

Portfolio Management

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In this lecture, we propose to study some aspects of the portfolio management (Portfolio Theory). A leitmotiv of this lecture is to relate Portfolio Construction and Asset Pricing. The main textbook for this lecture is BERTRAND P. and J.-L. PRIGENT (2006). Subsections 1.2 and 1.3 will provide an heuristic introduction to the concepts of dynamic programming and martingale approach. These concepts will be more developed and used in sections 5 and 6. For each section, some examples of financial products will be presented in order to illustrate the practice of portfolio management theory.

Contents

1	Introduction	3
1.0.1	Top-down, bottom-up, alpha-beta-solutions	3
1.0.2	Regulatory framework (e.g. UCITS III constraints and constrained optimization)	3
1.1	Fundamental and Quantitative analysis	3
1.2	Payoff versus Strategy Approach	3
1.3	Payoff/Strategy, Utility function and Expectations	3
2	Utility function and Risk Measures	3
2.1	Utility	3
2.1.1	Von Neumann - Morgenstern (1947) - classes of utility functions	3
2.1.2	HARA: power utility and logarithmic utility	3
2.1.3	CARA	3
2.2	Risk Measures	3
3	Standard Portfolio Theory	3
3.1	Markowitz: general case	3
3.2	Portfolio Resampling	3
3.3	A Bayesian Approach	3
3.3.1	The General framework	3
3.3.2	The Black-Litterman Model - following MEUCCI A. (2008)	3
3.3.3	Beyond the Black-Litterman Model	3
3.4	Robust Allocation	3
4	Performance study	3

5	Passive Management and Structured Products	4
5.1	Benchmarking and Replication	4
5.1.1	Constrained optimization	4
5.1.2	Replication with Kalman Filter	4
5.2	OBPI, CPPI and bridge the gap	4
5.3	Introducing Drawdown constraints (Grossman-Zhou)	4
5.4	Liability Driven Investment	4
6	Active Management - alpha creation	4
6.1	Introducing active management	4
6.2	From Core-Satellite to Portable Alpha	4
6.3	The 130-30 Approach	4
6.4	Hedge Funds	4
7	Conclusion	4

References

- [1] BERTRAND P. and J.-L. PRIGENT (2006), *Gestion de Portefeuille. Analyse quantitative et gestion structurée*, collection Finance, Economica.
- [2] HARVEY A. C. (1991), *Forecasting, Structural Time Series and the Kalman Filter*, Cambridge: Cambridge University
- [3] KALMAN R.E. (1960), A new approach to linear filtering and prediction problems, *J. Basic Eng.*, **82**, 35-45, March.
- [4] LEE W. (2000), *Theory and Methodology of Tactical Asset Allocation*, Wiley.
- [5] MEUCCI A. (2008), The Black-Litterman Approach: Original Model and Extensions, *The Encyclopedia of Quantitative Finance*, Wiley.
- [6] RONCALLI T. and J. TEILETCHE (2008), An Alternative Approach to Alternative Beta, *Journal of Financial Transformation*.
- [7] SCHERER B. (2007), *Portfolio Construction and Risk Budgeting*, Third Edition, Riskbooks.
- [8] SCHERER B. (2008), *Portfolio Management*, Introduction, Riskbooks.
- [9] SHARPE W. (2008), *Investors and Markets: Portfolio Choices, Asset Prices, and Investment Advice*, Princeton Lectures in Finance