Master Thesis Topics Spring Semester 2020

Topic 1: Tail Risk and the Cross-Section of Expected Returns

Supervisor: Markus Huggenberger

Tail risk is a major concern for individual and institutional investors. Its effect on the aggregate market risk premium and its pricing in the cross-section of expected stock returns have therefore received considerable attention in the asset pricing literature.

Recently, Atilgan et al. (2020) document a negative relation between the left tail-risk of individual stocks as measured by their Value-at-Risk and future stock returns. The purpose of this thesis is to replicate this main finding and to test its robustness.

Besides controlling for standard characteristics and factors that are known to explain the cross-section of expected stock returns, the student should include simple non-parametric versions of the lower-tail-dependence measures used by Chabi-Yo et al. (2018) and van Oordt/Zhou (2016) as control variables.

Recommended Software: Matlab (licenses available)

Data Sources: CRSP and Compustat (maybe Datastream)

Starting literature:

Atilgan, Y., Bali, T. G., Demirtas, K. O., & Gunaydin, A. D. (2020). Left-tail momentum: Underreaction to bad news, costly arbitrage and equity returns. *Journal of Financial Economics*, *135*(3), 725–753.

Chabi-Yo, F., Ruenzi, S., & Weigert, F. (2018). Crash Sensitivity and the Cross Section of Expected Stock Returns. *Journal of Financial and Quantitative Analysis*, *53*(03), 1059–1100.

Kelly, B., & Jiang, H. (2014). Tail Risk and Asset Prices. *Review of Financial Studies*, *27*(10), 2841–2871.

van Oordt, M. R. C., & Zhou, C. (2016). Systematic Tail Risk. *Journal of Financial and Quantitative Analysis*, *51*(02), 685–705.

Bali, T. G., Engle, R. F., & Murray, S. (2016). *Empirical Asset Pricing*. Wiley.

Ang, A., Chen, J., & Xing, Y. (2006). Downside Risk. *Review of Financial Studies*, *19*(4), 1191–1239.

Topic 2: Market Tail Risk during the COVID-19 Pandemic

Supervisor: Jan Bauer

Tail risk measures such as Value-at-Risk (VaR) or Expected Shotfall (ES) play an important role in financial risk management. The student introduces these tail risk measures and discusses non-parametric and parametric modelling frameworks.

In the empirical part, the student calculates VaR/ES using index return data for selected asset classes. The student determines the tail risk estimates over the last decades and analyzes the dynamics of the estimates during the ongoing COVID-19 pandemic in detail.

Depending on the preferences and previous knowledge, GARCH-based tail risk forecasts and/or VaR/ES-backtesting could be considered.

Recommended Software: Matlab (licenses available)

Data Sources: Datastream (maybe Bloomberg)

Starting literature:

Albrecht, P., & Huggenberger, M. (2015). Finanzrisikomanagement. Schaefer Poeschel.

Alexander, C. (2009). Market Risk Analysis IV: Value-at-Risk Models. John Wiley & Sons.

Christoffersen, P. (2012). Elements of Financial Risk Management. Elsevier.

Hull, John. C. (2018). Risk Management and Financial Institutions. John Wiley & Sons.

Topic 3: Multi-Asset Portfolio Selection with Heuristic Methods

Supervisor: Jan Bauer

A major problem with mean/variance portfolio optimization is that expected returns need to be estimated, which is a very difficult task. One way to deal with the associated estimation risk is to use heuristic techniques that do not require this estimate, such as equal weight-, minimum variance-, maximum diversification- or risk parity-investing. In this thesis, the performance of these heuristic techniques is evaluated in an out-of-sample study, where traditional mean/variance optimized portfolios serve as benchmarks.

The student should focus on risk parity, which has attracted a lot of attention ever since the global financial crisis due to its good performance figures. The aim of risk parity is to create portfolios that are well-diversified. Unlike in the classical Markowitz approach diversification is being measured via the portfolio constituent's contributions to portfolio risk. These contributions are equalized so that there are no concentrations in terms of risk contributions.

Depending on the preferences and previous knowledge of the student, extensions of risk parity could be considered. Furthermore, transaction costs could be taken into account.

Recommended Software: Matlab (licenses available)

Data Sources: Datastream (maybe Bloomberg)

Starting literature:

Albrecht, P., & Maurer, R. (2016). Investment- und Risikomanagement: Modelle, Methoden, Anwendungen. Chapter 6.7.

Anderson, R. M., Bianchi, S. W., & Goldberg, L. R. (2012). Will My Risk Parity Strategy Outperform? Financial Analysts Journal, 68(6), 75–93.

Chaves, D., Hsu, J., Li, F., & Shakernia, O. (2011). Risk Parity Portfolio vs. Other Asset Allocation Heuristic Portfolios. The Journal of Investing, 20(1), 108–118.

Elton, E. J., Gruber, M. J., Brown, S. J., & Goetzmann, W. N. (2014). Modern Portfolio Theory and Investment Analysis.

Lee, W. (2011). Risk-Based Asset Allocation: A New Answer to an Old Question? The Journal of Portfolio Management.

Maillard, S., Roncalli, T., & Teïletche, J. (2010). The Properties of Equally Weighted Risk Contribution Portfolios. The Journal of Portfolio Management, 36(4), 60–70.

Roncalli, T. (2014). Introduction to Risk Parity and Risk Budgeting.