CHAPTER 1  Risk Uncorrelated with Returns


CHAPTER 2  The Creation of the Standard Risk-Return Model

4. The Miller-Modigliani Theorem states that the value of a firm is independent of the way it is financed, that is, the debt-equity proportion does not affect the sum value of the debt plus equity.
5. Frank H. Knight, Risk, Uncertainty and Profit (Boston: Houghton Mifflin, 1921), 213.
6. Knight, 224.

8. Ecclesiastes 11:2; William Shakespeare, in *The Merchant of Venice*, Act I, Scene I.


17. \[ E(e^x) = e^{\mu + \frac{1}{2} \sigma^2} \]


CHAPTER 3  An Empirical Arc


4. This unpublished work by John Lintner was noted by Douglas in his paper.


6. The analysis of quirky events that allow one to isolate an effect is a theme of *Freakonomics*, as when they found that given the arbitrary age cutoffs for soccer players in Europe, those born in January did better than those in December, the key being that the hypothesis could not be examined without the arbitrary age cutoff in youth soccer leagues.


rest upon opinions . . . easily resolve themselves into opinions of a proba-

bility.” Frank H. Knight, Risk, Uncertainty and Profit (Boston: Houghton Mifflin, 1921), 237.

14. Rolf W. Banz, “The Relationship Between Return and Market Value of Com-


17. Tyler Shumway, “The Delisting Bias in CRSP Data,” Journal of Finance 52 

18. Peter J. Knez and Mark J. Ready, “On the Robustness of Size and Book-
1355–1382.

19. S. Basu, “Investment Performance of Common Stocks in Relation to Their Price-
Earnings Ratios: A Test of the Efficient Market Hypothesis,” Journal of Finance 
32 (3) (1977): 663–682.

20. Laxmi C. Bhandari, “Debt/Equity Ratio and Expected Common Stock Returns: 


22. G. William Schwert, “Size and Stock Returns, and Other Empirical Regulari-

23. Werner F.M. De Bondt and Richard H. Thaler, “Does the Stock Market Over-
and Richard H. Thaler, “Further Evidence on Investor Overreaction and Stock 

2005.


27. Christopher S. Jones, “Extracting Factors from Heteroskedastic Asset Returns,” 

28. The value-weighted index was used by Eugene F. Fama and Kenneth French, 
“Common Risk Factors in the Returns on Stocks and Bonds,” Journal of Fi-
nancial Economics 33 (1) (1993): 3–56; Eugene F. Fama and Kenneth French, 
“Size and Book-to-Market Factors in Earnings and Returns,” Journal of Finance 
50 (1995): 131; Eugene Fama and Kenneth French, “The Cross-Section of Ex-
Jegadeesh and Sheridan Titman, “Returns to Buying Winners and Selling Losers:


39. The SDF likes to use the generalized method of moments, whereas APT tests are more visual, looking at spreads of portfolios.


CHAPTER 4 Volatility, Risk, and Returns

16. Absence of proof is not proof of absence. In logic, $A \rightarrow B$ (A implies B) is not equivalent to $\neg A \rightarrow \neg B$, (not A implies not B). But in probability theory, absence of evidence is always evidence of absence. If $E$ is a binary event and $P(H|E) > P(H)$, “seeing $E$ increases the probability of $H$,” then $P(H|\neg E) < P(H)$, “failure to observe $E$ decreases the probability of $H$.” $P(H)$ is a weighted mix of $P(H|E)$ and $P(H|\neg E)$, and necessarily lies between the two.


CHAPTER 5  Investors Do Not Mind Their Utility Functions


2. Given the simultaneous independent development by John Lintner and Jay Mossin, the development of the CAPM was inevitable.


5. Mark T. Bradshaw, "The Use of Target Prices to Justify Sell-Side Analysts' Stock Recommendations," *Accounting Horizons* 16 (2002): 27–42, finds "buy" and "strong buy" recommendations from brokerages have an average one-year expected return of 25 percent and 34 percent, respectively.


18. Ibid.


### CHAPTER 6 Is The Equity Risk Premium Zero?

2. From the American Institute for Management and Research conference: Cornell (2.5 percent), Siegel (2.0), Campbell (1.5 percent), Williamson (2.0 percent), Arnott (0 percent), and Ibbotson (4.0 percent).
3. It is sad to note how many times good ideas are ruined by trying to make them even better. “Don’t gild the lily,” the Bard noted.
7. 42.8 percent, 40.8 percent, 17.1 percent and –97 percent.


---

**CHAPTER 7 Undiminished Praise of A Vacuous Theory**


5. Margaret Mead, *Coming of Age in Samoa* (New York: HarperPerennial Modern Classics, 2000) and Alfred C. Kinsey, Wardell B. Pomeroy, and Clyde E. Martin, *Sexual Behavior in the Human Male* (Philadelphia: W.B. Saunders, 1948), have both been found to be highly biased by the authors’ preconceptions, although they are often still referenced as seminal works.


10. “I hope to show in this paper that the period 1979 to 1999 has also been a highly productive one. Precisely because the conditions for the existence of a stochastic discount factor are so general, they place almost no restrictions on financial data.” John Y. Campbell, “Asset Pricing at the Millennium,” *Journal of Finance*, 55 (2000): 1515–1567.


**CHAPTER 8 Why Relative Utility Generates Zero-Risk Premiums**

1. Symmetries are the basis of physical laws about space, time, and angles, implying conservation in momentum, energy, and angular momentum, respectively. Local symmetries play an important role in physics because they form the basis for gauge theories.


NOTES


CHAPTER 9 Why We Are Inveterate Benchmarkers

7. Animals that pass the mirror test include great apes (including humans over 18 months), bottlenose dolphins, killer whales, elephants, and European magpies.


19. This implication for the Nash equilibrium, the prisoner's dilemma, was why Judd Hirsch says to Russell Crowe, “You just turned one hundred fifty years of economics on its head,” supposedly because it showed an equilibrium where the Invisible Hand does not lead to a societal optimum. If anyone thought this was a big take-away, the repeated game takes us back to the virtue of the Invisible Hand.


### CHAPTER 10 Alpha, Risk, and Hope


3. John Maynard Keynes, *The General Theory of Employment, Interest and Money.* (London and New York: Macmillan, 1936), 162. Elsewhere, Keynes makes the observation that “Businessmen play a mixed game of skill and chance, the average results of which to the players are not known by those who take a hand. If human nature felt no temptation to take a chance, no satisfaction (profit apart) in constructing a factor, a railway, a mine or a farm, there might not be much investment merely as a result of cold calculation.” (150).


**CHAPTER 11 Examples of Alpha**


21. In practice, it’s more complicated because the bonds are often callable, and exercising the option extinguishes the bond.


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**CHAPTER 12 Alpha Games**


17. Robert Shiller actually did call the Internet bubble, and on the book jacket of his 2008 book, *The Subprime Solution*, Lawrence Summers blurbed that Shiller called the housing bubble, too. Yet, if you read the revised edition of *Irrational Exuberance*, written in 2005, while he has a chapter on the then-recent run-up in housing prices, it was typical economese: On the one hand prices have risen a lot, but on the other hand they did this earlier without a problem (1948), and so forth. On page 209, he writes, “In cities where prices have gotten so high that many people cannot afford to live there, the price increases may start to slow down, and then to fall. At the same time, it is likely the boom will continue for quite a while in other cities.” Hardly the clarion call of warning.

18. Claire Robinson, a 20-year veteran who is in charge of asset-backed finance for Moody’s, told Roger Lowenstein, “We aren’t loan officers. Our expertise is as statisticians on an aggregate basis. We want to know, of one thousand individuals, based on historical performance, what percent will pay their loans?” in Roger Lowenstein, “Triple-A Failure,” *New York Times*, April 27, 2008.

**CHAPTER 13 Alpha Seeking Applications**

4. In 2005, regulation SHO in the United States created a much more demanding set of rules for short selling, which has increased the disclosure of short-sell lists, but published lists are often conservative (list distributed to the retail public put more “impossible to borrows” to avoid problems) and incomplete.
6. Define $T(x)$ as the cumulative area between the CDFs up to a point $x$, where $T(x) = \int_{-\infty}^{x}CDF(A(t)) - CDF(B(t))dt$. If $T(x)>0$ for all $x$, then $B$ is said to second order stochastically dominate $A$, and be less risky.
7. Robeco Institutional Conservative Equity Fund (RINCEFD NA), Robeco’s Capital Growth European Conservative Equity (ROECIEU LX), and Unigestions Unigest Swiss Minimum Variance (RBSSVMVF SW).
11. SVX, SGX, and SPX indexes.
15. It turns out that the default problem has a flat maximum, so that the basic model converges pretty well after 1,000 or so bad observations. Thus, the in-sample and out-of-sample default model, given sufficient data, are not hugely different; that is, the model outperforms the agency ratings, though not as much.

**CHAPTER 14 Conclusion**

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