 · Skip the forecast. Price-to-earnings, a relative measure:

$$PE = \frac{\text{Price}}{\text{Earnings}}$$

The denominator $k_e - g$ governs everything — and it is a **small difference between two uncertain numbers**. As $g \rightarrow k_e$ the price explodes, so a half-point revision moves

3 · The denominator does all the work



3 · Problem 2.5

1. A stock is expected to pay a dividend of **\$0.16** and to be worth **\$60** in a year. At a **12%** discount rate, what is it worth now?
2. If the industry PE ratio is **16** and the firm earns **\$1.13 per share**, what is the price?

3 · Problem 2.6

The DJIA was **10,000** in 2010 and **20,000** in 2017. What was the annual **geometric growth rate**?

4 · Mortgage markets

The market that ate the world

By 2006 an American mortgage was no longer a loan a bank made and held. It was an input: pooled, tranced, rated, and sold on to a German Landesbank that had never seen Ohio.

- A mortgage is a **long-term loan secured by real estate**.

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- A mortgage is a **long-term loan secured by real estate**.
- It is **amortised**: one fixed payment covers both interest and principal every month, so the balance falls to zero at maturity.
- The security interest in the property is what makes the loan cheap. It is also what links the credit market to the housing market.

4 · The instruments: eight kinds of mortgage

Type	What it is
Conventional	Not guaranteed; usually needs private mortgage insurance and 5-20% down
Insured	Guaranteed by a government agency; low or zero down payment
Fixed-rate	The rate is fixed for the life of the mortgage
Adjustable-rate (ARM)	Rate tied to another security, adjusted periodically within annual limits
Graduated-payment (GPM)	Low initial payment rising each year; amortises in 30 years
Growing-equity (GEM)	Payment rises each year; amortises in less than 30 years
Second mortgage	Secured by a second lien: used for credit

4 · Securitisation, in four steps

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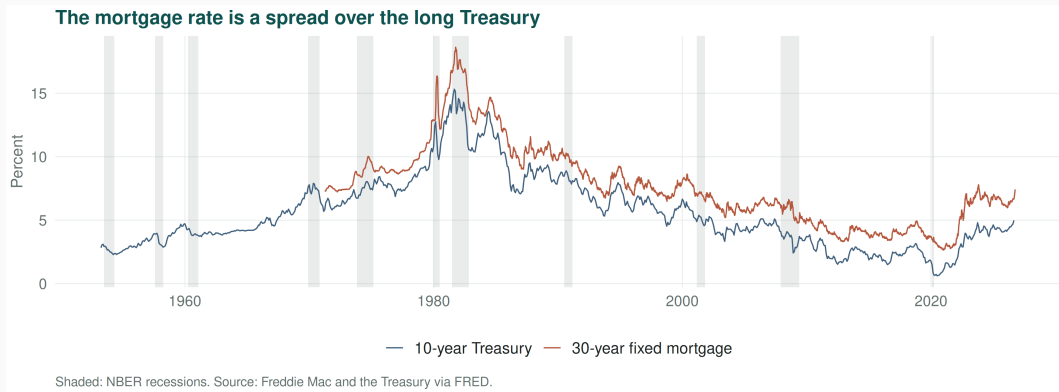
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Step 2 is load-bearing. Diversification removes risk that is **independent** across loans. What becomes of a pool of American mortgages if house prices fall **everywhere at once**?

4 · Mortgage rates track long Treasuries



The two series move together, but the **gap** between them is not constant. What widens it?

4 · Loan and annuity

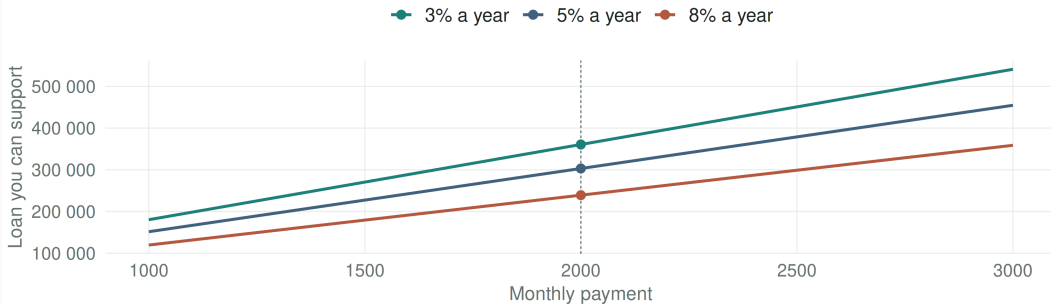
What you can **borrow**, given what you can pay each period:

$$C_0 = a \times \left[\frac{1 - (1 + i)^{-T}}{i} \right]$$

What you must **pay** each period, given what you borrowed:

$$a = C_0 \times \left[\frac{i}{1 - (1 + i)^{-T}} \right]$$

Same 20-year term, same payment - three interest rates



At 2 000 a month: 361 000 at 3%, 303 000 at 5%, 239 000 at 8%.

4 · Problem 2.7

You want to borrow **\$100,000**. Choose between a **12% 30-year** mortgage and an **11.5%** mortgage with **2 discount points**. Which?

A discount point is 1% of the loan paid up front: on a \$200,000 loan, 1 point costs \$2,000, half a point \$1,000, a quarter point \$500.

4 · Getting the rate and the period right

A rate is quoted **per year**. Every formula in this chapter wants it **per period** — and the number of periods has to match. The same €150,000 loan at a quoted **6% over 25 years**:

Payments	Rate per period	Periods	Payment	Paid per year
Monthly	$6 \div 12 = 0.50\%$	300	966.45	11,597
Quarterly	$6 \div 4 = 1.50\%$	100	2,905.59	11,622
Semi-annual	$6 \div 2 = 3.00\%$	50	5,829.82	11,660
Annual	6.00%	25	11,734.01	11,734

Same loan, same quoted rate, four different answers. Divide the rate and multiply the periods by the **same** number — and never mix a monthly rate with a count of years.

4 · Problem 2.7b

You borrow **€150,000** over **25 years**. The quoted rate is **6% a year**.

1. What is the **monthly** payment? And the **quarterly** payment?
2. A second lender offers **5.6%** with **1.5 discount points**, paid monthly. How much is the saving each month?
3. How long must you keep the loan for the points to be worth buying?

5 · The foreign exchange market

The biggest market nobody sees

No building, no opening bell, no ticker on the evening news. Over the counter, bank to bank, with turnover in the **trillions of dollars a day**.

- What is traded is not currency in the sense of notes, but **bank deposits denominated in different currencies**.

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- Trades are large — typically in excess of USD 1 million.
- We met the **price** in session 2. Now we meet the **market** that sets it.

5 · Purchasing power parity

Both versions rest on the **law of one price**: identical goods priced in a common currency should sell for the same amount, because arbitrage in goods moves the two prices together until the gap closes. PPP is that law applied to the basket rather than to the good.

- **Absolute PPP — a proposition about levels.** The nominal exchange rate equals the ratio of the two price levels; equivalently, the real exchange rate equals one. Requires identical baskets and frictionless trade in every good, including non-tradables.
- **Relative PPP — a proposition about rates of change.** The rate of depreciation equals the inflation differential, $\pi_{US} - \pi_{EUR}$. Requires only that frictions be **constant**, so they cancel in differences. This is the testable version.
- **Absolute PPP is rejected in the data.** Deviations are large and **persistent**: goods are differentiated, so firms hold pricing power, and nominal prices are **sticky**. Both break the arbitrage.

5 · The instruments: spot and forward

Spot rate — the price for near-immediate delivery of bank deposits, settling two business days forward.

Forward rate — the price, agreed today, for delivery at a fixed future date.

Quoted at a **premium** or **discount** to spot, not as a forecast.

The rate is the price that clears the market for the currency, so it moves with anything that shifts demand or supply. The standard fundamentals:

- **relative price levels** — the PPP channel
- **trade barriers** — tariffs and quotas
- **preferences** over domestic and foreign goods
- **relative productivity**

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Each fundamental enters as an **expected** change. The spot rate therefore already impounds the forecast, and moves only on news.

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So is a strong currency good news? Ask a French exporter and a French holidaymaker on the same afternoon and you will get two answers.

6 · Derivative markets

A price for a promise

In 1995 Barings Bank, 233 years old, was destroyed in a matter of weeks by one trader's position in Nikkei futures. The instruments were not exotic. The position was simply unhedged and unsupervised.

- A **derivative** is a contract whose value comes from the price of something else — an index, a rate, a currency, a tonne of wheat. You never own the thing itself; you own a claim written on its price.

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- **Hedging** is taking a second position that moves against a risk you already carry, so the two cancel.
- Taken on its own, that same contract is a **bet**. A hedge and a speculation are the same instrument — the difference is whether you already hold what it is written on.

6 · Long, short, and offsetting

A **long** position: you own the asset and gain if the price rises.

A **short** position: you do not own it — you borrow it, sell it, and gain if you can buy it back cheaper.

Hedging is not the absence of a position. It is **two** positions, chosen so that what one loses, the other gains.

To **hedge**:

- a long position is offset by taking an additional **short** position
- a short position is offset by taking an additional **long** position

6 · The instruments: five families

Forwards

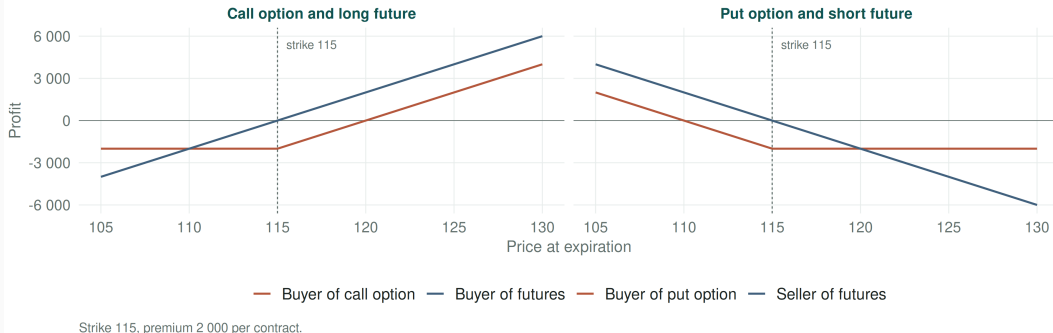
- An agreement between two parties to transact at a **future point in time**.
- Specifies the exact assets, the price, and the date of exchange.
- **Long** = agree to buy later. **Short** = agree to sell later.
- Private and bilateral, and therefore exposed to the other party defaulting.

Futures

- The same agreement as a forward — transact at a future date at a price fixed now — but on an **organised exchange** rather than privately.
- **Standardised**: the exchange fixes the contract size, the quality and the delivery dates, so contracts are interchangeable and far more liquid.
- A **clearing house** steps between buyer and seller and becomes the counterparty to each of them.
- **Marked to market daily** — the day's gain or loss is settled every evening against posted **margin**, which is what removes most of the default risk.

6 · Payoff profiles at expiration

The option has a floor. The future does not.



- The **strike** (here **115**) is the price written into the option: the price at which the holder may buy (call) or sell (put). The market price moves; the strike does not.
- The **future** is a straight line through it. The **option** follows that line, then goes **flat** at the premium — you buy the bend by giving up part of the upside.

6 · Problem 2.8

Rock Solid holds a **\$100 million** stock portfolio that tracks the S&P 500. The manager fears a decline and wants to hedge the downside completely.

1. The S&P is at **1,000**. How is the hedge constructed with **futures**?
2. What happens if a year later the index is at **900**?
3. And if it is at **1,100**?

An index futures contract has a multiplier of **250**, so one contract is worth $250 \times 1000 = \$250,000$.

6 · Problem 2.9

The same **\$100 million** portfolio tracking the S&P 500, the same fear, the same year ahead. The index is at **1,000**, and a strike of **950** costs a premium of **\$200 per contract**.

1. How is the hedge constructed with **options**?
2. What happens if a year later the index is at **900**?
3. And if it is at **1,100**?

An index option contract has a multiplier of **100**, so one contract is worth $100 \times 1000 = \$100,000$.

7 · Reading discussion

Does a green label change the price?

A green bond funds an environmental project. In every other respect it is an ordinary bond from an ordinary issuer, with the same claim on the same balance sheet.

- If the cash flows and the credit risk are identical, should it trade at a different yield?

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- If the cash flows and the credit risk are identical, should it trade at a different yield?
- If it should not, what exactly is the instrument **for**?

7 · Sartzetakis (2021), green bonds and the low-carbon transition

The six questions

Choose **one**. One question per section of the paper, so each of you is reading a different part of it closely.

1. Should the central bank's **mandate** be enlarged to cover the climate transition — and if it is, who decides which sectors get cheap credit?
2. Who should decide **what counts as green**, when the issuer writes the definition and also profits from it?
3. If the issuer appoints and pays the verifier, what is an **external review** actually worth?
4. Why should a green bond yield **less** than an identical conventional one — and why does the paper report a premium in §5.1 and deny one in §6?
5. Does debt genuinely **share** the cost of the transition across generations, or does it only move the bill?
6. What would have to change for the green label to **bite** — and is a bond the right

7 · Submission and marking

In your groups — maximum five.

One of the six questions, one document per group.

Two pages maximum, every name on the first line.

Due 19:15.

Write it yourselves. Submissions are checked with **Pangram**.

What you hand in	On the exam
Nothing	−2
Something you did not really try at	−1
All four sections, done properly	+2
Written with AI	−1 on top

There is no top band to compete for. Do the work properly and the two points are yours.

Session 5 moves from instruments to institutions: **banks**, what they do with the maturity mismatch we keep meeting, and why they are regulated differently from everyone else.

Group work: your security should be **chosen by now**. Not “a stock” — a specific one, with a ticker and available data.

Press **O** for the slide overview · **C** to draw · **S** for speaker notes · **F** for fullscreen · **E** then print for a PDF of the slides.