

Financial Intermediation

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Course description

The Financial Intermediation is a two-semester course for the 4-th year ICEF students. This is an intermediate banking course for the BSc Finance and Economics programme students. Introductory Banking course, Intermediate Microeconomics, and Quantitative Methods are pre-requisites. The course is taught in English.

The course aims to provide insights into financial economics, economics of banking, its role in the economy, and practical risk management issues. This course introduces the main models and surveys the basic literature on financial economics and financial intermediation. Utilising the tools of general microeconomic theory for problems of financial theory demonstrates the convergence of the two disciplines. The course underlines the distinctions between models based on symmetric information and competitive market and models that use the assumption of asymmetric information and contractual relationships. Under symmetric information assumption there is no need for financial intermediation and banks are unable to earn non-zero profit. Prices are determined by the competitive market and each agent decide on assets allocation to maximize expected utility. In this framework the models of asset pricing are considered.

If information is asymmetric the market allocation is no longer optimal. Financial intermediaries that enable loan and deposit contracts can provide better opportunities in that case. The role of banks in the economy is described and emphasised with the services provided by banks to investors and firms, namely liquidity insurance and delegated monitoring. The unit structure includes themes about most important issues on bank management, bank regulation, and development of financial markets.

The course combines topics of three different subjects: Financial Economics, Theory of Financial Intermediation, and Bank Management. The main topics are:

- the choice under uncertainty and condition of symmetric information;
- asset pricing models;
- financial intermediation and quality asset transformation;
- the role of banks in producing information and monitoring of borrowers that reduce negative consequences of adverse selection and moral hazard;

- financial risks faced by bank managers and the methods that are used for risk management;
- bank regulation;

Teaching objectives

Banking disciplines taught on BSc programs, as well as research papers, use advanced microeconomic analysis. The main objective the course is to introduce basic applications of general microeconomic theory to special financial problems. Eliminating barriers between economic and financial courses will help graduate students to apply theoretical background for further analysis and research of financial institutions and markets. The course also helps develop practical skills in common areas of risk measurement and management in banking.

Teaching methods

The methods explicitly outline the thinking process used in the discipline and emphasizes the need for learning by the students themselves rather than on teaching them. Throughout the one-year program, students are motivated to define and analyse the problems or issues, evaluate options. The following methods are used:

- lectures
- seminars, which include discussion of the basic problems covered at lectures, questions and problems for each theme are reviewed;
- home assignments for each topic;
- consultations with the teacher;
- self-study.

Grade determination

First semester:

- test in November — 25%
- home assignments and seminar activity — 20%
- first semester written exam in December — 55%

Second semester:

- home assignments and seminar activity — 20%
- second semester written exam in April — 80%

Final course grade:

- first semester grade — 50%
- second semester grade — 50%

The exams and test include problems and free response parts.

Students also take the University of London exam in June, which results are not included in the ICEF course grade.

Main reading

Books

1. Bessis, J., ‘Risk Management in Banking’. Wiley, 1998. [Bessis]
2. Copeland, T. E., “Financial Theory and Corporate Policy”, 3-rd ed, 1992. [Copeland]
3. Dewatripoint M., Tirole J., “The prudential Regulation of Banks”, MIT Press, 1994. [Dewatripoint-Tirole]
4. Freixas, X., Rochet J., “Microeconomics of banking”, MIT Press, 1999. [Freixas-Rochet]
5. Koch, T.W., MacDonald S.S., “Bank Management”, Harcourt Brace & Co., 2000. [Koch-MacDonald]
6. Glantz, M., “Managing Bank Risk: An introduction to broad-base credit engineering”, Academic Press, 2002. [Glantz]
7. Saunders, A., “Financial Institution Management: A Modern Perspective”, McGraw-hill, 2000. [Saunders]
8. Saunders, A., “Credit Risk Measurement”, Wiley, 1999. [Saunders — Credit Risk]
9. Varian H.R., ‘Microeconomic Analysis’, Third Edition, 1998. [Varian]

Articles

1. Akerlof, G., A., (1970), “The Market for “Lemons”: Quality Uncertainty and the Market Mechanism”, The Quarterly Journal of Economics, Volume 84, Issue 3, 488-500. [Akerlof]

2. Allen, F., Santomero, A.M., “The theory of Financial Intermediation”, *Journal of Banking and Finance*, 1998, 21. [Allen-Santomero]
3. Bhattacharya, S., Thakor, A.V., “Contemporary Banking Theory”, *Journal of Financial Intermediation*, 3, 2–50, 1993. [Bhattacharya-Thakor]
4. Black, F., and M. Scholes, “The Pricing of Options and Corporate Liabilities”, *Journal of Political Economy*, May-June 1973, 637–659. [Black-Scholes]
5. Bossone, B, The World Bank, “What Makes Banks Special? A study on banking, finance, and economic development”, 1999. [Bossone]
6. Cox, J., S. Ross, and M. Rubinstein, “Option Pricing: A simplified Approach,” *Journal of Financial Economics*, September 1979, 229–263. [Cox-Ross]
7. Diamond, D. , W., (1984), “Financial Intermediation and Delegated Monitoring”, *Review of Economic Studies*, Volume 51, Issue 3, 393–414. [Diamond 1984]
8. Diamond, D. , W., (1996), “Financial Intermediation as Delegated Monitoring: A Simple Example”, *Federal Reserve Bank of Richmond, Economic Quarterly*, 82/3. [Diamond 1996]
9. Diamond, Douglas W., and Philip Dybvig, 1983, “Bank runs, deposit insurance, and liquidity”, *Journal of Political Economy* 91, 401–419. [Diamond-Dybvig]
10. Nyberg, L., “Are the risks growing in the banking system?”, *BIS Review* 50, 2000. [Nyberg]
11. Raghuram G. Rajan, University of Chicago, “The Past and Future of Commercial Banking Viewed through an Incomplete Contract Lens”. [Rajan]
12. Scholtens, B., Wensveen, D., “A critique on the theory of financial intermediation”, *Journal of Banking and Finance*, 24, (2000) 1243–1251 [Scholtens-Wensveen]

Course outline

1. Fundamentals of Risk Analysis

1. Risk Aversion

2. Arrow-Debreu economy and general equilibrium

The chapter is devoted to the basics of Financial Economics concerned with the consumption and investment decisions of investors under uncertainty. Investors assumed to exhibit risk aversion and to maximize expected utility. They will require an extra risk premium, as a compensation for the risk.

For the first time uncertainty was incorporated to the economical model by Arrow (1963) and Debreu (1959). The basic idea: the commodity space was expanded to incorporate possible future states of the world. The market system was complete in the sense that there was as a set of contingent markets for all commodities. This allows an efficient allocation of resources under uncertainty.

Main readings:

1. [Copeland] Chapters 4, 5.
2. [Varian] pp. 323–335, 363–366.

2. Asset Pricing

1. Option Pricing
2. Forward Contract Pricing
3. Interest Rate and Currency swaps

Asset pricing is one of applied research areas of choice under uncertainty. It demonstrated the mechanics of financial assets' price dependence on risk. The analysis is based on patterns of consumers' behavior under uncertainty described in the first chapter.

Black and Scholes (1973) derived a relatively simple formula for pricing European call option on stock from no arbitrage condition described in the first chapter. In this case a replicative portfolio could be composed of the underlying asset and the risk-free asset.

The chapter also consider arbitrage free forward contract pricing. The relationship between the spot and forward prices is determined by the covered interest rate parity (CIRP) that rule out arbitrage possibilities. Interest rate, currency swaps, and Forward Rate Agreements (FRA) are considered as hedging instruments. The concept of replicative portfolio is applied to interest rate swap and FRA pricing. The need for using an interest rate hedge is demonstrated with US Savings & Loan Crisis example.

Main readings:

1. [Copeland] Chapters 8, 9.
2. [Saunders] pp. 690–695, 705–707.

3. [Koch-MacDonald] pp. 392–399.

Additional readings:

1. [Black-Scholes]
2. [Cox-Ross]
3. [Jameson]

3. Banking and Financial Intermediation

1. Introduction
2. Liquidity Provision
3. Asymmetric Information and delegated monitoring
4. New approaches to the theory of intermediation

Economic theory has traditionally focused on the real sector of the economy and disregarded the role of financial intermediation. Effectively, in an Arrow-Debreu world, where markets are complete, information is symmetric and other frictions are not present, there is no room for financial intermediaries. But, there are numerous evidences that financial intermediation does affect the economical grows. The chapter reviews the main literature about these contradictory statements (microeconomic theories of financial intermediation). In modern theories of financial intermediation, the two most prominent explanations for the existence of intermediaries like depository institutions are the provision of liquidity and the provision of monitoring services. Diamond and Dybvig (1983) assumed that by issuing demand deposits, banks can improve on a competitive market because these deposits allow for better risk sharing among households that face idiosyncratic shocks to their consumption needs over time. The importance of banks in this framework arises from an information asymmetry: the shock that affects a household's consumption needs is not publicly observable.

Diamond (1984) finds a special feature in banks acting as delegated monitors of borrowers, on behalf of the ultimate lenders (depositors), in the presence of costly monitoring. Banks exploit comparative advantage (comparative to individual lenders or specialized firms: rating agencies, securities analysts, or auditors) in information production because of economies of scale and scope, which reduce the cost of informational asymmetries and its extent in the economy. Diversification reduces the cost of delegating monitoring to a financial intermediary.

Recently, the work of Allen and Santomero (1997) has provided two additional functions to the list of services provided by the intermediary sector,

namely risk management and access to an increasingly complex financial sector. They have argued that although transaction costs and asymmetric information have declined, intermediation has increased. New markets for financial futures and options are mainly markets for intermediaries rather than individuals or firms. Participation costs are crucial to understanding the current activities of intermediaries and in particular their focus on risk management.

Main readings:

1. [Allen-Santomero]
2. [Bhattacharya-Thakor]
3. [Diamond 1996]
4. [Freixas-Rochet] pp.8-11, 20-23, 29-32.
5. [Saunders] Chapters 1, 6.
6. [Scholtens-Wensveen]

Additional readings:

1. [Akerlof]
2. [Bossone]
3. [Diamond 1984]
4. [Diamond-Dybvig]

4. Risks in Banking

1. Classification of banking risks
2. Introduction to risk management and measurement techniques

The role of banks as financial intermediaries makes them vulnerable to specific financial risks. Risks are defined as the adverse impact of various uncertainties on banks profitability and financial standing. The main categories of risk related to the special services provided by banks are liquidity, interest rate, and credit risk. Financial risks are subject to complex interdependencies that may significantly increase a bank's overall risk profile. Solvency risk is the risk of being unable to cover losses, generated by all types of risks, with the available capital.

Main readings:

1. [Saunders — Credit Risk] Chapter 7.

Additional readings:

1. [Nyberg]

5. Lending and Credit Risk

1. Default risk and credit rationing
2. Estimating default probability
3. Loss Given Default and Expected Loss
4. Credit portfolio management
5. Credit derivatives
6. Bank And Agency Rating systems

The chapter review several approaches to credit risks estimation used by banks: expert systems, rating system, credit-scoring systems, and option default model. The possibilities for active credit risk management were introduced with credit derivatives that are flexible instruments of risk management. Credit derivatives are financial instruments that provide insurance against losses related to credit events. With credit derivatives it is possible to overcome are restrictions that limit possibilities of diversification, namely: industrial specialization, relationship banking, the need for big credits.

Economic aspects analysis of bank lending: credit rationing, moral hazard and capital, long-term credit relations, debt restructuring.

Main readings:

1. [Freixas-Rochet] Chapters 5.1-5.2.
2. [Saunders] Chapters 11, 12, 27.
3. [Saunders – Credit Risk] Chapters 1, 2, 3.

6. Asset Liability Management, Liquidity Risk and Interest Rate Risk

1. Term structure of interest rates
2. Duration and convexity
3. Sources of interest rate risk, interest rate gap analyses
4. Liquidity risk

All financial institutions face interest rate risk. When interest rates fluctuate, a bank's earnings and expenses, as well as the economic value of its assets, liabilities, and off-balance-sheet positions, also change. The net effect of these changes is reflected in a bank's overall income and capital. Interest rate risk is by its nature a speculative type of financial risk, since interest rate movements can result in a profit or a loss. The combination of a volatile interest rate environment, deregulation, and a growing array of on- and off-balance-sheet products have made the management of interest rate risk an increasing challenge.

Interest rate risk management comprises various policies, actions, and techniques that a bank can use to reduce the risk of a diminution in its net equity resulting from adverse changes in interest rates. This chapter discusses various aspects of interest rate risk and reviews techniques to analyze and manage it, in particular, repricing and sensitivity analyses.

Liquidity risk management lies at the heart of confidence in the banking system. The importance of liquidity transcends the individual institution, since a liquidity shortfall at a single institution can have systemwide repercussions. By their very nature, banks transform the term of their liabilities to have different maturities on the asset side of the balance sheet. At the same time, banks must be able to meet their commitments (such as deposits) at the point at which they come due. The contractual inflow and outflow of funds will not necessarily be reflected in actual plans and may vary at different times. A bank may therefore experience liquidity mismatches, making its liquidity policies and liquidity risk management key factors in its business strategy. Understanding the context of liquidity risk management involves examining a bank's approach to funding and liquidity planning under alternative scenarios. As a result of the increasing complexity of banking, a fundamental shift has taken place in the perspective that authorities have on prudent liquidity management.

The management of balance sheet structure, or asset-liability management, is the core of a sound, modern bank. The central objective of this process — to stabilize and maximize the spread between interest paid to raise funds and interest earned on the bank's assets, and at the same time to ensure adequate liquidity and an acceptable level of risk — is as old as the banking business itself. The practices, norms, and techniques of asset-liability management have, however, changed substantially in recent years. Moreover, given the complexity and volatility of modern financial markets, the need for good asset-liability management has significantly increased. The adoption of techniques for such management is also a prerequisite for a more integrated approach to managing the risks associated with balance sheet and off-balance-sheet items. The key elements that guide decisions in asset-liability management include liquidity, interest rate sensitivity, and pricing. The framework for liquidity risk management has three aspects: measuring and managing net funding requirements, market access, and contingency planning. Forecasting future events is an es-

essential part of liquidity planning and risk management.

Main readings:

1. [Bessis] Chapters 10-14.
2. [Saunders] Chapters 8, 9, 17, 18.
3. [Koch-MacDonald] Chapters 6-9.

7. Using Derivatives for Risk Management

1. Risk Measurement and Value-at-risk models
2. Currency Hedging
3. Interest Rate Hedging
4. Delta Hedging and Options

Risk management enters the first stage of the decision making process and has been practised as a professional discipline in financial institutions that maintain derivative dealerships for at least a decade. A central issue in modern risk management is the measurement of risk. One decision that emerges from risk analysis is the amount of capital that the institution should hold to absorb future losses that can occur in the course of its trading activities. These two aspects of the risk management role turn the capital allocation decision into an optimisation problem: too small an amount exposes the firm to excessive levels of risk, but too large an amount raises funding costs and reduces profitability. The measurement of market risk — the potential losses due to adverse changes in the market prices of financial assets. Probably measures reflects the most advanced methodology for risk measurement. Its main tool is a position's or portfolio's Value-at-Risk (VaR), or the loss in market value that could occur over a given time interval at a specified level of confidence. Value-at-Risk has become the standard framework for measuring and reporting risk in banks worldwide. VAR is an absolute risk measure in units of dollars per day.

Main readings:

1. [Saunders] Chapters 10, 24, 26.
2. [Koch-MacDonald] Chapters 10, 11.

8. Analysis of Bank Performance

1. Introduction to bank data
2. Accounting versus market value measures

3. Risk-adjusted performance and RAROC model
4. Economic Value Added (EVA)

Financial ratio analyses can help to evaluate the source and magnitude of bank profits relative to selected risks taken. The procedure involves decomposing aggregate profit ratios into their components to help identify key factors that influence performance. It then associates financial ratios for different risks to demonstrate the trade-off between risks and return. Financial ratios should be compared with benchmark figures and used in planning for an acceptable future performance. Financial ratio analysis of the performance of a commercial bank is based on the fundamental assumption that the objective of management is to maximize shareholder's wealth. This goal interpreted to mean maximizing the market value of a bank's common stock, which depends on the present value of bank's cash flows. The present value increases with the future value of the cash flow and decreases with the risk of the cash flow.

Allocating capital directly to business units is an integral part of managing shareholders' value of a financial institution. The use of capital determines the rate of growth of a product or business. Capital allocation has recently become an important area of research because in part, regulatory agencies have proposed or are considering alternative risk-based capital requirements. If these risk-based capital requirements are not well designed, these regulations may result in inefficient use of capital and an increase in the cost of financial services to the economy. Risk-based bank analysis includes important qualitative factors, and places financial ratios within a broad framework of risk assessment and risk management and changes or trends in such risks, as well as underscoring the relevant institutional aspects. Traditionally, banks have seen the management of credit risk as their most important task, but as banking has changed and the market environment has become more complex and volatile, awareness has developed of the critical need to manage exposure to other operational and financial risks. The elements of the risk-based analytical review covered in this chapter. As a result, management is exploring the use of profitability measures adjusted for risks. The relationship between the risk measures of the balance sheet to the risk management of the firm and the firm value, while taking the future growth of the firm, taxes, and multiple business units into account is rarely understood. Bankers Trust's RAROC, has become the common yardstick of risk measurement.

Main readings:

1. [Saunders] Chapter 20, pp. 513-520.
2. [Saunders — Credit Risk] Chapter 12.
3. [Bessis] Chapters 1, 53, 54.

4. [Koch-MacDonald] Chapter 4.

Additional readings:

1. [Glantz] Chapter 16.

9. Capital Regulation

1. Capital Regulation
2. Capital requirements and securitisation

Banking is undoubtedly one of the most regulated industries in the world, and the rules on bank capital are one of the most prominent aspects of such regulation. This prominence results from the central role that banks play in financial intermediation, the importance of bank capital for bank soundness and the efforts of the international community to adopt common bank capital standards. There are two justifications that are often presented for regulating banks: the risk of a systemic crisis and the inability of depositors to monitor banks. Banks' provision of liquidity services leaves them exposed to runs. The reason is that a bank needs to operate with a balance sheet where the liquidation value of its assets is less than the value of liquid deposits in order to provide liquidity services. A central bank acts as lender of last resort in preventing a bank run from turning into a panic.

In recent years, the development of markets for securitized assets has provided another method for managing credit risk. In the asset securitization approach, bonds or loans with credit risk are pooled together and sold to an outside investor. Securitisation also provides issuers with what is frequently a more efficient, and lower cost source of financing in comparison with other bank and capital markets financing alternatives. Another central objective and benefit of securitisation from the bank standpoint is that it facilitates the removal of assets from the organization's balance sheet. This outcome can help an issuer improve various financial ratios, utilize capital more efficiently and achieve compliance with risk-based capital standards. As many banks must either increase capital or dispose of financial assets to comply with these guidelines, and as increasing capital may be quite expensive, disposing of assets through a securitisation transaction has become an increasingly attractive means of assisting commercial banks in complying with the Basel framework.

Main readings:

1. [Saunders] Chapters 19, 20, 28.
2. [Freixas-Rochet] Chapters 7.1, 7.2, 7.4, 9.
3. [Dewatripoint-Tirole] Chapters 2.1.5, 2.2, 3.1, 9.2, 11.

Additional readings:

1. [Rajan]

Distribution of hours

#	Topic	Total hours	Contact hours		Self study
			Lectures	Seminars	
1.	Fundamentals Of Risk Analysis	32	6	6	20
2.	Asset Pricing	44	10	10	24
3.	Banking And Financial Inter- mediation	48	12	12	24
4.	Risks In Banking	28	4	4	20
5.	Lending And Credit Risk	30	6	6	18
6.	Asset-Liability Management, Liquidity Risk And Interest Rate Risk	30	6	6	18
7.	Using Derivatives for Risk Management	40	8	8	24
8.	Analysis Of Bank Performance	32	6	6	20
9.	Banking Regulation	40	8	8	24
Total:		324	66	66	192