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Course Title: Financial Modeling and Business Decisions  
Course Code: BUS 150 W  
Instructor: Iddo Hadar  
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Grade Option: Letter Grade

Title: **Optimal Asset Allocation with MS-Excel**

## Final Assignment Problem Statement

A US defined contribution Pension Fund traditionally allocates its Master-Portfolio between two in-house managed Sub-Funds tracking the S&P 500 index and the NASDAQ Composite index, respectively. According to the fund's charter, senior management decides quarterly about strategic changes in the allocation based on a quantitative report that applies Modern Portfolio Theory (MPT) and analyses 30 years of historical data. The individual clients' portfolios hold shares of the Master-Fund and of US Treasury Notes with of an appropriate maturity to reduce volatility. For example, 10 years before out payment starts at age 67 the pension plan starts shifting 10% of a policy holder's assets into 10yr T-Notes. The following year the risk-free allocation is increased to 20% by buying 9yr T-Notes. The investment returns for the last 10 years have been satisfying, but the board of directors is concerned about signs of overheating and a lack of diversification in the domestic equity markets. In addition, the board recommends looking overseas to investable companies that can profit from expected economic growth in Europe, Asia and emerging markets.

Recently the Fund's charter was amended and now allows for up to 60% investments in Non-USD equity markets, albeit only in Investment Grade rated countries. You are a senior analyst at the pension fund and the CEO asked you to prepare an investment thesis based on MPT and state of the art statistical modelling. Microsoft Excel 2016 is available and both the CEO and the board members are trained economists who like to run the models by themselves. Furthermore, the company's senior risk manager needs to approve your proposal and you decide to include Pivot table risk factor break downs, Monte Carlo performance simulations and statistical hypothesis tests as well. You prepare a demo MS Excel Spreadsheet and a MS-PowerPoint presentation to illustrate the method and course of the study. Your report offers 3 alternative Model portfolios with similar risk/return characteristics for senior management to decide which one should replace the current Master Portfolio.

Peter Schuld