UNIVERSITY OF PENNSYLVANIA
The Wharton School

Investment Management — Course Syllabus
Professor Stambaugh — Fall 2017

Course Description

The course undertakes a rigorous study of concepts and evidence relevant to investment management. Topics include asset allocation, diversification, long-short strategies, factor models, long-horizon investing, portfolio optimization, hedge funds, mutual funds, behavioral finance, performance evaluation, trading, and simulation. The course deals very little with individual security valuation and discretionary investing (i.e., "equity research" or "stock picking").

The prerequisites for MBA students are Fin 611 or 612 and Stat 613 or 621. The prerequisites for undergraduates are Fin 100 and Stat 101–102. (Stat 102 may be taken concurrently with this course). Given that investment management requires one to analyze and deal effectively with uncertainty, a good grounding in statistics is essential, and familiarity with statistics should extend through multiple regression, covariance, and correlation.

Purchases

1. *Investments*, by Zvi Bodie, Alex Kane, and Alan J. Marcus (10th ed.), McGraw-Hill. (*Student Solutions Manual* recommended.) Several copies of the book and solutions manual will be on reserve at Lippincott Library. [The recently available 11th edition is also fine. Pages for reading assignments are provided for both editions.]

2. *Efficiently Inefficient***,** by Lasse Heje Pedersen, Princeton University Press, with the downloadable exercises at http://docs.lhpedersen.com/EfficientlyInefficient_Exercises.pdf. (Solutions as well as the supplementary exercise materials are available on the course Canvas site.) Several copies of the book will be on reserve at Lippincott Library.

3. Cases available from Wharton Reprographics, via www.study.net.

Grading

Course grades will be based on two exams, four project write-ups, and class participation:

	Percent
Exam 1 (**Oct. 9**, in class)	32
Exam 2 (**Dec. 6**, in class)	32
Project write-ups	20
Class participation	16
Total	100

Team sign up

At the beginning of the course, students will form teams of three or four members for purposes of submitting project write-ups and preparing for class discussions. The members of a team may be registered for different undergrad and MBA sections of the course. Team sign up is via Canvas. (Non-

Wharton students who are enrolled in the course but do not yet have a Wharton computing account, required for Canvas, can establish one by visiting http://accounts.wharton.upenn.edu.)

Projects

Team members will work jointly on each of the four projects and submit one write-up per team. Write-ups should be submitted by **9:00 AM on the due date**, using Canvas, in order to avoid lateness penalties. Project assignments will be posted on Canvas about two weeks prior to the due dates. Project due dates are **September 13, October 4, November 8, and December 11**.

Case discussions

A significant portion of the class participation grade is based on case discussions. It is expected that team members will work jointly in analyzing cases and preparing for class discussions, but every student in the class should be prepared to discuss each case. I will cold-call occasionally but expect students to volunteer comments much of the time. I will post on Canvas a few pertinent questions about the case. These questions are not intended to be a comprehensive summary of the issues that could arise during the case discussion, but I hope they will be useful when thinking about the case and in stimulating discussion. Written answers are not submitted.

Exams

The exams, given during regular class-meeting times, are closed-book but you may bring one 8½ × 11 inch "cheat sheet" (two-sided) to each exam. Exam answers will be posted on Canvas a day or two following the exam. Exam 2 will confine its focus to topics covered after Exam 1. Much of the course knowledge is cumulative, however, such that fully understanding issues addressed later in the course can require mastery of earlier material.

Help and questions

I welcome students to see me outside of class to discuss any aspect of the course. My scheduled office hours, when students may come without appointments, are Wednesdays, 4:45–6:00pm, but I am available by appointment at other times. My office is at 3251 SHDH, my e-mail is stambaugh@wharton.upenn.edu, and my phone is 215-898-5734.

The TA's for the course are Roberto Gomez Cram and Jianan Liu, Wharton finance PhD students, and Simon Oh, a Wharton/Engineering undergraduate:

TA	email	Office hours
Roberto Gomez Cram	rogo@wharton.upenn.edu	Fridays, 1:45–3:00pm, SH-DH 2314
Jianan Liu	jiananl@wharton.upenn.edu	Thursdays, 4:30–5:45pm, SH-DH 2316
Simon Oh	sangmino@wharton.upenn.edu	Tuesdays, 4:30-6:00pm, SH-DH 2305, Desk D

version: Sep 3, 2017

COURSE OUTLINE

I. Foundations: Portfolio return, risk, asset allocation, performance evaluation
   a. Returns and risk
   b. Stock-cash positions; using return swaps and futures
   c. Beta; hedging
   d. Portfolio diversification, time-varying volatility
   e. Alpha; long-short; margin and leverage
   f. Portfolio opportunities and selection
   g. Portfolio optimization and asset allocation
   h. Refining optimization: Black-Litterman model
   i. Performance evaluation and attribution

*** Exam 1 ***

II. Investment strategies: Exploiting potential sources of performance
   a. Multiple return factors; size and value
   b. Behavioral approaches
   c. Information ratio and active allocation; long-short quantitative strategies
   d. Implementing strategies; trading costs; combining value and momentum
   e. Hedge funds; liquidity; arbitrage
   f. Mutual funds – performance and scale
   g. Valuation and value investing

III. Long-run investment issues
   a. Equity premium
   b. Shortfall risk and options/insurance
   c. Mean reversion and the life-cycle
   d. Pension funds

*** Exam 2 ***

IV. Active management's past and future

CLASS SCHEDULE - SUMMARY

	Topics	***Cases & Projects***
30-Aug	Overview; returns and risk	
6-Sep	Stock-cash positions; using return swaps & futures	
11-Sep	Beta; hedging	
13- Sep	Portfolio diversification; time-varying volatility	**Diversification write-up due**
18- Sep	Alpha; long-short; margin & leverage	*The Vanderbilt University Endowment (2006)*
20- Sep	Portfolio opportunities and selection	
25- Sep	Portfolio optimization and asset allocation	*Harvard Management Company (2010)*
27- Sep	Refining optimization: Black-Litterman model	
2- Oct	Performance evaluation and attribution	
4- Oct	Review and synthesis	**Optimization write-up due**
9-Oct	**Exam 1 (in class)**	
11-Oct	Multiple risk factors; size & value	*Dimensional Fund Advisors, 2002*
16- Oct	Behavioral approaches	*Behavioral Finance at JP Morgan*
18- Oct	Information ratio and active allocation; long-short quantitative strategies	
23- Oct*	***Guest speaker***: Joseph Cerniglia, BlackRock	
25- Oct	Implementing strategies; trading costs; combining value and momentum	*numeric investors l.p.*
30- Oct*	***Guest speaker***: Gregor Andrade, AQR	
1- Nov	Hedge funds; liquidity; arbitrage	
6-Nov	Mutual funds – performance and scale	
8- Nov	Valuation and value investing	**Stock-screening write-up due***; Grantham, Mayo, Van Otterloo & Co., 2001*
13- Nov*	***Guest speaker***: Giorgio De Santis, Kepos Capital	
15-Nov	Equity premium – alternative approaches	*Deutsche Bank: Discussing the Equity Risk Premium; Grantham, Mayo, Van Otterloo 2012: Estimating the Equity Risk Premium*
20- Nov	Long-horizon framework; shortfall and options/insurance	*The Risk of Stocks in the Long Run: The Barnstable College Endowment*
27- Nov	Life-cycle issues; mean reversion and long-horizon volatility	*The Vanguard Group, Inc. in 2006 and Target Retirement Funds*
29- Nov	Pension-fund asset allocation	*Pension Policy at The Boots Company PLC*
4- Dec	Review and synthesis	
6-Dec	***Exam 2 (in class)***	
11-Dec	Active management's past and future	**Simulation write-up due**

***Note: this class will meet at 4:30pm and not in the regular classroom.**

CLASS SCHEDULE – ASSIGNMENTS AND READINGS

Notes:

- "BKM" denotes *Investments*, by Bodie, Kane, and Marcus. Reading assignment page numbers are given for both the 10th edition *[and 11th edition, in bracketed italics]*. The numbers for assigned chapter-end problems are the same in both editions.
- "Pedersen" denotes *Efficiently Inefficient*, by Pedersen
- The exercises from BKM and Pedersen and the sample exam problems are not submitted/graded.
- The sample exam problems and solutions are available on the course Canvas site.
- Optional readings are ordered by likely accessibility/relevance and available on the course Canvas site

Date	Topics, assignments, and readings
30- Aug	Overview; returns and risk BKM chapter 5, pp. 117–152 *[117–147]*, problems 7, 9, 10 Sample exam problems 1–3
6-Sep	Stock-cash positions; using return swaps and futures BKM chapter 6, pp. 175–181, 187–189 *[164–170, 176–178]*, problems 13–18 BKM chapter 22, pp. 771–781 *[747–757]* BKM chapter 23, pp. 806–809 *[783–785]*, problem 7(a & b) BKM chapter 4, pp. 103–107 *[103–106]* Sample exam problem 4 Optional: BKM chapter 22, pp. 785–788 *[761–764]*, problems 4–10 Chance, "Equity Swaps and Equity Investing" ProShares (hyperlink) Direxion (hyperlink)
11-Sep	Beta; hedging BKM chapter 8, pp. 258–259, 264–271, 279–282 *[247–248, 255–258, 259–261]*, problems 9, 10, 12–14 BKM chapter 23, problems 7c, 8 Sample exam problems 5–8
13-Sep	Portfolio diversification; time-varying volatility **Diversification write-up due** BKM chapter 7, pp. 206–207, 226–228 *[194–195, 214–216]*, CFA problems 1–3, 8–10 BKM chapter 8, pp. 262–264 *[253–254]* BKM chapter 21, pp. 743–744 *[720]* Sample exam problem 11 Optional: Booth and Fama, "Diversification Returns and Asset Contributions"

18-Sep Alpha; long-short; margin & leverage

● Case discussion: *The Vanderbilt University Endowment (2006)*
BKM chapter 3, pp. 76–83 *[74–82],* problems 11, 12
BKM chapter 9, pp. 291–302 *[277–288]*, problems 20, 23, CFA problems 11, 12
Pedersen sections 5.6–5.9 and 8.1, problem 8.1
Sample exam problems 9, 10
Optional:
Cohen et al., "Mechanics of the Equity Lending Market"
Jacobs and Levy, "Long/Short Equity Investing" and "Enhanced Active Equity Strategies"

20-Sep Portfolio opportunities and selection

BKM chapter 6, pp. 168–175, 182–187 *[157–164, 170–175]*
BKM chapter 7, pp. 208–226 *[195–214]*, CFA problems 8–10, 12
Sample exam problems 12–18
Optional:
Fidelity (hyperlink)
Vanguard - https://investor.vanguard.com/mutual-funds/lifestrategy/#/
Optimization examples (hyperlink)

25-Sep Portfolio optimization and asset allocation

● Case discussion: *Harvard Management Company (2010)*
BKM chapter 14, pp. 446–460 *[426–440]*
BKM chapter 16, pp. 516–518 *[496–498]*
Pedersen chapter 4 and sections 10.1–10.2, problem 4.1
Optional:
BKM chapter 7, pp. 244–249 *[232–236]*

27-Sep Refining optimization: Black-Litterman model

BKM chapter 8, pp. 257, 259–262 *[246–252]*
Sample exam problems 19–22
Optional:
He and Litterman, "The Intuition Behind Black-Litterman Model Portfolios"
Litterman, "Beyond Equilibrium: The Black-Litterman Approach"
Black and Litterman,, " Global Portfolio Optimization"
http://www.blacklitterman.org/

2-Oct Performance evaluation and attribution

BKM chapter 24 (all but pp. 851–853 & 858–860) *[all but pp. 833–835]*, problems 7–12
Pedersen chapter 2, problems 1.1, 2.1
Sample exam problems 23–28
Optional:
Elton and Gruber, "Mutual Funds"
Wermers, "Mutual Fund Performance: An Empirical Decomposition into Stock-Picking

Talent, Style, Transactions Costs, and Expenses"
Pastor and Stambaugh, "Mutual Fund Performance and Seemingly Unrelated Assets"

4-Oct **Optimization write-up due**
Review and synthesis

9-Oct **Exam 1 (in class)**

11-Oct Multiple risk factors; size and value

● Case discussion: *Dimensional Fund Advisors, 2002*
BKM chapter 10 (all), problems 7–9
BKM chapter 13, pp. 426–432 *[407–413]*
Sample exam problems 29–32
Optional:
Fama and French, "Common Risk Factors in the Returns on Stocks and Bonds"
Fama and French, " Value versus Growth: The International Evidence"
Berk, "Does Size Really Matter?"

16-Oct Behavioral approaches

● Case discussion: *Behavioral Finance at JP Morgan*
BKM chapter 12, pp. 388–400 *[373–384]*, CFA problems 1, 2
Pedersen chapter 12
Sample exam problems 40, 41, 42
Optional:
Barber and Odean, "The Courage of Misguided Convictions"
Baker, Wang, Wurgler, "How Does Investor Sentiment Affect the Cross-Section of Stock Returns
Lakonishok, Shleifer, Vishny, "Contrarian Investment, Extrapolation, and Risk"
Jacowitz and Kahneman, "Measures of Anchoring in Estimation Tasks"

18-Oct Information ratio and active allocation; long-short quantitative strategies

BKM chapter 8, pp. 271–275 *[262–266]*
BKM chapter 24, pp. 851–853 *[none]*
Pedersen sections 8.2–8.5 and chapter 9, problems 1.2, 9.1–9.12
Sample exam problems 33–39
Optional:
Stambaugh, Yu, and Yuan, "The Short of It: Investor Sentiment and Anomalies"
Stambaugh, Yu, and Yuan, "Arbitrage Asymmetry and the Idiosyncratic Volatility Puzzle"
Cooper, Gulen, Schill, "Asset Growth and the Cross-Section of Stock Returns"

23-Oct **Guest speaker:** Joseph Cerniglia, BlackRock

4:30pm, SHDH 1206
***Note special time—no class meeting at regular time

25-Oct Implementing strategies; trading costs; combining value and momentum

● Case discussion: *numeric investors l.p.*
Pedersen chapter 3 and sections 5.1–5.5; problems 3.2, 3.4, 5.1–5.4
Sample exam problems 43–47
Optional:
Keim and Madhavan, "The Cost of Institutional Equity Trades"
Daniel and Moskowitz, "Momentum Crashes"
Chan, Jegadeesh, Lakonishok, "The Profitability of Momentum Strategies"
Da, Gurun, Warachka, "Frog in the Pan: Continuous Information and Momentum"
Hameed and Mian, "Industries and Stock Return Reversals"

30-Oct **Guest speaker:** Gregor Andrade, AQR Capital Management

4:30pm, SHDH 1206
***Note special time—no class meeting at regular time

1-Nov Hedge funds; liquidity; arbitrage

BKM chapter 9, 310–313 *[294–298]*
BKM chapter 13, 433–435 *[414–416]*
Pedersen chapters 1, 15, and 16, sections 5.10–5.11, problems 1.3, 2.3, 2.4, 16.1–16.8
Optional:
Asness, Krail, and Liew, "Do Hedge Funds Hedge?"
Goldman Sachs, "The Quant Liquidity Crunch"
Pastor and Stambaugh, "Liquidity Risk and Expected Stock Returns"
Sadka, "Liquidity Risk and the Cross-Section of Hedge-Fund Returns"
Franzoni, Nowak, Phalippou, "Private Equity Performance and Liquidity Risk"
Mitchell and Pulvino, "Characteristics of Risk and Return in Risk Arbitrage"
Gatev, Goetzmann, and Rouwenhorst, "Pairs Trading: Performance of a Relative-Value Arbitrage Rule"
Cohen and Frazzini, "Economic Links and Predictable Returns"
Daniel and Titman, "Market Reactions to Tangible and Intangible Information"

6-Nov Mutual funds – performance and scale

Optional:
Berk, "Five Myths of Active Portfolio Management"
Berk and Green, "Mutual Fund Flows and Performance in Rational Markets"
Pastor and Stambaugh, "On the Size of the Active Management Industry"
Pastor, Stambaugh, and Taylor, "Scale and Skill in Active Management"
Pastor, Stambaugh, and Taylor, "Do Funds Make More When They Trade More?"

Akbas, Armstrong, Sorescu, Subrahmanyam, “Smart Money, Dumb Money, and Capital Market Anomalies”

9-Nov Valuation and value investing

● Case discussion: *Grantham, Mayo, Van Oterloo & Co., 2001*
BKM chapter 18, pp. 591–617, 622–623 *[569–595, 599–601]*, CFA problems 1, 2, 4
Pedersen chapters 6 and 7
Sample exam problem 48
Optional:
Cohen, Polk, Vuolteenaho, “The Value Spread”
Gulen, Xing, Zhang, “Value versus Growth: Time-Varying Expected Stock Returns”
Asness, Moskowitz, Pedersen, "Value and Momentum Everywhere”

13-Nov **Guest speaker:** Giorgio De Santis, Kepos Capital

4:30pm, SHDH 1206
***Note special time—no class meeting at regular time

15-Nov Equity premium – alternative approaches

Stock-screening write-up due
● Case discussion: *Deutsche Bank: Discussing the Equity Risk Premium*
● Case discussion: *Grantham, Mayo, Van Otterloo 2012: Estimating the Equity Risk Premium*
BKM chapter 13, pp. 435–441 *[416–422]*
Pedersen section 10.3
Sample exam problems 49–53
Optional:
Stowe, McLeavey, Pinto, “Share Repurchases and Stock Valuation Models”
Fama and French, “The Equity Premium”
Fama and French, "The Corporate Cost of Capital and the Return on Corp. Investment"

20-Nov Long-horizon framework; shortfall and options/insurance

● Case discussion: *The Risk of Stocks in the Long Run: The Barnstable College Endowment*
BKM chapter 5, pp. 152–161 *[147–151]*
BKM chapter 20, pp. 679–680, 685–693, 698–700 *[657–659, 663–671, 675–678]*, problem 29
BKM chapter 21, pp. 729–731 *[706–708]*, problems 9, 10
Sample exam problems 54–58

27-Nov Life-cycle issues; mean reversion and long-horizon volatility

● Case discussion: The Vanguard Group, Inc. in 2006 and Target Retirement Funds
BKM chapter 28, pp. 1003–1004 *[954–955]*
Sample exam problems 59, 60
Optional:

NYTimes articles, 3/29/2009 and 6/20/2009
Pastor and Stambaugh, “Are Stocks Really Less Volatile in the Long Run?”

29-Nov Pension-fund asset allocation

● Case discussion: *Pension Policy at The Boots Company PLC*
BKM chapter 28, pp. 1000–1002 *[951–954]*
Sample exam problems 61–63
Optional:
Bodie, “Shortfall Risk and Pension Fund Asset Management”
Black, “The Tax Consequences of Long-Run Pension Policy”
Dammon, Spatt, Zhang, “Optimal Asset Location and Allocation with Taxable and Tax-Deferred Investing”

4-Dec Review and synthesis

6-Dec Exam 2 (in class)

11-Dec Active management’s past and future

Simulation write-up due
Optional:
Stambaugh, “Investment Noise and Trends”