

Market Collective Wisdom Discovery for Portfolio Investments

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Abstract

The goal of numerous investing strategies, as opposed to hedging strategies, is “to beat the market”, i.e. to secure returns higher than those guaranteed by tracking market indices. In order to achieve this goal, one needs to identify key factors which drive markets and cause security prices to fluctuate.

We assume that distinctive key market factors exist, though it is not known how such factors correlate and aggregate, and eventually push a market from one quotation to another. In other words, we purport that at a given time there is the collective wisdom in a market which shapes the collective investment pattern for the future. We engage ourselves to reverse engineer that wisdom. Specifically, we attempt to reverse engineer it from market returns (which we interpret as collective market wisdom embodiment) with the use of the notions of *vectors of concessions and compromise half lines*, recently introduced into Multiple Criteria Decision Analysis. We illustrate our approach with preliminary calculations for selecting portfolios of international investment funds.

Keywords: Multiple criteria decision making, investment portfolio, knowledge discovery.

1. Introduction

A portfolio selection model was first proposed in the 1952 by Harry Markowitz [20]. The problem was formulated as a bi-criteria optimization problem, with the expected rate of return and risk as conflicting criteria. A survey on the Markowitz model and its modifications was given in [30] and the fifty-year retrospective of this model was presented by Mark Rubenstein in [25].

On the basis of the approach developed by Markowitz, a number of authors independently proposed the Capital Asset Pricing Model (CAPM) to estimate the relationship between the expected return and risk of individual assets [19, 22, 27, 32]. Since that time, the appropriateness of CAPM has been discussed in numerous publications. Only as late as in 2004 it was shown that the original CAPM cannot correctly capture correlation between risk and the expected return, which put the question mark on its practical