

Financial Economics

ECON2103

Lecture 1:
*Introduction, and What is
Money*

Dr Shino Takayama
University of Queensland
2024



Introduction to Introduction

- Financial Economics is a field that studies how people or firms (or government) make decisions in financial markets. It covers concepts like how money's value changes over time, the relationship between risk and return, pricing of assets like stocks and bonds, and the efficiency of markets. In this course, we will learn important concepts and topics in financial economics.



Agenda

- Introduction to Introduction
- Introduction to the Course
- Topic one: What is Money?
- Topic two: Inflation
- Topic three: Present Value and Yield to Maturity
- Topic four: The Manhattan Story
- Summary

Learning Objectives

- Understanding what this course is about
- Defining money
- Exploring why inflation can cause a serious problem in our economy
- Calculate the present value of future cash flow
- Defining the yield to maturity



Introduction

About the course

About the Team

- Instructor: Shino Takayama
 - Email: s.takayama1@uq.edu.au
 - Please mention the course code (ECON2103) in your email.
 - Consultation: Thursday 9:00am—10:00am & noon–1:00pm or by Appointment
 - Location: 39-617

Tutors:	Consultation Time	Venue
Yunlong Liu	Wednesday 3.00 – 5.00 pm	Building 39 – 125A



About the Team

- Lecture/Tutorial timetables available on UQ Allocate+ (<https://timetable.my.uq.edu.au/odd/timetable/#subjects>)
- Please check the venue before going to the tutorial.

• Student Enquiries – School of Economics

- Always check the Electronic Course Profile (ECP) & Course Blackboard site for information

Contact your Course Coordinator if you have questions about:

- ✓ Assessment format and content
- ✓ Learning materials
- ✓ Marks and assessment feedback
- ✓ Anything academic/course content related

Contact the School's Professional Staff Team on enquiries@economics.uq.edu.au

(*include the Course Code in the Subject line, e.g. ECON2103*) if you have questions about:

- ✓ Timetable and tutorial allocation
- ✓ Blackboard access
- ✓ Extension to assessment due date requests
- ✓ Deferred / Supplementary In-Semester Exams
- ✓ Anything admin related

The Course: Objective

- To acquire knowledge about Contemporary Topics in Financial Markets and discuss them.
- After completing this course, you will be able to:
 1. Use economic theories to analyse choices under uncertainty in the context of financial markets
 2. Demonstrate how to price financial assets using financial economic theories
 3. Illustrate the impact of asymmetric information on financial transactions
 4. Identify financial phenomena and assess their implications for economies



Teaching Materials

- The teaching materials are partially based on the followings:
 1. “The Economics of Money, Banking, and Financial Markets,” by F. Mishkin, Pearson Global edition, 12th edition
 2. “Financial Economics,” by F. J. Fabozzi, E.H. Neave, and G. Zhou, Wiley.
- I will also use academic papers and newspaper articles which will be posted when they are available.
- The slides are self-contained.

Learning Activities

1: Introduction to Financial Economics and What is Money	Mishkin (Ch 3-4)
2: The Foundation of Financial Economics	Fabozzi (Ch 3-4); Mishkin (Ch 4)
3: Investment Decision and Asset Pricing	Fabozzi (Ch 9-10); Mishkin (Ch 4)
4: Asymmetric Information and Financial Contract	Fabozzi (Ch 9-10); Mishkin (Ch 8)
5: Risk and Insurance; Guest Lecture	Fabozzi (Ch 10-11)
6: CAPM and Investment	Fabozzi (Ch 14)
7: Efficient Market Hypothesis and Behavioural Finance	Fabozzi (Ch 9); Mishkin (Ch 7)
8: Financial Crisis	Mishkin (Ch 11-12)
9: Financial Regulation and Central Bank	Mishkin (Ch 10&14)
10: Central Bank and Cryptocurrency	Mishkin (Ch 14-15)

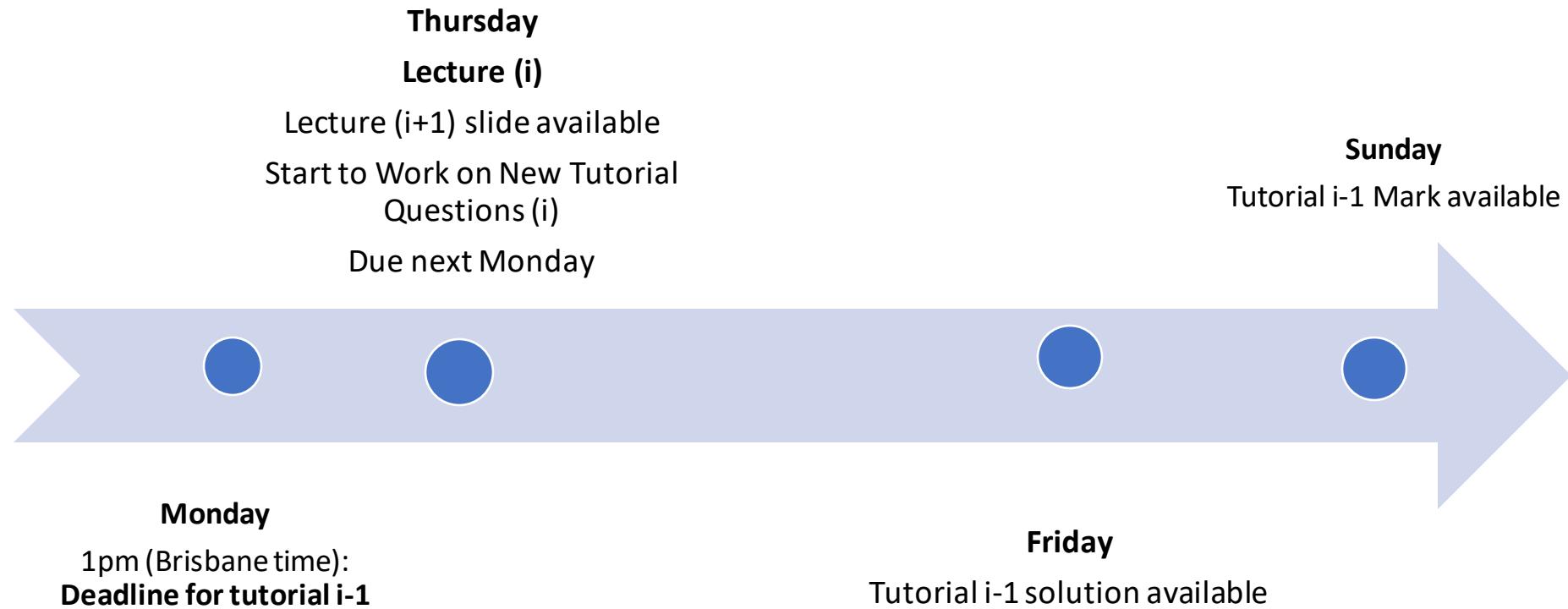
Assessment

Task Item	Time/Due	Weights to Grade
Tutorial Preparation	26 February – 24 May	10%
Essay -- Assignment	3 May 16:00	25%
Group Presentation	16, 23 May	25%
Final Examination	During the exam week	40%

Tutorial Preparation

- **Due:** every Monday 1pm (Brisbane time)
- The submission for each tutorial is marked out of 2 marks per tutorial.
- You have to **attempt all the questions.**
- Your answers do not need to be correct, but you have to be sincere in your attempt.
- If your attempt is inadequate, you receive only 1 mark.
- Questions will be available a week before the deadline.
- You can submit in Blackboard and please use an openable file format for tutors, such as .docx, or .pdf.

Snapshot for one week (Week i)



Tutorials

Go through Questions in tutorial i-1

Assignment

- Contributes **25%** toward final grade
- **Due: Friday 3 May, at 4pm** (Brisbane time)
- Each student submit one essay (with proper introduction & conclusion).
- You will be given an article to read, summarize, explain a concept, and discuss.
- Writing guides available in the Assessment tab on Blackboard.

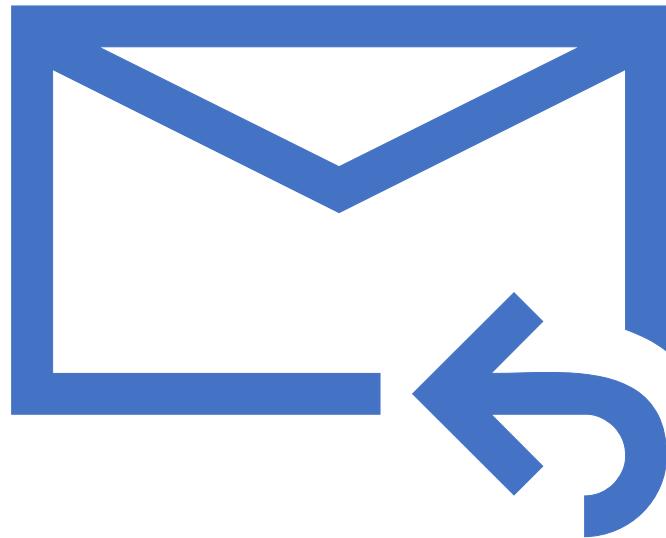
Group Presentation

- Contributes **25%** toward final grade
- Students are required to work in groups of 4 to 5.
- The assignment questions will be made available on Blackboard.
- Each group makes a 5-min presentation.
- Please try to form your group with your friends by the end of week 3.
- Please sign up the google sheet by the end of week 3 (finalized).
- If there is an issue, please let us know.

Final Examination

- Contributes **40%** toward final grade
- **During the examination week**
- Format: Multiple-choice, Short answer, Problem solving
- It covers ALL topics of the course

Feedback about the Course



- Please email me at s.takayama1@uq.edu.au
- Talk to Shino or your tutor
- Join consultation hours
- Padlet for each Lecture
- Discussion in the Blackboard

Financial Economics vs Finance

- Financial Economics: A specialized branch of economics that analyses the **intersection of financial markets and economic behaviour**.
- It uses **economic theories** to understand **financial phenomena** and **their impact on the economy**.
- Finance: A broader field that covers various aspects of **financial management** and **decision-making**, including personal finance, corporate finance, investment management, and risk management.
- Disclaimer: the line between the two areas are quite blurry, and sometimes indistinguishable.

Let's Play a Placing Game!

- I will give you some article titles from two leading journals:
 - Journal of Financial Economics
 - The Journal of Finance
- Have a think about which journal do think the title belongs to.
 - If possible, give a comment as to why.



ARTICLES

MIKHAIL CHERNOV, MAGNUS DAHLQUIST, and LARS LOCHSTOER
Pricing Currency Risks

XUEWEN LIU
A Model of Systemic Bank Runs

MATHIEU AUBRY, ROMAN KRÄUSSL, GUSTAVO MANZO, and CHRISTOPHE SPAENJERS
Biased Auctioneers

BRIAN H. BOYER, TAYLOR D. NADAULD, KEITH P. VORKINK, and MICHAEL S. WEISBACH
Discount-Rate Risk in Private Equity: Evidence from Secondary Market Transactions

JOHN M. GRIFFIN, NICHOLAS HIRSCHEY, and SAMUEL KRUGER
Do Municipal Bond Dealers Give Their Customers "Fair and Reasonable" Pricing?

HIASUN LI
Information Aggregation via Contracting

BRUNO BIAIS, CHRISTOPHE BISIÈRE, MATTHIEU BOUARD, CATHERINE CASAMATTA, and ALBERT J. MENKVELD
Equilibrium Bitcoin Pricing

ANTONIO GARGANO, MARCO GIACOLETTI, and ELVIS JARNECIC
Local Experiences, Search, and Spillovers in the Housing Market

YARON LEITNER and BASIL WILLIAMS
Model Secrecy and Stress Tests

PAUL GOLDSMITH-PINKHAM and KELLY SHUE
The Gender Gap in Housing Returns

(Contents continued on back cover)

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Financial markets and unemployment

Tommaso Monacelli, Vincenzo Quadrini, Antonella Trigari

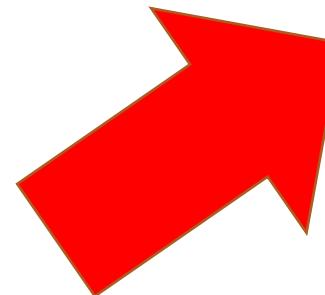
We study the importance of financial markets for (un)employment fluctuations in a model with matching frictions where firms borrow under limited enforcement. Borrowing affects employment through a ‘debt bargaining channel’: higher debt improves the bargaining position of employers with workers and increases the incentive to hire. We estimate the model structurally and find that the debt bargaining channel accounts for 26 percent of unemployment fluctuations. We find empirical support for the channel at the micro level using firm level data from Compustat.



Financial markets and unemployment

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The Cross-Section of Expected Stock Returns

Eugene Fama, Kenneth French

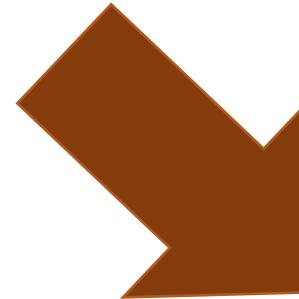
Two easily measured variables, size and book-to-market equity, combine to capture the cross-sectional variation in average stock returns associated with market β , size, leverage, book-to-market equity, and earnings-price ratios. Moreover, when the tests allow for variation in β that is unrelated to size, the relation between market β and average return is flat, even when β is the only explanatory variable.



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Theory of the firm: Managerial behavior, agency costs and ownership structure

Michael Jensen, William Meckling

This paper integrates elements from the theory of agency, the theory of property rights and the theory of finance to develop a theory of the ownership structure of the firm. We define the concept of agency costs, show its relationship to the 'separation and control' issue, investigate the nature of the agency costs generated by the existence of debt and outside equity, demonstrate who bears these costs and why, and investigate the Pareto optimality of their existence. We also provide a new definition of the firm, and show how our analysis of the factors influencing the creation and issuance of debt and equity claims is a special case of the supply side of the completeness of markets problem.

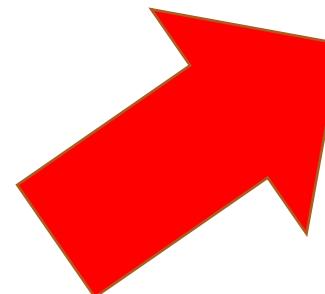
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The Journal of
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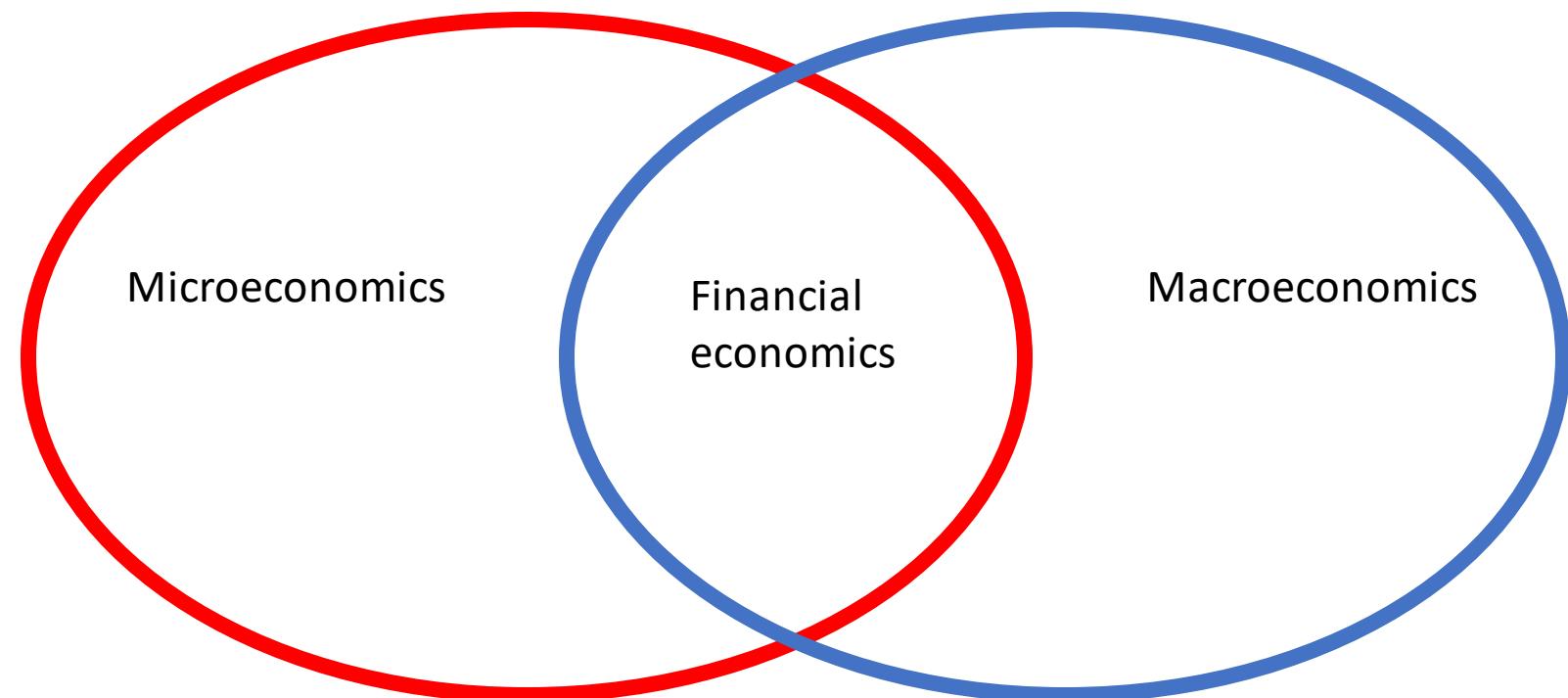


So, what is Financial Economics?

A perfect blend of:

- Microeconomics;
- Macroeconomics.

(and actually
Econometrics too, if
you want to be
thorough)



Disclaimer: This oversimplified Venn diagram is not exhaustive

What are keywords that appear in your mind when you heard “Financial Economics”?



Topic one

What is Money?

What is Money?

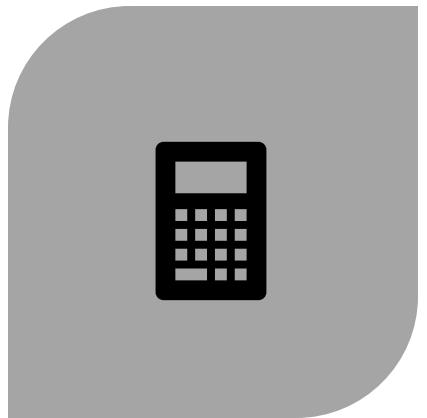
- Money is anything that is generally accepted as payment for goods or services or in the repayment of debts.



Functions of Money



MEDIUM OF EXCHANGE



UNIT OF ACCOUNT



STORE OF VALUE

Functions of Money: Medium of Exchange

- **Medium of Exchange:**
 - Eliminates the trouble of finding a double coincidence of needs (reduces transaction costs)
 - Promotes specialization
- A medium of exchange must:
 - be easily standardized
 - be widely accepted
 - be divisible
 - be easy to carry
 - not deteriorate quickly



Functions of Money: Unit of Account

- **Unit of Account:**
 - Used to measure value in the economy
 - Reduces transaction costs

Functions of Money: Store of Value

- **Store of Value:**
 - Used to save purchasing power over time
 - Other assets also serve this function.
 - Money is the most liquid of all assets but loses value during inflation.



Topic two

Inflation

Hyperinflation in Germany

- To fund WWI, Germany decided to borrow money, instead of imposing income tax.
- German government expected that they would win and so they would obtain massive reparations from other defeated nations.
- Germany lost the war with a massive war debt and reparations (130 Billion Mark by Versailles Treaty).
- One strategy that Germany used was the mass printing of bank notes to buy foreign currency, which was then used to pay reparations.
- The Government issued Rentenmark (1 trillion Mark).

Rentenmark

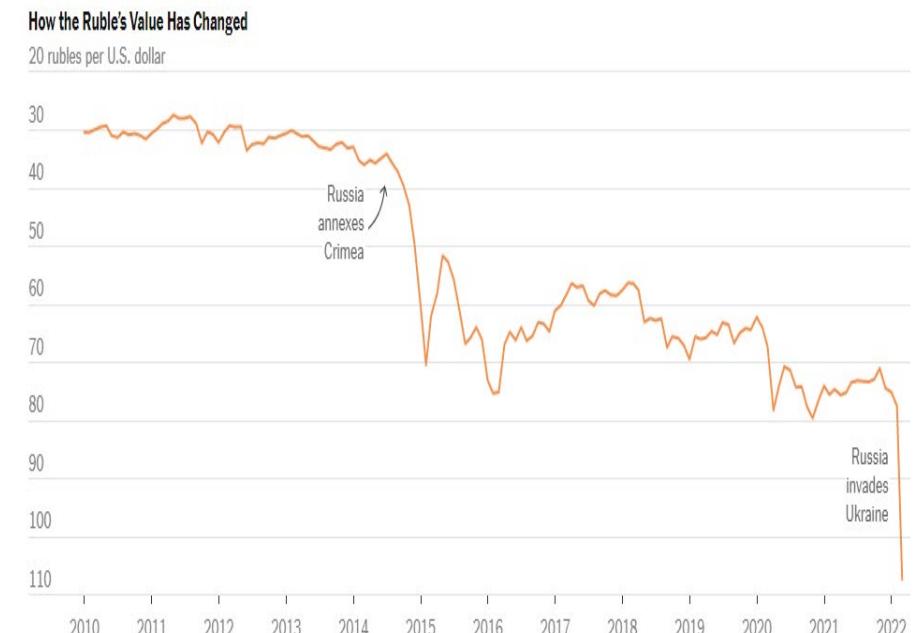
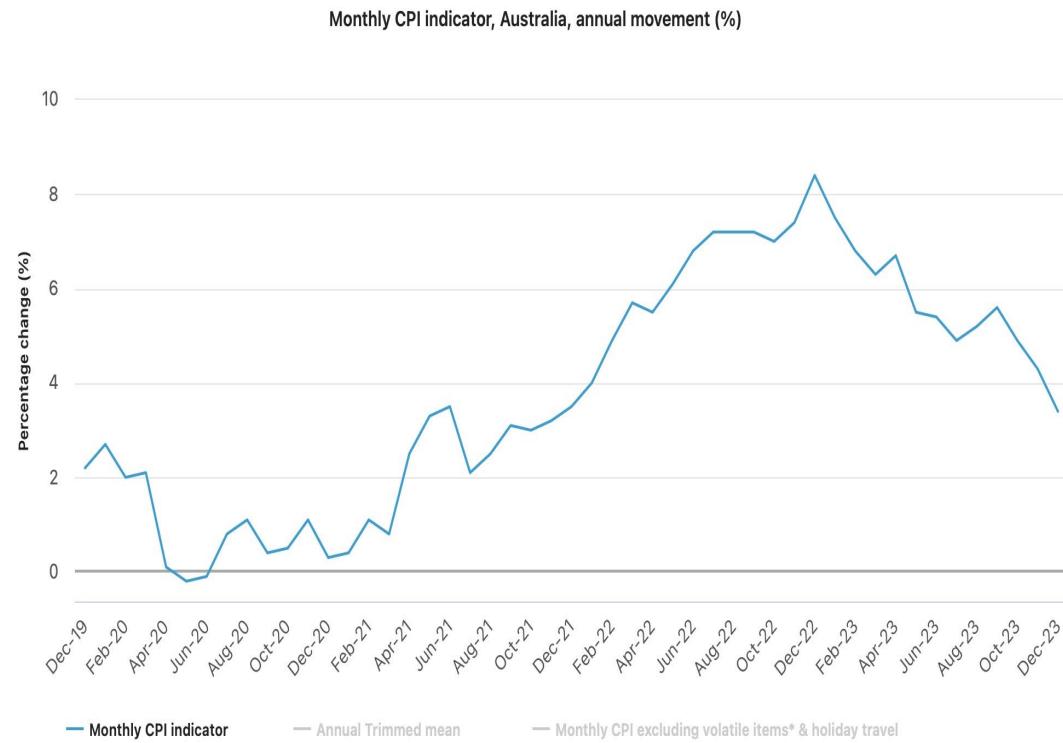
(Source: Historisches Museum der Pfalz, Speyer / Vanessa Velikonja, HMP Speyer
<https://rlp.museum-digital.de/>)



Germany in 1922 - 23



<https://mashable.com/2016/07/27/german-hyperinflation/#fzzVyTBpVsqh>



Australia's Consumer Price Index (CPI)

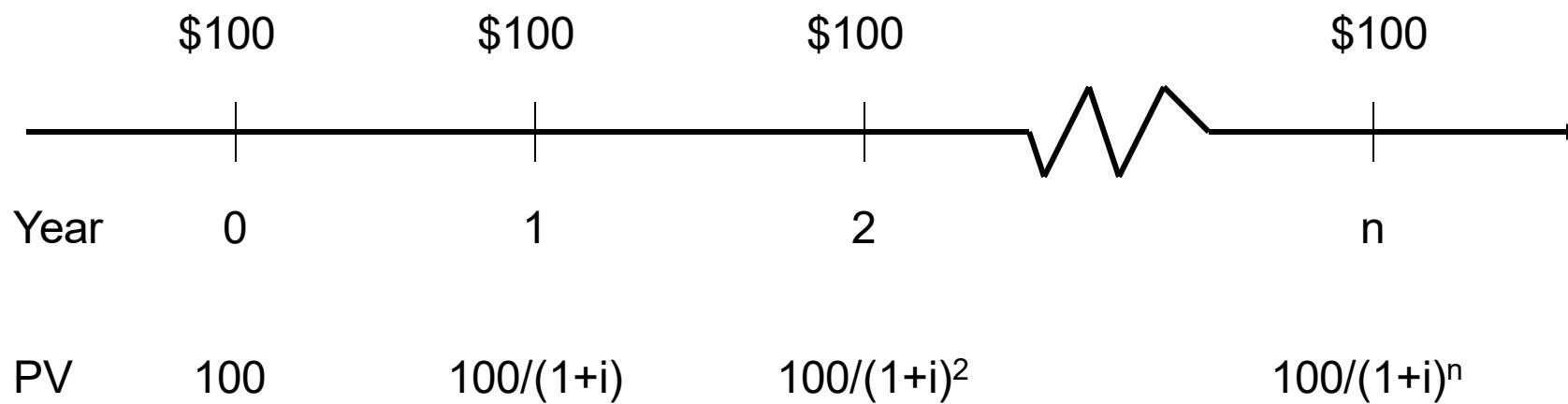
Russian Ruble

Topic three

Present Value

Simple Present Value

- Cannot directly compare payments scheduled in different points in the timeline



Simple present value

- Let PV denote today's (present) value.
- Let CF denote future cash flow (payment) in year n .
- Let i denote the interest rate.
- Then Equation 1 states:

$$PV = \frac{CF}{(1 + i)^n}$$

Intuition of Equation 1

- If you had the \$1 today, you could invest it and end up with more than \$1 in ten years.
- Intuitively, what Equation 1 tells us is that if you are promised \$1 for certain ten years from now, this dollar would not be as valuable to you as \$1 is today.
- An interest rate is the cost of borrowing or the price paid for the rental of funds.
- Today, we see that a concept known as the yield to maturity is the most accurate measure of interest rate.

Present Value

- Consider the following two income streams and a market rate of interest of 10%:

$$(y_1^A, y_2^A) = (1000, 770) \text{ and } (y_1^B, y_2^B) = (200, 1650)$$

- Then the wealth in time 1 is

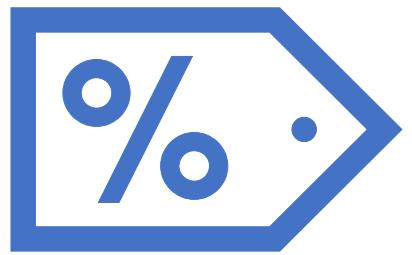
$$w_1^A = 1000 + \frac{770}{1.1} = 1700$$

$$w_1^B = 200 + \frac{1650}{1.1} = 1700$$



Yield to Maturity

- **Yield to maturity:** the interest rate that equates the **present value of cash flow payments** received from a debt instrument with **its value today**



Example: Coupon Bond

- A coupon bond is a type of debt security or bond that pays periodic interest, known as coupons, to its holder.
- A coupon bond with \$1,000 face value might pay you a coupon payment of \$100 per year for ten years, and at the maturity date repay you the face value amount of \$1,000.
- The **coupon rate** is then $\$100/\$1,000$, which is 0.10, or 10%.

Coupon bond

- Let P denote the price of the bond.
- Let C denote the yearly coupon payment.
- Let F denote the face value of the bond.
- Let n denote the number of years to maturity.
- Then Equation 3 is

$$P = \frac{C}{1+i} + \frac{C}{(1+i)^2} + \frac{C}{(1+i)^3} + \cdots + \frac{C}{(1+i)^n} + \frac{F}{(1+i)^n}$$

Table 1: From Equation 3

**TABLE 1 Yields to Maturity on a 10%-Coupon-Rate Bond Maturing
in Ten Years (Face Value = \$1,000)**

Price of Bond (\$)	Yield to Maturity (%)
1,200	7.13
1,100	8.48
1,000	10.00
900	11.75
800	13.81

$$800 = \frac{100}{1+i} + \frac{100}{(1+i)^2} + \frac{100}{(1+i)^3} + \cdots + \frac{100}{(1+i)^{10}} + \frac{1000}{(1+i)^{10}} \rightarrow i = 0.138052 \dots$$

Consol

- **Consol or perpetuity:** a bond with no maturity date that does not repay principal but pays fixed coupon payments forever

P_C = price of the consol

C = yearly interest payment

i_C = yield to maturity of the consol

$$P_C = \frac{C}{i_c} \quad \text{⌚️ See Calculation in the next slide!}$$

For coupon bonds, this equation gives the **current yield**, easy to calculate approximation to the yield to maturity.

Infinite series

We want to study $S_n = a + a^2 + \cdots + a^n$.

$$\begin{aligned} S_n &= a + a^2 + \cdots + a^n \\ - aS_n &= \quad a^2 + a^3 + \cdots + a^{n+1} \end{aligned}$$

$$\text{Thus } (1 - a)S_n = a - a^{n+1}$$

$$\text{Finally } S_n = \frac{(a - a^{n+1})}{1-a}$$

If $a < 1$, when $n \rightarrow \infty$, $S_n \rightarrow \frac{a}{1-a} = \frac{1}{1-a} - 1$

Consol – Alfred Nobel

“All of my remaining realisable assets are to be disbursed as follows: the capital, converted to safe securities by my executors, is to constitute a fund, the interest on which is to be distributed annually as prizes to those who, during the preceding year, have conferred the greatest benefit to humankind.”

- Alfred Nobel’s will -

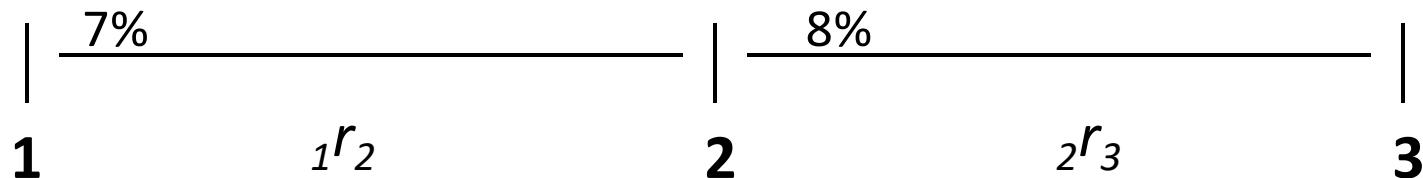


Source: nobelprize.org

- Physics
- Chemistry
- Medicine
- Literature
- Peace
- Economics (added in 1968)

Returns on financial instruments outstanding for several periods

- Consider a simple numerical example with interest rates as shown in the following diagram:



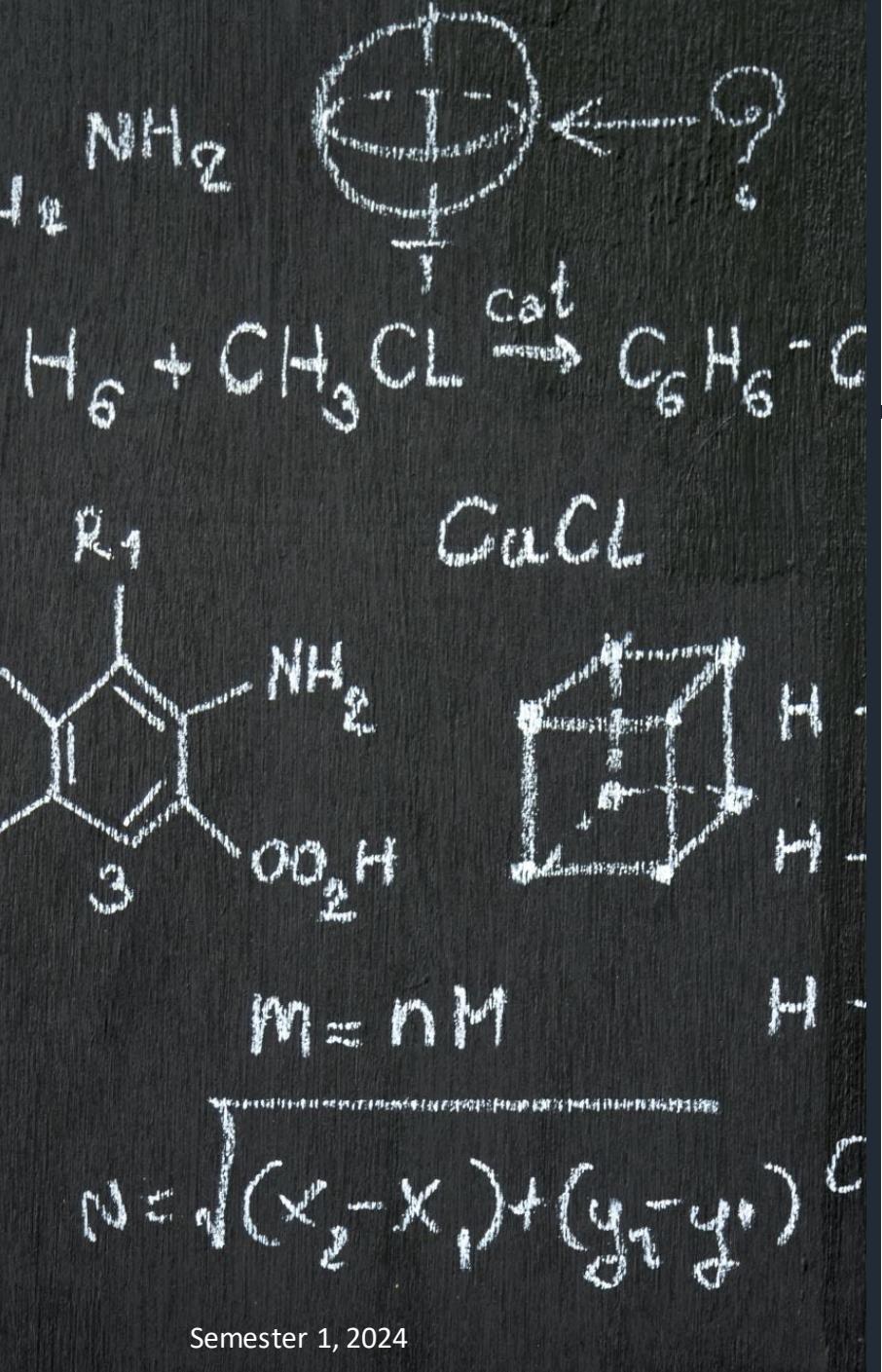
where $_s r_t$ denotes the interest rate from time s to time t .

- Suppose \$100 is invested on the terms indicated by the diagram for two periods (i.e., from time 1 to time 3). The value of the investment at the end of two periods will be:

$$\$100(1 + _1 r_2)(1 + _2 r_3)$$

which can be modified to

$$\$100(1 + _1 r_3)^2 \text{ where } 1 + _1 r_3 = [(1 + _1 r_2)(1 + _2 r_3)]^{1/2}$$



The geometric mean rate of interest

- Thus, r_3 is defined as the **geometric mean rate of interest** (or geometric average rate of interest) earned in each of the two periods.
- Then $1+r_3 = [1.07(1.080)]^{1/2} = 1.07499$.
- The average interest rate earned over each of the two periods is 7.499%.

The rule of 72

- **The rule of 72:** For a small interest rate i the doubling time (in years) is approximately $72/i$. For example:
 - $i = 1\%: \frac{72}{i} = 72$. And $1.01^{72} = 2.047$
 - $i = 3\%: \frac{72}{i} = 24$. And $1.03^{24} = 2.032$
 - $i = 8\%: \frac{72}{i} = 9$. And $1.08^9 = 1.999$
- $2^{10} \approx 10^3$ (or $1024 \approx 1000$)

Topic four

The Manhattan Story



The Manhattan Story

- According to American legend, Native Americans sold Manhattan to Dutch traders for \$24 worth of beads in 1624.
 - In a record, the value of the items used in the purchase was 60 guilders, which is roughly **\$1000** now.

Source: *Alfred Fredericks/Wikicommons*

What level of interest rate makes it possible?

- It is also often said that if they had put the money in a bank and let the interest compound, they could now buy all of Manhattan's real estate, which is now valued at around \$3 trillion. Is this right?
- Note $2022 - 1624 = 398$ years.



The Manhattan Story

- At a 6% interest rate, money doubles every $72/6 = 12$ years
 - $\rightarrow 398/12 = 33.167$: after 398 years, money has doubled roughly 33 times
 - Then, calculate $\$1000 \times 2^{33} = \$1000 \times 2^3 \times 2^{30} = \$1000 \times 2^3 \times 10^9 = \8 trillion
 - Definitely yes!

5%?

- What about if the interest rate is 5%? Money doubles every $72/5 = 14.4$ years
 - → $398/14.4 = 27.64$: after 398 years, money has doubled roughly 27 times
 - Calculate $\$1000 \times 2^{27} = \$1000 \times 2^7 \times 2^{20} = \$1000 \times 2^7 \times 10^6 = \$128,000,000,000$ ($\$128$ Billion)
 - Not even close 😞

Summary

A complex network graph with numerous nodes (white, red, blue) connected by a web of lines (blue, red, yellow) against a dark blue background with blurred circular highlights.

We have studied Three key topics: money, inflation, and the calculation of present value. We also defined the yield to maturity and learnt about coupon bond as well as consol. Using the Manhattan story, we studied how to use the calculation of the next present value in investment opportunities.

Feedback for Topic 1

- [https://padletuq.padlet.org/Shino/econ
2103-shared-thoughts-topic-1-
gvalxqnmhh063xfr](https://padletuq.padlet.org/Shino/econ2103-shared-thoughts-topic-1-gvalxqnmhh063xfr)



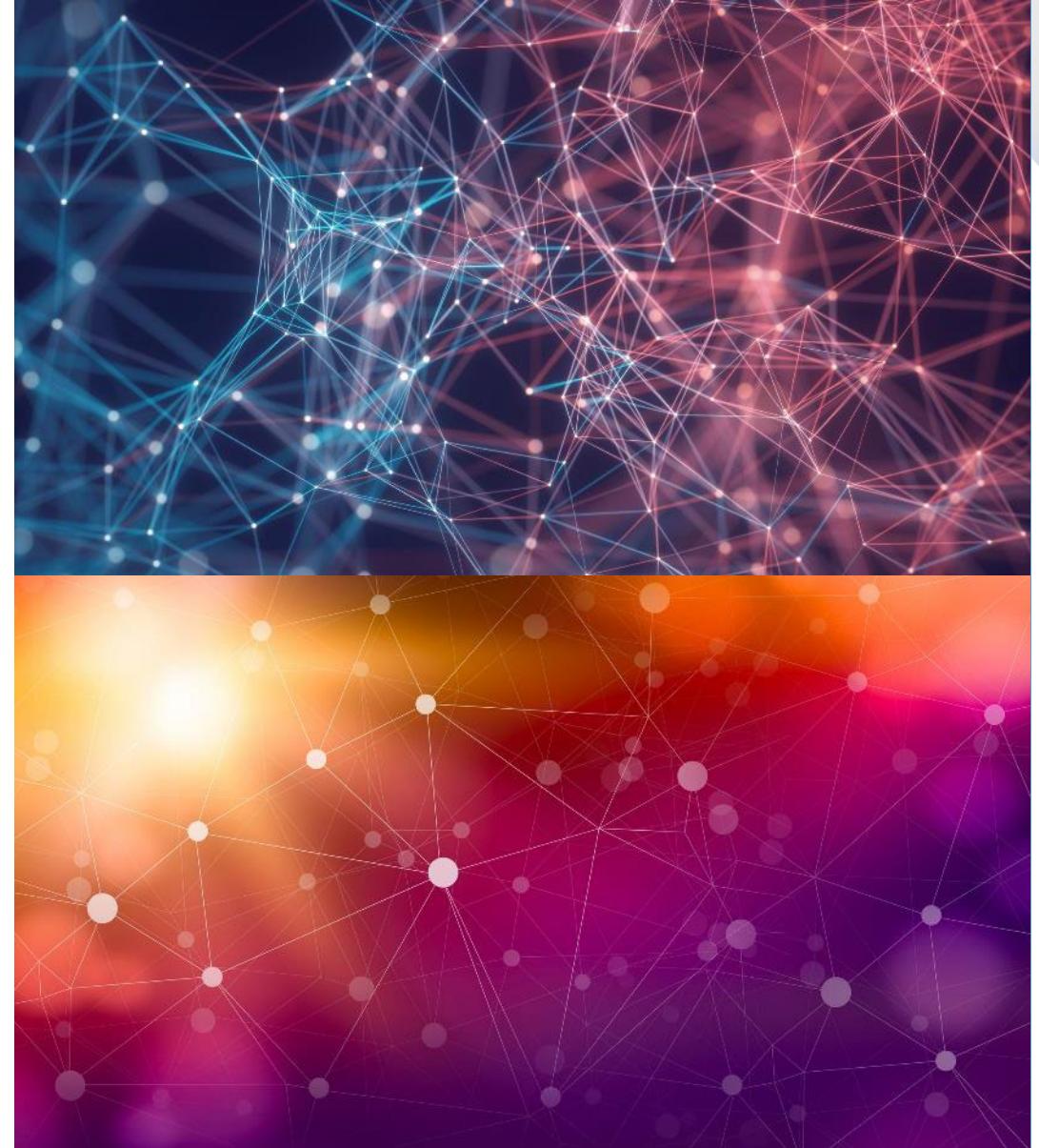
Thank You

Shino Takayama

s.takayama1@uq.edu.au

shino.mclennan@gmail.com

www.shinotakayama.com



Source

- Chapter 3, “The Economics of Money, Banking, and Financial Markets,” in “*The Economics of Money, Banking, and Financial Markets*,” by F. S. Mishkin, Pearson, Twelfth Edition.
- Chapter 4, “The Meaning of Interest Rates,” in “*The Economics of Money, Banking, and Financial Markets*,” by F. S. Mishkin, Pearson, Twelfth Edition.
- Image sources: iStock, Commons Wikimedia and Adobe Stock.