

Financial Instruments & Markets

Motivation and Course Content

The purpose of this note is to explain the motivation for a manager to learn about sophisticated financial instruments and the capital markets in which they trade, as well as to provide a brief description of the course content and administration.

Course Motivation

The last 35 years have seen an unprecedented pace of financial innovation in the markets. A whole new range of financial instruments are now available; from basic equity derivatives, such as single-stock calls and puts that trade on the Chicago Board Options Exchange and the International Securities Exchange, to more complicated products, like collateralized mortgage-backed securities and swaptions that trade over-the-counter (OTC). The use of these instruments is not confined to obscure hedge funds, but has become standard operating procedure at most large and mid-sized businesses, whether public or private, financial or non-financial. These businesses use sophisticated financial instruments and the capital markets to accomplish both strategic goals as well as the narrower goal of risk management. As a result, the modern business manager now needs to be well-trained in financial instruments and the capital markets.

The increased pace of financial innovation is primarily due to a dramatic increase in volatility of several economic quantities over the last three to four decades. The trend toward globalization that we've seen over this same time period has only served to exacerbate the problems induced by increased volatility. The reaction to this increase in volatility was an enormous demand by investors¹ for financial instruments that could transfer volatility to those economic institutions and investors that could best bear this risk. The most basic way to reduce volatility is through diversification. Investors that found themselves less than perfectly diversified realized they were paying a premium in the form of opportunity costs for the additional risk they were bearing.² Thus, these investors were willing to pay a small premium (less than the opportunity costs they were already bearing) to obtain risks that better diversified them. Additionally, there was an enormous increase in demand from investors who simply wanted to remove certain risks off of their balance sheets entirely. The need to transfer risk resulted in an explosion of new financial instruments that were capable of "slicing and dicing" volatility and moving the individual slices to investors who could best make use of specific

¹ By investors we mean generally all economic agents, from retail investors to financial institutions to corporations.

² Rather than earning a risk premium on all of the risk they were bearing, the portion of risk that was diversifiable, or non-systematic, earned them zero risk premium. They simply earned the risk-free rate on this risk. Thus, some of their risk capacity was essentially being underutilized, or earning sub-par returns.

types of volatility. This process of creating new financial instruments—of “slicing risk”—came to be known as “financial engineering”.

As a result of the increase in risk and the number of instruments created to deal with this risk, in the modern economic climate it is virtually impossible for a manager overseeing a substantial business, whether a financial or non-financial business, to be successful without a thorough understanding of these financial instruments and their value in hedging and diversifying.³ The use of complex financial instruments has risen substantially in both the US and Europe – even among non-financial corporations.⁴ Therefore, the demand for training in these instruments – from simply being able to decompose their structures in order to obtain a basic understanding, to sophisticated valuation and hedging methodologies – has witnessed an enormous increase. Most business schools now offer multiple advanced courses in teaching about these instruments, at the MBA and Executive Education levels. These courses typically have titles such as “Financial Instruments,” “Capital Markets,” “Fixed Income Securities,” “Options and Futures,” or “Risk Management.” In fact, many schools now offer specialized programs for those who want to train exclusively in these instruments and methods.⁵

Course Content

This course covers the basics of financial instruments and the markets (public or OTC) in which these instruments trade. The course stems from a number of previous courses taught by the author at the MBA and Executive Education levels at Harvard Business School (HBS), including “Corporate Financial Engineering,” “Capital Markets,” and “Financial Instruments”.

The course consists of two sections with similar structures: fixed income securities and derivative securities. Each section begins with a set of concepts, introduced through a reading note(s) with a problem set at the end. Then, each section moves to applications. In the applications, case studies are used to introduce advanced securities and institutional features of the markets in which these securities trade. The common theme among these cases is how these securities accomplish risk transfer. The cases all require the student to analyze a new security. The students therefore develop a general framework for analyzing new financial instruments. This framework involves decomposing a security into simpler pieces, analyzing (pricing, hedging, etc.) each piece separately, and then putting these pieces back together for a unified analysis. Once a basic technical analysis is accomplished, it is easy to construct the risk transfer being accomplished by a security. Then the question of how/why this risk transfer creates value is asked and answered. Answering this question is always the key to solving the case. Along the way, the student also picks up substantial institutional knowledge about the markets in which these securities trade, the security design process, and the role and motivation of financial intermediaries, including commercial banks, investment banks, insurance companies, and hedge funds.

Course Materials

Course Assignments: The course is taught primarily by the case method. Therefore the typical course assignment will be the preparation of a case study and supplemental textbook readings or notes prepared by the instructor.

Cases, Readings, and Textbook: A combination of cases, readings from the financial press, academic articles, firm filings, and textbooks will be used in the course. The main textbooks for the course are

³ It is important to note that by hedging and diversifying, we are not just limiting ourselves to investors’ stock of financial capital, but also their stock of human capital.

⁴ A recent survey found that well over 50% percent of non-financial businesses (public and private) in the US and Europe used complex financial instruments of some form as part of their normal course of business.

⁵ Many of these programs typically lead to a non-MBA degree such as a Master’s in Financial Engineering.

Chacko et al, Financial Instruments and Markets: A Casebook, and Hull, Fundamentals of Futures and Options Markets.

Optional Readings: There will usually be additional articles handed out in class covering related current events in the business world.

Computers: Students must own a computer, or have access to a computer, with the standard set of software used at SCU. Microsoft Excel will be particularly useful throughout the course.

Grading

Grades will be based on class participation (35%), a midterm quiz (15%), and a final exam (50%).

Participation: Participation in the class discussion is an integral part of the course. One of the main goals of the course is to develop a facility to explain technical material in an easily understandable manner. Therefore, students are expected to attend class and to share their own case analyses and conclusions with the class.

Mid-term Quiz: Roughly midway through the course, a multiple-choice quiz will be administered. The quiz will immediately follow the section of the course that introduces options and option pricing. The primary purpose of the quiz is to provide feedback on a student's comprehension of the material covered in the course.

Final Exam: The final exam will be a case study. Any of the case studies used in the course would be exemplary of the final exam.

Prerequisites

The prerequisites for this course are an introductory corporate finance course and an introductory investments course, covering the basics of fixed-income mathematics such as the definition and calculation of yield-to-maturity, and basic options concepts such as terminal payoff diagrams for European calls and puts. Specifically, this class is intended as an introduction to fixed income securities, options, and other derivative securities – nothing but rudimentary knowledge of these instruments is assumed.

The material for the course, by its very nature, is technical. Knowledge of algebra and basic probability/statistics is assumed.

Syllabus

Day	Topic	Case Study
1	Introduction to Equities	Abbott-Alza Acquisition: Risk Arbitrage
2	Basic Option Properties	Problem Set: Option Diagrams and Basic Replication
3	Basic Option Properties	Dell Computer: Hedging Stock Options
4	Option Valuation	Problem Set: Dynamic Replication
5	Option Valuation	Derivium Capital: Tax Deferral Using Options
6	Equity Option Application	Pine Street Capital: Option Greeks
7	Equity Option Application	Cox Communications PRIDES: Structured Debt
8	Equity Option Application	Ramtron (Floorless Convertibles): Structured Debt
9	Equity Option Application	Alza (SWORDS): Synthetic Debt
10	Midterm Quiz	
11	Introduction to Fixed Income	Problem Set: Basic Fixed Income Math
12	Introduction to Fixed Income	Deutsche Bank: Yield Curve Trade
13	Introduction to Fixed Income	Problem Set: Duration and Convexity
14	Introduction to Fixed Income	Ticonderoga Capital: Interest Rate Risk Management
15	Fixed Income Applications	Prudential Insurance: Asset/Liability Management
16	Fixed Income Applications	Swedish National Debt Office: Lottery Bonds
17	Fixed Income Applications	Nexgen: Collateralized Debt Obligations
18	Fixed Income Applications	First American Bank: Credit Default Swaps
19	Introduction to Forwards/Swaps	Problem Set: Forward and Swap Contracts
20	Introduction to Forwards/Swaps	Problem Set: Forward and Swap Contracts