

# Investments and Portfolio Management (Econ-180.367)

## Fall 2021

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### Teaching Assistants:

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This is an introductory course in investments. The course is broken into four parts. The first part covers the fundamental concepts of asset returns, risk, and risk-aversion, and then studies how investors should optimally choose their portfolios given the observed patterns of risk and return. The second part of the course studies the reverse question: given how investors choose their portfolios, what are the equilibrium patterns of risk and expected return in financial markets: in other words, what is the expected return that various types of assets must earn to compensate investors for bearing their risk. The second question is studied in the context of two theories of returns: the capital asset pricing model (CAPM) and arbitrage pricing theory (APT). The third part of the course studies the empirical evidence for and against the equilibrium theories of asset returns, with an emphasis on the evidence in support and against the efficient markets hypothesis. The fourth and final part of the course studies four classes of assets in more detail. The topics that are covered include models of equity valuation, bond valuation and hedging, futures markets, and option valuation.

Homeworks and class will include empirical work, to be done in **Excel**. **Bloomberg** will also be used in class and may be part of the homeworks, depending on student access to the library.

**PREREQUISITES:** Statistics 111-112 and Microeconomic Theory 301.

**Textbook:** The textbook for the course is “Investments” by Bodie, Kane and Marcus, 12<sup>th</sup> Edition.

**Learning Goals:** At the conclusion of this course, students should be familiar with different classes of financial securities, measurement of interest rates, returns and risk premia, optimal portfolio management, and the valuation of equities, bonds and derivative securities. The course also aims to give you the analytical tools to understand finance-related topics in current analysis that you might read about in newspapers such as the *Wall Street Journal* or the *Economist*. While the course emphasizes broad principles rather than preparation for specific jobs, it should be helpful in preparing students for job interviews and for jobs in investment analysis or public policy. It also has some overlap with professional qualifications such as the CFA exams.

**Homework:** I expect to assign around 6 homeworks during the semester. Late homeworks will not be accepted. You can collaborate on homeworks but everyone must write up their own solutions. If the TA finds that two people have substantively identical solutions or have simply copied spreadsheets from each other, then both will receive a grade of zero. The lowest

homework out of the 6 will be dropped, so you get an “insurance policy” against something unexpected preventing the homework from being turned in on time. But use it wisely.

**Classroom Climate:** The instructor is committed to creating a classroom environment that values the diversity of experiences and perspectives that all students bring. All students have the right to be treated with dignity and respect. Fostering an inclusive climate is important because research and experience shows that students who interact with peers who are different from themselves learn new things and experience tangible educational outcomes. Please join in creating a welcoming and vibrant classroom climate. Note, too, that you should expect to be challenged intellectually by the instructor, the TAs, and your peers, and at times this may feel uncomfortable. Indeed, it can be helpful to be pushed sometimes in order to learn and grow. But at no time in this learning process should someone be singled out or treated unequally on the basis of any seen or unseen part of their identity. If you ever have concerns in this course about harassment, discrimination, or any unequal treatment, or if you seek accommodations or resources, I invite you to share directly with the instructor or the TA, who will take your communication seriously and to seek mutually acceptable resolutions and accommodations. Reporting will never impact a student’s course grade. You may also share concerns with the department chair (Professor Yingyao Hu, [yhu@jhu.edu](mailto:yhu@jhu.edu)), the Director of Undergraduate Studies (Professor Somasree Dasgupta, [sdasgupta@jhu.edu](mailto:sdasgupta@jhu.edu)), the Assistant Dean for Diversity and Inclusion (Darlene Saporu, [dsaporu@jhu.edu](mailto:dsaporu@jhu.edu)), or the Office of Institutional Equity ([oiie@jhu.edu](mailto:oiie@jhu.edu)). In handling reports, your privacy will be protected as much as possible, but faculty and staff are required to officially report information for some cases (e.g. sexual harassment).

**Course materials:** Slides for projection in class and other course materials are available on the course webpage: <http://www.econ2.jhu.edu/courses/367>

**Grades:**

- Homework: 20 percent.
- Midterm 1: 20 percent.
- Midterm 2: 20 percent.
- Final: 40 percent.

The overall grade will then be determined from the following table.

Score	Grade
96+	A+
92+	A
88+	A-
84+	B+
80+	B
76+	B-
72+	C+
68+	C
64+	C-
50+	D
<50	F

**Exam Times:**

- Midterm 1: October 5 at class time in Remsen 1.
- Midterm 2: November 4 at class time in Remsen 1.
- Final: TBD

**Important Points:**

1. There is no senior option in this course.
2. The exams will be held in person and will be closed book. Anyone with a valid reason for being unable to attend any exam in person will instead have a one-on-one closed book oral exam on Zoom with the instructor.
3. Exams will cover all topics discussed in class. Slides, the book, and past exams are there to help you with studying. But they are not the primary reference. Anything that I cover in class is fair game, even if it isn't in the slides, in the book or in past exams.
4. Course grades depend on homeworks, midterms and final alone. There is no way of getting "extra credit" or revising a grade from that determined by performance on homeworks and exams.
5. Any request for a regrade of a homework must be submitted in writing within two weeks of the homework being given back.
6. Because of the coronavirus situation, the plans for this course, including the exam format, may need to be changed.

**Course Outline:**

1. Introduction. Types of assets. Financial math. Real and nominal interest rates. Present value calculations. Risk and return, utility functions and risk aversion. Concept of a risk premium. (Chapters 2, 5 and 6).
2. Optimal portfolio choice and risk sharing. (Chapter 7).
3. The Capital Asset Pricing Model and single index models, including solving for the efficient frontier in Excel. The security market line. (Chapters 8 and 9).
4. Multi-Factor Models of Returns and Arbitrage Pricing Theory. Factor-mimicking portfolios, market price of factor risk. (Chapter 10).
5. The Efficient Markets Hypothesis. Weak, semi-strong and strong efficiency. Behavioral Anomalies (Chapters 11 and 12).
6. Empirical Evidence on Stock Market Returns. Predictability of returns. Dividend discount model (Chapters 13 and 18).
7. Bond Valuation Models. The term structure of interest rates. Zero-coupon and forward rates. Compounding. Duration and convexity. Managing bond portfolios. Types of bonds and default risk. Interest rate swaps. (Chapters 14-16 and 23.4).
8. Options. Types of Options (American v. European, Put v. Call, Strike Price). Options payoffs. Put-Call Parity. Binomial Option Pricing. Implementation in Excel. Black Scholes. (Chapters 20 and 21).
9. Futures Markets. Spot-Futures Arbitrage. Models of Backwardation and Contango. (Chapter 22).