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Research Statement

My research has been centered on two areas related to international finance and investments. The first area is the role of private information in international equity markets. The second is how to design optimal portfolios of international equities while accounting for many potential problems. I will explain each area in turn.

(1) Private Information in International Equity Markets

One of the major puzzles in international finance is the “home bias puzzle”: investors hold a smaller amount of foreign equities in their portfolios than that suggested by models of international portfolio diversification. One of the leading theoretical explanations for this puzzle is asymmetric (i.e. “private”) information: domestic investors have better information about their securities than foreign investors could obtain. For example, a French investor will have much more detailed knowledge of French equities as she understands French firms, French accounting practices, the French economy, etc. As it is costly for US investors to acquire this information, and hard to verify when they do, US investors avoid investing in French equities. The home bias puzzle can thus be potentially explained by the different information sets of US versus foreign investors.

In the paper “**Characterizing Asymmetric Information in International Equity Markets**”, my coauthors (Rui Albuquerque, University of Rochester and Martin Schneider, UCLA) and I examine whether this simple view of asymmetric information is true. It turns out that the structure of private information in international equity markets is actually much more complicated than the one given in the theoretical papers. Based on a model of portfolio choice with both public and private information, we construct new empirical measures of trades by US investors due to private information. The first surprising result is that these trades help explain the cross section of international equity returns, after controlling for public information. Sophisticated US investors appear to have an information advantage in foreign equity markets, contrary to current thinking. The next surprising result is that trades motivated by private information are highly correlated across countries. In particular, a common “global” factor accounts for about half of the variation in US investors’ trades due to private information and can also be used to predict returns in many countries. Private information is not just a country-specific phenomenon; it has both global and local components.

There are a variety of potential explanations for the superior information of sophisticated US investors. For example, a US analyst may have a better understanding of a US industry which gives her good information about foreign firms in the industry. US investors may also have better information about the US economy, US asset markets or customer flows in these markets. If these factors are related to foreign equity prices, then the private information obtained by US investors at home will help them when they invest abroad.

This paper has been submitted to the *Journal of Financial Economics* and we are waiting for the first referee report. The paper won the “**Outstanding Academic Paper in International Finance Award**” at the 2002 Meeting of the Eastern Finance Association. It has been presented at the Western Finance Association Meeting, the European Finance Association Meeting, the Northern Finance Association Meeting, the European Summer Symposium in Financial Markets (CEPR), the Georgia Tech Conference on International Finance, and at Arizona State University, Brigham Young University, McGill University, NYU (Stern), UCLA, and the University of Rochester.

My coauthors and I are writing a subsequent paper (“**The Cross Section of International Equity Flows and Returns**”) which takes our empirical findings and puts them into a calibrated general-equilibrium model of international capital flows and portfolio choice. We are trying to see if the asymmetric information explanation of the home bias puzzle fits with our empirical findings of global and local components in private information. We are endowing investors with both types of private information and seeing if such a structure can generate the observed stylized facts in international finance, in particular the home bias puzzle in foreign equity holdings and the persistence in international equity flows.

In an almost completed working paper, “**US Monetary Policy, Asymmetric Information, and International Equity Returns**”, Clara Vega of the University of Rochester and I take a deeper look at the economic origins of private information. There are many papers which state that asymmetric information exists in both domestic and international equity markets and yet nobody has examined if it is related to any economic fundamental. Our contribution in this paper is to show that asymmetric information about future interest rates (as captured by trades in the Eurodollar futures market) is related to asymmetric information in domestic and foreign equity markets (for the former we use trades in the S&P 500 Exchange Traded Fund (“Spider”); for the latter we use trades in the Exchange Traded Funds from Barclay’s Global Investors that track the MSCI International equity indexes (“iShares”). As the Eurodollar futures markets are related to potential monetary policy moves by the Federal Reserve Board, we find a large role for US monetary policy in international equity markets. To the best of our knowledge, this is the first paper to find that an economic fundamental is responsible for correlated private information.

(2) Designing Optimal International Portfolios

The second part of my research agenda concerns the design of international equity portfolios. There are many problems that investors face when investing abroad. In “**Conditional Currency Hedging and Asset Market Shocks**”, I examine how a US based investor should hedge the currency risk of his international equity portfolio in response to different asset market shocks that he perceives. These shocks affect his forecasts of expected returns in the domestic and foreign equity markets as well as in the foreign exchange market. It turns out that the investor can gain a lot of utility (measured

in certainty equivalent terms) if he alters his conditional portfolio allocation and currency hedge ratios in response to these shocks. This is true whether he is investing for the short run (one-month portfolio allocations) or constructing a buy-and-hold portfolio of several years duration. The investor accounts for the potentially large effect of parameter uncertainty on his optimal decision by adopting a Bayesian perspective which allows him to incorporate this additional source of risk into his forecasts.

This paper was submitted to the *Journal of Finance* and I have received a request for revisions and resubmission. The paper has been presented at Arizona State University, Brigham Young University, the Georgia Tech Conference on International Finance, University of Georgia and the University of Rochester.

In “**The Foreign Exchange Risk Premium Over the Long Run**”, I analyze the behavior of the foreign exchange risk premium using long-horizon regressions. A long-horizon analysis may provide new evidence about three key issues concerning the foreign exchange risk premium. The first issue is the relationship between expected foreign exchange returns and expected returns on other assets. Long-horizon regressions are able to explain a large portion of the variation of foreign exchange returns using instruments that have been shown to predict domestic asset returns. I undertake a careful small-sample study to examine the size of the statistics and provide evidence of increased power. The second issue is the high variability of the foreign exchange risk premium. Using the long-horizon regression results, I show that Fama's (1984) finding that the variability of the risk premium is greater than that of the expected change in the spot rate holds even for horizons extending out to four years and is, therefore, not the result of market frictions which would bind only in the short run. The third issue is the economic model that can explain foreign exchange risk premiums. I show that both the length of the holding period and the inclusion of global and local risk factors are important for tests of latent variable models.

This paper was submitted to the *Journal of International Money and Finance* and I have received a request for revisions and resubmission. It has been presented at Boston College, University of British Columbia, University of California (Davis), University of Pennsylvania (Wharton), University of Rochester, University of Toronto, and University of Washington.

The paper "**Evaluating Alternative Models of Nonlinear Returns: Cross Hedging the Canadian Dollar**" was published in *The Bank of Canada Conference on Monetary Policy and the Exchange Rate* (conference volume, March 1997). In this paper, I examine the ability of several non-linear exchange rate models to hedge exchange rate risk. It turns out that the empirical specification of the exchange rate volatility can have a large impact on the optimal hedge and the subsequent portfolio performance.

This highlights an important problem for practitioners: how to choose a model of stock and exchange rate co-variability when both the volatilities of the individual assets and the correlations between them are varying over time. Existing models of multivariate conditional heteroskedasticity suffer from a number of problems, including over-

parameterization. In work in progress, Keith Vorkink (Brigham Young University) and I are constructing a new model of the cross-section of realized volatility. The paper is interesting as it allows both the variances of the individual assets and the correlations between them to vary over time in response to current information. It is based on a factor approach so the number of parameters is small, yet it is relatively easy to estimate compared to previous factor models.

I am working on two other papers related to problems with model specification. In the first, “**Exchange Rates and Fundamentals: Accounting for Parameter and Model Uncertainty**”, Michela Verardo (Ph.D. candidate, University of Rochester) and I re-examine the relationship between exchange rates and fundamental variables. While models of exchange rates based on fundamentals have theoretical appeal, they exhibit poor empirical properties in sample, and an out-of-sample forecasting ability that is often inferior to a simple random walk. Our view is that these results may be due to inadequate specifications of the uncertainty surrounding the data generating processes of the variables. In particular, current approaches ignore the parameter and model uncertainty that is present in estimating long-run relationships. In this paper, we use a Bayesian cointegration model to account for these problems. Our estimation procedure is based on Markov Chain Monte Carlo methods and inference is made using posterior odds ratios. Using Bayesian model averaging techniques, we can construct a final model that accounts for both parameter and model uncertainty. We compare the cointegration and random walk approaches by examining their ability to explain both short and long-run movements in nominal exchange rates.

The second paper is “**The Cross Section of Expected Stock Returns with Imperfectly Observed Factors**” (joint with Chris Jones (USC), Lucas Pomorski (Chicago) and Ane Tamayo (LBS)). Most of the existing implementations of factor models suffer from a number of problems: (i) the factors are static and thus miss important asset pricing dynamics; (ii) a two-pass procedure is used causing an errors-in-variables problem; (iii) the economic identification of the factors is either completely absent (factors are unobservable and are extracted from the data using statistical methods such as factor analysis) or strongly specified a priori (factors are represented by predetermined macroeconomic and financial variables). In this paper, we present a dynamic multivariate factor model that overcomes these problems. The factor variances and the expected stock returns are both time varying and are linked by asset pricing theory. Thus important asset pricing dynamics that arise in the time series of stock returns are captured in the cross section of expected stock returns. The model is Bayesian and is implemented using Markov Chain Monte Carlo methods. Our method is a one-pass procedure that overcomes the errors-in-variables problems of two-pass approaches. By tilting our prior beliefs towards either source of factor dynamics we are able to nest the two extreme assumptions of the existing literature and evaluate such problems as using a proxy for the unobserved market portfolio. We derive the exact, small-sample posterior distributions of the parameters of interest instead of relying on asymptotic tests.