

EMBA Derivatives - B7309-001-20193
FALL 2020
Warren 207

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REQUIRED COURSE MATERIAL

Equity Derivatives: Corporate and Institutional Applications
Neil C. Schofield, 2017

Some selected readings can be accessed by control/clicking on the syllabus, some can be found in the Library Reserves (LR) tabs in Canvas, and some in PDF files under "Miscellaneous" in the Files tab in Canvas.

REQUIRED PREREQUISITES

Capital Markets and Investments

CONNECTION WITH THE CORE

This course builds on knowledge from the Capital Markets and Statistics courses (B8306). Specifically, statistical techniques are used to estimate parameters of option pricing models, data are used to develop scenarios for risk analysis; and are used to understand simulation output when pricing and hedging derivative securities.

COURSE DESCRIPTION AND OBJECTIVES

Successful investing requires more than just picking stocks and bonds given the wide array of products at a portfolio manager's disposal.

Through a combination of lectures, guest speakers and a final project, this course is intended to provide firsthand experience on how products like Options, Futures, Swaps, ETFs, Structured Notes, and Convertible Bonds are structured, valued, and used by all types of investors globally. Although the majority of the course relates to Equities, there will be a few classes on Fixed Income, Commodities and Credit Derivatives.

The course is designed from both the perspective of a practitioner who has to account for the real costs of trading derivatives and how the derivative can improve the return and/or reduce the risk of his/her portfolio.

The course is broken into the following sections:

Products - The course starts with a discussion of "Delta 1" Derivatives like Exchange Traded Funds, Futures, and Swaps. These products trade dollar for dollar with the underlying security. We then explore options based Equity, Fixed Income and Commodity products, like Options, Structured Notes, Credit Default Swaps, and Convertible Bonds.

Strategies - A component of this course will revolve around how investors use these products through the combination of class discussions, guest speakers and project work.

Toward the end of the course, we will try to identify future trends that may affect the market. We also look at historical events that shaped the markets, with a specific focus on market events in 2020.

ASSIGNMENTS, EXAM AND FINAL PROJECT

All assignments must be completed in writing with hard copies handed in before class. Some assignments will be Type A, some Type B.

For Type A assignments, each student must participate in a group discussion regarding the assignment before submission and review and if needed edit the final submission.

Collaboration across groups is not allowed.

For Type B Assignments, each student should attempt to answer the questions on their own before collaborating with other students. Each student should hand in their own submission for Type B assignments.

METHOD OF EVALUATION

Class Participation and Assignments	40%
Take-Home Exam	35%
Final Project	25%

An important component of Class Participation is attendance which will be tracked. It is up to you to sign the attendance sheet when it is passed around in class, failure to sign the sheet results in an absence for the class. I reserve the right to downgrade (including failing) any student who misses a significant number of classes, or does not complete all of the assignments.

I will try to avoid cold calling, with the exception being case discussions. During class, please do not use laptops, tablet computers, and smartphones. Exceptions will be made with my prior approval.

For the Final Project, depending on the health environment, each group will work with an industry practitioner on a project they created or complete a case study I created. The practitioner-based projects will be presented to the class, the case studies just to me. In either case, every student (without exceptions) must attend their group's presentation.

If you were a student in my Capital Markets class, please do not use any material from that course to help you complete the assignments for this course.

1. Course Introduction/Indices and Exchange Traded Funds (09/08)

After a quick overview of the class, we introduce the measurement of trading costs, a concept that will be used throughout the course. This is followed by a discussion of Indices, focusing on the ways they are constructed and traded. If there is time, I will introduce Exchange Traded Funds.

Readings:

- Chapter 1, pp. 3-7
- Not All Commodity Indexes Are Alike (PIMCO) (LR)

2. Exchange Traded Funds and Futures (09/15)

This class reviews products investors use to obtain broad market exposure, starting with Exchange Traded Funds. The class addresses how they are created, what forces impact the way they trade and how they compare to other index products.

After ETFs the class moves onto Futures, starting with Stock Index Futures. We review how the markets operate and how futures are valued. We then compare the cost, return, and risk of futures vs. ETFs.

Readings:

- Chapter 1, pp. 16-19; Chapter 4, pp. 73-78; Chapter 9, pp. 273-276
- ETFs for the Single Stock Manager: Correlations, Myths, & Realities (Goldman Sachs) (PDF)
- [The Evolution and Success of Index Strategies in ETFs](#) (Hill, Joanne M.) (PDF)

3. Futures and Swap Markets (09/22)

After completing our discussion on futures, I introduce Equity Index Swaps, comparing them to Futures and ETFs. Then we discuss Equity Finance, which is the business of lending money

to investors and facilitating short sales and describe how swaps on individual stocks are employed in that business.

Readings:

- Chapter 1, pp. 10-14, 19-20; Chapter 10, pp. 287-292
- Making Alpha Portable (Bernstein, Peter L.) (PDF)
- Mechanics of the Equity Lending Market (Fabozzi, Frank J.) (PDF)

4. Options Introduction and Valuation (09/29)

With Delta 1 products completed, we move to Equity Options. We start with a discussion on how the market operates and liquidity is provided using the ISE case study as background. Please read the case and be prepared to discuss it.

We then move on to Valuation, a topic that can get fairly complex. Although options pricing cannot be explained without formulas, I try to provide intuition on what drives pricing leaving out the higher mathematics.

Readings:

- Chapter 1, pp. 20-23; Chapter 5, pp. 105-119
- [The International Securities Exchange: New Ground in Options Markets](#)

Assignments

Assignment (1) - ISE Questions/Comparing the use of ETFs, Futures and Swaps (Type A)

5. Options Models/Practical Considerations in Pricing Options (10/06)

We start this class by reviewing the commonly used Options Models like the Binomial and Black-Scholes Models.

We then discuss how the cost of trading stock influences the price of an equity option and why the interest rate used to price a particular option depends on how the trader hedges that option.

In the index options market there are historical relationships between implied and historical volatility, as well as implied volatility for options with different strike prices (skew) and terms (term structure). Relying on historical data, this class discusses those relationships.

Readings:

- Chapter 6 - pp. 139-172, pp. 190-196
- Introduction to Binomial Trees (Hull, John) (PDF)
- Valuing Stock Options The Black-Scholes Model (Hull, John) (PDF)

Assignments:

Assignment (2) - Options Pricing Questions (Type B)

6. Single Stock Options Strategies/Convertible Bonds and Structured Notes (10/13)

To start this class we contrast the behavior of volatility in stocks and indices. Then we discuss how Asset Managers tie their knowledge of the underlying company to develop options strategies on individual stocks. We go into mathematical detail on the most popular Equity Options strategies, writing covered calls and puts.

Then I will review Convertible Bonds and Structured Notes. Structured Notes are fixed income securities that combine bonds issued by an investment bank with options to provide equity exposure with different risk than conventional equities.

Readings:

- Tutorial on Using Options in Active Strategies (Tsu, Maria E.) (PDF)
- Covered Call Strategies: One Fact and Eight Myths (Israelov, Roni) (LR)
- Convertible Securities Chapter 12, pp. 347-351

Assignments:

Assignment (3) - Options Skew and Term Structure (Type B)

7. How Institution and Corporations Use Derivatives (10/20)

Pension Funds use Index Options and Interest Rates Futures and Options to control the risk of both their Assets and Liabilities. We start the class by exploring the strategies they follow and how to arrive at an appropriate hedge.

We then discuss how corporations use Equity Derivatives in Share Repurchase and Capital Formation strategies. The class ends with a review of how Insurance Companies use Equity Derivatives in Asset and Liability Management.

Readings:

- Chapter 14, pp. 426-436

8. Using Derivatives in Wealth Management (10/27)

The focus of this class is using Equity Derivatives in Wealth Management. Cecilia Manzolillo and I start by explaining how individuals use Structured Notes in their portfolios. Then we introduce strategies that employ Exotic Equity Derivatives.

Taxable investors often use derivatives to improve after-tax returns. During the second half of the class we cover the tax laws most relevant to Equity Derivatives transactions and introduce strategies to enhance After-Tax returns.

Guest Speaker: Cecilia Manzolillo, Columbia Business School

Readings:

- Chapter 7, pp. 203-206; Chapter 10, pp. 247-267
- Chapter 10, pp. 293-294

Assignments:

Assignment (4) - Convertible Bonds and Structured Notes (Type B)

9. Currency and Credit Derivatives (11/10)

Sanjiv Poori will explore how investors use Currency Derivatives to control risk, followed by Dylan Ross from Brigade Capital who will delve into the inner workings of the Credit Derivatives Market.

10. Volatility and Interest Rate Derivatives (11/17)

Rocky Fishman from Goldman Sachs will start by sharing current research he has done on strategies using the VIX. Jack Hattem from Blackrock will then provide an overview of Fixed Income Derivatives products and describe how his company uses them.

11. Learning From History (11/24)

To better understand the impact Derivatives has on the Capital Markets it is useful to understand history. In this class we discuss situations in history where Futures and Options were misused. Prior to 2008, two stand out, Portfolio Insurance and the 1987 crash and Long-Term Capital Management.

Starting in 2008, the two most important events were AIG in 2008, and the Flash Crash of 2010. Toward the end of the class, we will review 2020 and the impact of the Pandemic on Derivatives markets.

Guest Speaker: Bud Kroll

Readings:

- Bank of Volatility (Lowenstein, Roger) (PDF)
- The Demons of '87 (Bookstaber, Richard M.) (PDF)
- [Leland O'Brien Rubinstein Associates, Inc.: Portfolio Insurance](#) (PDF)
- [Long-Term Capital Management, L.P. \(A\)](#)
- [Long-Term Capital Management, L.P. \(C\)](#)
- [Long-Term Capital Management, L.P. \(D\)](#)

- [Findings Regarding the Market Events of May 6, 2010](#) (CFTC & SEC), Executive Summary only, pp. 1-8
- Enhancing Our Equity Market Structure (White, Mary Jo) (LR)
- From Free Lunch to Black Hole: Credit Default Swaps at AIG (PDF)

Assignments:

Assignment (5) - LOR/LTCM/AIG/Flash Crash /2020 Questions (Type A)

12. Final Project (12/1)

To end the course each group will present their final project. If we use practitioners and they are available, each practitioner/advisor will also speak to the class, providing an overview of their business and how it relates to the project their group completed.