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How to Diversify Internationally? A Comparison of Conditional and Unconditional Asset Allocation Methods

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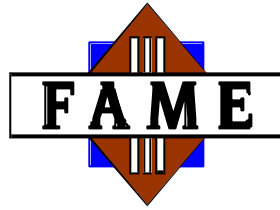
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Abstract:

To obtain the maximum benefits from diversification, financial theory suggests that investors should invest internationally because of the larger potential for risk reduction stemming from the lower correlation existing between assets of different countries. The question that we raise in this paper is how to choose the best mix of countries to diversify internationally? We compare several methods of asset allocation from a Swiss perspective over the period 1988-2001. We simulate different investment policies and compare conditional and unconditional methods. We find that conditional methods, that explicitly assume time-variation in expected returns, outperform all other asset allocation methods.

Executive Summary:

Modern portfolio theory gives very precise indications to an investor wishing to diversify internationally his portfolio. The theory shows that to get the maximum benefits from diversification, the international investor should allocate his wealth to various countries to obtain a maximal risk reduction, as assets from different countries are less correlated than stocks originating from the same country. The question raised in this paper is how to select the optimal portfolio of countries? At the first sight, this question seems to be irrelevant because financial theory provides a normative framework for such choices and shows that investors try to



maximize the expected return of a portfolio for any given level of risk, represented by the standard deviation of a portfolio. This, in turn, will provide the optimal weights to invest in each country. The practical implementation of this theoretical framework raises several issues. It requires the estimation of a vector of expected returns and of a covariance matrix of returns. This is usually done in an unconditional framework, meaning that these moments are assumed to be constant through time, which leads to parameters being estimated with the historical means, variances and covariances of returns. Unfortunately, this procedure yields very poor results, as it does not provide the best mean-variance trade-off for future returns. For this reason, more efficient approaches are called for. A reasonable alternative to this approach is to assume that moments are changing through time and therefore to rely on a conditional implementation of the model. One way to approach this issue is to use the results from empirical studies on the predictability of stock returns that have found that returns can be partially predicted with some economic variables such as the term spread, the default spread, the dividend yield and lagged stock returns. These studies show that there is a linear relation between future stock returns and past observations of the predictive variables. This relation, estimated by ordinary least squares (OLS), provides an alternative and easy way to characterize the dynamics of returns. The goal of this paper is to give a comprehensive view of all the main methods available to achieve an optimal international asset allocation and to implement them from a Swiss perspective.

The different asset allocation methods considered in this paper are: the classical unconditional model, an alternative version of this model that improves estimates of the expected returns vector (Bayes-Stein) and two conditional methods. The first involves the direct estimation of expected returns with predictive variables such as the U.S. default spread, the local term spread and the lagged stock returns (OLS-based method). The second method has stronger theoretical foundations as it is based on a conditional international asset pricing model (APM-based method), which uses predictive variables to determine the risk premia on two factors: the world market return and an exchange rate factor. The returns are simulated on a sample of 17 countries that includes 11 developed markets and 6 emerging markets. We use weekly returns on MSCI indices over the period 1988-2001. We allow the investor to hedge currency risk with future contracts. The optimal weights invested in each country are obtained by maximizing the Sharpe ratio of the investor's portfolio. All the simulations are implemented in a truly out-of-sample approach as the parameters are first estimated on a five-year window and then used as inputs to determine the optimal weights for subsequent periods. We only model the expected return vector as the covariance matrix has been shown to be fairly stable through time in the literature.

The results of our empirical analysis show that the OLS-based conditional asset allocation outperforms in absolute terms all the other strategies that have been investigated in the paper.

Over the simulation period 1995-2001, it yields an average annualized returns of 32.31%. This average return is significantly above 14.37% which is the average annualized return of the



classical unconditional method. Other allocation methods yield the following average return: 13.58% for the Bayes-Stein estimator and 8.45% for the APM-based conditional allocation. The OLS-based conditional allocation also yields the best results in terms of risk-adjusted return as its Sharpe ratio is 1.26 whereas all other methods have Sharpe ratios between 0.5 and 0.8. We also compare the outcome of our strategies to standard benchmarks such as the MSCI World index and the minimum variance portfolio and find that they are also dominated by the OLS-based conditional allocation. We attribute the outstanding results obtained by this type of conditional allocation to its ability to capture the effect of changing economic conditions on financial markets.