I am interested in futures and options because
I will spend the rest of my life in the future
and I want to improve my options.

Professor Avraham Kamara

FIN 561 - FINANCIAL FUTURES AND OPTIONS

SPRING 2020 (REVISED FOR THE ONLINE-ONLY QUARTER)

PROFESSOR AVRAHAM (AVI) KAMARA

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I hope that you and your family are well.

This course provides a comprehensive overview of futures markets and options markets. We will analyze the pricing of futures contracts and options as well as various price relationships and review available empirical evidence concerning these markets. We will give particular attention to risk management by hedging. We will compare Futures, forwards, swaps and option contracts, and study alternative investment and risk management strategies.

COURSE RESPONSIBILITIES

Students will be graded on the basis of:

1. **HOMEWORK ASSIGNMENTS AND PROJECTS EVERY CLASS! (A TOTAL WEIGHT OF 20%).**

   You are allowed to work with other students on the problems, but you must submit the solution INDIVIDUALLY on Canvas BEFORE the start of the meeting!

   THE HOMEWORK ASSIGNMENTS ARE ONLINE ON CANVAS INSIDE “FILES.”

   I WILL ANNOUNCE THE DUE DATES DURING CLASS.

   THERE IS NO LATE SUBMISSION!

2. **TWO OPEN-BOOK EXAMS (that must be done individually, of course…). (EACH EXAM HAS A WEIGHT OF 40%, FOR TOTAL WEIGHT OF 80%).**

EXAM DATES and WEIGHTS

1. **EXAM #1:**
   A TAKE HOME EXAM BETWEEN CLASS 5 (on APRIL 28) AND CLASS 6 (on MAY 5). A WEIGHT OF 40%.

2. **EXAM #2**
   A TAKE HOME EXAM ON THE WEEKEND AFTER THE LAST CLASS (on JUNE 2). A WEIGHT OF 40%.

THERE WILL BE NO MAKE-UP EXAMS!

As a student in FIN 561, you acknowledge that you are a member of a learning community in the Foster School of Business that is committed to the highest academic standards. As a member of this community, you agree to uphold the fundamental standards of honesty, respect, and integrity, and you accept the responsibility to encourage others to adhere to these standards.

"Wise people realize how little they understand about life, themselves, and the world around them."

"Improve yourself by learning from others knowledge, so that you shall gain easily what others have labored hard for."

Socrates *(*469–399 B.C.E.)

"Teach your tongue to say 'I don't know' and you shall progress."

Moses Maimonides *(*1135 or 1138 – 1204)

Moses Maimonides *(Rabbi Moshe Ben Maimon, also called RAMBAM)* – A Jewish rabbi, physician, and philosopher in the Middle Ages, who also influenced the non-Jewish world. Although his writings on Jewish law and ethics were met with Jewish opposition during his lifetime, he was posthumously acknowledged as one of the foremost philosophers in Jewish history. Today, his works and views are considered a cornerstone of Jewish thought and study.

REQUIRED READINGS:

FIN 561 – LECTURE NOTES:

1. **VOLUME I - FUTURES, FORWARDS AND SWAPS.**
2. **VOLUME II - OPTIONS.**

The two volumes have my lecture notes for the entire course (Vol. I - for Exam #1 and Vol. II - for Exam #2).

THE LECTURE NOTES WILL BE AVAILABLE ON CANVAS INSIDE "FILES."

BY DOWNLOADING A LECTURE NOTE, YOU AGREE NOT TO SHARE IT WITH ANYONE OUTSIDE THE FIN 561 COMMUNITY (THE STUDENTS IN SECTIONS A AND B)!

PLEASE READ THE ASSIGNED LECTURE NOTES BEFORE and, AGAIN, AFTER THE LECTURE!

THERE ARE NO REQUIRED OR OPTIONAL TEXTBOOKS.

IF YOU NEED ADDITIONAL HELP FROM TEXTBOOKS, LET ME KNOW.

The derivatives exchanges and associations have interesting educational material online (often free of charge) on pricing and trading strategies using futures, swaps and options.

Chicago Mercantile Exchange (CME Group), Chicago Board of Options (CBOE),

Futures Industry Association (FIA), Options Clearing Corporation (OCC), and Options

Industry Council, at:

www.cmegroup. com, www.futuresindustry.org, www.cboe.com,

www.optionsclearing.com, www.optionseducation.org.

In particular, CBOE has interesting educational material online (at no cost), including an Options Calculator that calculates the prices of the American and European options that we will study in this course.

How do you calculate the grade credit for your homework assignments?

CURRENTLY, ALL THE QUESTIONS AND ASSIGNMENTS ARE REQUIRED. However, some homework assignments CAN have required and optional questions. The change in the designation of a particular question from required to optional will be announced in class depending on the material studied in the class. **Otherwise, the question remains a required question.**

The optional questions give you bonus points. You will NOT lose any homework credit towards your grade because you did not answer any optional question. You will lose homework credit towards your grade ONLY IF you do not get full credit on the required questions of the assignments, and do not have enough bonus points to offset that loss.

The score that you will get for each homework assignment is your total points for that assignment. If you solve an optional question, your total points for that assignment can exceed the total required points. The bonus points for optional questions will help you in case you lose any required homework points on that assignment or any other assignment.

The MAXIMUM grade credit that you can get for your homework assignments, even with bonus points, is 20% (= 20 grade points of 100 total grade points).

Example: Suppose we have two homework assignments only. Each has a required 100 points, and the first assignment also has 20 bonus points. The maximum number of required homework points is 200.

As long as you get a total of **AT LEAST** 200 homework points (required plus bonus), you will get the maximum of **20 grade points, and no more than 20 grade points**.

Suppose you get 120 points (100 required points + 20 bonus points) on the first assignment and 100 points on the second assignment. You will have a total of 220 points. You will get **20 grade points, and no more than 20 grade points**.

Suppose you get 100 (required or required plus bonus) points on the first assignment and 100 points on the second assignment. You will have a total of 200 points. You will get **20 grade points.**

Suppose you get 120 points on the first assignment and 80 points on the second assignment. You will have a total of 200 points. You will get **20 grade points**.

Suppose you get a total of 100 points (required or required plus bonus) on the first assignment and 80 points on the second assignment. You will have a total of 180 points. You will get 20 × (180/200) = **18 grade points.**

It is important to understand that the bonus points on homework assignments count towards the 20% homework part of the grade only. They cannot be used towards any other part of the grade. That is, they will not help you with points lost on an exam.

Solving optional questions and getting bonus points is a good risk management (and learning ☺) strategy. It reduces the risk of not getting the full 20 grade points.

Emanuel Derman is one of the world's leading experts on financial-derivatives modeling. He had a very distinguished career on Wall Street, at Goldman Sachs and briefly at Salomon Brothers, from 1985 until he retired in 2002.

He is currently a professor at Columbia University and the Director of its program in financial engineering (he received a Ph.D. in theoretical physics from Columbia University in 1973.)

He writes about financial-modeling and risk management related issues on his site: http://www.emanuelderman.com

The following "Opinion" from January 29, 2014, is a nice, simple, way to describe most of what we will study in this course.
In Fin 460 and 560 – Investments, you study points #1 and #2.

In our course, we will study point #3 (Hedging) and the sentences below it.

Financial Valuation Modeling in a Nutshell: Dilution, Diversification and Hedging

Every couple of years I make some attempt to condense the principles of financial modeling:

All securities bear risk.

The essential problem of financial modeling is to determine the expected return that goes with a given estimated (future) risk.

To determine the expected return of a given risky security, note that there are three ways of lowering its risk:

1. **Dilution**: combining the security with a **riskless** bond.
2. **Diversification**: combining the security with other **uncorrelated** securities.
3. **Hedging**: combining the security with another **anti-correlated** security to cancel one aspect of its risk.

If by these means you can lower the estimated risk of a portfolio that contains the security to zero, it is logical that you should expect to earn the return of a riskless bond, assumed known. The expected return of the given security can then be pinned down from this constraint. *

[The paragraph above describes "The No-Arbitrage Pricing Method."]

* - *All of this is perfectly reasonable a priori. Where it fails in real life is that one cannot estimate risk correctly.*

[It is crucial to remember this footnote when working with financial models to price securities and manage risk.]

COURSE OUTLINE

WE WILL DEVIATE FROM THE OUTLINE DEPENDING ON THE PACE THE CLASS FEELS COMFORTABLE WITH.

PLEASE READ THE ASSIGNED MATERIAL BEFORE AND, AGAIN, AFTER THE LECTURE!

Articles, which I have written on issues related to class topics, are designated by an asterisk. They are available on Canvas. They are **NOT** required for the class.

PART 1 – FUTURES, FORWARDS AND SWAP CONTRACTS

LECTURE NOTES FOR ALL THE TOPICS IN PART 1 ARE IN VOLUME 1.

EXAM #1 WILL COVER EVERYTHING THAT WE WILL STUDY FROM PART 1.

1. Introduction to Futures, Forwards and Options Contracts.

* Kamara, "Delivery Structure of Futures Contracts." In *The New Palgrave Dictionary of Money and Finance*, edited by P. Newman, M. Milgate and J. Eatwell, Macmillan Press Limited, London, 1992.

2. The Pricing of Futures Contracts.
Arbitrage strategies in Futures and Spot Markets.

* Kamara, "Market Trading Structures and Asset Pricing: Evidence from Treasury Bill Markets," Review *of Financial Studies*, Winter 1988, pp. 357-375.

* Eldor, Hauser, Kahn and Kamara, "The Nontradability Premium of Derivatives Contracts" *Journal of Business*, Vol. 79, no. 4, July 2006, pp. 2067-2097.

* Kamara, "The Behavior of Futures Prices", *Financial Analysts Journal*, July-August 1984, pp. 68-75.

* Kamara, "Forecasting Accuracy and Development of a Financial Market: The Treasury Bill Futures Market", *Journal of Futures Markets*, August 1990, pp. 397-405.

3. Hedging with futures contracts.

* Kamara, "Issues in Futures Markets: A Survey," *Journal of Futures* Markets, Fall 1982, pp. 261-270.

* Kamara and Siegel, "Optimal Hedging in Futures Contracts with Multiple Delivery Specifications," *Journal of Finance*, September 1987, pp. 1007-1021.

* Kamara, "Production Flexibility, Stochastic Separation, Hedging, and Futures Prices," *Review of Financial Studies*, Vol. 6, No. 4, Winter 1993, pp. 935-957.

MANAGING INTEREST RATE RISK:

4. Short-Term Interest Rate Futures.

* Kamara, "The Relation Between Default-free Interest Rates and Economic Growth is Stronger Than You Think," *Journal of Finance*, Vol. 52, No. 4, September 1997, pp. 1681-1694.

* Hess and Kamara, "Conditional Time-Varying Interest Rate Risk Premium: Evidence from the Treasury Bill Futures Market," *Journal of Money, Credit and Banking*, Vol. 37, no, 4, August 2005, pp. 679-698.

5. Interest Rate Swaps.

6. Stock Index Futures.

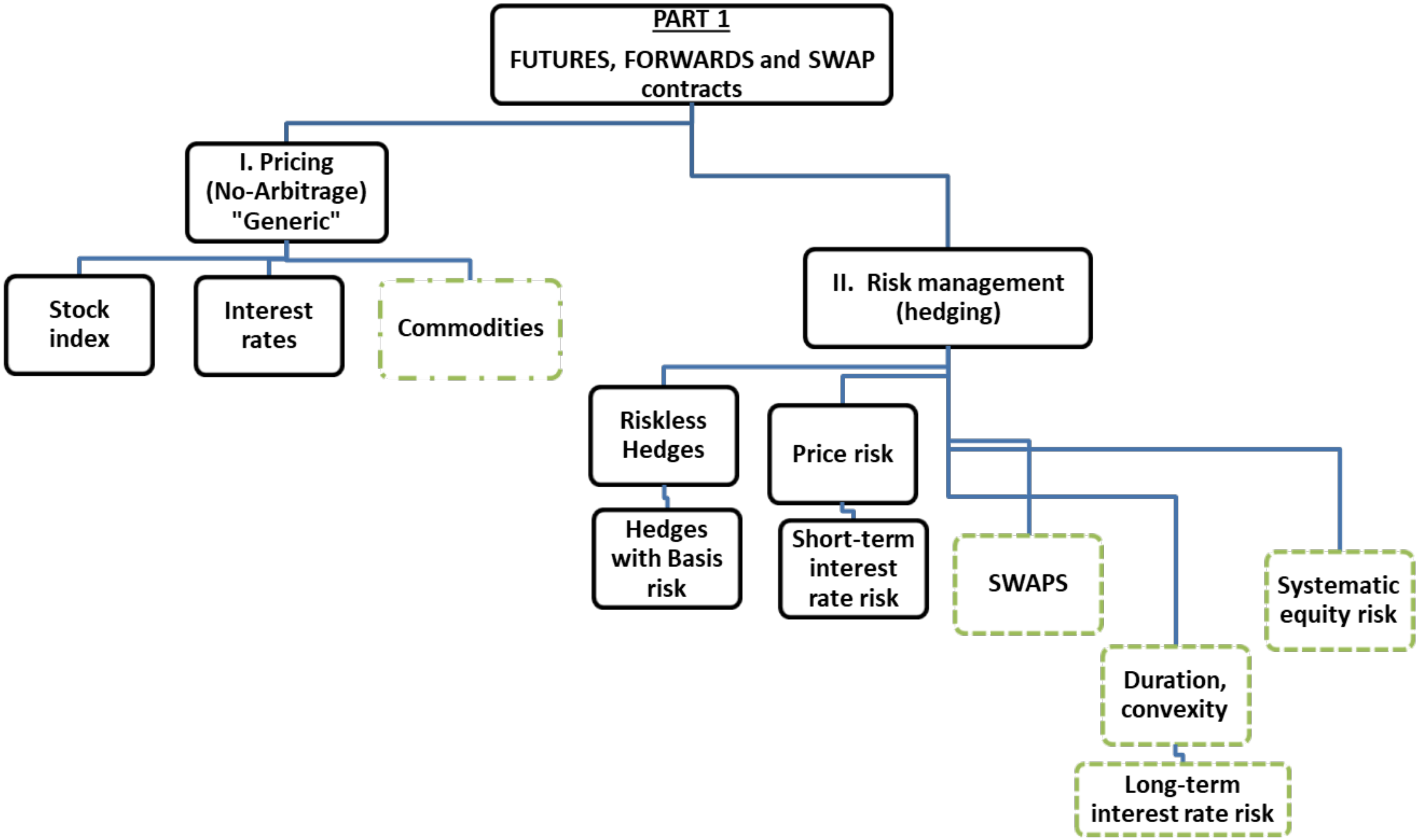
* Kamara, "New Evidence on the Monday Seasonal in Stock Returns," *Journal of Business*, Vol. 70, No. 1, January 1997, pp. 63-84.

* Kamara, "The Effects of Futures Trading on the Stability of Standard and Poor's 500 Returns," *Journal of Futures Markets*, Vol. 12, No. 6, December 1992, pp. 645-658 (with Thomas W. Miller Jr. and Andrew F. Siegel).

* Kamara, Lou and Sadka, "Has the US Stock Market Become More Vulnerable Over Time?" *Financial Analysts Journal*, Vol. 66, no. 1, January/February 2010, pp. 41-52.

7. Duration (and convexity).

8. Long-Term Interest Rate Futures.


PART 1
FUTURES, FORWARDS and SWAP contracts
I. Pricing (No-Arbitrage) "Generic"
Stock index
Interest rates
Commodities
II. Risk management (hedging)
Riskless Hedges
Hedges with Basis risk
Price risk
Short-term interest rate risk
SWAPS
Systematic equity risk
Duration, convexity
Long-term interest rate risk

PART 2 – OPTIONS CONTRACTS

THE LECTURE NOTES FOR THE TOPICS BELOW ARE IN VOLUME 2.

EXAM #2 WILL COVER EVERYTHING THAT WE WILL STUDY FROM PART 2.

CBOE has interesting educational material online (at no cost), including an Options Calculator that calculates the prices of the American and European options that we will study in this course.

9. Introduction to Options Markets. Basic Trading Strategies.

10. Hedging with Options.

11. Put-Call Parity.

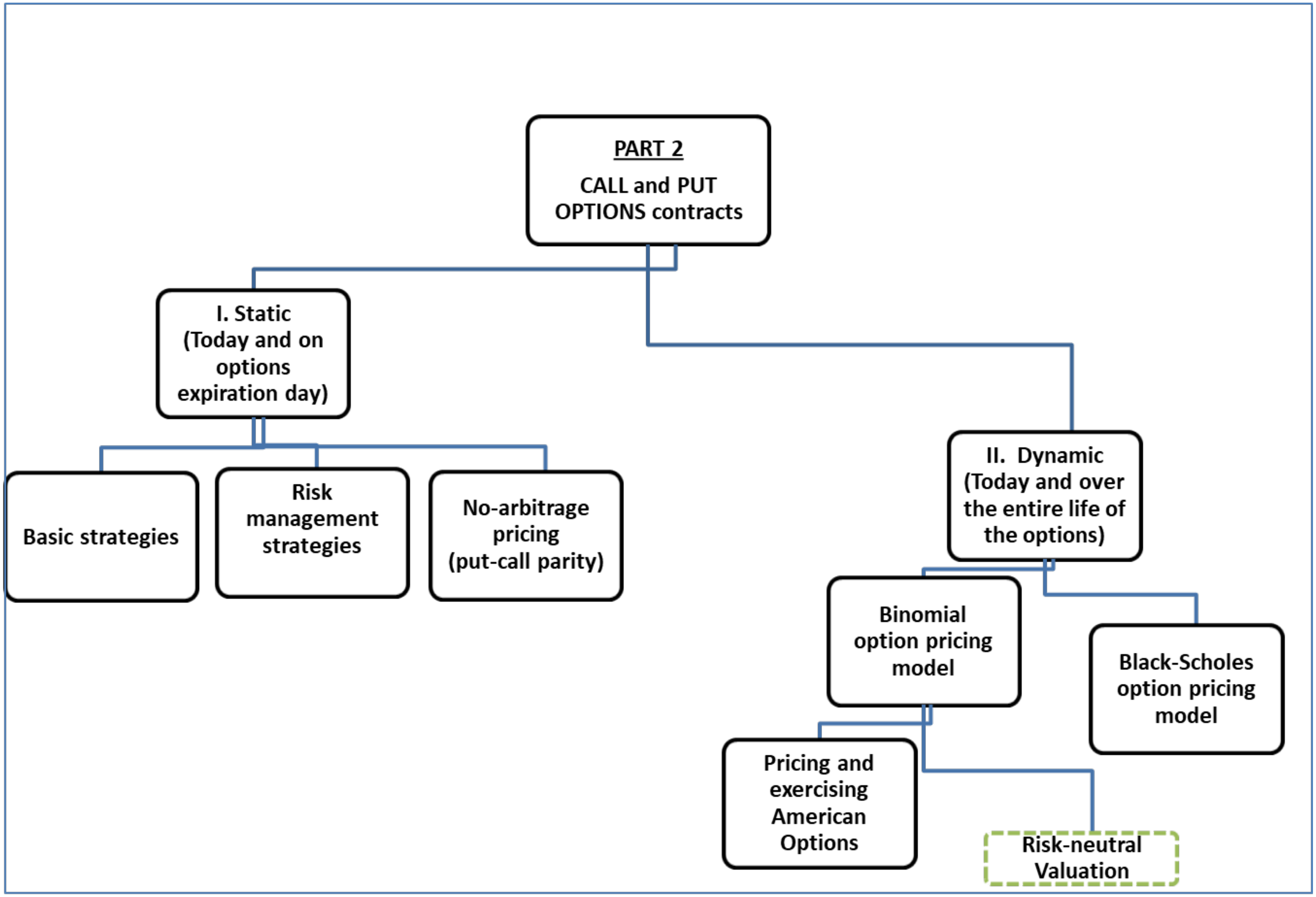
* Kamara and Miller, "Daily and Intradaily Tests of European Put-Call Parity," *Journal of Financial and Quantitative Analysis*, December 1995, pp. 519-539.

12. The Binomial Options Pricing Model – European Options. Delta.
One-period, two-periods and many-period binomial models.

13. The Black-Scholes Option Pricing Model. Implied volatility. Delta.
The "Greeks."

14. Pricing and Optimal Exercise of American Call and Put Options.
American and European options on dividend paying stocks.

15. Risk-Neutral Valuation.


PART 2
CALL and PUT OPTIONS contracts
I. Static (Today and on options expiration day)
Basic strategies
Risk management strategies
No-arbitrage pricing (put-call parity)
II. Dynamic (Today and over the entire life of the options)
Binomial option pricing model
Black-Scholes option pricing model
Pricing and exercising American Options
Risk-neutral Valuation

A Short Bio

AVRAHAM (Avi) KAMARA
Professor of Finance
William W. Alberts Professor
University of Washington, Michael G. Foster School of Business

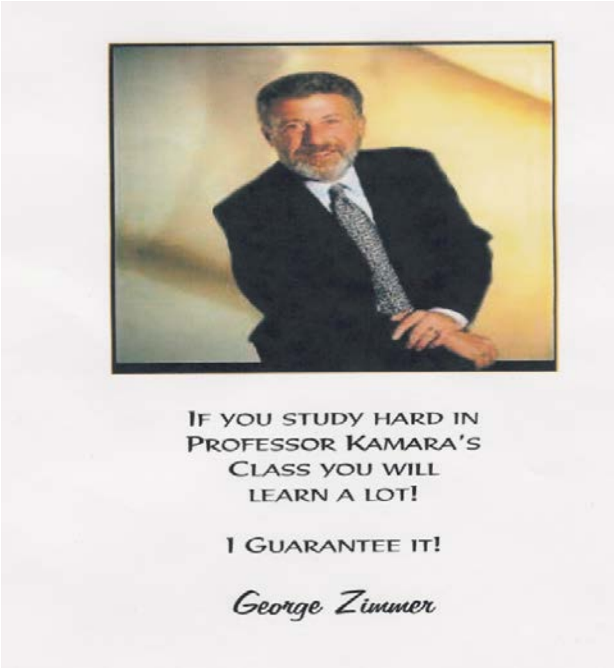
Ph.D., Columbia University, New York, 1986.

Professor Kamara has taught courses on financial risk management, futures and options contracts, real options, capital markets and security valuation in the MBA, executives, and undergraduate programs at the University of Washington. He also taught at Columbia University, UCLA, and overseas.

During 2002-2006, Professor Kamara served as the Chairman of the Department of Finance and Business Economics at the University of Washington.

Professor Kamara has served as an expert advisor on financial products and risk management for several companies and law firms (for example, locally, Safeco and Darigold, among others). He has also worked with the Commodity Futures Trading Commission in the USA, and with foreign governments/companies.

Professor Kamara has published articles in the *Financial Analysts Journal, Journal of Business*, *Journal of Finance*, *Journal of Financial and Quantitative Analysis, Journal of* Financial Economics, Journal of Financial Markets, Journal of Future Markets, Journal of Money, Credit and Banking, the Review of Financial Studies, as well as other outlets. Professor Kamara's research focuses on risk management, derivatives contracts (futures, swaps, and options), and commodities, equity and fixed-income markets.



Created by Tad Sommerville, a student in my TMMBA 506 class in Spring 2001.