



UNIVERSITY OF
BATH

Andreas Krause

ES22016 Money and finance
Module outline

Dear all,

welcome to the module 'Money and finance', which I am teaching. This module aims to give you an introduction to finance and banking. The intention is to equip you with the basic knowledge in this area, but also understand the connection between the different market participants, investors, companies, and banks, and the wider economy. The module also prepares you for any placements, or jobs, in the finance industry or in roles that require knowledge about financial aspects in the economy, of companies, or other organisations.

This module outline explains to you in detail what to expect from my teaching, the contents that is covered, the resources available to support your learning, and information on the assessment; please read this information carefully. If you have any questions about the module, whether it is about its organisation, you require additional support to understand some of its contents, or you seek additional feedback on seminar problems, please feel free to attend my office hours.

I look forward to teaching this module and working with you to achieve your best.

Andreas Krause

Dr Andreas Krause

The module ES22016 Money and finance is available to students in semester 1 of their second year on the undergraduate programmes of BSc (Hons) Politics with Economics, BSc (Hons) International Development with Economics, and BSc (Hons) Economics and Mathematics; it is a compulsory module for students studying for the degree of BSc (Hons) Politics with Economics and an optional module for students studying BSc (Hons) International Development with Economics as well as BSc (Hons) Economics and Mathematics.

Students successfully passing the assessment will gain 10 credits at FHEQ level 5 towards their degree. The module is taught during semester 1 and requires a total of 200 notional study hours, of which 50 notional study hours are allocated to lectures and seminars, while 150 notional study hours are allocated to independent study, mostly comprising the preparation of lectures and seminars. Taking into account revision time, students are expected to study independently for approximately 10 hours per teaching week for this module.

1 Aims and objectives

This module aims to introduce students to the basic concepts in finance and banking. It will cover the fundamental theories to determine the value of securities, how companies make financial decisions and what the consequences of such decisions might be, the role of banks and how their lending decisions are made, as well as the practices of investment banks helping companies to raise funds.

The learning objectives of this module go beyond learning about the theories and practices in finance and banking. Apart from learning about such theories, this module will also develop transferable skills that prepare students for the workplace in general, not only in finance and banking. It is therefore not only of essence to learn the details of the models discussed, but gain an overall understanding of their implications for the behaviour of markets, investors, companies, and banks.

Knowledge

An important part in this module is, of course, to learn about finance and banking. We will look into the key theories underpinning modern financial theory and what their basis is in economic theory, as well as problems and practices in banking. Our main focus will be on understanding the key theories and why they are fundamental, even if much simplified from reality. This will give students a deeper understanding and knowledge of finance and banking overall, allowing them to actively participate in discussions about the implications such theories have in the wider economy. Another part of the knowledge base for this module is the ability to apply models in asset and

derivatives pricing to determine the value of such assets using the available information.

Understanding

Apart from the specific knowledge in finance and banking, by working through the models, students will also be able to gain a better understanding of economic models in general. While the specific elements of the models relate to finance and banking, many approaches can easily be transferred to other areas in economics and beyond. There are general principles common from economics applied, especially the need to provide incentives to pursue a specific action, or prevent a specific action being chosen, but also arbitrage between assets, or combinations of assets, with identical payoff profiles.

Analysis

We will look at many realistic problems which can be addressed using the economic models discussed in this module, in addition to conducting calculations to determine the value of financial assets. Students will learn how economic models can be used to explain realistic scenarios without having to resort to a detailed mathematical analysis. Using intuition and economic reasoning, informed by the models we discuss, students will learn how to approach such problems and provide a meaningful answer.

Communication

All too often economic ideas are only communicated using mathematical formulae based on abstract ideas. In this module students will be required to express their ideas in plain English that can be communicated to a non-specialist audience; students will have to provide an analysis of practical problem sets and instead of relying on a mathematical analysis they will have to use a non-technical approach in its solution, not least as specific quantitative information is not provided, making a mathematical analysis impossible.

Subject specific knowledge is essential in this module, but students need to be able to properly understand, apply and communicate their subject-specific knowledge.

2 Teaching arrangements

Key information	
Lecturer	Dr Andreas Krause
Email contact	mnsak@bath.ac.uk
Lectures A	Mondays, 14.15-15.45 in room 2E3.1
Lectures B	Tuesdays, 9.15-10.45 in room CB1.12
Seminars	Tuesdays, 8.15-9.05 in room CB1.12
Office hours	Thursdays, 8.30-10.00 in room 3E4.26
Webpage	https://people.bath.ac.uk/mnsak/

This module is taught over ten weeks with two sessions of two hours of lectures and one hour of seminars each week. During lectures, the key concepts and ideas of the topics in this module are presented. In each lecture a new topic is covered. Having acquired the necessary knowledge during lectures, students are then offered seminars in which this knowledge is applied to problem sets. Students are expected to attempt the problem sets prior to the seminar and discuss any problems they faced solving them. The problems discussed during seminars are representative of exam questions and attendance at seminars is an essential part of preparing for the assessment.

Prerequisite knowledge

Students are required to have a basic knowledge of microeconomics as provided in our first year economics modules; no knowledge of econometrics beyond basic statistics is required. While most topics will involve the use of theoretical models and the associated use of mathematics, no advanced mathematical knowledge is needed. Emphasis will be laid upon an intuitive understanding of the model, its derivation and the interpretation of results rather than their mathematical derivation and detailed mathematical analysis. To fully comprehend the models discussed, students will be required to understand the ideas behind constrained optimisation as well as basic matrix algebra, however, there is no requirement for students to conduct such mathematical operations themselves. The module has been designed to provide a first overview in the field of finance and banking and as such no detailed knowledge in this field is required.

Lectures

Lectures are used to convey the main theories used in finance and banking. During lectures we will discuss the motivation of these theories, the idea how to derive the main results and discuss the main results, the intuition behind them and their implications. It is essential to attend all lectures as these provide students with the knowledge necessary to understand and critically evaluate problems in finance and banking.

As lectures are quite fast-paced and cover different aspects within a topic, it is beneficial if student have familiarised themselves with the material beforehand. This might be through consulting the readings provided for each topic and thereby gaining some knowledge of the context and main ideas, helping them to understand the context of the topic better. After each lecture students should carefully work through the material covered, consulting their notes as well as the readings required to deepen their understanding. Only once students have obtained a good understanding of the theory, are they able to apply their knowledge to solve actual problems; the application of the theory is then practiced in weekly seminars.

Each lecture lasts approximately 90 minutes and there will be two such lecture in each week; lectures will be recorded through Re:View and recordings will be made available to students shortly after the lecture, subject to technical availability. The schedule of lectures and seminars shown below shows the topic that will be covered in each of these lectures. Lectures A will cover topics in finance and lectures B topics in banking; this split allows students a full week to familiarize themselves with the material before each strand progresses further.

Seminars

Seminars are taught weekly and last approximately 50 minutes and start in week 2. In each seminar problems are discussed that relate to topics which have previously been presented in lectures. Students should attempt these problems before attending the seminar; there are benefits even if not succeeding with solving the problem completely. Furthermore, having engaged with the problem beforehand, allows students to understand the suggested solutions more easily. Where problems are requiring a calculation, sketches of solutions will be provided in class, which should allow students to work through the problem step-by-step independently after the seminar and obtain the solution, but it will not always be possible to show all steps required in a calculation. If the problem discussed, or a part of the problem, is not quantitative, the solutions will be discussed in class.

For quantitative and non-quantitative problems student input is required. It is expected that students make suggestions that lead towards a solution, or provide parts of a solution. By providing their suggestions, or comparing the suggestions of other

students with their own ideas, students can obtain feedback on their progress in the module. This feedback will allow them to self-assess whether they have obtained sufficient knowledge from the lectures and where any deficits might be found.

It is strongly advised that after each seminar students reflect on their solutions and the solution discussed in class. If their solutions were incorrect, it might be necessary to revisit the corresponding lecture to deepen the understanding of the material. Attendance at seminars and engagement with the problems are an essential preparation for the examination. The questions in the examination will be similar in nature to the problems discussed in seminars.

Which problems are relevant for each topic in seminars is listed together with the reading list below. While indicative answers to all problems will be provided to allow students comparing their answers at a later stage, these might not cover all aspects or go beyond the contents covered in lectures. Students are responsible for taking their own notes and are strongly advised to not rely on the indicative answer instead of attending seminars as the learning effect will be significantly diminished.

Seminars will not be recorded to allow students to provide wrong answers without having these answers replayed by other students. Students who are unavoidably absent during a seminar, can attend my office hours, as outlined below, to gain feedback on their solutions if the indicative answers provided are not sufficient.

More problems than can be discussed in seminars are provided to students, this is due to time constraints in seminars. Having additional problems allows students to practice their knowledge in preparation of the assessment; they can compare their solutions with the indicative answers provided and for any additional clarifications attend office hours.

Lecture and seminar schedule

	Lecture A	Lecture B	Seminar
Week 1	Topic 1	Topic 11	<i>No seminar</i>
Week 2	Topic 2	Topic 12	Topics 1, 11
Week 3	Topic 3	Topic 13	Topics 2, 12
Week 4	Topic 4	Topic 14	Topics 3, 13
Week 5	Topic 5	Topic 15	Topics 4, 14
Week 6	Reading week		
Week 7	Topic 6	Topic 16	Topics 5, 15
Week 8	Topic 7	Topic 17	Topics 6, 16
Week 9	Topic 8	Topic 18	Topics 7, 17
Week 10	Topic 9	Topic 19	Topics 8, 18
Week 11	Topic 10	Topic 20	Topics 9, 10, 19, 20
Week 15	Revision week		

Office hours

Office hours are available weekly during teaching weeks and in revision week. Office hours allow students to clarify questions they have regarding lectures or seminars on a one-to-one basis. Students are expected to have worked through the relevant lectures, associated readings, and seminars to resolve their question through self-study. If this is not leading to a question being resolved, students can attend office hours to obtain individual support on this specific question. It provides them with an opportunity to obtain individual feedback on their progress and identify gaps in their knowledge or skills. Students are expected to come prepared and ask specific questions, office hours are not designed to provide private tuition.

Students who are unavoidably absent from a seminar, for example due to illness, are invited to visit the office hours with their proposed solutions, or attempts at finding a solution, for a brief discussion that will help them to catch-up with the material covered. For lectures missed for the same reason, students are referred to the recordings that are provided.

Office hours are normally in-person, but in special circumstances where a student cannot reasonably attend in person, a meeting through Teams can be arranged during office hours, please contact the lecturer a few days in advance if this applies; please note that students must join the Teams meeting using their university username. For in-person office hours, no time slots can be booked, students can attend at any time during the office hours. Should the office hours fall into a time where students have other lectures or seminars, please contact the lecturer in advance to make alternative arrangements.

Short questions, for example a clarification, can also be addressed directly after lecture B or the seminar in the room by approaching the lecturer. Similarly, brief questions, requiring a brief answer, can be asked by emailing the lecturer and an answer would normally be provided by the next office hours. However, in most cases asking questions by email is not effective and students might be asked to attend office hours instead; usually only questions of clarification are suitable, while providing explanations of theories or solutions to problems is in most cases not effective.

Resources available

Students are provided with the following resources to help them learn and achieve the learning outcomes:

- module outline (*this document*),
- recordings of lectures through Re:View,

- lecture slides with extensive notes,
- problems for seminars with indicative answers,
- readings accompanying the lecture and seminar material.

The recordings of lectures are provided through Re:View and can be accessed through Moodle only, while all other resources are available from the module webpage at people.bath.ac.uk/mnsak/, a link to the module webpage has also been placed in Moodle.

On the module webpage, students will find all resources as listed above, apart from lecture recordings, which can only be accessed through Moodle. The lecture slides are available in two versions, one consists of the final version of each slide, while the other version includes the dynamic uncovering and colouring of text as used during lectures. Each topic has its own set of files, consisting of a file providing some context to the topic and the files for each model.

3 Topics covered

This module introduces students to the field of finance and banking. We will cover core concepts on asset pricing, the valuation of securities, corporate finance, commercial banking, and investment banking. The aim is to give students an overview of the issues in these fields and equip them with some basic knowledge, which would allow them to understand the key ideas on which finance and banking builds, as well as enabling them to apply these ideas to solve practical problems.

Topic 1: Utility theory This topic sets out the basic economic concepts that are central to analysing problems in finance and banking. We will be looking at decision-making under uncertainty and focus especially on the importance of risk in decision-making. Furthermore, a re-occurring problem in finance and banking is that market participants have different levels of information; this can lead to a situation where the better informed market participant can exploit their informational advantage at the cost of the less well-informed market participant. We will see what the implications of this adverse selection are and then subsequent topics use these ideas to investigate how markets react to such instances. Another frequently observed problem is that of moral hazard, typically when one market participant can exploit the fact that its actions cannot be credibly agreed on through a contract. We will look into the consequences of such a situation and in some of the following topics explore moral hazard in more specific circumstances.

Asset pricing theory

Topic 2: Portfolio selection Investors in financial markets have a choice between a large number of different assets. Portfolio selection seeks to determine which assets to invest in and how much to invest into each of these assets. We will determine the sets of portfolios that are generally preferred by investors and from there obtain the optimal portfolio, showing how this portfolio can be separated into risky and risk-free assets.

Topic 3: Asset pricing Based on portfolio selection theory, we will develop the idea further and discuss the resulting equilibrium from which the Capital Asset Pricing Model (CAPM) emerges, which can be used to determine the expected returns of an asset, given its risk characteristics. As we will see in topic 4, this will form the basis on which assets, in particular stocks, are valued. The CAPM is not the only model that allows us to determine the expected returns of an asset; an alternative model is the Arbitrage Pricing Theory (APT). We will discuss this model and how it compares to the CAPM. Furthermore, as we will find that only undiversifiable risk is priced, we will look at diversification and how this is limited in a market.

Valuation of securities

Topic 4: Stock valuation models Building on the asset pricing models from the previous topic, we will use the asset pricing models to determine the value of stocks. We will compare different assumptions on the future prospects of companies and how they impact the value of stocks. If market prices correctly reflect the available information, thus its value, markets are said to be efficient. We will look at the implications of efficient markets for the properties of asset prices. Based on these ideas, we will also look at how companies should be making investment decisions.

Topic 5: Fixed income securities Fixed-income securities, more commonly known as bonds, issued by governments are often regarded as risk-free. Yields of bonds with different times to maturity vary and we will look at how these differences can be explained. While government bonds are often regarded as risk-free, this can only be true for the default risk, they are exposed to the risk of changing interest rates. We will see how this risk can be assessed and how bond investors can use different bonds to eliminate such risk.

Topic 6: Valuing futures and swaps Forwards and futures are a form of derivative in which a price to purchase or sell an asset is agreed in advance. In a swap, the purchaser and seller exchange multiple payments against another, for example the

payments on bonds in different currencies or the payments of a bond with fixed against that of variable interest rates. Both derivatives are widely used by companies and banks to manage risks; some central banks even use swaps as part of their monetary policy. We will see how the value of these derivatives are determined.

Topic 7: Option strategies A call (put) option gives the purchaser the right to buy (sell) an underlying asset at a pre-determined price. What distinguishes options from futures is that the purchaser has no obligation to purchase (sell) the underlying asset, while the seller of the option has an obligation to sell (buy) the underlying at the agreed price if the purchaser of the option demands this. Using such options, we will see how much these are worth at the maturity of the option and how different options will be combined to develop trading strategies that allow for specific risk profiles. We will then also look at the relationship of put and call options.

Topic 8: Option pricing Options need to be valued not only at maturity, but in particular at any time period to their maturity. In this topic we will look at two ways to price options, the binomial model and the Black-Scholes formula. We will hint at the derivation of these pricing formulas and then explain how they depend on the parameters that determine their value.

Corporate finance

Topic 9: Capital structure Capital structure describes the way a company finances its investments through equity and debt. While for investment decisions, the capital structure is assumed to be given, companies can actively choose their capital structure. We will look at how capital structure is optimally determined, but also what implication it has for a company to finance investments through debt or equity, taking into account that companies have a better knowledge of the prospect of an investment than outside investors. Using debt can also limit moral hazard in companies and acts as a disciplining mechanism to ensure companies are run efficiently.

Topic 10: Dividend policy Companies use parts of their profits to pay dividends to their shareholders and other parts are retained to increase the equity of companies with the aim of financing future investments. We will look at the implications of such dividend payments for the value of the company. We will see how dividends under perfect conditions are irrelevant for the value of companies, but if asymmetric information between the company and its shareholders exist or moral hazard in managerial decisions become relevant, dividends can affect the company value.

Commercial banking

Topic 11: The role of commercial banks Banks can be seen a pure intermediaries between borrowers and depositors. In such a view, banks might be beneficial by reducing the costs for borrowers and depositors negotiating a large number of smaller loans directly. In addition, banks allow deposits to be withdrawn at any time, while loans are given for a fixed longer term. We will explore how banks can reduce negotiation costs but also how they can provide long-term loans using short-term deposits.

Topic 12: Credit rationing A common notion in economics is that in equilibrium supply meets demand. Should there be an imbalance between demand and supply, the price would adjust until this imbalance vanishes, assuming there are no other exogenous constraints. However, in banking we find situations in which borrowers are applying for a loan and only a smaller loan is approved by the bank; offering to pay a higher loan rate will not increase the the size of the loan offered. We will investigate why banks would offer smaller loans than companies seek, regardless of the loan rate a borrower is willing to pay.

Topic 13: Collateral provision In many instances, banks require collateral when providing a loan, most notably in the form of mortgages who use the property financed as collateral, which is transferred to the bank in case the loan is not repaid; as such collateral will reduce the losses of banks. We will look at incentives of borrowers to provide collateral and how banks can use borrowers' willingness to provide collateral to extract additional information about the risk of borrowers. In addition, banks might use collateral they have obtained from borrowers to secure loan themselves. We will analyse why borrowers providing the original collateral would agree to such a practice.

Topic 14: Relationship banking Customers are in most instances loyal to their bank and return to their bank frequently, allowing it to build up information about their customers that frequently include information that can only be gained through personal and repeated interactions. Such information is not easily available to competitors such that a bank might gain an informational advantage; we will look at the implications of such a situation and how competition between banks affects the outcome. Having obtained a loan previously, which is still outstanding, might induce banks to approve further loans with the aim that the new investments the borrower makes, will secure not only the new loan, but also the already existing loan; such practices are only possible with an ongoing relationship. We will explore all these aspects in detail.

Topic 15: Bank runs and deposit insurance Depositors can withdraw at any time, forcing banks to use their cash reserves to repay deposits or even to liquidate

assets. We will analyse how a coordinated withdrawal of deposits at a bank can emerge. In order to prevent such bank runs, deposit insurance is in place in many countries. We will look at the implications that deposit insurance has on bank behaviour and also why it is optimal for banks to not provide deposit insurance for all deposits.

Investment banking

Topic 16: Investment banks as information providers It is common in economic theory to assume that an intermediary is uninformed and has no active role in the transaction between a buyer and seller of securities. Investment banks are, however, often better informed than either the buyer or seller of securities. We will explore how this informational advantage of investment banks affects the buying and selling of securities, but also the issue of securities in the first place.

Topic 17: Advice in mergers & acquisitions Investment banks advising companies on mergers and acquisitions are commonly only paid if the transaction is completed. We will explore how this contractual arrangement, a contingent contract, affects the advice investment banks provide and then extend this contractual arrangement by introducing a break-up fee and see how this might alleviate some of the incentive mismatches between the investment bank and their client.

Topic 18: The process of underwriting The contractual arrangements in the issuance of new securities are particularly complex. Investment banks commonly cooperate with other investment banks in a syndicate to attract the widest possible range of investors to purchase the newly issued securities. Furthermore they engage in a book-building process where selected investors provide non-binding offers to purchase the security, which then forms the basis of the offer price. We will explore the optimality of these contractual arrangements for the investment banks, but also their clients.

Topic 19: Underpricing security issues Newly issued securities are commonly underpriced, that is issued at prices well below the market price. We will explore some of the reasons why such underpricing might well be optimal for the investment bank, despite their remuneration obtained from the issuer being lower, and will also explore the consequences for the issuers of securities.

Topic 20: Financial analysts Financial analysts provide information to investors about the prospects of companies; this information is normally biased in the sense that the company's prospects are presented overly positive. We will explore the reason why

this positive bias is observed and see that regulation seeking to address the incentive problem at the heart of this bias is not effective; other measures need to be taken to improve the quality of analyst coverage.

4 Reading list

As emphasised above, for meeting the learning outcomes of this module, students do not need to go beyond the contents provided in the lectures and seminar. Readings here are provided such that students can deepen their understanding of the material covered in lectures and seminar, as well as becoming aware of the context and relevance of the topics discussed.

Required readings

The readings comprise parts of the following books:

1. Edwin J. Elton, Martin J. Gruber, Stephen J. Brown, and William N. Goetzmann: *Modern Portfolio Theory and Investment Analysis*, 9th edition, Wiley, 2014
2. Richard A. Brealey, Stewart C. Myers, Franklin Allen, Alex Edmans: *Principles of Corporate Finance*, 14th edition, McGrawHill, 2022
3. Andreas Krause: *Theoretical Foundations of Banking*, Volume 1, 2024
4. Andreas Krause: *Theoretical Foundations of Investment Banking*, SpringerNature, 2024

Book [3] is available from the module webpage as part of the resources for this module. Book [4] will be available from the publisher during the course of the semester and until this time, access to the book will be available through from the module webpage; the book is part of the file downloadable from the link 'Download all resources in a single file' at the bottom of the page.

For topics 1-10, other books on portfolio theory, investment management, and corporate finance cover the same topics and can be equally consulted if students find them more accessible for their needs. Similarly, other editions to those suggested here can be consulted.

For each topic specific chapters are relevant as outlined in the table below. While for topics 11-20 the lecture follows the readings closely, the readings for topics 1-10 are providing more the context of the theories and discuss them in more practical terms than the lectures, which provide students with a more economic and theoretical

approach. Students are not required to know the context and practical implications of these topics, nor are they expected to know of any methods to actually perform an empirical investigation. The readings may nevertheless help students to understand the context of the topic better and are therefore valuable.

Detailed reading list and problems by topic

	Reading	Problems
Topic 1	[1, Ch. 11 Appendix]	1, 2
Topic 2	[1, Chs. 4-11]	3, 4, 5, 6
Topic 3	[1, Chs. 13-16]	7, 8, 9, 10
Topic 4	[1, Chs. 17-19]	11, 12, 13, 14
Topic 5	[1, Chs. 21-22]	15, 16, 17, 18
Topic 6	[1, Ch. 24]	19, 20, 21, 22
Topic 7	[1, Ch. 23]	23, 24, 25, 26
Topic 8	[1, Ch. 23]	27, 28, 29, 30
Topic 9	[2, Chs. 16-18]	31, 32, 33, 34
Topic 10	[2, Ch. 14]	37, 38, 39, 40
Topic 11	[3, Chs. 2.1, 3.1]	41, 42, 43, 44
Topic 12	[3, Chs. 7.1, 7.2]	45, 46, 47, 48
Topic 13	[3, Chs. 8.2.1, 8.3]	49, 50, 51, 52
Topic 14	[3, Chs. 10.1.2, 10.2.3, 10.3.1]	53, 54, 55, 56
Topic 15	[3, Chs. 14.1, 17.1.1, 17.2.1]	57, 58, 59, 60
Topic 16	[2, Chs. 1, 3, 4.2]	2, 3, 4, 7
Topic 17	[2, Chs. 2.1, 6.2, 6.3]	10, 13, 15, 36
Topic 18	[2, Chs. 2.2, 7.1.2, 7.2.2]	16, 19, 20, 37
Topic 19	[2, Chs. 7.3.1, 7.3.4]	22, 23, 29, 38
Topic 20	[2, Chs. 2.3, 8, 10]	42, 43, 45, 48

The problems for topics 16 to 20 are taken from the textbook [4] and the problem numbers refer to the numbers of the problems therein. These problems are not included in the problems available for this module, but have to be taken directly from the textbook. The indicative answers, however, are provided together with the answers to topics 1 to 15, using the original numbering of the problems in the textbook, but organised by topic.

Additional readings

Some students might be interested in going beyond the requirements of this module and learn more about the practical aspects of finance as well as commercial or investment

banking. Books [1] and [2] provide much of such extensions and can be recommended for this purpose.

A more generic overview of commercial banks and their business practices can be found in a wide variety of textbooks on banking. Books that might be helpful include the following:

1. Shelagh Heffernan: *Modern Banking*, Wiley, New York, NY, 2005
2. Benton E. Gup and James W. Kolari: *Commercial banking*, 3rd edition, Wiley, New York, NY, 2005
3. Xavier Freixas and Jean-Charles Rochet: *Microeconomics of banking*, 3rd edition, MIT Press, Cambridge, MA, 2023
4. Hans Keiding: *Economics of banking*, Palgrave Macmillan, London, 2016
5. Jin Cao: *The economics of banking*, Routledge, Abingdon, 2022
6. Kent Matthews, John Thompson and Tiantian Zhang: *The Economics of Banking*, 4th edition, World Scientific Publishing, Singapore, 2024

The latter four books are textbooks on the economics of banking that cover similar topics as in this module and might be useful supplements to the required readings on commercial banking. The first two books describe in more detail the banking market and the practical aspects of banking.

Students interested in the practices of investment banks may find the following books helpful:

1. Michel Fleuriet: *Investment banking explained*, McGrawHill, New York NY, 2008
2. Giuliano Ianotta: *Investment Banking*. Springer Verlag, Heidelberg, 2010
3. Joshua Rosenbaum and Joshua Pearl: *Investment Banking*, 3rd edition, Wiley, New York NY, 2009
4. K. Thomas Liaw: *The Business of Investment Banking*, 3rd edition, Wiley, New York NY, 2012
5. Stefano Caselli, Gimede Gigante, and Andrea Tortoroglio: *Corporate and Investment Banking*, Bocconi University Press, Milan, 2021
6. David P. Stowell: *Investment Banks, Hedge Funds, and Private Equity*, 4th edition, Academic Press, London, 2023

These books are not required for the successful completion of this module, but provide more in-depth practical insights into commercial and investment banking for those interested. They cover in particular valuation practices as used by investment banks in mergers & acquisitions advice, underwriting of share offerings (IPOs), as well as the basis for the recommendations made in analyst reports.

5 Assessment

The assessment consists of an in-person examination lasting three hours during the assessment period. The examination will be open-book and students are allowed to take any non-electronic material into the examination. Students will not be provided with any other material beyond the question paper, an answer booklet and a calculator; anything else students may want to or need to rely on is to be brought to the examination by the student. Students are only allowed to use university calculators and their own calculators are not permitted.

The exam paper will cover the entire contents of this module and students are not given a choice of questions to answer, all questions are compulsory. The exam will consist of questions requiring calculations based on formulas derived in lectures and questions requiring to solve an applied problem using their knowledge from this module. While the exact weighting of questions in the examination will vary in each exam paper, students can expect that approximately 20-30% of questions will require calculations and 70-80% the solving of applied problems.

The style of questions in the exam paper will be similar to the problems discussed during seminars; it is therefore that seminar attendance is an integral part of preparing for the examination. As in the problem sets, students will not be asked to derive a formula, whether a formula we have discussed in lectures or a new formula. Instead, students are required to apply a formula and the results of models to the problem on hand, by choosing the correct formula and parameters where calculations are required and by choosing the right model(s) to answer the applied problem.

Knowing and understanding the contents of the lectures is sufficient for the examination and students can achieve any mark. It is not necessary to read beyond the contents of the lectures, although this can be beneficial as it will help students to gain a better and deeper understanding of the topic; this may make answering exam questions easier. Students wishing to go beyond the contents of this module are free to do so in the examination, but there is no inherent advantage in doing so, nor is there a disadvantage; the answer will be assessed in the same way and to the same standards as for students who restrict themselves to answers based on the module contents. When answering questions and using exclusively contents from the module, no referencing is required; however should a student go beyond the contents of the module and appropriate reference must be provided.

Assessment preparation

Although the examination is open-book, allowing students to make use of any non-electronic material they wish, students are strongly advised to prepare in the same way they would prepare for closed-book examinations. Students are required to identify

the correct models to apply to the questions given, and they will only be able to do this successfully if they have a good overview of these models. Knowledge of the framework used for each model and its key results are also essential to assess whether a model is useful in the context of the question and to develop initial ideas on how to apply this model. Where the use of notes and other material will be useful is obtaining the details of model assumptions and more specific aspects of the insights these models provide; these aspects can be looked up during the exam rather than be memorised beforehand. Notes are also useful for quantitative questions where formulae do not need to be memorised, but can be looked up.

By experience, if students decide that due to the open-book examination they can rely completely on looking up models to decide which one(s) are applicable and then read up on the key results of these models, they will not have sufficient time to answer all questions adequately. The number of questions is chosen such that students who are well prepared and have knowledge of all models and their key results will be able to finish all questions by working continuously throughout the length of the examination; this includes looking up any details of the models they are required to apply. Time is, however, not sufficient to read up on the models themselves in the first place. Therefore, as part of their revision, students should have a sound understanding of all models discussed in the lectures and seminars.

It is also essential that students practice answering problems prior to the examination. While attendance at the seminars will allow them to gain an understanding of the approach to be taken and how to structure an answer, how to make the argument they apply more sound, and how much detail to provide, it is the practice of writing answers to seminar problems that have not been discussed in the seminars and then comparing these answers with the indicative answers provided, that gives students the skills required and confidence for the examination. The same holds for quantitative questions, where the ability to select the correct formulae and parameters to insert into the formulae are essential and by experience students that have not practiced to answer such questions, will find it difficult to do so in exam conditions. It is strongly suggested that students initially attempt seminar problems without having looked at the indicative answers to maximize the learning effect; it is for this reason that a separate file of seminar problems without indicative answers is provided.

Exam technique

The exam will last three hours and consist of eight questions; students are not given a choice of questions to answer. The questions are not ordered by difficulty and also not ordered by topic; thus no inferences can be made from the position of the question in the exam paper about the level of difficulty or which models are applicable to it. In order to maximize their marks, students may answer questions in any order they wish. With eight questions, the average time spent on each question will be $22\frac{1}{2}$ minutes and while some questions might be answered in less time and others may take a little bit

longer, students should make sure they are not significantly outside of this time frame. Students taking considerably more than 25 minutes answering a question (this would not include excessive time spent thinking about a solution) might consider that they either have taken a wrong approach or provided levels of detail that are not necessary; in the examination, please focus on the key ideas and arguments only. If, on the other hand, students spend considerably less than 20 minutes on a question, they might want to consider whether they have covered all aspects relevant to this question and gone into sufficient depth and detail in their answer.

In terms of the length of an answer, again from experience, it is sufficient to write approximately two paragraphs (200-300 words) for non-quantitative questions. Where a non-quantitative question is included as a sub-question in an otherwise quantitative question, the answer will usually be considerably shorter at around 50 words. This is not a guideline of how much students should write, but might give you an indication of the typical length; some problems might require a much shorter answer while others might necessitate a longer reply. These differences arise from a variety of factors, for example a more difficult problem might not require much detail, but a very succinct solution, while other, sometimes, but not always, easier questions might require more aspects to consider which are more straightforward. The indicative answers to the seminar problems are approximately half the length of what students typically write. The reason is that students tend to be less succinct and provide more evidence from the problem itself to support their analysis of the problem than has been done in the indicative answers, where this evidence is merely hinted at; for this reason, they are not labelled 'solutions' but instead 'indicative answers'.

When providing an answer to a question, students must make sure they answer the question asked, it is not sufficient to describe a model (even if the correct model). Students must address the specific question asked, using an appropriate model to apply to the circumstances and support their analysis with evidence from the problem to show that key assumptions of the model are met (or not). It is then essential to show how the results of the model are answering the question and provide a rationale for this result. Students are not required to derive a model, and there is no benefit in doing so, nor are they required to reproduce formulae from these models in their answer. What is required is that students use these results, apply the appropriate formulae as part of their answer. The answer should be in plain English and be comprehensible to a non-specialist audience, which has knowledge of basic economics, finance, and banking. References to models do not need to be made as long as these models were discussed in this module; students using models not discussed in this module are required to provide an adequate reference. How to provide an answer to exam questions will be practiced extensively in the seminars.

For quantitative questions, students may have to work backwards and identify information that is not directly given in the question. In all cases, there should be sufficient information from which this missing information can be inferred. Students who are not able to determine the missing information, or those believing that essential information is genuinely missing, should make a reasonable assumption about

this information, clearly state that they did make such an assumption due to missing information or they do not know how to obtain the information, and then use their assumed information in any further calculations. For calculations it is strongly advised to show intermediate steps such that any mistakes made during calculations can be identified; this allows to distinguish numerical errors from other errors. When marking, the emphasis will be laid on the correct steps being taken to obtain the result, not numerical accuracy, hence students should not be overly concerned about any numerical values they obtain; spending time checking for purely numerical errors is usually not productive as the marks lost will be minimal. If a result, whether intermediate or final, is unrealistic or impossible, students should indicate this with a brief note to this effect, showing that they have identified a potential numerical error. It is advisable to try and correct this error only if there is sufficient time to do so and all other questions have been completed.

Assessment criteria for non-quantitative questions

When marking the exam, attention will be paid to the following aspects, in no particular order of importance:

- choice of an appropriate model/framework that can be used to address the problem, with additional well justified assumptions being made as appropriate and needed,
- presence of a coherent argument being made (within the framework of the model chosen) that leads from observations to meaningful results on any particular point being made, as far as relevant to the problem,
- a well-argued overall conclusion that brings together the different arguments made throughout the answer into a single final result, or two opposing results conditional upon certain aspects discussed before, as appropriate,
- avoidance of the discussion of irrelevant aspects that do not directly contribute to the answer,
- consideration of alternative explanations and approaches to the one chosen and justification of the chosen approach.

The marking of answers like these is necessarily subjective, thus no firm rules or right/wrong answers can exist. If students make a mistake, for example using an incorrect model, giving a wrong solution, students will only lose marks for the initial mistake and any subsequently wrong outcomes ('follow-up mistakes') will attract full marks, provided they are correct conditional on their initial mistake. Roughly answers might be characterized as follows:

Fail Students choose the wrong theory or model and typically do not apply it to the problem at hand, but rather describe the theory itself. It may also be a case of choosing the correct theory or model but not showing how it and its results relate to the problem in the problem or misinterpreting its relevance.

Third class Students choose a theory or model that is wrong but make an effort to show its relevance. Alternatively, students might choose the correct model but fail to argue its relevance convincingly or make substantive mistakes in its application.

Lower Second class Students choose the correct theory or model, but their arguments to its relevance are incomplete or partially wrong. Students may have all elements in place, but not connected to form a coherent argument for their analysis.

Upper Second class Students use theories and models well to support their arguments, but may not properly consider alternative theories and other explanations that do not directly emerge from conventional theories. Explanations using models and theories show some gaps or inconsistencies.

First class Students support their arguments well with existing theories or models, consider alternatives to the models chosen as well as look beyond the models themselves by considering alternative explanations. Explanations are free of errors and gaps in arguments are minimal.

Assessment criteria for quantitative questions

When marking the exam, attention will be paid to the following aspects, in no particular order of importance:

- choice of the appropriate model and formulae within that model,
- identification of the parameters used in the formulae,
- ability to identify missing parameters and determine these from different formulae, including formulae used when discussing different topics,
- solving the equation for the correct variable.

In most cases, there will be only a single correct answer, making an answer correct or wrong. However, mistakes have a different degree of severity. Numerical accuracy is secondary to using the correct formulae, identifying parameters correctly and being able to solve the model for the correct variable. If students make a mistake, for example identifying a variable incorrectly, and then use this variable in subsequent calculations, giving a wrong result, students will only lose marks for the initial mistake and any

subsequently wrong results ('follow-up mistakes') will attract full marks, provided they are correct conditional on the initial mistake. This will also apply to any instances where students have to interpret their numerical results; students will be assessed on interpreting the numerical result they present.

Roughly answers might be characterized as follows:

Fail Students do not identify the correct model or formula to use or only state the formula without showing how they would use it, for example by not identifying most of the parameters correctly.

Third class Students identify the correct model, but fail to identify most parameters correctly or do not solve for the required variable or solve for the wrong variable. Alternatively, students might have used the wrong formula in the circumstances, although the formula could be used for a similar problem. Using information from the question students have attempted to provide an answer, but have failed to do so correctly.

Lower second class Students identify the model or formula correctly, but fail to correctly identify some parameters. Students will have made an attempt at solving the formula for the correct variable, but have not fully succeeded. Alternatively, students might have used the wrong formula, but using information from the question have been able to provide an answer. Students might have made significant mistakes while solving the model, have obtained a result which is not realistic and have not identified it as such.

Upper second class Students are able to fully solve the model using the correct formulae, but might have made some mistakes, such as misidentified some parameters of lesser importance or made minor errors while deriving their result. If students made a numerical error in their calculation and their results are unrealistic, the student will have identified them as such and provided a brief comment to this effect.

First class Students have identified the models and formulae correctly, as well as all parameters. Students have been able to solve their model correctly and in the case of minor numerical errors have identified any unrealistic results by providing a short comment to this effect.

In some cases a question might require a calculation to be performed and this result to be interpreted. In this case, the marking will be based on a combination of the assessment criteria for quantitative and non-quantitative questions.

Illustration of an answer not meeting the learning outcomes

Good answers can be found in the indicative solutions to the seminar problems. Here is an example for an answer to a non-quantitative problem that would not meet the learning outcomes of this module. Consider problem 22 from topic 19 and the following answer which has been generated by ChatGPT:

The lead underwriter could justify the underpricing in several ways, emphasizing the strategic importance of ensuring a successful IPO and the longer-term benefits of the pricing strategy. Here's how the underwriter might defend their approach:

- **Market Dynamics and Risk Mitigation**
 - ***Uncertainty and Risk Compensation***: The underwriter could argue that the high initial returns (or "pop") compensate investors for the risks associated with participating in an IPO. IPOs are inherently risky, and offering a discount ensures that investors are incentivized to participate, despite the uncertainty surrounding the new public company's future performance.
 - ***Ensuring High Demand***: By setting the price lower, the underwriter aimed to create a strong demand for the shares. This high demand helps ensure that the IPO is fully subscribed or even oversubscribed, reducing the risk of an unsuccessful offering. A successful IPO is crucial for the company's reputation and future capital-raising efforts.
- **Building Long-Term Relationships**
 - ***Loyalty and Recurring Business***: The underwriter might highlight the importance of maintaining strong relationships with their long-standing clients, who are often institutional investors. These investors not only bring stability to the IPO but are also likely to support future equity offerings by the company. Rewarding them with a favorable allocation helps maintain these relationships, which is beneficial for all parties in the long run.
 - ***Repeat Participation***: Loyal clients are more likely to participate in future IPOs, providing a reliable base of demand. Their continued participation is essential for the underwriter's business model, as it ensures a steady flow of capital for future deals.
- **Price Discovery and Market Reception**
 - ***Initial Price Discovery***: The underwriter could argue that the underpricing was part of the price discovery process. The IPO price is an estimate based on available information, and the true market value often emerges only after trading begins. A significant price increase post-IPO suggests strong market demand

and positive investor sentiment, which can be advantageous for the company's public image.

- ***Positive Market Reception***: A strong post-IPO performance signals to the market that the company is healthy and desirable, potentially leading to a higher long-term valuation. This initial underpricing can be viewed as an investment in the company's market perception, which can attract more investors over time.

- **Ensuring Liquidity**

- ***Encouraging Active Trading***: By underpricing the shares, the underwriter helps ensure that there will be active trading in the stock after the IPO. High liquidity is important because it attracts more investors and helps stabilize the stock price, reducing volatility in the early days of trading.
- ***Avoiding a Price Drop***: If the IPO is priced too high and the stock price falls after trading begins, it could damage the company's reputation and discourage future investments. Underpricing helps to mitigate this risk by setting a price that is likely to rise, rather than fall, in the open market.

- **Aligning Interests**

- ***Aligning Interests of Stakeholders***: The underwriter could explain that their role is to balance the interests of the issuing company, the investors, and the broader market. Ensuring that all parties feel they have received fair value is crucial for the long-term success of the IPO market. While the company may feel that they left money on the table, the benefits of a successful and well-received IPO may outweigh the initial perceived loss.

Conclusion

The underwriter's primary defense would center on the argument that underpricing, while seemingly costly in the short term, is essential for managing the risks of an IPO, ensuring its success, and maintaining healthy relationships with key institutional investors. This approach can ultimately lead to a stronger market presence and higher long-term valuation for the company.

This answer, while overall correct, does not make use of specific models and explores how they are relevant to this case. Instead, the answer lacks depth and makes statements that are not justified by economic reasoning. The answer also does not address the specifics of the company in the problem itself, thus is just a generic discussion of the benefits of underpricing. In contrast, the indicative answer makes explicit reference to models discussed in this module and goes into more depth rather than staying generic as in the answer shown here.

6 Disability adjustment

Any student with a disability, whether formally diagnosed or not, is invited to contact the lecturer at the earliest possibility to discuss any adjustments that might help the student to participate fully in this module, as long as these can reasonably be made. Such adjustments might be in addition to any provisions in the Disability Access Plan.



Copyright © by Andreas Krause

Picture credits:

Cover: Premier regard, Public domain, via Wikimedia Commons, [https://commons.wikimedia.org/wiki/File:DALL-E_-_Financial_markets_\(1\).jpg](https://commons.wikimedia.org/wiki/File:DALL-E_-_Financial_markets_(1).jpg)

Back: Rhododendrites, CC BY-SA 4.0 <https://creativecommons.org/licenses/by-sa/4.0/>, via Wikimedia Commons, [https://upload.wikimedia.org/wikipedia/commons/0/04/Manhattan_at_night_south_of_Rockefeller_Center_panorama_\(11263p\).jpg](https://upload.wikimedia.org/wikipedia/commons/0/04/Manhattan_at_night_south_of_Rockefeller_Center_panorama_(11263p).jpg)

Andreas Krause
Department of Economics
University of Bath
Claverton Down
Bath BA2 7AY
United Kingdom
E-mail: mnsak@bath.ac.uk