UNIVERSITY OF BATH

Andreas Krause

ES30089 Economics of banking

Module outline

Dear all,

welcome to the module 'Economics of Banking', which I am teaching. This module aims to give you an overview of some key issues in both commercial and investment banking; the intention is to allow you to understand some of the practices that can be observed in banks and understand why they have developed, what these practices achieve, but also their limitations and shortcomings.

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 ES30089 Economics of banking is available as an optional module to students in semester 1 of their final year on the undergraduate programmes of BSc(Hons) Economics, BSc(Hons) Economics and Mathematics, and BSc(Hons) Economics and Politics.

Students successfully passing the assessment will gain 6 credits at FHEQ level 6 towards their degree. The module is taught during semester 1 and requires a total of 100 notional study hours, of which 25 notional study hours are allocated to lectures and seminars, while 75 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 5 hours per teaching week for this module.

1 Aims and objectives

This module aims to introduce students to the basic concepts in commercial banking as well as investment banking. It will cover the role of commercial and investment banks, how lending decisions are made by commercial banks, as well as the practices of investment banks helping companies to raise funds.

The learning objectives go beyond only learning about the practices of working in commercial and investment banks. Apart from learning about banking, this module will also develop transferable skills that prepare students for the workplace in general, not only in the banking industry. 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 banks.

Knowledge

An important part in this module is, of course, to learn about banking. We will look at some practices which are common in banks and the main focus will be on understanding why these practices have become widespread, which conditions are required for them to become relevant, and what their implications are. This will give students a deeper understanding and knowledge of banking overall and in particular an appreciation of the conflicts of interests between banks and their clients/customers, along with how the market has found solutions to address such conflicts of interest.

Understanding

Apart from the specific knowledge in 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 banks, 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. If an interested party cannot control the decision of another individual, he might be able to provide incentives to ensure the individual takes the action he desires.

Analysis

We will look at many realistic problems which can be addressed using the economic models discussed in this module. 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 discussed, students will learn how to approach such problems and provide a meaningful answer based on economic reasoning. This will be achieved with only limited information being available, often even without key information being given, requiring additional assumptions to be made, which in the circumstances are reasonable.

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 problems and instead of relying on a mathematical analysis will have to use a non-technical approach when providing an answer, 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 as well.

2 Teaching arrangements

Key information	
Lecturer	Dr Andreas Krause
Email contact	`mnsak@bath.ac.uk`
Lectures	Wednesdays, 9.15-10.45 in room 6W1.1
Seminars	Thursdays 10.15-11.05 or 11.15-12.05 in room CB5.1
Office hours	Thursdays, 8.30-10.00 in room 3E4.26
Module webpage	https://people.bath.ac.uk/mnsak/

This module is taught over ten weeks with two hours of lectures each week and one hour of seminars bi-weekly. During lectures, the key concepts and ideas of the topics in this module are presented, where 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 specific problems. Students are expected to attempt these problems prior to the seminar and discuss any problems they faced in the seminar. The problems discussed during seminars are representative of exam questions and attendance at seminars is an essential part of gaining subject knowledge and to learn communicating this subject knowledge. For this reason, active participation in seminars is an important preparation for the assessment.

Prerequisite knowledge

Students are required to have a basic knowledge of microeconomics covering utility theory, equilibria, moral hazard, and adverse selection; 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 on 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.

Lectures

Lectures are used to convey the main theories used in banking. During lectures we will discuss the motivation of these theories, the idea how to derive the main results, discuss the intuition behind them, and the implications such results may have. It is essential to attend all lectures as these provide students with the subject knowledge necessary to understand and critically evaluate problems in 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 achieved 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 theories learnt, are they able to apply their knowledge to solve actual problems; the application of the theory is then practiced in bi-weekly seminars.

Each lecture lasts approximately 90 minutes and there will be one 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.

Seminars

Seminars are taught bi-weekly and last approximately 50 minutes; students are allocated to one of the two seminar sessions, which cover the same contents. Therefore students should only attend one of the two seminars as per their allocation. 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.

In the discussion of 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 and style to the problems discussed in seminars.

Lecture and seminar schedule

	Lecture	Seminar
Week 1	Topic 1	*No seminar*
Week 2	Topic 2	*No seminar*
Week 3	Topic 3	Topics 1 & 2
Week 4	Topic 4	*No seminar*
Week 5	Topic 5	Topics 3 & 4
Week 6	Reading week	
Week 7	Topic 6	*No seminar*
Week 8	Topic 7	Topics 5 & 6
Week 9	Topic 8	*No seminar*
Week 10	Topic 9	Topics 7 & 8
Week 11	Topic 10	Topics 9 & 10
Christmas break		
Week 15	Revision week	

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.

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 the lectures or seminars 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 accessed through Moodle. The lecture slides are available in two versions, one consist 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 come context to the topic and the files for each model.

3 Topics covered

Banks can generally be divided into commercial banks and investment banks. The type of activities of these two types of banks are quite different and while universal banks combine both types of banks, they are mainly operated separately, such that these activities can be treated individually. Commercial banks, often simply referred to as banks, provide loans to the general public - individuals, companies, governments, and international organisations - and accept deposits from the general public. Through the provision of loans, banks are essential for companies to finance investments, but also for individuals to make larger purchases such as property and cars. We will see how the provision of loans affects the incentives of borrowers and banks alike, but also how banks address any adverse incentives. A bank's customers are not only borrowers, but also depositors who might have concerns about the risks banks are taking, affecting the safety of their deposits. We will be looking at the possibility of deposits being withdrawn from banks as well as the way deposit insurance can re-assure depositors.

Investment banks are acting as intermediaries with the aim to facilitate large capital market transactions, such as mergers or the issuance of securities. To aid this facilitation, they have also extended the range of services they offer to providing information to investors, developing new securities, managing assets on behalf of clients, amongst others. This module will explore the key services investment banks provide - providing advice in mergers and acquisitions, underwriting securities and providing financial analyst coverage. The focus will be on the conflicts of interests between the investment bank and their clients. We will see how the often opposing interests are more aligned by using contractual arrangements that reconcile these differing interests as much as possible. While an important role of investment bankers is to value securities, this aspect will not be covered in this module. The focus will instead exclusively be on the conflicts of interest between investment banks and their clients, taking the ability of investment bankers to conduct a valuation as given.

We will now briefly outline the specific topics in commercial and investment banking that will covered in this module.

Commercial banking

Topic 1: 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 2: 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 3: 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 4: 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 5: 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 6: 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 7: 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 8: 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 9: 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 10: 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

For meeting the learning outcomes of this module, students do not need to go beyond the contents provided in the lectures and seminars. The specific readings for each topic are given in the table below; all readings are taking from the following two textbooks:

Required readings

The readings comprise parts of the following books:

1. Andreas Krause: Theoretical Foundations of Banking, Volume 1, 2024
2. Andreas Krause: Theoretical Foundations of Investment Banking, SpringerNature, 2024

The first book is available from the module webpage as part of the resources for this module. The second book 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 each topic, specific chapters from these textbooks are required as outlined below. The table also specifies which problems are relevant for each topic.

Detailed reading list and problems by topic

	Reading	**Problems**
Topic 1	[1, Chs. 2.1, 3.1]	1, 2, 3, 4
Topic 2	[1, Chs. 7.1, 7.2]	5, 6, 7, 8
Topic 3	[1, Chs. 8.2.1, 8.3]	9, 10, 11, 12
Topic 4	[1, Chs. 10.1.2, 10.2.3, 10.3.1]	13, 14, 15, 16
Topic 5	[1, Chs. 14.1, 17.1.1, 17.2.1]	17, 18, 19, 20
Topic 6	[2, Chs. 1, 3, 4.2]	2, 3, 4, 7
Topic 7	[2, Chs. 2.1, 6.2, 6.3]	10, 13, 15, 36
Topic 8	[2, Chs. 2.2, 7.1.2, 7.2.2]	16, 19, 20, 37
Topic 9	[2, Chs. 7.3.1, 7.3.4]	22, 23, 29, 38
Topic 10	[2, Chs. 2.3, 8, 10]	42, 43, 45, 48

The problems for topics 6 to 10 are taken from the textbook [2] 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 5, 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 commercial or investment banking.

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, 3^{rd} edition, Wiley, New York, NY, 2005
3. Xavier Freixas and Jean-Charles Rochet:. Microeconomics of banking, 3^{rd} 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, 4^{th} 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, 3^{rd} 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 two 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 and an answer booklet; anything else students may want to or need to rely on, is to be brought to the examination by the student.

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 6 questions, each requiring to solve an applied problem using their knowledge from this module. All questions carry the same weight. The difficulty of questions will vary to allow for an assessment of the degree to which the learning outcomes have been met and the final mark to reflect the standards achieved. In the exam paper, questions will not be ordered by their level of difficulty or by topic. Furthermore, as with the seminar problems, some questions will require the application of more than one model for a complete answer, but these are not necessarily more difficult than questions requiring the use of only a single model.

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 model, whether a model we have discussed in lectures or a new model. Instead, students are required to apply one or several models and their results to the problem on hand.

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, an 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 to obtain 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.

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. 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 two hours and consist of six 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 six questions, the average time spent on each question will be 20 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 20 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). This is not a guideline of how much students should write, but might give 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 that 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 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.

Assessment criteria

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.

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 that would not meet the learning outcomes of this module. Consider problem 22 from topic 9 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.

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