Examiners' commentaries 2015

FN2029 Financial intermediation

Important note

This commentary reflects the examination and assessment arrangements for this course in the academic year 2014–15. The format and structure of the examination may change in future years, and any such changes will be publicised on the virtual learning environment (VLE).

Information about the subject guide and the Essential reading references

Unless otherwise stated, all cross-references will be to the latest version of the subject guide (2011). You should always attempt to use the most recent edition of any Essential reading textbook, even if the commentary and/or online reading list and/or subject guide refer to an earlier edition. If different editions of Essential reading are listed, please check the VLE for reading supplements – if none are available, please use the contents list and index of the new edition to find the relevant section.

General remarks

Learning outcomes

At the end of this course, and having completed the Essential reading and activities, you should be able to:

- discuss and evaluate key theories relating to the role of banks as financial intermediaries
- discuss and evaluate the risks which banks face and explain how these risks are managed, with particular focus on techniques of asset and liability management, and credit risk measurement and management
- discuss the importance of capital in bank management and the role of securitisation, and explain the importance of capital adequacy within banking regulation
- describe and analyse the various means of analysing bank performance
- explain the principles and techniques involved in the use of derivative instruments for hedging credit, interest rate and exchange rate risk.

Format of the examination

The examination is three hours long. You must answer **four** questions from a choice of **eight**.

Questions on this paper will often contain multiple elements. In such cases, the primary element often requires an explanation or description of theoretical concepts; with the secondary element requiring application of such information to a specific issue of theoretical importance or practical relevance. Complete answers to this style of question should seek to ensure that the answers to the two elements are well integrated.

Planning your time in the examination

It is essential that you prepare sufficiently thoroughly to be able to make a serious attempt at four questions on the paper. Try to allow an approximately equal amount of time for each answer and make sure that you attempt **all** parts or aspects of a question. It is a very common failing for candidates to be unable to provide four adequate answers in the time permitted, due either to inappropriate study and revision strategies or to ineffective time management during the examination itself. If you gain only a low mark for the fourth answer, this does severe harm to your overall mark, which may result in a fail.

Select your material carefully

When reading an examination question, it is important that you first identify key words. To begin, identify the words in the question that indicate the depth required in each part of the answer; for example, 'analyse', 'assess' and 'explain' will require greater depth than 'define', 'describe' or 'outline'. Then identify the scope of the question (namely, what content must be included in the answer). It is equally important to identify what should be excluded from the answer (that is, marks will not be gained for presenting information that is irrelevant to the question posed).

You should be prepared to demonstrate an understanding of theory and you should be able to cite appropriate models, arguments and examples. Some questions allow an element of independent thought and reasoning. However, where personal opinions or experiences are offered, their relevance should be fully explained and justified and they should not comprise the major part of the answer provided.

Some of the examination questions will require breadth across the syllabus. It will be common for questions to require a synthesis of topics from different chapters of the subject guide. Therefore, it is important to appreciate that different topics within the subject guide are not self-contained, and you are guided in this respect by the cross-referencing between different chapters of the subject guide. For examination purposes, you need to have an understanding of the subject as a whole, and remember that the examination seeks to cover the entire breadth of the syllabus.

Read widely

The best examination answers are those that reflect knowledge and understanding obtained from following the suggested readings given in the subject guide. When following the suggested readings, you need to keep in mind the following question: 'how can I reflect the insights from this reading within an examination answer?' Take notes on your reading and link these notes to the material in the subject guide. Alternatively, treat the subject guide material as a starting point, and seek to supplement this with relevant extracts or examples obtained from the suggested readings. The structure of each chapter in the subject guide can guide you in such activities. Wider reading gives you a stronger and deeper appreciation of theory and empirical evidence, and will enable you to take a more critical and analytical approach to examination questions. This is the very best thing you can do when preparing for the examination.

This course covers some dynamic subject material. If you keep abreast of current issues in financial markets (for example, by reading from quality sources such as the *Bank of England Quarterly Bulletin*, the *Financial Times*

and *The Economist*), you will be able to include topical perspectives in your answers. The examiners will reward answers that blend awareness of current events (for example, the European sovereign debt crisis, the credit crunch or sub-prime mortgage crisis, or the downgrading of the USA or France sovereign credit ratings) with the theory and empirical evidence from the subject guide and suggested readings.

Structure your argument

Your answers should be constructed in a logical and coherent manner, and must always address the question posed. Conceptual terms and definitions should always be clearly explained. Examiners expect to read a clear introduction to each answer, which sets out the objective of the answer and the key points under analysis; as well as a concluding paragraph that acts as a summary of the main points of the argument. The main body of the answer should develop and substantiate the issues under analysis. Make sure that you write clearly and legibly. You should also clearly label diagrams and tables, and cite relevant sources when quoting empirical data or evidence.

Key steps to improvement

The most important issue is to read widely beyond the subject guide, as this additional material will allow you to provide a more thoughtful and comprehensive answer in line with the examiners' expectations. The examination is not a test of how well you have read the subject guide (rather how well you **apply** the material in it to the subject). Achieving good marks therefore requires **explicit arguments in the context of the question**, and the quality of each answer depends on a **critical, analytical approach to theories** alongside **empirical evidence**.

Updating of Essential reading

There is a new edition of the recommended textbook by Joel Bessis. The full details are:

Bessis, J. *Risk management in banking.* (Chichester: Wiley, 2010) third edition [ISBN 9780470019139].

This new edition contains additional chapters and very substantial revisions to the material appearing in the second edition. It is very important that you use the revised citations to this textbook, available on the VLE.

Question spotting

Many candidates are disappointed to find that their examination performance is poorer than they expected. This may be due to a number of reasons. The *Examiners' commentaries* suggest ways of addressing common problems and improving your performance. One particular failing is 'question spotting', that is, confining your examination preparation to a few questions and/or topics which have come up in past papers for the course. This can have serious consequences.

We recognise that candidates may not cover all topics in the syllabus in the same depth, but you need to be aware that Examiners are free to set questions on any aspect of the syllabus. This means that you need to study enough of the syllabus to enable you to answer the required number of examination questions.

The syllabus can be found in the Course information sheet in the section of the VLE dedicated to each course. You should read the syllabus carefully and ensure that you cover sufficient material in preparation for the examination. Examiners will vary the topics and questions from year to year and may well set questions that have not appeared in past papers. Examination papers may legitimately include questions on any topic in the syllabus. So, although past papers can be helpful during your revision, you cannot assume that topics or specific questions that have come up in past examinations will occur again.

If you rely on a question-spotting strategy, it is likely you will find yourself in difficulties when you sit the examination. We strongly advise you not to adopt this strategy.

Examiners' commentaries 2015

FN2029 Financial intermediation – Zone A

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General remarks

Candidates should answer FOUR of the following EIGHT questions. All questions carry equal marks.

A calculator may be used when answering questions on this paper and it must comply in all respects with the specification given with your Admission Notice. The make and type of machine must be clearly stated on the front cover of the answer book.

Comments on specific questions

Question 1

Explain how the theories of transactions costs and delegated monitoring lead to the dominance of financial intermediation over direct financing.

Reading for this question

Please refer to Chapter 1 of the subject guide (pp.9–16). Within these pages, there are 'Activity' boxes which direct you to study appropriate sections from Matthews and Thompson (2008), Saunders and Cornett (2008), Bhattacharya and Thakor (1993) and Diamond (1996). You may also benefit from reading relevant chapters in Freixas and Rochet (1998). Chapter 1 of the subject guide covers four reasons for the dominance of intermediation over direct financing (see bottom of p.11). Two of these reasons are covered in this question.

Approaching this question

This question requires an explanation of the preference for intermediation over direct financing, and specifically expects the focus to be on transactions costs and delegated monitoring.

You should use the material from pp.10–11 of the subject guide to set the context for your answer. Despite different requirements of lenders and borrowers, one could still envisage that the shorter chain of transactions involved in direct financing would be less costly than intermediated financing. In a situation of perfect knowledge, no transaction costs and no indivisibilities, financial intermediaries would be unnecessary, but these conditions are not present in the real world.

With regard to transaction costs, the relevant elements consist of search, verification, monitoring and enforcement costs. The algebraic analysis of transaction costs (see p.12 of the subject guide) is an essential component in a strong answer. Additionally, you have an opportunity here to demonstrate to the examiners that you have studied the essential textbook readings. Specifically, the Activity box on p.12 of the subject guide directs you to a graphical illustration from Matthews and Thompson (2008). Using this in your answer would be a considerable benefit. The discussion should proceed to explain the operational aspects which would mean that the presence of banks leads to reduced transaction costs (for example, branch networks, internet banking, mobile banking, standardised contracts). A fuller discussion of economies of scale and scope would also be relevant (possibly including elements from Chapter 2 of the subject guide on size and maturity transformation). Better answers would include a consideration of how banks' advantages in these respects are arguably eroding over time (for example, using some elements on dis-intermediation from Chapters 4 and 6 of the subject guide). Most importantly, there are directed activities in the 'Activity' box on p.13 of the subject guide. You should pursue such reading and study in a manner that enables you to bring in additional discussion in an answer to a question like this.

The theory of financial intermediation as delegated monitoring is one of the key learning objectives of Chapter 1 of the subject guide. In a good answer to this question, at least half of the material should focus upon this aspect (starting from the elements covered on pp.13–16 of the subject guide). Defined broadly, 'monitoring' of a borrower by a bank refers to information collection before and after a loan is granted, including screening of loan applications, examining the borrower's ongoing creditworthiness, and ensuring that the borrower adheres to the terms of the contract. This section could initially address information costs and monitoring costs, which would then serve as a foundation to proceed to a discussion of the Diamond (1984, 1996) model.

An important constraint on direct investment by households in the financial claims of corporations is the cost of information collection. Failure to monitor in a timely and complete manner exposes a supplier of funds to agency costs. Financial institutions provide a solution to these problems by pooling funds from suppliers (e.g. household savers) and investing in the financial claims of corporations. The financial institution has an incentive to collect information and monitor, which also alleviates potential 'free rider' problems with direct financing. The average cost of collecting information is also reduced. It is thus argued that suppliers of funds appoint banks as delegated monitors (to act on their behalf). Better answers are expected to proceed to analyse the costs and benefits of monitoring and include a critical evaluation of the material.

Generally, there is much scope in this question for you to demonstrate analysis drawn from the textbook and journal readings suggested as 'Essential reading' and 'Further reading' in Chapter 1 of the subject guide.

Question 2

Use the Diamond and Dybvig (1983) model to explain the liquidity insurance theory for the preference for financial intermediation over direct financing. Discuss the implications of the equilibrium outcomes of the model.

Reading for this question

Please refer to Chapters 1 and 2 of the subject guide (p.13 and pp.18–22). In addition to Diamond and Dybvig (1983), 'Activity' boxes within these pages highlight suggested readings from Matthews and Thompson (2008), Saunders and Cornett (2008) and Bhattacharya and Thakor (1993). You would also benefit greatly from reading Chapter 2 (pp.20–23) of Freixas and Rochet (1998).

Approaching the question

The answer requires careful reading of Chapters 1 and 2 of the subject guide (supplemented by Diamond and Dybvig, 1983; Freixas and Rochet, 1998, Ch. 2; Matthews and Thompson, 2008, Ch. 12; and Saunders and Cornett, 2008) in order to demonstrate a clear understanding of the term 'liquidity insurance'. Note: this should not be confused with deposit insurance, which is a completely different concept. Liquidity insurance relates to the fact that consumers are unsure of their future liquidity requirements in the face of unanticipated events. In the absence of perfect information, consumers will maintain their own pool of liquidity. Provided that shocks are not perfectly correlated across individuals, portfolio theory suggests that the total liquid reserves needed by a bank will be less than the aggregation of the reserves required by individual consumers acting independently. Diamond and Dybvig (1983) use this argument to account for the existence of banks. The view is that banks enable consumers to alter their consumption patterns according to the influence of shocks, and the value of this service permits a fee to be earned by the bank. In terms of the game theory model, there are two equilibria – the first is the existence of a bank providing liquidity insurance and optimal risk sharing among economic agents; while the second is the situation of a bank run.

The second part of the answer should include a clear definition of a 'bank run'. Financing long-term assets through short-term deposits is a source of potential fragility for banks because they are exposed to the possibility that a large number of depositors will decide to withdraw funds for reasons other than liquidity needs. This results in a vulnerability to bank runs. Better answers would link the theory of bank runs to the nature of the deposit contract. The implication of the possibility of a bank run is that it provides a rationale for regulation. A key reason for regulation is that uninsured depositors are likely to cause a bank run when faced with information of an adverse shock to bank balance sheets. Diamond and Dybvig (1983) argue that deposit insurance could be introduced to prevent bank runs, and there are many historical examples to support this theory. Better answers will highlight the faults in the provision of deposit insurance (moral hazard in particular) and will present other possible solutions.

The material in the subject guide provides an intuitive argument and some of the more formal theory; a good answer should include **both** aspects. A very good answer would provide a full analysis of the implications of the theory, and would include discussion of the relevance of the design of deposit contracts and critical evaluation of deposit insurance. Generally, there is much scope in this question for you to demonstrate rigorous analysis drawn from readings suggested above.

Question 3

Analyse the roles of the gearing ratio and the risk-assets ratio in banking regulation.

Reading for this question

The relevant material can be found in Chapter 2 of the subject guide (pp.18–25 and 30–32). 'Activity' boxes within these pages highlight suggested readings from Bessis (2010), Matthews and Thompson (2008) and Saunders and Cornett (2008).

Approaching the question

This question requires a discussion of banking regulation but with particular focus on two key tools of regulation; namely, the gearing ratio and the risk-assets ratio. Your answer must recognise that both are measures of capital adequacy. A good answer would begin by presenting the rationale for banking regulation (and some counter arguments) and its focus on bank capital (see pp.18–23 and 30–32 of the subject guide). The 2007–9 financial crisis and other events since provide numerous examples that can be used to motivate the topic and to support the need for banking regulation. The best answers would provide a flavour of the debate surrounding banking regulation during and after this crisis, and would reflect the sense of outrage expressed by the public and politicians in many countries.

The main body of your answer must focus on detailed analysis of **the two ratios** mentioned in the question. You must use terminology in a precise manner and avoid confusion between liquidity and solvency. It is reasonable to devote more attention to the risk-assets ratio than to the gearing ratio. Some algebraic analysis should be used to support your intuitive arguments on the gearing ratio (see pp.23–24 of the subject guide and the suggested readings from Matthews and Thompson, 2008). The gearing ratio is based on the level of deposits held by a bank relative to its capital. It is an indicator of how much of the deposit base is covered if a given proportion of the bank's borrowers default.

Your discussion of the risk-assets ratio should naturally link with the Basle I and Basle II accords. The best answers would offer some comments on the current moves towards a new regulatory regime under Basle III. However, your answer should remain focused on the risk-assets ratio; the question is not focused towards a critique or comparison of the Basle accords. A key element of the discussion should focus on the means by which bank assets can be risk weighted. There is potential for a deep analysis of the approach of using internal and external credit ratings within the Basle II accord. However, your answer must also recognise how regulators have sought to incorporate measures of interest rate risk, market risk, operational risk and liquidity risk. It is not necessary to discuss Pillars 2 and 3 of the Basle II accord in detail. To support the above approach, it is essential for your answer to reflect your reading from Matthews and Thompson (2008) and Saunders and Cornett (2008).

The answer should conclude with a summary of the key points:

- Why is banking regulation important?
- Why is bank capital a focus for regulatory interest?
- Why are the gearing ratio and the risk-assets ratio important factors for regulators?

Question 4

Explain the constituents of credit risk and discuss how these risks could be managed.

Reading for this question

Please refer to Chapter 4 of the subject guide (pp.53–58). Within these pages, there are various citations to Bessis (2010) and Saunders and Cornett (2008).

Approaching the question

This question has two elements: analysis of the constituents of credit risk; and explanation of how these risks could be managed. The question is entirely focused on credit risk, but requires you to show an understanding of how the risks can be managed.

There are several themes which could be explored in introducing the importance of credit risk to banks. Even with no mismatching of assets and liabilities, banks would still face credit risk. Credit risk is probably the most important type of risk in terms of potential losses for a bank. Default by a small number of key customers could be catastrophic for some banks. In addition, there is scope for you to draw on examples from the sub-prime crisis; or the recent example of the concerns emanating from the reduction in the credit standing of Greece and other European sovereigns.

The first part of the question focuses on Equation 4.1 and pp.53–56 from the subject guide:

$L = D \cdot X \cdot (1 - R)$. The expected loss given default (L) is the product of the loss given default and the default probability (D). The loss given default is comprised of an uncertain exposure (X) and an uncertain recovery rate (R). The answer should initially present a detailed explanation of the three elements: default risk, exposure risk and recovery risk. The default risk is measured by the probability of default. It is important to note that default can be defined in several ways. Answers should highlight the factors that will influence the probability of default, and the possibility of mapping default probabilities from historical data linked to rating systems. Exposure is the amount at risk in the event of default (excluding recoveries). Since default occurs at an unknown future date, the risk is generated by the uncertainty regarding future amounts at risk. You should be careful with this element: exposure risk is often not well defined by candidates in this type of question. Recoveries in the event of default are unpredictable and depend on the type of default and the guarantees received from the borrower. Recoveries involve legal procedures, expenses and a significant lapse of time. A key issue is that the 'expected loss given default' goes beyond the probability of default, which might be viewed as a more traditional measure. You may also describe migration risk even though it does not form part of the equation explicitly.

The second part of the question should address the management of these constituents of credit risk (see pp.57–58 of the subject guide). You should explain the contractual mechanisms that can control credit risk. Basic answers will describe how banks employ traditional selection, limitation and diversification techniques to manage default probabilities. However, it is important that your answers recognise that credit risk management needs to focus beyond these simple processes and beyond the management of only this single constituent of credit risk. For example, you should explain that exposure also needs to be properly managed and that there is potential for recovery rates to be improved through the use of enhancements such as collateral, guarantees and covenants

(refer to pp.36–37 and 57–58 of the subject guide and relevant readings in Saunders and Cornett, 2008 and Bessis, 2010). Finally, good answers may explain briefly how securitisation and credit derivatives can help to transfer credit risk, using material from Chapter 6 of the subject guide. While these are certainly relevant and will be rewarded, they should not comprise a significant proportion of your answer.

Question 5

Explain the nature of liquidity risk and interest rate risk, and analyse the relevance of gap analysis for managing these risks.

Reading for this question

Please refer to Chapters 3 and 5 of the subject guide (pp.37–39 and 63–69). Within these pages, there are 'Activity' boxes which direct you to study appropriate sections from Bessis (2010), Matthews and Thompson (2008) and Saunders and Cornett (2008).

Approaching the question

A good starting point for your answer is to address the rationale for asset and liability management (ALM) in banks (see pp.64–65 of the subject guide). Answers should highlight the relevance of net interest margin and net interest income as target variables, with both the level and variability of these variables being important. These relate to the broader concepts of risk measurement and management.

To address the first part of the question, answers should focus on the issues of liquidity risk and interest rate risk in bank balance sheets (covered in Chapter 3 of the subject guide, pp.37–39). Good answers should explain that the two risks are inter-related; for example, when considering liquidity risk arising through maturity mismatching and the associated re-investment or re-financing interest rate risk.

The second part of the answer should consist of a detailed consideration of liquidity gap analysis and interest rate gap analysis. In discussing liquidity gap analysis, sources of liquidity and maturity mismatching should be addressed in the answer. Under interest rate gap analysis, it is important for candidates to discuss the identification of rate-sensitive assets and liabilities. Illustrative examples should be provided in both cases. There are many examples available in the suggested readings from the textbooks. The section in Chapter 5 of the subject guide titled 'Issues associated with ALM' (pp.65–66) is of limited relevance to the question posed here, and this material should not constitute a large portion of an answer. You should draw only on those issues that relate directly to liquidity or interest rate risk.

Generally, there is much scope in this question for the answer to demonstrate rigorous analysis drawn from the suggested readings.

Question 6

Explain the mechanics, costs and benefits of different forms of securitisation.

Reading for this question

The appropriate reading is from Chapter 6 of the subject guide. Key sections appear on pp.72–78. Within these pages, you are guided to pursue readings from Matthews and Thompson (2008), Saunders and Cornett (2008), and Bessis (2010).

Approaching this question

A good starting point for your answer would be to identify that

securitisation is a financial innovation with far-reaching consequences, not least in its role within the credit crunch and financial crisis (2007 onwards). To place securitisation within a broader context, it is recommended that you introduce information such as that in Table 6.1 in the subject guide. You are expected to discuss 'other forms of securitisation' discussed on p.77 of the subject guide as well as 'pass-through' securitisation. Your answer should proceed with two main themes linked to the question; namely, 'mechanics' and 'costs and benefits'.

The main options available to banks to increase the flexibility of operations while adhering to the regulatory capital requirements are to liquidate assets or to reduce risks. During the period prior to the US sub-prime crisis, liquidation of assets through securitisation became an increasingly widespread means used by banks to transform illiquid assets like loans into securities that are attractive to investors. Securitisation is recognised as an efficient means of redistributing the credit risks held by a bank to other banks or non-bank investors. In principle, it offers a vehicle to transform illiquid financial assets into tradable capital market instruments, which therefore offers potential for enhanced diversification of risks.

Within Chapter 6 of the subject guide, you should identify that Figure 6.1 and the surrounding discussion is highly relevant to the 'mechanics' element required by the question. Pursuing the directions given in the 'Activity' boxes on pp.73–74 of the subject guide would be highly beneficial to your ability to produce a complete answer to this element of the question. You should explain clearly how mechanics of securitisation differ between the different forms of securitisation.

A very good answer to this question would provide a thorough and comprehensive analysis of the costs and benefits of securitisation. Many of these are included in Chapter 6 of the subject guide; and further relevant arguments can be found in the recommended reading. Securitisation provides benefits to banks in terms of both capital position and funding costs. Securitised assets reduce the capital required to comply with regulations. A bank's decision to engage in a securitisation transaction will depend on the balance between the cost of raising funds in this manner relative to attracting deposits or issuing bonds. The identification of appropriate packages of assets on the bank's balance sheet also has an important influence on the viability of a securitisation transaction. With a given set of benefits from securitisation, the more costly and difficult it is to find asset packages of sufficient size and homogeneity, the more expensive it will be to securitise these asset packages. The potential boundary to securitisation may be defined by the relative degree of heterogeneity and credit quality of an asset type or group.

There are important suggested readings on p. 76 of the subject guide and in the 'Activity' box on p.77. Engagement with these readings and activities would greatly enhance your answer.

Question 7

Discuss the main sources of risk in commercial banking, and critically evaluate the approaches used to conduct risk-adjusted performance measurement.

Reading for this question

This question requires a synthesis of material from Chapters 3 and 7 of the subject guide. There are important suggested activities and readings from Bessis (2010) and Saunders and Cornett (2008) cited in these chapters of the subject guide.

Approaching this question

The theme of the question is risks in banking and how risk-taking might influence performance. If a bank performs well over a particular time period, it is important to identify the level of risks taken in order to achieve such performance. In general, this theme has resonance with the 2007–09 credit crunch and financial crisis, and the best answers would include some reference to risk-taking by Western banks in the years prior to 2007 (e.g. sub-prime lending); as well as comments on some banks' reliance on liquidity from wholesale sources (e.g. Northern Rock; see Matthews and Thompson, 2008).

Drawing mainly from material in Chapter 3 of the subject guide, the answer should focus on the 'main' sources of risk in commercial banking. An argument should be made for the selection of risks that are considered to be most important. The subject guide stresses several reasons why credit risk might be viewed as the most important (e.g. even a perfectly matched balance sheet will remain subject to credit risk). Other crucial risks addressed in the subject guide include: liquidity risk; interest rate risk; operational risk; and market risk. Good answers would identify where credit and liquidity risk arose in the build-up to the 2007–09 financial crisis. An additional argument could be made based on the types of risks addressed by regulators. For example, Chapter 2 of the subject guide explains the role of credit risk, interest rate risk, market risk and operational risk in the Basle II accord.

The second half of the answer should proceed to consider performance measures. To remain focused on the question, accounting-based measures of performance could be omitted or alternatively should only be discussed very briefly for the purposes of context. The answer should focus on the rationale for making a risk-adjustment when assessing bank performance. The construction of risk-adjusted measures (e.g. RAROC, RORAC and EVA) should be explained in detail. The 'Activity' box on p.90 of the subject guide is highly relevant to this part of your answer. The best answers would address any limitations with these measures or any issues with implementation or interpretation in practice.

A concluding paragraph should be included to draw together the key themes addressed in your answer in a summarised form.

Question 8

Using appropriate examples, explain how banks use forward and swap contracts to manage credit risk, exchange rate risk and interest rate risk.

Reading for this question

This question relates to Chapter 6 (credit derivatives) and Chapter 8 (exchange rate and interest rate risk) of the subject guide, which should be supplemented by the recommended readings from Saunders and Cornett (2008).

Approaching this question

The question relates to key learning outcomes stated in Chapters 6 and 8 of the subject guide. A good starting point for an answer would be to establish the key features of the forwards and swaps which are used to hedge the three categories of risk mentioned in the question. A concise comparison of them would serve as a strong foundation for more specific analysis later in the answer.

In the case of managing credit risk, a good answer should focus on the characteristics of hedging using credit forwards, credit default swaps and

total return swaps. The relevant suggested readings from Saunders and Cornett (2008) cited in Chapter 6 of the subject guide provide examples and payoff diagrams which would provide an excellent focus for this element.

For managing exchange rate risk, a good approach in the context of this syllabus is to focus the analysis on the covered interest parity condition. After explaining this condition and its relevance to forward contract pricing, the answer should demonstrate the mechanics of a forward hedge. Information relating to a money market hedge is not required, although some candidates may point out that if the parity condition holds, the two hedging techniques produce the same outcome. In a very good answer, the forward hedge should be demonstrated by numerical examples.

In this syllabus, swaps would be the obvious instrument for the discussion of managing interest rate risk (although you may refer to FRAs if you have gained knowledge of this from beyond the subject guide). The interest rate swap is based on comparative advantage in borrowing at fixed and floating interest rates. Beware that it is common for answers to this type of question to provide an illustration of the mechanics of the interest rate swap without explaining the source of interest rate risk faced by the parties involved. A very good answer should explain clearly how an interest rate swap is beneficial to both counterparties in reducing borrowing costs and managing interest rate risk. For this particular question, the analysis could usefully be extended to currency swaps. In this case, a common problem for past candidates has been a failure to emphasise that the hedging technique is based on comparative advantage in borrowing in different currencies.

Examiners' commentaries 2015

FN2029 Financial intermediation – Zone B

Important note

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Comments on specific questions

Question 1

Discuss the primary functions of financial intermediaries and critically evaluate the theories of information sharing coalitions and delegated monitoring that resolve the problems of information asymmetry in direct financing.

Reading for this question

Please refer to Chapter 1 of the 2011 subject guide (pp.9–16). Within these pages, there are 'Activity' boxes that direct you to study appropriate sections from Matthews and Thompson (2008), Saunders and Cornett (2008), Bhattacharya and Thakor (1993) and Diamond (1996). You may also benefit from reading relevant chapters in Freixas and Rochet (1998). Chapter 1 of the subject guide covers four reasons for the dominance of intermediation over direct financing (see the bottom of p.11). Two of these reasons are covered in this question.

Approaching the question

This question comprises two elements; with the latter requiring a more detailed and technical discussion. The first part of your answer (see

pp.10–11 of the subject guide including the 'Activity Box') should focus on the main activities of financial institutions in their provision of brokerage and asset transformation functions. In brokerage, financial institutions match surplus and deficit units, and thus reduce transaction costs and information costs. In asset transformation, they issue claims that are far more attractive to savers than the claims issued directly by corporations. The asset transformation function includes an asset diversification function and an asset evaluation function. The most important contribution of intermediaries is a steady flow of funds from surplus to deficit units.

This second part of the question requires an explanation of the preference for intermediation over direct financing; and specifically expects the focus to be on information asymmetry; and the theories of information sharing coalitions and delegated monitoring.

You should use the material from p.11 of the subject guide to set the context for your answer. Despite different requirements of lenders and borrowers, one could still envisage that the shorter chain of transactions involved in direct financing would be less costly than intermediated financing. In a situation of perfect knowledge, no transaction costs and no indivisibilities, financial intermediaries would be unnecessary, but these conditions are not present in the real world. In this context, information asymmetry relates to the notion that the borrower is very likely to have more information than the lender about the risks of the project for which they receive funds. This situation leads to problems of moral hazard and adverse selection (discussed on pp.13–14 of the subject guide). Your answer should specifically mention banks' commitment to long-term relationships with customers, and the notion of banks as information sharing coalitions (see Matthews and Thompson, 2008 and Leland and Pyle, 1997, which are referred to in the subject guide).

The theory of financial intermediation as delegated monitoring is one of the key learning objectives of Chapter 1 of the subject guide. In a good answer to this question, at least half of the material should focus upon this aspect (starting from the elements covered on pp.14–16 of the subject guide). Defined broadly, 'monitoring' of a borrower by a bank refers to information collection before and after a loan is granted, including screening of loan applications, examining the borrower's ongoing creditworthiness, and ensuring that the borrower adheres to the terms of the contract. This section could initially address information costs and monitoring costs, which would then serve as a foundation to proceed to a discussion of the Diamond (1984, 1996) model.

An important constraint on direct investment by households in the financial claims of corporations is the cost of information collection. Failure to monitor in a timely and complete manner exposes a supplier of funds to agency costs. Financial institutions provide a solution to these problems by pooling funds from suppliers (e.g. household savers); and investing in the financial claims of corporations. The financial institution has an incentive to collect information and monitor, which also alleviates potential 'free rider' problems with direct financing. The average cost of collecting information is also reduced. It is thus argued that suppliers of funds appoint banks as delegated monitors (to act on their behalf). Better answers are expected to proceed to analyse the costs and benefits of monitoring and offer critical evaluation of the theory, which can be found in the recommended readings.

Generally, there is much scope in this question for you to demonstrate analysis drawn from the textbook and journal readings suggested as 'Essential reading' and 'Further reading' in Chapter 1 of the subject guide.

Question 2

Use the Diamond and Dybvig (1983) model to explain the liquidity insurance theory for the preference for financial intermediation over direct financing. Discuss the implications of the equilibrium outcomes of the model.

Reading for this question

Please refer to Chapters 1 and 2 of the subject guide (p.13 and pp.18–22). In addition to Diamond and Dybvig (1983), 'Activity' boxes within these pages highlight suggested readings from Matthews and Thompson (2008), Saunders and Cornett (2008) and Bhattacharya and Thakor (1993). You would also benefit greatly from reading Chapter 2 (pp.20–23) of Freixas and Rochet (1998).

Approaching the question

The answer requires careful reading of Chapters 1 and 2 of the subject guide (supplemented by Diamond and Dybvig, 1983; Freixas and Rochet, 1998, Ch. 2; Matthews and Thompson, 2008, Ch. 12; and Saunders and Cornett, 2008) in order to demonstrate a clear understanding of the term 'liquidity insurance'. Note: this should not be confused with deposit insurance, which is a completely different concept. Liquidity insurance relates to the fact that consumers are unsure of their future liquidity requirements in the face of unanticipated events. In the absence of perfect information, consumers will maintain their own pool of liquidity. Provided that shocks are not perfectly correlated across individuals, portfolio theory suggests that the total liquid reserves needed by a bank will be less than the aggregation of the reserves required by individual consumers acting independently. Diamond and Dybvig (1983) use this argument to account for the existence of banks. The view is that banks enable consumers to alter their consumption patterns according to the influence of shocks, and the value of this service permits a fee to be earned by the bank. In terms of the game theory model, there are two equilibria – the first is the existence of a bank providing liquidity insurance and optimal risk sharing among economic agents; while the second is the situation of a bank run.

The second part of the answer should include a clear definition of a 'bank run'. Financing long-term assets through short-term deposits is a source of potential fragility for banks because they are exposed to the possibility that a large number of depositors will decide to withdraw funds for reasons other than liquidity needs. This results in a vulnerability to bank runs. Better answers would link the theory of bank runs to the nature of the deposit contract. The implication of the possibility of a bank run is that it provides a rationale for regulation. A key reason for regulation is that uninsured depositors are likely to cause a bank run when faced with information of an adverse shock to bank balance sheets. Diamond and Dybvig (1983) argue that deposit insurance could be introduced to prevent bank runs, and there are many historical examples to support this theory. Better answers will highlight the faults in the provision of deposit insurance (moral hazard in particular) and will present other possible solutions.

The material in the subject guide provides an intuitive argument and some of the more formal theory; a good answer should include **both** aspects. A very good answer would provide a full analysis of the implications of the theory, and would include discussion of the relevance of the design of deposit contracts and critical evaluation of deposit insurance. Generally, there is much scope in this question for you to demonstrate rigorous analysis drawn from readings suggested above.

Question 3

Discuss the main sources of risks in commercial banking and explain the principles of capital adequacy regulation. Explain how market and operational risks are addressed in the Basel capital adequacy accords.

Reading for this question

Please refer to Chapter 2 (pp.19–25) and Chapter 3 of the subject guide. Within these pages, there are 'Activity' boxes which direct you to study appropriate sections from Matthews and Thompson (2008), Saunders and Cornett (2008) and Bessis (2010).

Approaching the question

This question requires analysis of the inherent risks in commercial banking activities and the associated need for capital adequacy regulation. The question relates to the third and fourth learning objectives of Chapter 2 (found on pp.17–18 of the subject guide) and the first learning objective of Chapter 3 (seen on p.35 of the subject guide). You are therefore required to link elements from Chapters 2 and 3 of the guide in tackling the question.

In the first part of your answer, you should address the sources of risk. Drawing from Chapter 3 of the subject guide, you should cover credit risk, interest-rate risk, market risk and operational risk as the 'main' relevant sources. Several other categories of risk could be mentioned, but these four are the types of risk that relate directly to provisions in the Basle capital adequacy regulations. Drawing on pp.19-20 and pp.23–27 of the subject guide, the question requires you to emphasise the rationale and principles of capital adequacy regulation. Central banks and other regulatory agencies have typically utilised two measures of capital adequacy; namely, the gearing ratio and the risk assets ratio. Discussion of the gearing ratio is an essential component of a good answer (see p.23 of the subject guide).

Banks would generally prefer to maintain a relatively low amount of capital in order to boost their return on equity. However, even for the best-managed bank which has effective risk management procedures, there always remains the possibility of risks materialising that produce losses. Therefore, it is essential for banks to have adequate capital backing. The need to generate more capital acts as a vital constraint on a bank's asset and liability management. Because capital is so important to the banking firm, capital adequacy has become a primary concern of bank supervision.

The second part of the answer requires more specific detail about the provisions made for market and operational risks. Under Basel II, market risk exposure was incorporated using an 'add-on', where a bank's exposure to market risk is calculated using either a regulatory model or their own internal model (approved by regulatory audits). Basel II proposed that capital required to cover operational risk could be calculated using three methods: Basic Indicator; Standardised; and Advanced Measurement Approaches. This material is summarised on pp.26–27 of the subject guide, which should be supplemented by readings from Bessis (2010); Saunders and Cornett, (2008); and Matthews and Thompson (2008). An outstanding answer would enhance the discussion by drawing on the recent debate and developments on bank capital in Basel III that include provision for liquidity risk.

Question 4

Discuss the motivations and techniques of Asset and Liability Management.

Reading for this question

Please refer to Chapter 5 of the subject guide. Within this chapter, there are 'Activity' boxes which direct you to study appropriate sections from Saunders and Cornett (2008), Bessis (2010) and Matthews and Thompson (2008). Good answers may also include some discussion of securitisation as a form of asset management, drawing from Chapter 6 of the subject guide (pp.72–78) and the suggested readings cited there.

Approaching the question

This question relates to the learning objectives of Chapter 5 of the subject guide (p.63) and the first learning objective of Chapter 6 (p.71).

A good answer would begin with a clear statement of the aims inherent in asset and liability management (ALM). You should focus on the issues of liquidity risk and interest-rate risk in bank balance sheets, and you should highlight the relevance of net-interest margin and net- interest income as target variables. ALM involves the continual monitoring of the existing position of a bank, evaluating how this differs from the desired position, and undertaking transactions (including hedging) to move the bank towards the desired position. The objective is to enhance profitability, while controlling and limiting different risks, as well as complying with the constraints of banking supervision. Therefore, a bank must assess the risks and benefits of all assets and liabilities in the light of the contribution they make to the earnings and to the risks of its total portfolio. Banks have to continually adjust assets and liabilities, both by varying the terms they offer for business with clients and by regular trading in financial markets.

Your answer should then proceed to focus on techniques. Gap analysis (both liquidity and interest rate); and interest margin variance analysis (IMVA); are the main aspects covered in the syllabus. Your discussion should be complemented by clearly explained numerical examples, especially for gap analysis. In this aspect, good answers would take the opportunity to demonstrate insights achieved from reading beyond the subject guide. In discussing liquidity gap analysis, sources of liquidity and maturity mismatching should be addressed. Under interest rate gap analysis, it is important to discuss the identification of rate-sensitive assets and liabilities.

If you draw the potential link to securitisation, you may also include material relating to events during the credit crunch. This type of material could significantly enhance your answer, if used with precision and appropriate detail. You may perceive that this question has very clear and straightforward requirements, but you need to ensure that the answer covers the issues in depth. In order to obtain a high mark, it would be essential for your answer to demonstrate insights achieved from reading beyond the subject guide (namely, following the suggested readings from the textbooks).

Question 5

Explain the structures of credit derivative products and discuss the motivations for using such products.

Reading for this question

Please refer to Chapter 6 of the subject guide (especially pp.72, 78–83). Within this chapter, there are 'Activity' boxes which direct you to study appropriate sections from Bessis (2010), Saunders and Cornett (2008) and Neal (1996). These boxes also direct you to several relevant websites.

Approaching the question

This question relates to the final two learning objectives of Chapter 6 (see p. 71 of the subject guide). Please note that the question specifically relates to credit derivatives, not to financial derivatives in general. Your answer should begin by explaining the context of risk transfer (e.g. using the information on p. 72 and Table 6.1 in the subject guide).

The question specifically requires you to explain the structures of products and there are four examples of 'pure' credit derivatives discussed in the subject guide: credit default swap (including indices), total return swap, credit spread call option and credit forward. Discussion of CLOs and CDOs would be acceptable since these would often be included in a wider definition of credit derivatives (see Table 6.1 of the subject guide). A good answer would clearly distinguish between securitisation (used for funding purposes) and credit derivative transactions (typically having hedging or trading motivations).

To achieve the higher range of marks, there would be a need to supplement the material derived from the subject guide with evidence of reading from the textbooks. One example of how to achieve this would be to present payoff diagrams in your answer (e.g. of the type illustrated in Figure 6.3 of the subject guide). The first 'Activity' box on p.83 of the subject guide also directs you to another approach you could use to prepare thoroughly for a question of this type.

Motivations for using credit derivatives are focused on trading, hedging and customising credit risk, which are discussed directly in the subject guide (pp.78–80). A discussion of market participants and market growth would reinforce this section of your answer. An excellent answer would highlight negative aspects of the use of risk transfer instruments which have come to light during the credit crunch. This would be well rewarded if presented with accuracy and conviction. Note that there is a short section in the subject guide which addresses the impact of the credit derivatives market on financial stability (see p.83), which would be relevant to the answer.

Question 6

Explain the mechanics, costs and benefits of different forms of securitisation.

Reading for this question

The appropriate reading is from Chapter 6 of the subject guide. Key sections appear on pp.72–78. Within these pages, you are guided to pursue readings from Matthews and Thompson (2008), Saunders and Cornett (2008), and Bessis (2010).

Approaching this question

A good starting point for your answer would be to identify that securitisation is a financial innovation with far-reaching consequences, not least in its role within the credit crunch and financial crisis (2007 onwards). To place securitisation within a broader context, it is recommended that you introduce information such as that in Table 6.1 in the subject guide. You are expected to discuss 'other forms of securitisation' discussed on p.77 of the subject guide as well as 'pass-through' securitisation. Your answer should proceed with two main themes linked to the question; namely, 'mechanics' and 'costs and benefits'.

The main options available to banks to increase the flexibility of operations while adhering to the regulatory capital requirements are to liquidate assets or to reduce risks. During the period prior to the US sub-prime

crisis, liquidation of assets through securitisation became an increasingly widespread means used by banks to transform illiquid assets like loans into securities that are attractive to investors. Securitisation is recognised as an efficient means of redistributing the credit risks held by a bank to other banks or non-bank investors. In principle, it offers a vehicle to transform illiquid financial assets into tradable capital market instruments, which therefore offers potential for enhanced diversification of risks.

Within Chapter 6 of the subject guide, you should identify that Figure 6.1 and the surrounding discussion is highly relevant to the 'mechanics' element required by the question. Pursuing the directions given in the 'Activity' boxes on pp.73–74 of the subject guide would be highly beneficial to your ability to produce a complete answer to this element of the question. You should explain clearly how mechanics of securitisation differ between the different forms of securitisation.

A very good answer to this question would provide a thorough and comprehensive analysis of the costs and benefits of securitisation. Many of these are included in Chapter 6 of the subject guide, and further relevant arguments can be found in the recommended reading. Securitisation provides benefits to banks in terms of both capital position and funding costs. Securitised assets reduce the capital required to comply with regulations. A bank's decision to engage in a securitisation transaction will depend on the balance between the cost of raising funds in this manner relative to attracting deposits or issuing bonds. The identification of appropriate packages of assets on the bank's balance sheet also has an important influence on the viability of a securitisation transaction. With a given set of benefits from securitisation, the more costly and difficult it is to find asset packages of sufficient size and homogeneity, the more expensive it will be to securitise these asset packages. The potential boundary to securitisation may be defined by the relative degree of heterogeneity and credit quality of an asset type or group.

There are important suggested readings on p. 76 of the subject guide and in the 'Activity' box on p.77. Engagement with these readings and activities would greatly enhance your answer.

Question 7

Explain the rationale for bank performance measurement and critically analyse the various methods of bank performance measurement.

Reading for this question

Please refer to Chapter 7 of the subject guide. Within this chapter, there are 'Activity' boxes which direct you to study appropriate sections from Bessis (2010) and Matthews and Thompson (2008).

Approaching the question

This question relates to all learning objectives of Chapter 7 of the subject guide. The question addresses both the rationale for performance measurement and discussion of performance measures. From the question, firstly you should note that the examiners' expectations require a critical analysis, not simply a description of the methods.

A good answer should begin by identifying the rationale for analysing bank performance (pp.85–86). The initial focus should be on the risk–return trade-off, and this issue should then permeate the answer in the sense of comparing accounting measures with risk-adjusted measures of performance.

In addressing the accounting measures of performance, answers should focus discussion around the 'du Pont' model, which decomposes the accounting return on equity. Candidates should identify how different measures of profitability can provide alternative perspectives. A good answer would analyse the potential for misleading inferences from accounting measures (e.g. if a bank has inadequate equity capital). Answers should proceed to consider market value measures of performance and should compare these with the accounting measures.

Discussion of risk-adjusted performance measures should then represent a significant portion of the answer. Good answers would demonstrate reading on this issue from beyond the subject guide (e.g. from Bessis, 2010). From past experience, candidates often perceive that this type of question has very clear and straightforward requirements. However, you need to ensure that your answer **covers the issues in depth**. In order to obtain a high mark, it would be essential for your answer to demonstrate insights achieved from reading beyond the subject guide (namely, following the suggested readings from the textbooks).

Question 8

Discuss the main features and payoff structures of call and put options, and discuss the determinants of call and put option prices. Explain how these payoff structures and determinants are useful in option-based credit modelling.

Reading for this question

Please refer to Chapters 4 and 8 of the subject guide. In these chapters, there are 'Activity' boxes that direct you to study appropriate sections from Saunders and Cornett (2008).

Approaching this question

This question requires candidates to draw on material from different parts of the subject guide: Chapter 8 for the characteristics of options; and Chapter 4 for credit risk modelling. The question links technical material on options with an application more closely focused towards the theme of credit risk in this course. The second part of the question is more challenging and requires a deeper and more technical discussion.

Many candidates who have attempted this question in the past have been unable to answer both parts of the question thoroughly. In many cases, they were only able to tackle the first part of the question. In other cases, the candidates wrote about credit derivatives, an area which is not relevant to this question. You should ensure that you have a clear understanding of the distinction between credit derivatives and option-based credit risk modelling.

Your answer should begin by explaining the definitions and structures of call and put options and should then proceed to identify the characteristics of call options and put options in turn. Attention should be placed on the payoff structures (pp.93–94 of the subject guide) and how they differ between calls and puts (and for both holders and writers). The determinants of option prices (see p.101 of the subject guide) should be addressed, with a clear discussion of how each factor influences the call and put option prices. A full discussion of put options would indicate to the examiners that you have engaged in reading beyond the subject guide. A detailed discussion of option pricing models is not expected for this particular question. Discussion of payoff structures for call and put options and determinants of call and put option prices are essential for the first part of the question, since these form the basis of the application of the theory to option-based credit risk modelling in the second part.

The second element in this question requires candidates to demonstrate an understanding of how option pricing theory can be applied to credit risk (see pp.60–62 of the subject guide). There are two main insights:

1. Holding equity is analogous to buying a call option on the value of the firm's assets.
2. The payoff structure for debt holders resembles that of writing a put option on the value of the firm's (borrower's) assets.

Continuing to repay debt is not rational if liabilities exceed assets; thus the borrower may relinquish assets instead. Lenders should adjust the risk premium as a borrower's leverage and asset risk change. Market value of assets and asset risk are a key focus in estimating default probabilities under this approach. Value of, and volatility of, assets are not directly observable. The KMV method offers an alternative method that relies mostly on equity market information instead. The key output is the probability (over a one year horizon) that the market value of assets will fall below promised repayments on short-term liabilities.

The best answers would demonstrate evidence of reading beyond the subject guide (e.g. from Saunders and Cornett, 2008, Chapter 11).