

**Equity Derivatives – B8384-001-20171**  
**Spring 2018**  
**Mondays & Wednesdays, 12:30pm – 2:00pm**  
**Uris 303**

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**TEACHING ASSISTANT:** TBD

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**REQUIRED COURSE MATERIAL**

The Practical Guide to Wall Street: Equities and Derivatives

*Matthew Tagliani, 2009*

Selected Readings are on electronic reserve and accessible through the Library Reserves tab in Canvas (LR), and in PDF files under "Miscellaneous" in the Files tab in Canvas (PDF).

**REQUIRED PREREQUISITES AND CONNECTION TO THE CORE**

**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 in Equities Markets requires more than just picking stocks 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, Swaps, Futures, 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 and Commodities 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.

My course notes have been developed from the experiences I have had working with institutional and private clients for 18 years at Goldman Sachs.

The course is broken into the following sections:

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

**Strategies** - A large component of this course will revolve around how investors use these products through the combination of class discussions, guest speakers and your final project. The project will require diving deeply into how an institutional or individual investor uses Derivatives to enhance return and/or control risk.

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.

### ASSIGNMENTS

**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. 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.

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.

## Course Outline

### Section 1 - Products

#### 1. Course Introduction/Indices

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.

##### Readings:

- Chapter 4
- [MSCI: Developed, Emerging, Frontier Markets](https://www.msci.com/market-cap-weighted-indexes) (<https://www.msci.com/market-cap-weighted-indexes>)
- Not All Commodity Indexes Are Alike (PIMCO) (LR)

#### 2. Exchange Traded Funds

After completing Indices, we explore Exchange Traded Funds, addressing how they are created, what forces impact the way they trade and how they compare to other index products. ETFs have expanded into new markets like Fixed Income, Commodities and Currencies, providing individual investors choices that have historically been only available to institutions.

##### Readings:

- Chapter 6
- ETFs for the Single Stock Manager: Correlations, Myths, & Realities (PDF)
- [The Evolution and Success of Index Strategies in ETFs](http://www.cfapubs.org/doi/pdf/10.2469/faj.v72.n5.2) (Hill, Joanne M.) (<http://www.cfapubs.org/doi/pdf/10.2469/faj.v72.n5.2>)

#### 3. Stock Index Futures

After completing ETFs, we move on to Stock Index Futures, describing how the markets operate and how futures are valued. We then compare the cost, return, and risk of futures to ETFs.

##### Readings:

- Chapter 7
- The Relationship between MSCI EAFE, Mini MSCI EAFE Index Futures and the iShares MSCI EAFE ETF (PDF)

#### 4. Equity Index Swaps

After completing Futures, we review Equity Index Swaps, comparing them to ETFs and Stock Index Futures.

##### Readings:

- Chapter 8
- Making Alpha Portable (PDF)

## 5. Single Stock Swaps

After completing Index Swaps, 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:

- Mechanics of the Equity Lending Market (PDF)

## 6. Introduction to the Options Market

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.

Readings:

- Chapter 9 (p. 299-326, 337-341)
- The International Securities Exchange: New Ground in Options Markets

Assignments:

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

## 7 & 8. Options Valuation

Options Valuation, a topic that can get fairly complex, is where we head next. Although options pricing cannot be explained without any formulas, I start by providing intuition on what drives pricing leaving out the higher mathematics.

After teaching you how to price options using a spreadsheet, we then review the commonly used Options Models like the Binomial and Black-Scholes Models.

Readings:

- Chapter 10 - Pages 343-374
- Introduction to Binomial Trees - PDF
- Valuing Stock Options: The Black-Scholes Model - PDF
- The New CBOE Volatility Index - VIX

## 9. Practical Considerations in Pricing Options

To move from the theoretical to the practical, we start by discussing 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. We then introduce the volatility relationships that drive Equity Options trading.

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

Readings:

- Chapter 10 (p. 374 - 377)

Assignments:

Assignment (2) - Options Valuation (Type B)

#### 10. 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. With Cecilia's help, this class discusses how structured notes are created, what factors determine their pricing and how they are used by institutional and individual investors.

Guest Speaker: Cecilia Manzillo, Columbia Business School

Readings:

- Equity Linked Notes (PDF)

#### 11. Fixed Income Derivatives

For the next few classes we move away from Equities into Fixed Income and Commodities.

Jack Hattem from Blackrock provides an overview of Fixed Income Derivatives products and describes how his company uses them.

Guest Speaker: Jack Hattem, Blackrock

Assignments:

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

#### 12. Commodity Indices and Futures

After completing our discussion on Convertible Bonds, a guest speaker will lead a discussion on strategies used to hedge oil.

Guest Speaker: TBD

Readings:

- Commodity Investments: The Missing Piece of the Portfolio Puzzle? (Kang, Xiaowei) (LR)
- PIMCO, the Quiet Giant Among Commodity Investors: Kemp (LR)

**Exams: Exam handed out**

#### 13. Credit Derivatives and Convertible Bonds

Dominique Touban will explore the inner workings of the Credit Derivatives Market, then I will introduce Convertible Bonds.

Guest Speaker: Dominique Touban, J.P. Morgan

Readings:

- Convertible Securities

#### 14. Exotic Equity Derivatives

Exotic Equity Derivatives is the focus of this class, concentrating on Path Dependent Options and Correlation Options. Cecilia and I start by explaining each product and

comparing its benefits and risks to more conventional derivatives. We end each class by discussing how investors use Exotic Equity Derivatives in their portfolios.

Guest Speaker: Cecilia Manzollillo, Columbia Business School

Readings:

- Applications of OTC Options and other Structured Products (PDF)

**Exams: Exam due**

## 15. Volatility Derivatives

Rocky Fishman from Deutsche Bank will share current research he has done on strategies using the VIX.

Guest Speaker: Rocky Fishman, Deutsche Bank

Assignments:

- Assignment (4) - Structured Notes, Convertible Bonds (Type A)

## Section 2 - Strategies

### 16. Single Stock Options Strategies

In this class we will discuss how Active 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.

Readings:

- Tutorial on Using Options in Active Strategies (Tsu, Maria E.) (PDF)
- Covered Call Strategies: One Fact and Eight Myths (Israelov, Roni) (LR)

### 17. Portfolio Hedging (04/03)

Fund Managers use index options to change the risk on their overall portfolio. In this class, we explore the strategies they follow and how to arrive at an appropriate hedge.

Assignments:

Assignment (5) - Stock Options Strategies (Type B)

### 18. Tax Considerations in Using Equity Derivatives

Individuals and corporations, before using derivatives need to be well versed in tax issues related to their overall strategy. In this class we cover the tax laws most relevant to Equity Derivatives transactions and introduce strategies to enhance After-Tax returns.

Readings:

- Using Equity Derivatives to Enhance After-Tax Returns (LR)

### 19. Legal and Accounting Issues/Corporations and Insurance Companies

We start the class with a discussion of the relevant legal and accounting considerations in hedging a concentrated stock position.

We then discuss how corporations use Equity Derivatives in Share Repurchase and Capital Formation strategies and how insurance companies use Equity Derivatives in Asset and Liability management.

Readings:

- [Rule 144: Selling Restricted and Control Securities](http://www.sec.gov/investor/pubs/rule144.htm) (<http://www.sec.gov/investor/pubs/rule144.htm>)
- Diversifying Concentrated Stock Positions Through Equity Collars (PDF)

### **Section 3 - The Future**

#### 20. Learning from Ancient History

To help project the future impact of Equity Derivatives on the Equities Market it is useful to understand history. In this class we discuss situations in history where Equity Futures and Options were misused. Prior to 2008, three stand out, Portfolio Insurance and the 1987 crash, Long-Term Capital Management, Nick Leeson - Barings, and the Japanese Market in 1995. Today we will focus on Portfolio Insurance and the crash of 1987 and LTCM and briefly discuss Barings.

Guest Speaker: TBD

Readings:

- The Demons of '87 - PDF
- [Leland O'Brien Rubenstein](#)
- Long-Term Capital Management, L.P. (A, C, D)
- Bank of Volatility (PDF)

Assignments:

Assignment (6) - LOR/LTCM (Type A)

#### 21. Learning from Recent History

In this class we will discuss events in 2008, the Flash Crash of 2010, and the ETF Mini-Crash on August 24, 2015. Then we will discuss current regulatory initiatives.

Readings:

- Chapter 3 - Tagliani
- [Findings Regarding the Market Events of May 6, 2010](http://www.cftc.gov/idc/groups/public/@otherif/documents/ifdocs/staff-findings050610.pdf) (CFTC & SEC), Executive Summary only, pp. 1-8 (<http://www.cftc.gov/idc/groups/public/@otherif/documents/ifdocs/staff-findings050610.pdf>)
- Enhancing Our Equity Market Structure (White, Mary Jo) (LR)
- From Free Lunch to Black Hole: Credit Default Swaps at AIG (PDF)

Assignments:

Assignment (7) - Flash Crash Questions (Type A)

#### 22. Panel of Equity Derivatives Experts

Did the markets learn anything from prior market meltdowns? How do Fund Managers profit from the current state of the Equity Derivatives Market? A panel of Fund Managers will address these and your questions.

Guest Speakers: TBD

#### 23 & 24. Final Project

Each group will be asked to present their Final Project to the class and their Advisor, followed by a brief discussion by the Advisor.

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