Three Essays in Asset pricing and Portfolio Choice

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2012

document version
Publisher's PDF, also known as Version of record

citation for published version (APA)
Botshekan, M. (2012). *Three Essays in Asset pricing and Portfolio Choice*.

Summary in English

Three Essays in Asset Pricing and Portfolio Choice

In this thesis, I provide new insights in the field of asset pricing and portfolio optimization by investigating the role of information and factor decompositions. In particular, I investigate the effect of disentangling specific risk factors as used in the earlier asset pricing and portfolio allocation literature into their different sub-components.

In Chapter 2, I propose an extension to the two-beta model of Campbell and Vuolteenaho (2004) and the two-beta model of Ang, Chen, and Xing (2006) to account for investor preferences in two respects. First, based on the assumption that investors are loss-averse, I distinguish between co-variation of stock returns with market returns in up and down markets, respectively. Second, I distinguish different investor reactions to market cash flow news and market discount rate news, particularly for long-term and short-term investors. Based on decomposing the risk factor space in all these different directions, I propose a four-factor asset pricing model. The new model distinguishes the co-variation of stock returns with cash flow and discount rate news in up and down markets.

By disaggregating the risk factors into these different components rather than leaving them in their aggregated form as in Campbell and Vuolteenaho (2004) or Ang, Chen, and Xing (2006), I find that downside cash flow and discount rate betas typically carry the largest premia in the cross section. Downside cash flow risk is priced most consistently across different samples, periods, and return decomposition methods. It is also the only component of beta with significant out-of-sample predictive ability. I also find that for small stocks, mainly the downside risk components carry the premia. For the larger companies, the priced components of risk become more symmetric (both upside and downside) and are cash flow related.

In Chapter 3, I examine whether investors can benefit from return predictability in their asset allocation decisions by decomposing the variation in commonly used state variables into long-term and short-term components. Based on a variety of filtering techniques and a semi-parametric approach of Ait-Sahalia and Brandt (2001) to model the dependence of asset allocation decisions on state variables, I find that for short term investors the short-term component in state variables matters more for asset allocation decisions. This result, is obtained while accounting for short-sale restrictions into the regular GMM moment conditions by using the appropriate Lagrange-Kuhn-Tucker multipliers. For longer horizons, the long-term components

gradually become more important.

I find that for some state variables such as the dividend yield and stock market trend, a decomposition into short-term and long-term components can improve the out-of-sample performance of asset allocation decisions both in terms of Sharpe ratios and expected utilities. The results are robust to different levels of investors' risk aversion parameters. Again, the results illustrate that care should be taken when aggregating long-term and short-term components into one common effect, as is often done in the literature. Different investors may have different preferences and uses for different components of state variables. These should therefore carefully be distinguished.

In Chapter 4, I examine the effect of the factor structure of the returns on the performance of different portfolio strategies. I compare all strategies with a naive diversification strategy that invests equally in all assets. I show analytically and numerically that if the asset returns are generated by a one-factor model, the Sharpe ratio of the optimal and naive $(1/N)$ portfolio are very close, even if the true parameters are known. Therefore, simulation studies that are based on a one-factor set-up are not informative for comparing the performance of optimal investment strategies with the $1/N$ rule. In a two-factor set-up, I show that the difference can become substantially larger. The conditions to obtain these large differences, however, are typically not satisfied for real data. Using empirical data I show that when a sufficiently large number of factors that drives the underlying asset returns is taken into account, there is more room for portfolio strategies to outperform naive diversification. Again, I confirm that care should be taken when investors consider the space of common risk factors for optimal portfolio choice: by reducing this dimension too rigidly, e.g., to one or two, all potential benefits may be lost. It is precisely the case of a more refined decomposition of the risk factor space that allows investors to exploit the covariance structure of returns.

To conclude, the decomposition of information to a sufficiently refined disaggregate level is important for both asset pricing studies and portfolio choice research. Aggregating information too much may hamper our understanding of what risk factors are actually priced. In addition, it may blur our insight into what part of typical state-variables or what techniques for optimal portfolio choice may be more relevant for investors, depending on their objectives, preferences, and time horizon. The set of tools developed in this thesis can be seen as a way forward in empirical research for improving our understanding on these aspects of financial decision making.