

Research
Based
Curricula



You've Got to Speculate to Accumulate: Financial Markets and Portfolio Investments

Key Stage 5 Business

2019



Contents

Part 1: Introduction

03	Welcome
04	University Skills
05	Information for Teachers
07	Introduction
09	Meet the PhD researcher
10	Glossary

Part 2: Resources

11	Resource 1
17	Resource 2
23	Resource 3
29	Resource 4
34	Resource 5
39	Resource 6

Part 3: Advice and Guidance

46	University Study Skills: Cornell Notes
48	University Study Skills: Key Instruction Words
50	University Guidance

For Pupils Welcome



To get into the best universities, you must demonstrate that you are intellectually curious, and will make the most of the wonderful academic opportunities available to you.

One of the best ways of demonstrating this, is by going above and beyond what is taught in school and studying something that is not on the curriculum.

This resource will give you exactly such an opportunity. You will have something interesting to write about in your application to university, something interesting to talk about in a university interview, and open whole new areas of study you might be interested in!

You will develop valuable academic skills as you go, that we have marked out with gold badges (see the next page on university skills). As you work through the resource you can look out for these badges so that you can explain which skills you have developed and what you did to demonstrate them. Developing these skills will help you get university ready!

If you have any questions while you are using the resources in this pack, you can contact your teacher or email us directly at schools@access-ed.ngo.

Good luck with your journey to higher education!



For Pupils University Skills



To complete this resource, you will have to demonstrate impressive academic skills. When universities are looking for new students, they will want young people who can study independently and go above and beyond the curriculum. All of these skills that you will see here will demonstrate your abilities as a university student – while you're still at school!

Every time you have to look something up, or write up a reference you are showing that you can work independently. Every time that you complete a challenging problem or write an answer to a difficult question, you might demonstrate your ability to think logically or build an argument. Every time that you evaluate the sources or data that you are presented with, you are showing that you can “dive deep” into an unfamiliar topic and learn from it.



Here are the skills that you will develop in this course:

independent research	your ability to work on your own and find answers online or in other books
creativity	your ability to create something original and express your ideas
problem solving	your ability to apply what you know to new problems
building an argument	your ability to logically express yourself
providing evidence	your ability to refer to sources that back up your opinions/ ideas
academic referencing	your ability to refer to what others have said in your answer, and credit them for their ideas
deep dive	your ability to go above and beyond the school curriculum to new areas of knowledge
source analysis	your ability to evaluate sources (e.g. for bias, origin, purpose)
data interpretation	your ability to discuss the implications of what the numbers show
active reading	your ability to engage with what you are reading by highlighting and annotating

For Teachers RBC Guide



Programme Aims

The Research-Based Curriculum aims to support student attainment and university progression by providing classroom resources about cutting-edge research at local universities. The resources are designed to:

- ✓ promote intellectual curiosity through exposure to academic research
- ✓ stretch and challenge students to think deeply about content that may be beyond the confines of the curriculum
- ✓ develop core academic skills, including critical thinking, metacognition, and written and verbal communication
- ✓ inform students about how subjects are studied at university, and provide information, advice and guidance on pursuing subjects at undergraduate level

Content

The programme represents a unique collaboration between universities and schools. Trained by AccessEd, PhD Researchers use their subject expertise to create rich resources that help bring new discoveries and debates to students.

The Research-Based Curriculum offers ten modules suitable for either KS4 or KS5 study. The modules span a range of disciplines, including EBacc and A-level subjects, as well as degree subjects like biochemistry. Each module includes six hours of teaching content, supported by student packs, teacher notes and slides. All modules are available online and free of charge for teachers at select schools.

Delivery

Resources are designed to be used flexibly by teachers. The resources can be completed by students individually or in groups, in or out of the classroom.

For Teachers

RBC Guide



Here are five examples of delivery options:

Extra-Curricular Subject Enrichment Clubs

The resources can be completed in small groups (4–8 pupils) across a series of weekly lunch clubs or after-school clubs. Groups can reflect on their learning by presenting a talk or poster on the subject matter at the end of the course.

University Access Workshops

The resources can be used by students to explore subjects that they are interested in studying at university. This can inform their decision making with regards to university degree courses, and allow students to write more effective personal statements by including reflections on the Research-Based Curriculum.

Research Challenge

The resources can be used to ignite curiosity in new topics and encourage independent research. Schools could hold a research challenge across a class or year group to submit a piece of work based on the resources. Pupils could submit individually or in small groups, with a final celebration event.

Summer Project

Resource packs can function as 'transition' projects over the summer, serving as an introduction to the next level of study between KS3 and KS4, or KS4 and KS5. Students could present their reflections on the experience in a journal.

Evidence

The Research-Based Curricula programme builds on the University Learning in Schools programme (ULiS), which was successfully delivered and evaluated through the London Schools Excellence Fund in 2015. The project was designed in a collaboration between Achievement for All and The Brilliant Club, the latter of which is the sister organisation of AccessEd. ULiS resulted in the design and dissemination of 15 schemes of work based on PhD research for teachers and pupils at Key Stage 3. The project was evaluated by LKMCo. Overall, pupils made higher than expected progress and felt more engaged with the subject content. The full evaluation can be found here: [ULiS Evaluation](#).

Questions?

For more information contact hello@access-ed.ngo

Introduction to Topic Financial Markets



Financial markets are a huge part of modern world and everyone knows about their existence, however, not everyone understands how they work, their role and importance in the global economy. Financial markets are complex yet a simple topic. In general terms, they do not refer to any specific place or spot or location. Every financial transaction takes place in the financial market. They are pervasive in nature because the financial transactions are very pervasive throughout the entire economic system.

Financial markets are those centres and arrangements that make it possible to buy and sell financial assets. In other simple words, they facilitate the process of buying and selling, which we call trading. Sometimes, it is possible to come across the existence of a financial market with a physical location. An example of such a physically existing financial market is the Stock Exchange.

The topics within this
pack will include:

Financial Securities

Financial Investments

Financial Returns

Portfolios

Institutional Investors

Trading

It wasn't until recent decades that financial markets have seen rapid growth and the number of market players have increased, as well as with development of markets and emergence of new companies, new trading strategies appeared. With technological advancements quantitative trading using algorithms became widely used across institutional investors. However, market defaults such as recent financial crisis of 2008 might happen. Therefore, nowadays researchers are interested in looking at how different trading strategies might affect the performance of financial markets as a system and how to predict unexpected bad events in order to prevent them from happening. The ability to predict future market crashes based on the given information is an exciting journey!

Introduction to Subject Finance at University



Very often when choosing their major, students do not know what the difference between economics and finance is. Although these two subjects are related, they are absolutely different. There are several aspects and divisions of finance as well, however, if you want to study performance of the companies, their ways of raising capital, trading financial assets and financial crises, then Finance is for you!

Finance is an exciting subject to study at the University! Finance as a subject is relatively new and changes very rapidly, therefore, you never get bored! You always need to keep up with financial, economic and political news to understand how markets work and behave in one or another situation. One of the best aspects to study financial markets is that the research you make can have an incredibly big impact on how investors and market players act. You also need to understand psychological and behavioural aspect of every investor to be able to predict the next move and not to let the whole system get ruined.

Pursuing research in finance at the University does not mean you will have to work in academia. Many banks and hedge funds hire PhDs because their knowledge is what makes companies do right decisions. The work you will do first of all is empirical. Even if you concentrate on theory it always finds implications in the real markets. Moreover, you will work with real data and learn programming skills in order to analyse huge amounts of datasets and available information to incorporate in your strategies.

Good luck!

Adina

Meet the PhD Researcher Adina Yelekenova



I was always passionate about finance, but I never thought that one day I would pursue a PhD. My journey started by getting bachelor degree in Economics from the university in my home country. Then I became more interested in finance and decided to pursue masters degree in Finance from University in Manchester. During the thesis period of my masters degree I already thought that research in finance fascinates me.

However, I decided to go to industry and see if I will like it. I worked for a year for one of the big four auditing firms and realised that I wanted to move into academia. I contacted my supervisor and applied to the University of Lancaster Management School, since it is well-known for its high-quality research in finance.

A-Level Subjects

I studied equivalent business courses in my own country

Undergraduate

Economics

Postgraduate

Finance

Glossary



Term	Definition
Bond	A fixed-income instrument that represents a loan made by an investor to a borrower, often a corporation or a government. Typically, a bond will pay an interest dividend in each year and the initial value is then recovered at the end of the period. For example, a US Government 10 Year Treasury Note pays interest at a fixed rate every six months and pays the face value back to the holder at maturity after 10 years.
Capital goods	Tangible assets, such as buildings, machinery, equipment, vehicles and tools that one organization uses to produce goods or services as an input to produce consumer goods and goods for other businesses
Dividend	A sum of money paid regularly – typically on an annual basis – by a company to its shareholders out of its profits or reserves. For example, for Unilever the dividend yield was 3.2% of the value of a share, so each share earned €1.59.
Fund Manager	A fund manager is a person whose job is to manage a portfolio of assets with the aim of maximising the financial return. Fund managers can work for private individuals, companies, hedge funds etc.
Institutional investor	An organization that invests on behalf of its members. One very common example is pension funds, which are invested on behalf of members.
Maturity	The termination or due date on which an instalment loan must be paid in full
Portfolio	A portfolio is a collection of assets and instruments that are owned by the same person or organisation. For example, savers might talk about their 'stocks and shares portfolio'.
Portfolio return	The gain or loss realized by an investment portfolio containing several types of investments.
Securities	Financial instrument that holds some type of monetary value. It represents an ownership position in a publicly-traded business (via stock).
Stock	A type of security that gives an ownership in a corporation and represents a claim on part of the corporation's assets and earnings.

Resource One Overview



Topic	Introduction to Financial Markets
A-Level Modules	Market mechanism. Market failure.
Objectives	<p>After completing this resource you should be able to understand:</p> <ul style="list-style-type: none">✓ How financial markets enable individuals to make intertemporal exchanges✓ What are mutually beneficial transactions✓ What is risk and how can it affect decision-making✓ Economic function of financial markets
Instructions	<ol style="list-style-type: none">1. Read the data source2. Complete the activities3. Explore the further reading
Context	<p>A financial market brings buyers and sellers together to trade in financial assets such as stocks, bonds, commodities, derivatives and currencies. The purpose of a financial market is to set prices for global trade, raise capital, and transfer liquidity and risk. Although there are many components to a financial market, two of the most commonly used are money markets and capital markets.</p>



Resource One

Data Source



Section A

Intertemporal Exchange

An intertemporal exchange is one in which the two sides of the exchange occur at different times.

Example: Person A will give something of value to Person B at time X in exchange for a commitment by Person B to give something of value to Person A at a later time. In some cases, Person B may promise to deliver things of value to Person A at several future times.

An essential property of an intertemporal exchange is the *risk* that Person B will be unable to make the promised delivery, or will refuse to do so. Another form of risk arises if what Person B promises to deliver depends on an outcome (such as the size of a crop) that will not be known until some future time.

Mutually beneficial intertemporal exchanges

Financial markets promote three kinds of intertemporal exchanges:

- Mutually beneficial exchanges between current and future consumption that do not involve net capital accumulation for the economy
- Mutually beneficial exchanges between current and future consumption that do involve net capital accumulation for the economy
- Mutually beneficial exchanges of claims to uncertain future outcomes

Now let's consider examples for each of them.

1.

Resource One

Data Source



One

Exchanges that do not
involve capital
accumulation

Individuals may exchange claims to current and future consumption without increasing the stock of capital goods in the economy.

- Mr. Black will decrease the rate of his consumption next year by as much as \$125 in exchange for increasing his rate of consumption this year by \$100.
- Mr. Green will decrease his current rate of consumption by \$100 in exchange for an increase in his rate of consumption next year by at least \$115.
- That is, Mr. Black is willing to borrow at rates of interest up to 25%, and Mr. Green is willing to lend at rates of interest no less than 15%.
- Obviously, the two men can construct a mutually beneficial exchange.

Two

Exchanges that do
involve capital
accumulation

Saving and investment in capital goods

- We say that Mr. Green saves if he spends less than his current income.
- If Mr. Green's savings enables the economy to accumulate capital goods, then Mr. Green can be repaid out of the net increase in future production that the expanded stock of capital goods will make possible.

Three

Exchanges of claims to
uncertain future
outcomes

- Ms. Tall and Ms. Short operate identical farms.
- Each year the output of each farm is either 800 tons or 1,200 tons.
- Each of the two states occurs with a probability equal to 50% – so average annual product of each farm is 1,000 tons.

Resource One

Data Source



- The two women differ in their willingness to tolerate uncertainty:
 - Ms. Tall is risk averse. She prefers to have a guaranteed annual product of 900 tons, rather than tolerating unpredictable fluctuations between 800 and 1,200 tons.
 - Ms. Short is risk preferring. She will accept an increase in the range over which her product fluctuates, if she can gain a sufficiently large increase in the average level of her product.
- Ms. Tall and Ms. Short can construct a mutually beneficial exchange (thanks to the difference in their attitudes towards uncertainty).
- Ms. Tall and Ms. Short combine their farms into a single firm.
- The risk-averse Ms. Tall will hold a contractual claim: she will receive 900 tons of corn each year regardless of the state of nature.
- Ms. Short will absorb the vagaries of nature by holding a residual claim: each year she will receive whatever is left over from the aggregate output after Ms. Tall is paid her contractual 900 tons.

Section B

Economic function of a financial market

Financial markets facilitate this kind of exchanges by enabling firms to offer different kinds of **securities**.

The contractual claim that Ms. Tall holds is similar to a **bond** and the residual claim that Ms. Short holds is similar to a **common stock**.

For any two persons to conduct mutually beneficial exchanges, they must first find each other (**meet**), then they must **agree on the terms** of the exchange. An essential function of any system of markets, including financial markets, is to **reduce the costs** of meeting these conditions.

Resource One Activities



Activities

1. Imagine a barter economy, where there is no money and people only can exchange products. Person A work as a farmer and Person B owns a bakery. They agree that each Sunday they make an exchange: person A gives milk to person B in exchange for some bread. Can this action be called intertemporal exchange? Explain your answer.
2. Explain the difference between risk-averse and preferring individuals.
3. Ms. White and Ms. Black own farms next to each other. When the weather is good, each farm produces 2,000 tons of apples per year. When the weather is bad, each farm produces 1,000 tons per year. Ms. White is risk-averse. Ms. Black is willing to accept additional risk in exchange for a sufficient increase in her average rate of return.
 - a) If good weather and bad weather occur with equal probability, and if Ms. White will accept a guaranteed return of 1,000 apples per year, can the two women effect a mutually beneficial exchange?
 - b) What type of claim would each woman hold?
4. Ms. White and Ms. Black own farms next to each other. When the weather is good, each farm produces 2,000 tons of apples per year. When the weather is bad, each farm produces 1,000 tons per year. Ms. White is risk-averse. Ms. Black is willing to accept additional risk in exchange for a sufficient increase in her average rate of return.

Resource One Further Reading



Explore

Book: "Introduction to Economics of Financial Markets" by James Bradfield:

Chapter 1: The Economics of Financial Markets

Chapter 2: Financial Markets and Economic Efficiency



Resource Two Overview



Topic	Financial Securities
A-Level Modules	Competitive and concentrated markets
Objectives	<p>After completing this resource you should be able to understand:</p> <ul style="list-style-type: none">✓ The main financial securities.✓ The difference between types of securities.✓ The advantages and disadvantages of each.
Instructions	<ol style="list-style-type: none">1. Read the data source2. Complete the activities3. Explore the further reading
Context	<p>Financial securities, also referred to as financial instruments or financial assets, is a generic term used to describe stocks, bonds, money market securities (e.g., treasury bills), and other instruments representing the right to receive future benefits under a set of stated conditions.</p> <p>Financial assets are claims on the income generated by real assets (or claims on income from the government). Real assets are the land, buildings, equipment and knowledge used to produce goods and services.</p>



Resource Two

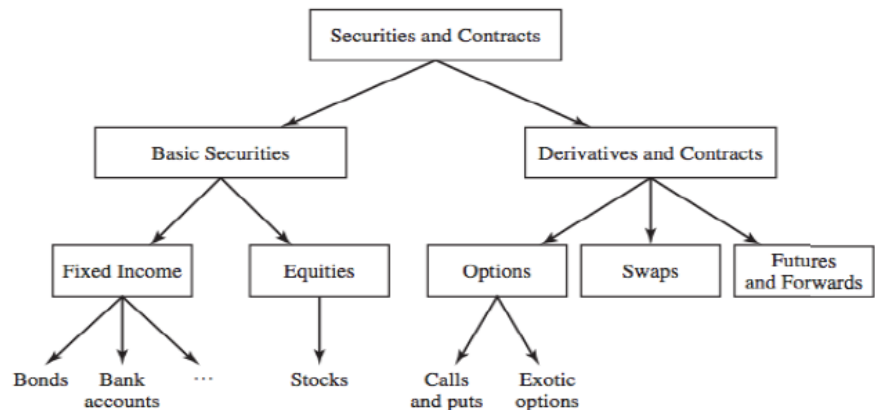
Data Source



A **security** is a document that confers upon its owner a financial claim. In contrast, a general financial contract links two parties nominally and not through the ownership of a document.

Figure 1

A classification of financial instruments: financial securities and contracts



Section A

Bonds



Definition of a Bond: A bond is a saleable right to receive a finite sequence of guaranteed payments.

In a very broad sense, a bond is a security (a document) that gives its owner the right to a fixed, predetermined payment, at a future, predetermined date, called maturity. The amount of money that a bond will pay in the future is called nominal value, face value, par value, or principal.

A bond is characterised by its interest and its maturity. In principle, bonds represent the paradigm of risk-free securities, in the sense that there is a guaranteed payoff at maturity, known in advance. The lack of risk is the result of the certainty about that amount.

Types of bonds:

- Short-term bonds
- Long-term bonds
- Pure discount bonds also called zero-coupon bonds: involve only an initial payment (the initial price) and a final payment (the nominal value)
- Coupon bonds
- A coupon bond is equivalent to a collection, or a basket, of pure discount bonds with nominal values equal to the coupons

Resource Two

Data Source



Section B

Stocks

Definition of a Common Stock: A share of **common stock** is a saleable right to receive an indefinitely long sequence of future payments, with the size of each payment contingent on both the firm's future earnings and on the firm's future opportunities to finance new investment projects.

So, a stock is a security that gives its owner the right to a proportion of any profits that might be distributed (rather than reinvested) by the firm that issues the stock and to the corresponding part of the firm in case it decides to close down and liquidate. The owner of the stock is called the **stockholder**. The profits that the company distributes to the stockholders are called **dividends**.

Section C

Difference between stocks and bonds

- Randomness of dividend payments and absence of a guaranteed nominal value represent the main differences with respect to the coupon bonds: the bond's coupons and nominal value are predetermined.
- The stock, in principle, will not expire. We say "in principle," because the company might go out of business, in which case it would be liquidated and the stockholders will receive a certain part of the proceedings of the liquidation.
- When there is no risk of default, we can predict exactly how much a bond will pay if held until maturity. With stocks there is no such possibility: future dividends are uncertain, and so is the price of the stock at any future date. Therefore, a stock is always a risky security.
- With respect to the inflation uncertainty, stocks can behave better than bonds.
- General price increases mean that corporations are charging more for their sales and might be able to increase their revenues, and profits will go up. This reasoning does not apply to bonds.

Resource Two

Data Source



From an economic point of view, an important difference results from the type of legal claim they represent:

1. Bonds are financial instruments that allow people to allocate their purchasing decisions over time
 - With a bond, we have two people or entities, a debtor and a creditor. No physical assets or business activities involved
2. Stocks represent claims to the wealth in the economy
 - There has to be a corporation conducting some type of business behind the stock
 - Stock is issued when there is some business opportunity that looks profitable
 - When stock is issued, wealth is added to the economy
3. A stock will go up in price when the business prospects of the company improve. That increase will mean that the economy is wealthier
4. An increase in the price of a bond does not have that implication

Resource Two

Activities



- Activities**
1. Why are stocks usually more risky than bonds?

In questions 2–5 complete sentences with explanation or a specific term:

2. To have or own a share in a company is to have a ...
3. A certificate of a loan to the government or a corporation that is repaid with interest or a sum at a future time is a...
4. Profits of a firm that are distributed or given out to its investors are called...
5. A type of stock in which the stockholder gets a certain percentage of dividends each year based on the profits of the company is...

Resource Two

Further Reading



Explore

Book: "Options, Futures and Other Derivatives" by John Hull

Investopedia article:

<https://www.investopedia.com/video/play/stocks-versus-bonds/>



Resource Three Overview



Topic	Financial Investments and Returns
A-Level Modules	Capital investments, returns
Objectives	<p>After completing this resource you should be able to understand:</p> <ul style="list-style-type: none">✓ What financial investments are and how to calculate their returns.✓ Why some stocks earn higher return than others.✓ What the reasons behind fluctuation in security prices are.
Instructions	<ol style="list-style-type: none">1. Read the data source2. Complete the activities3. Explore the further reading
Context	<p>In an economic sense, an investment is the purchase of goods that are not consumed today but are used in the future to create wealth. In finance, an investment is a monetary asset purchased with the idea that the asset will provide income in the future or will later be sold at a higher price for a profit.</p>



Resource Three

Data Source



Section A

What are financial investments?

- Stocks and bonds are financial investments
- In general, investments can be:
 - ✓ Real investments: they require an input of physical resources today and deliver an output of resources tomorrow
 - ✓ Financial investments: claims to the output produced by real investments
- General point: people with productive ideas are not the same as people with wealth
- Stocks and bonds allow wealth to be transferred to people with ideas, who can use it productively

Example: A company with productive ideas in need of cash issues shares of stock to investors

- Proceeds used to build factory generating revenues
- After paying workers and depreciation, company left with earnings
- Some earnings paid to shareholders as dividends
- stocks = ownership

Later, to expand, company issues corporate bonds that promise fixed payment to bondholders

- bonds = borrowing (debt)

Stocks and bonds are traded in financial markets, where people (including you) can purchase them



Resource Three

Data Source



Section B Returns

How should we measure the performance of financial investments?

Let P_t denote the price of a security (e.g., a stock) at time t

Let D_{t+1} be the dividend paid by the stock on date $t+1$

Then the **gross simple return** between t and $t+1$ is a measure of how well a security performs:

$$1 + R_t = \frac{P_{t+1} + D_{t+1}}{P_t}$$

Higher returns mean greater earnings per amount invested.

Gross and net returns

Consider the following data for Microsoft:

Price 08/25/2011	Dividends during year	Price 08/24/2012
\$27.66	\$0.52	\$24.64

The gross return between August 25 2011 and August 24 2012 is:

$$\frac{P_{t+1} + D_{t+1}}{P_t} = \frac{24.64 + 0.52}{27.66} = .910$$

The net simple return is:

$$R_{t+1} = \frac{P_{t+1} + D_{t+1}}{P_t} - 1$$

In the example, net return = -0.99 or -9%

Multi-period returns

How should we measure the performance of financial investments over multiple years?

- ✓ Answer: gross return between t and $t+2$
- ✓ This is return from holding stock between t and $t+1$, reinvest dividends and hold until $t+2$

Resource Three

Data Source



Formally, the two-period compound return is:

$$1 + R_{t,t+2} = (1 + R_{t+1})(1 + R_{t+2})$$

Average returns

What is the average annual return?

Consider the case where there are only two years: year $t+1$ and year $t+2$.

One way to compute average return is simply to take the arithmetic mean:

$$R = \frac{R_{t+1} + R_{t+2}}{2}$$

Another way is to calculate geometric average.

Because of compounding, calculating the arithmetic average may be misleading. Instead, we want a return R such that:

$$(1 + R)(1 + R) = (1 + R_{t+1})(1 + R_{t+2}) , \text{ or}$$
$$R = [(1 + R_{t+1})(1 + R_{t+2})]^{1/2} - 1$$

Resource Three

Activities



Activities

1. Calculate return of a stock over 2 periods t and $t+2$, given that $R_{t+1}=10\%$ and $R_{t+2}=20\%$
2. What is the average annual return, where return in year 1 is 30%, while return in year 2 is 0%? Find both arithmetic and geometric averages.
3. Does it mean that earning 15% per year for two year is the same as the investment in question 2?
4. Consider a one-month investment in Microsoft stock. Suppose you buy the stock in month $t-1$ at $P_{t-1} = \$85$ and sell the stock the next month for $P_t = \$90$. Further assume that Microsoft does not pay a dividend between months $t-1$ and t . Find the one-month simple net and gross returns.
5. Continuing with the previous example, suppose that the price of Microsoft stock in month $t-2$ is \$80 and no dividend is paid between months $t-2$ and t . Calculate the two-month net return, two one-month returns, and the geometric average of the two one-month gross returns.

Resource Three

Further Reading



Explore

Khan Academy lectures:

www.khanacademy.org/economics-finance-domain/ap-macroeconomics/ap-financial-sector/nominal-v-real-interest-rates-ap/v/real-and-nominal-return



Books:

"The intelligent investor" by Benjamin Graham

"Value investing" by Christopher Browne

Resource Four Overview



Topic	Portfolios
A-Level Modules	Decision making, strategies
Objectives	<p>After completing this resource you should be able to:</p> <ul style="list-style-type: none">✓ Calculate portfolio return.✓ Distinguish between different weighting schemes.
Instructions	<ol style="list-style-type: none">1. Read the data source2. Complete the activities3. Explore the further reading
Context	<p>A portfolio investment is a hands-off or passive investment of securities in a portfolio, and it is made with the expectation of earning a return. This expected return is directly correlated with the investment's expected risk. Portfolio investment is distinct from direct investment, which involves taking a sizable stake in a target company and possibly being involved with its day-to-day management.</p> <p>For a young investor with limited funds, mutual funds or exchange-traded funds may be appropriate portfolio investments. For a high net worth individual, portfolio investments may include stocks, bonds, commodities, and rental properties</p>



Resource Four

Data Source



Section A

Introduction

Vanguard (<https://personal.vanguard.com/us/FundsByName>) offers various mutual funds for the investing public. All these funds are portfolios: they are combinations of various securities (stocks, bonds, etc.). To measure performance of a portfolio, recall:

$$1 + R_t = \frac{P_{t+1} + D_{t+1}}{P_t} = \frac{\text{Payoff tomorrow}}{\text{Price today}}$$

Assume you buy α_1 shares of stock 1 and α_2 shares of stock 2. The price (more precisely value) at time t is:

$$\alpha_1 P_{1t} + \alpha_2 P_{2t}$$

Next period, your portfolio is worth:

$$\alpha_1 (P_{1,t+1} + D_{1,t+1}) + \alpha_2 (P_{2,t+1} + D_{2,t+1})$$

Section B

Portfolio Return

The portfolio return is a weighted average of the individual stock returns, where the weights are the shares of wealth invested in each stock.

The portfolio return is:

$$1 + R_{p,t+1} = \frac{\alpha_1 (P_{1,t+1} + D_{1,t+1}) + \alpha_2 (P_{2,t+1} + D_{2,t+1})}{\alpha_1 P_{1t} + \alpha_2 P_{2t}}$$

Let ω_{it} be the fraction of wealth invested in stock i (for $i = 1, 2$), then

$$1 + R_{p,t+1} = \omega_{1t}(1 + R_{1,t+1}) + \omega_{2t}(1 + R_{2,t+1})$$

**Problem
solving**

Example: Invest 40% of wealth in MFT, 60% in GE

If $R_{MSFT} = 12.5\%$ and $R_{GE} = 25\%$, then

$$R_{portfolio} = 0.4 * 12.5\% + 0.6 * 25\% = 5\% + 15\% = 20\%$$

Resource Four

Data Source



Section C

Stock Indexes

Indexes are portfolios thought to represent the general stock market. Indexes are described by the number and identity of stock included, and the portfolio weight placed on them.

E.g. Dow Jones Industrial Average: a portfolio of 30 major stocks in America, including Boeing, Intel, Microsoft, Wal-Mart.

Alternative weighting scheme

1. Equal weighted: $\omega_i = 1/n$ (invest equal amount of dollars in all assets)
2. Price weighted: $\omega_i = P_i / (P_1 + \dots + P_n)$
 - E.g.: Dow Jones Industrial Average: a portfolio of 30 major stocks in America, including Boeing, Intel, Microsoft, and Wal-Mart
3. Value weighted: $\omega_i = V_i / (V_1 + \dots + V_n)$
 - Where V_i is the total market value of company i , $V_i = P_i * M_i$, where M_i is the number of shares outstanding
 - You invest more in companies with bigger market value
 - E.g.: Standard and Poor's 500: Index of 500 leading companies in the U.S.
4. Free float weighted: Same as value weighted, except shares held privately or by the government are excluded from the calculation
 - E.g.: Morgan Stanley Capital International indexes of foreign stocks.

Resource Four Activities



Activities



1. Portfolio weights in practice.

Suppose you have \$100, and consider the following stock market data:

Name	2012 Price	2013 Price	# of shares
ABC Co.	\$40	\$45	100
XYZ Ltd.	\$20	\$33	50

How do the equal-weighted, price-weighted, and value-weighted portfolios look like in 2012?

2. Consider an investor who forms a portfolio, consisting of only two stocks, by investing \$4,000 in one stock and \$6,000 in a second stock. Suppose that the results after 1 year are:

Stock	Investment	Value after 1 yr	Rate of return
A	\$4000	\$5000	$R_A = 25\%$
B	\$6000	\$5400	$R_B = -10\%$
Total	?	?	?

Find value-weighted portfolio return and fill in the table.

3. Consider a portfolio of Microsoft and Starbucks stock in which you purchase ten shares of each stock at the end of month t at the following prices $P_{msft,t} = \$85$ and $P_{sbux,t} = \$30$, respectively.

The initial value of the portfolio is $V_{t-1} = 10 \times \$85 + 10 \times \$30 = \$1,150$. Therefore, the proportion of each stock in the portfolio is $x_{msft} = 850/1150 = 0.7391\%$ and $x_{sbux} = 30/1150 = 0.2609\%$.

Then suppose at the end of month $t+1$ the prices of the shares have changed to, $P_{msft,t+1} = \$90$ and $P_{sbux,t+1} = \$28$.

Assuming that Microsoft and Starbucks do not pay a dividend between periods t and $t+1$, calculate the following:

- a) the returns on the two stocks
- b) the one-month rate of return on the portfolio
- c) the portfolio value at the end of month t .

Resource Four

Further Reading



Explore



1. Investopedia:
<https://www.investopedia.com/terms/p/portfolio-return.asp>
2. Online source on understanding of portfolio returns:
<https://faculty.washington.edu/ezivot/econ424/returnCalculations.pdf>

Resource Five Overview



Topic	Institutional Investors: Smart vs Dumb Money
A-Level Modules	Decision making, strategies
Objectives	<p>After completing this resource you should be able to understand:</p> <ul style="list-style-type: none">✓ What institutional investors are and the different types✓ The reasons for their growth and development.
Instructions	<ol style="list-style-type: none">1. Read the data source2. Complete the activities3. Explore the further reading
Context	<p>Retail and institutional investors invest in bonds, options, futures contracts and stocks. However, because of the nature of the securities and/or the manner in which transactions occur, some markets are primarily for institutional investors rather than retail investors.</p> <p>Retail investors pay brokerage firm fees along with marketing and distribution costs for each trade. In contrast, institutional investors send trades through to exchanges independently or through intermediaries; they negotiate a fee for each transaction and avoid paying marketing and distribution costs.</p>



Resource Five

Data Source



Section A

Institutional Investors



Trend over decades has been to greater institutional investing, and volume of trade on stock market now dominated by it. An epic shift of power in our society towards Wall Street.

An institutional investor is an organization that invests on behalf of its members. Institutional investors face fewer protective regulations because it is assumed they are more knowledgeable and better able to protect themselves.

Why are institutional investors important?

- institutions' growing dominance of the financial system and markets
- main players in securities investment
- illustrate all principles necessary for understanding securities investment
- careers in financial services are either in or dealing with institutional investors

Section B

The nature of institutional asset management

We must distinguish between **asset management** (service involving management of an investment portfolio on behalf of others) versus **institutional investment** (asset holder which may be distinct from the asset manager). So for example the Universities pension fund (institutional investor) may either manage its own funds (internal asset manager), or employ Merrill Lynch (external asset manager) to manage part or all of its portfolio.

Their size and growing importance justifies a focus on institutional investors. We shall see that institutions become more important as countries' financial systems become more sophisticated.

Resource Five

Data Source



There are also key cross country contrasts in financial structure – overall trends are common across countries but stylised differences remain. Notably, we see that financial sectors are larger and also institutional investors in the UK, US and Canada (Anglo Saxon countries) rather than in France, Germany, Italy and Japan (Europe and Japan).

The main types of institutional investors

- endowment funds
- commercial banks
- mutual funds
- hedge funds
- pension funds
- insurance companies

Section C

Mutual and hedge funds

Here we consider mutual and hedge funds, which are also known as dumb and smart money respectively. As we know, both mutual and hedge funds are managed portfolios, however they differ a lot in the way they manage those portfolios:

1. Hedge funds are managed in a much more aggressive fashion. Unlike mutual funds, hedge funds take speculative positions in derivatives, and they short sell stocks. With it comes increased risk, but also the chance to gain when the market is falling. Therefore, hedge funds are called smart, because they can take advantage of market conditions quickly and have some predictive ability.
2. Hedge funds are only available to accredited investors, who must meet a specific set of criteria to qualify. They are sophisticated investors with high net worth. Mutual funds are easy to purchase with minimal cash.

Resource Five Activities



- Activities** 1. What is a mutual fund? (Choose from below)

A company that pools investors' money to create an investment portfolio

Large insurance company with shareholders

A low risk hedge fund

2. How is a typical mutual fund managed in order to insure the best return on investment? (Choose from below)

Mutual funds are managed based on co-operative decisions made at quarterly shareholder meetings.

A professional investment manager manages a mutual fund on behalf of the investors.

A Certified Financial Planner is responsible to manage all aspects of any mutual fund.

3. Why hedge funds are called smart money?
4. The difference between hedge fund and mutual fund is? (Choose from below)
- a) A hedge fund is more regulated
 - b) There is no difference, both are heavily regulated
 - c) A mutual fund is more regulated
 - d) There is no difference, both are not heavily regulated

Resource Five

Further Reading



Explore



1. Khan Academy online resource on mutual funds and ETFs:
[https://www.khanacademy.org/economics-finance-domain/core-finance/investment-vehicles-tutorial#mutual-funds](https://www.khanacademy.org/economics-finance-domain/core-finance/investment-vehicles-tutorial/mutual-funds)
2. "Common sense on mutual funds" by John Bogle
3. "When genius failed" by Roger Lowenstein
4. "The Ultimate Hedge Fund Guide: How to Form and Manage a Successful Hedge Fund" by Frank Nagy

Resource Six Overview



Topic	Trading
A-Level Modules	Price determination, market mechanism
Objectives	<p>After completing this resource you should be able to understand:</p> <ul style="list-style-type: none">✓ Long and short positions in the market.✓ What forward and futures contracts are.✓ Market indexes and the role they play in financial markets.
Instructions	<ol style="list-style-type: none">1. Read the data source2. Complete the activities3. Explore the further reading
Context	<p>Trading is an active style of participating in the financial markets, which seeks to outperform traditional buy-and-hold investing. Instead of waiting to profit from long-term uptrends in the markets, traders seek short-term price moves in order to profit during both rising and falling markets. As a trader, you can be your own boss, work from home, set your own schedule and have the opportunity to achieve unlimited income potential. These factors, combined with the ease with which someone can enter the field, help make trading attractive.</p>



Resource Six

Data Source



Section A

Going long or short?

Short-selling the stock consists in borrowing the stock from someone who owns it and selling it. The short-seller hopes that the price of the stock will drop. When that happens, she will buy the stock at that lower price and return it to the original owner. The investor that owes the stock has a **short position** in the stock. The act of buying back the stock and returning it to the original owner is called **covering the short position**.

Section B

Futures and forwards

Futures and forwards are contracts by which:

- one party agrees to buy the underlying asset (this party takes a long position in the contract) at a future, predetermined date (maturity) at a predetermined price (futures price or forward price), and
- the other party agrees to deliver the underlying (this party takes a short position in the contract) at the predetermined date for the agreed price

There is no exchange of money today for this obligation to buy/sell at the forward/futures price.

The difference between the futures and forwards is the way the payments are made from one party to the other:

- In the case of a forward contract, the exchange of money and assets is made only at the final date
- For futures the exchange is more complex, occurring in stages – futures are marked to market which entails less bookkeeping. It is for this reason that futures are traded on exchanges

Resource Six

Data Source



Section C

Reasons for trading futures



An investor may want to use futures for:

1. Speculation: bet on the direction of the price of the underlying
2. Leverage:
 - a) trading futures provides a way of borrowing assets; futures provide embedded leverage
 - b) trading in futures requires less initial investment than buying the commodity immediately at the spot price
3. Hedging (risks of other positions or business moves): A farmer who will harvest corn in four months and is afraid that an unexpected drop in the price of corn might run him out of business can take a short position in a futures contract on corn with maturity at the date of the harvest to eliminate uncertainty about the price

Section D

Organisation of financial markets

Some securities and financial contracts can be purchased, or entered into, in markets with a physical location. Those markets are called exchanges.

- ✓ New York Stock Exchange (NYSE) – trades stocks of most of the largest companies
- ✓ American Exchange (Amex) – trades stocks of smaller companies
- ✓ Chicago Board of Options Exchange (CBOE)
- ✓ Chicago Board of Trade (CBOT), Chicago Mercantile Exchange (CME) – trade futures contracts
- ✓ Corporate bonds are typically traded on exchanges

Resource Six

Data Source



Some securities and contracts are sold through sources without a physical location. They are traded over the counter or on an OTC market.

- ✓ The National Association of Security Dealers Automated Quotation (Nasdaq)
- ✓ American Exchange or Amex (trades stocks of smaller companies)
- ✓ Treasury bonds, issued by the U.S. Treasury, are traded OTC
- ✓ Exotic options trade only OTC

In the United States there are two federal agencies that oversee the proper functioning of financial markets:

1. The Securities and Exchange Commission (SEC) oversees the securities markets, stocks, and options
2. The Commodities and Futures Trading Commission (CFTC) in charge of the futures markets

Section E

Organisation of financial markets

An index tries to express through a single number a summary of the level of the markets or a subset of markets.

1. Standard & Poor's 500 (S&P 500) Weighted average (by market capitalization value) of the prices of 500 of the largest stocks listed on the NYSE or Nasdaq
2. Dow Jones Industrial Average (DJIA) Weighted average of 30 of the most important companies (highly correlated with the S&P 500)
3. Nasdaq index Weighted average (by market capitalization value) of all the securities listed on Nasdaq (indicator of the performance of the technology sector)
4. Russell 3000, Russel 2000, Wilshire 6000

Resource Six

Activities



Activities

1. Can agents buy a negative amount of a financial asset in practice?
2. What are the price expectations of an investor who takes a long position?
3. Explain the process of short-selling, particularly, how investors expect the stock price to behave when they are taking a short position?
4. What is the main difference between futures and forwards?
5. Explain what hedging is, particularly, what can it be compared to and why investors want to hedge their portfolios.

Resource Six

Further Reading



Explore



1. Try some trading games for you to understand how it works:
 - <https://www.wallstreetsurvivor.com/>
 - <https://www.howthemarketworks.com/>
2. Book: "Liar's Poker" by Michael Lewis
3. Movie: "Big Short"

Final Reflection



Topic	How do you Understand Financial Markets?
Objectives	<p>By the end of this course you should now have a better understanding of financial markets and its participants. You should be able to distinguish between institutional and retail investors, dumb and smart money. You will be able to calculate portfolio returns and know how trading works.</p> <p>In the further assignment, you can try your hand as a market participant by playing a game with your friends or family. You will see how the index can be tracked and what it is comprised of. This will allow you to practice simple trading and portfolio formation strategies.</p>
Instructions	<p>To better understand how it can be used on practice complete the following task:</p> <ol style="list-style-type: none">1. Imagine you and your friend open a hedge funds. It means that you are active investors and ready to take risk for higher return.2. Each of you should choose 10 stocks from list of companies in S&P500 that you want to include in your portfolio. Note that your portfolio should be constructed so you can earn positive return in the end, so be careful with your choice. To help you with that you might want to see how those stocks performed during the last year and make some assumptions about their future performance.3. For the next month, rebalance your portfolio every week based on the actual performance of your portfolio.4. At the end of the month calculate your portfolio returns and see who was a "Smart" investor!

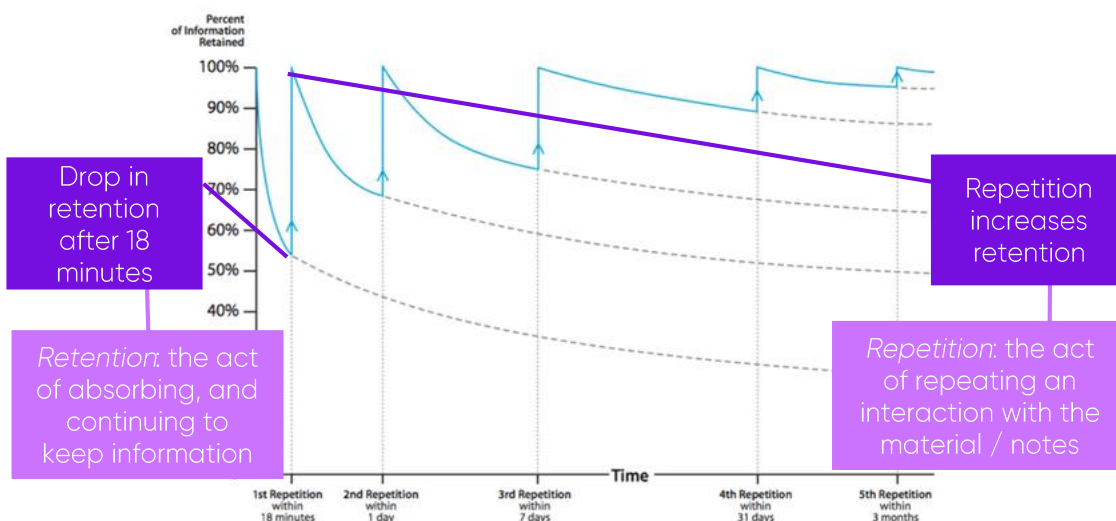
University Study Skills Cornell Notes



Why is good note taking important?

If it feels like you forget new information almost as quickly as you hear it, even if you write it down, that's because we tend to lose almost 40% of new information within the first 24 hours of first reading or hearing it.

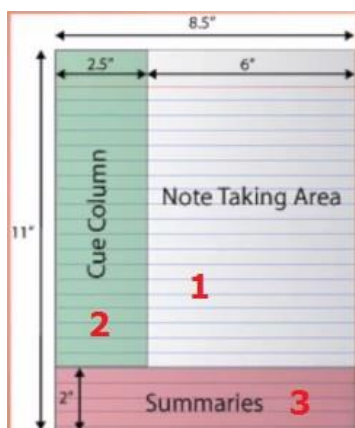
If we take notes effectively, however, we can retain and retrieve almost 100% of the information we receive. Consider this graph on the rate of forgetting with study/repetition:



Learning a new system

The Cornell Note System was developed in the 1950s at the University of Cornell in the USA. The system includes interacting with your notes and is suitable for all subjects. There are three steps to the Cornell Note System.

Step 1: Note-Taking



1. Create Format: Notes are set up in the Cornell Way. This means creating 3 boxes like the ones on the left. You should put your name, date, and topic at the top of the page.

2. Write and Organise: You then take your notes in area on the right side of the page. You should organise these notes by keeping a line or a space between 'chunks' / main ideas of information. You can also use bullet points for lists of information to help organise your notes.

Step 2 Note-Making

1. Revise and Edit Notes: Go back to box 1, the note taking area and spend some time revising and editing. You can do this by: highlighting 'chunks' of information with a number or a colour; circling all key words in a different colour; highlighting main ideas; adding new information in another colour

2. Note Key Idea: Go to box 2 on the left hand side of the page and develop some questions about the main ideas in your notes. The questions should be 'high level'. This means they should encourage you to think deeper about the ideas. Example 'high level' questions would be:

- Which is most important / significant reason for...
- To what extent...
- How does the (data / text / ideas) support the viewpoint?
- How do we know that...

Here is an example of step 1 and step 2 for notes on the story of Cinderella:

Questions:	Notes:
How does C's mother die?	<ul style="list-style-type: none"> • Cinderella is an only child • Cinderella's dad might <u>spoil</u> her • Cinderella's Step-Mother is <u>jealous</u> of her beauty • Maybe Cinderella becomes the <u>woman of the house</u>
Why does C make the Step-M so angry?	<p>↳ BUT then the Step-Mother wants that <u>position</u>.</p>
↓ What language shows this?	<p>* <u>Key point</u> → Fairy takes teach is <u>morals</u></p>
* What is the moral of 'C'?	
How do I know?	<ul style="list-style-type: none"> • Cinderella is <u>kind</u> → her Step-M is not
Is this just one side of the story?	<ul style="list-style-type: none"> • Is there a <u>reason</u> for C to be badly be treated?

Step 3 Note-Interacting

1. Summary: Go to box 3 at the bottom of the page and summarise the main ideas in box 1 and answer the essential questions in box 2.

Summary:	<p>Because C is an only child, she takes over as 'woman of the house' when her real M dies. Her Step-M is jealous and angry. We only get C's side of the story so it is difficult to know whether C is really badly treated for no reason.</p>
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Give the Cornell Note Taking System a try and see if it works for you!

University Study Skills

Key Instruction Words



These words will often be used when university tutors set youu essay questions – it is a good idea to carefully read instruction words before attempting to answer the question.

Analyse – When you analyse something you consider it carefully and in detail in order to understand and explain it. To analyse, identify the main parts or ideas of a subject and examine or interpret the connections between them.

Comment on – When you comment on a subject or the ideas in a subject, you say something that gives your opinion about it or an explanation for it.

Compare – To compare things means to point out the differences or similarities between them. A comparison essay would involve examining qualities/characteristics of a subject and emphasising the similarities and differences.

Contrast – When you contrast two subjects you show how they differ when compared with each other. A contrast essay should emphasise striking differences between two elements.

Compare and contrast – To write a compare and contrast essay you would examine the similarities and differences of two subjects.

Criticise – When you criticise you make judgments about a subject after thinking about it carefully and deeply. Express your judgement with respect to the correctness or merit of the factors under consideration. Give the results of your own analysis and discuss the limitations and contributions of the factors in question. Support your judgement with evidence.

Define – When you define something you show, describe, or state clearly what it is and what it is like, you can also say what its limits are. Do not include details but do include what distinguishes it from the other related things, sometimes by giving examples.

Describe – To describe in an essay requires you to give a detailed account of characteristics, properties or qualities of a subject.

Discuss – To discuss in an essay consider your subject from different points of view. Examine, analyse and present considerations for and against the problem or statement.

University Study Skills

Key Instruction Words



Evaluate – When you evaluate in an essay, decide on your subject's significance, value, or quality after carefully studying its good and bad features. Use authoritative (e.g. from established authors or theorists in the field) and, to some extent, personal appraisal of both contributions and limitations of the subject. Similar to **assess**.

Illustrate – If asked to illustrate in an essay, explain the points that you are making clearly by using examples, diagrams, statistics etc.

Interpret – In an essay that requires you to interpret, you should translate, solve, give examples, or comment upon the subject and evaluate it in terms of your judgement or reaction. Basically, give an explanation of what your subject means. Similar to **explain**.

Justify – When asked to justify a statement in an essay you should provide the reasons and grounds for the conclusions you draw from the statement. Present your evidence in a form that will convince your reader.

Outline – Outlining requires that you explain ideas, plans, or theories in a general way, without giving all the details. Organise and systematically describe the main points or general principles. Use essential supplementary material, but omit minor details.

Prove – When proving a statement, experiment or theory in an essay, you must confirm or verify it. You are expected to evaluate the material and present experimental evidence and/or logical argument.

Relate – To relate two things, you should state or claim the connection or link between them. Show the relationship by emphasising these connections and associations.

Review – When you review, critically examine, analyse and comment on the major points of a subject in an organised manner

Exploring Careers and Study Options

- ✓ Find job descriptions, salaries and hours, routes into different careers, and more at <https://www.startprofile.com/>
- ✓ Research career and study choices, and see videos of those who have pursued various routes at <http://www.careerpilot.org.uk/>
- ✓ See videos about what it's like to work in different jobs and for different organisations at <https://www.careersbox.co.uk/>
- ✓ Find out what different degrees could lead to, how to choose the right course for you, and how to apply for courses and student finance at <https://www.prospects.ac.uk/>
- ✓ Explore job descriptions and career options, and contact careers advisers at <https://nationalcareersservice.direct.gov.uk/>
- ✓ Discover which subjects and qualifications (not just A levels) lead to different degrees, and what careers these degrees can lead to, at <http://www.russellgroup.ac.uk/media/5457/informed-choices-2016.pdf>

Comparing Universities

- ✓ <https://www.whatuni.com/>
- ✓ <http://unistats.direct.gov.uk/>
- ✓ <https://www.thecompleteuniversityguide.co.uk/>
- ✓ Which? Explorer tool – find out your degree options based on your A level and BTEC subjects: <https://university.which.co.uk/>

UCAS

- ✓ Key dates and deadlines: <https://university.which.co.uk/advice/ucas-application/ucas-deadlines-key-application-dates>
- ✓ Untangle UCAS terminology at <https://www.ucas.com/corporate/about-us/who-we-are/ucas-terms-explained>
- ✓ Get advice on writing a UCAS personal statement at <https://www.ucas.com/ucas/undergraduate/getting-started/when-apply/how-write-ucas-undergraduate-personal-statement>
- ✓ You can also find a template to help you structure a UCAS statement, at <https://www.ucas.com/sites/default/files/ucas-personal-statement-worksheet.pdf>
- ✓ How to survive Clearing: <https://university.which.co.uk/advice/clearing-results-day/the-survivors-guide-to-clearing>



Finance at University



- ✓ Finance is a field that is concerned with the allocation (investment) of assets and liabilities over space and time, often under conditions of risk or uncertainty. Finance can also be defined as the art of money management.
- ✓ You will learn how to make decisions taking into account all available information. You will also develop programming skills by doing quantitative analysis using different software.
- ✓ You can find out more about different courses and entry requirements by exploring the UCAS Finance Guide online:
<https://www.ucas.com/ucas/subject-guide-list/business-management-and-administrative-studies>
- ✓ You can find out more about the different careers by exploring the UCAS Investment Analyst Careers online:
<https://www.ucas.com/ucas/after-gcses/find-career-ideas/explore-jobs/job-%20profile?k=finance&j=/investment-analyst>

A Deeper Look Into Finance

- ✓ Read: Financial Times: <https://www.ft.com/>
- ✓ Read: The Economist: <https://www.economist.com/>
- ✓ Read: "The Black Swan" by Nassim Nicolas Taleb
- ✓ Read: "A random walk down Wall Street" by Burton Malkiel
- ✓ Browse: <http://www.nasdaq.com/markets/crude-oil-brent.aspx?timeframe=6m>
<https://www.bloomberg.com/quote/USDKZT:CUR>
- ✓ Browse: <https://www.khanacademy.org/economics-finance-domain/core-finance> - Khan Academy online lessons
- ✓ Browse: <https://www.math.utah.edu/~eyre/computing/matlab-intro/> - Intro to Matlab



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