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Academic Integrity

All students are expected to know, understand and live up to the standards of academic integrity explained at http://academicintegrity.rutgers.edu/integrity.shtml. The minimum penalty for any cheating in an exam is the immediate failure of the course. The minimum penalty for any plagiarism in an assignment is a zero point for the assignment.

Policy on Electronic Devices in the Classroom

Students are not allowed to use the computer or other electronic devices to chat, email or surf the internet in class. Violators will be politely asked to leave the classroom. Unauthorized use of the computer or other electronic devices during an exam will be considered cheating and will result in the immediate failure of the course.

Course Description

This is a quantitatively-oriented financial economics course for the Master of Quantitative Finance (MQF) students. The course covers the basic concepts and analytical techniques of modern portfolio theory and asset pricing. Topics include Fisher separation, risk analysis using expected utility theory, mean-variance analysis, capital asset pricing model, arbitrage pricing theory, state preference theory, consumption-based asset pricing, market efficiency, empirical tests of asset pricing models, and market anomalies.

Main Text

Pennacchi, George, 2008, Theory of Asset Pricing, Pearson Addison-Wesley, ISBN 13-978-0-321-127720-4.

Other References

1. Francis, Jack Clark and Dongcheol Kim, 2013, Modern Portfolio Theory, Wiley, 978-1-118-37052-0.
2. Huang, Chi-fu and Robert Litzenberger, 1988, *Foundations for Financial Economics*, Prentice-Hall, ISBN 0-13-500653-8.
3. Back, Kerry, 2017, *Asset Pricing and Portfolio Choice Theory*, 2nd ed., Oxford University Press, ISBN 978-0-19-024114-8.
4. Ang, Andrew, 2014, *Asset Management*, Oxford University Press, ISBN 978-0-19-995932-7.
5. Copeland, Thomas E. and J. Fred Weston, 2005, *Financial Theory and Corporate Policy*, 4th ed., Addison-Wesley Publishing Company, ISBN 0-321-12721-8.
6. Cochrane, John, 2005, *Asset Pricing*, second edition, Princeton University Press, ISBN 978-0-691-12137-6.
7. Campbell, John Y., Andrew W. Lo and A. Craig MacKinlay, 1997, *The Econometrics of Financial Markets*, Princeton University Press, ISBN 0-691-04301-9.

Grading Policy

1. Exam I, Wed, 2/28/18, 1-3pm, 25%
2. Exam II, Wed, 4/25/18, 1-3pm, 25%
3. Problem sets, 25%
4. Group project, 15%, due 5/2/18

5. Class participation, 10%

Active class participation is extremely important and can affect your grade.

Exams are close-book, close-note. Homework must be submitted in hardcopy.

Group Project
The class will be divided into groups, each of which consists of no more than 5 students. Each group is required to do a simple portfolio investment project. A notional $1 million is provided for your investment. Trading is restricted to the 30 stocks in the DJIA and the 1-month T-bill. Short sale and margin trading are both allowed. Assume a one-way transaction cost of 20 basis points for trading stocks. Securities are bought/sold once a week (every Friday) for 15 weeks (1/19-4/27). You must report to me your transactions every Friday after trading by e-mail, or I will assume that you do not trade in that week. Each purchase/sale should be justified on the basis of current market conditions and finance principles. Each group will write a report and do a presentation in class. Your report must explain the rationale of your trading, report the weekly profit and loss of your portfolio and provide key summary statistics of the portfolio performance over the trading period. In particular, the summary statistics must include the following: portfolio mean return, standard deviation, t-ratio of mean return (and statistical significance), excess return over the T-bill (and statistical significance), excess return over the DJIA return (and statistical significance), Sharpe ratio, market beta, market alpha (and statistical significance), Fama-French betas, Fama-French alpha (and statistical significance), Treynor measure ($(\overline{r}_p - \overline{r}_f)/\beta_p$), M^2 measure (portfolio outperformance relative to the market), appraisal ratio ($\alpha_p/\sigma_{\varepsilon_p}$), best weekly return, worst weekly return, number of winning weeks, number of losing weeks, and maximum consecutive losing weeks. You should do the analysis on a before-cost basis and on an after-cost basis. The final report is due on 5/2/18. You are graded on the performance of your portfolio as well as the quality of your analysis.

Topics Covered (tentative, subject to change)

I.   Review of Expected Utility Theory and Risk Aversion
Pennacchi, 1; Copeland-Weston, 3; Huang-Litzernberger, 1, 2; Francis-Kim, 4

II.   The Mean-Variance Analysis
Pennacchi, 2; Copeland-Weston, 5; Huang-Litzernberger, 3; Francis-Kim, 5, 6, 7

III.   Market Equilibrium, CAPM and Factor Models
Pennacchi, 3; Copeland-Weston, 6; Huang-Litzernberger, 4; Francis-Kim, 12, 13

IV.   State Preference Theory and Equilibrium under Complete Markets
Pennacchi, 4; Copeland-Weston, 4; Huang-Litzernberger, 5

V.   Market Efficiency and Test of Asset Pricing Models
Copeland-Weston, 6; Campbell, et al, 5, 6; Cochrane, 12, 15; Francis-Kim, 14

VI.   Market Anomalies and Active Investment Strategies
Notes to be distributed

VII.   Multi-period Portfolio Choice and Asset Pricing (if time allows)
Pennacchi, 5, 6

Appendix

30 Companies in the DJIA Index			
Company	Exchange	Symbol	Industry
3M	NYSE	MMM	Conglomerate
American Express	NYSE	AXP	Consumer finance
Apple	NASDAQ	AAPL	Consumer electronics
Boeing	NYSE	BA	Aerospace and defense
Caterpillar	NYSE	CAT	Construction and mining equipment
Chevron	NYSE	CVX	Oil & gas
Cisco Systems	NASDAQ	CSCO	Computer networking
Coca-Cola	NYSE	KO	Beverages
DowDuPont	NYSE	DWDP	Chemical industry
ExxonMobil	NYSE	XOM	Oil & gas
General Electric	NYSE	GE	Conglomerate
Goldman Sachs	NYSE	GS	Banking, Financial services
The Home Depot	NYSE	HD	Home improvement retailer
IBM	NYSE	IBM	Computers and technology
Intel	NASDAQ	INTC	Semiconductors
Johnson & Johnson	NYSE	JNJ	Pharmaceuticals
JPMorgan Chase	NYSE	JPM	Banking
McDonald's	NYSE	MCD	Fast food
Merck	NYSE	MRK	Pharmaceuticals
Microsoft	NASDAQ	MSFT	Software
Nike	NYSE	NKE	Apparel
Pfizer	NYSE	PFE	Pharmaceuticals
Procter & Gamble	NYSE	PG	Consumer goods
Travelers	NYSE	TRV	Insurance
UnitedHealth Group	NYSE	UNH	Managed health care
United Technologies	NYSE	UTX	Conglomerate
Verizon	NYSE	VZ	Telecommunication
Visa	NYSE	V	Consumer banking
Walmart	NYSE	WMT	Retail
Walt Disney	NYSE	DIS	Broadcasting and entertainment