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Risk premia in international equity markets revisited ☆

Stephen J. Brown [a,*], Takato Hiraki [b], Kiyoshi Arakawa [c], Saburo Ohno [c]

[a] NYU Stern School of Business, New York University, 44 West 4th Street, KMEC 9-190, New York, NY 10012, United States
[b] Institute of Business and Accounting, Kwansei Gakuin University, Japan
[c] Société Générale Asset Management (Japan), Tokyo, Japan

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ABSTRACT

Recent evidence suggests that global equity markets are becoming more risky. We develop a model to explain risk premia in international equity markets. The model is then used to investigate the changing nature of conditional risk premia and their effect on unconditional global risk. Using this model we find that the increase in international variance and covariance of realized excess returns can be attributed to systematic variations in global risk premia correlated across markets as well. Understanding this additional source of increased global correlation is important. These results have interest both for practitioners and for those interested in modeling global asset prices.

Today's global equity markets are characterized by very high average return correlations (see, e.g., Goetzmann et al., 2005, in a historical context). Why have equity market correlations around the world increased to such a high level recently? One can argue that increased return correlations are due to enhanced global economic integration, resulting in reduced benefits from global diversification. Apparently, however, these reduced benefits have not deterred international investment (and flows). We argue that increases in unconditional global correlations are an artifact of changes in global risk premia. These changes are predictable using information available to global investors. Understanding both the predictability of risk premia and the effect this has on unconditional correlations is especially important both for practitioners and those interested in global asset pricing.

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* Corresponding author.
E-mail addresses: sbrown@stern.nyu.edu (S.J. Brown), thiraki@kwansei.ac.jp (T. Hiraki), kiyoshi.arakawa@sgam.co.jp (K. Arakawa), saburo.ohno@sgam.co.jp (S. Ohno).

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The model we develop is parsimonious in predicting risk premia. Each of the factor risk premia estimated can be interpreted in relation to major world economic or market events. Based on this model, we document that there is a statistically significant increase in unconditional risk, and that the increase can be attributed to systematic variations in global conditional risk premia correlated across global markets. The increase in *ex post* risk caused by changing risk premia can be conveniently distinguished from the increase caused by fundamental changes in the risk attributes of these markets.

There are many studies of the international asset pricing model. The Intertemporal International Arbitrage Pricing Theory (IIAPT) emphasizes the importance of considering global asset pricing in the context of conditional expectations. Ferson and Harvey (1993), for example, investigate predictability in international equity markets, focusing on the conditional factor risk premia, and find that the significant fraction of excess return variation is explained by time variation in global factor risk premia. Dumas and Solnik (1995) show that a conditional asset pricing model, in which both factor risk premia and factor loads vary over time, in a statistical sense outperforms its unconditional counterpart for equity and currency markets of the four largest economies (Germany, U.K., Japan, and the U.S.). Choi et al. (1998) show an advantage of conditional APT models over unconditional counterparts in that the former can capture the time-varying risk premium associated with foreign exchange risk in the Tokyo stock market better than the latter.

More recently, Bekaert et al. (2005) attempt to establish a single most parsimonious asset pricing model to capture the variance and covariance structure of international equity market returns. Their focus is on the changes of unconditional variance and covariance measured over many short periods on a (six-month) rolling basis with the use of a weekly interval. They find that a three-factor APT specification, using factor analysis and mimicking portfolio techniques, best serves their purpose of total variance decomposition; and that the changes in betas contribute most to explain the time behavior of variance within the value-weighted global market portfolio. They find that an upward trend in global return correlation is attributed to the increasing integration of European stock markets.

Allowing risk premia to vary over time, Brown and Otsuki (1993) find that risk premia in the Pacific-Basin markets for the period 1981–1992 are highly predictable on the basis of prior information to investors. A novel feature of their empirical methodology is that factor innovations, factor loadings and risk premia are determined simultaneously in a single system of equations. Their model can be extended to consider changes in risk attributes over sub-periods, allowing betas to change from one sub-period to the next. Thus it can be used to break down global risk into two main sources: fundamental changes in the risk attributes of the markets and systematic variations in global risk premia, i.e., expected returns.[1]

It is important to note that our analysis is conditional on realizations of factors and instruments, and it is interesting that we can explain some significant component of global variance changes through the predictable component of changing risk premia even assuming that the underlying and unexplained components of global variance are stationary. In order to predict future changes in variance, we would need to model the time-series components and correlations of factors and instruments. Our objective in this study is to understand the time variation of international return covariances, possibly, caused by both factors and instruments. If on the other hand, the objective is to purely predict future changes in variance, a more straightforward approach would be applied to model the time series of dynamic conditional covariance directly (Engle, 2002).[2]

The paper is organized as follows: Section 1 presents the model structure and specification. Section 2 describes the data with global correlation analysis. In Section 3 we present the result of model estimation for country index portfolios. After comparing the predicted risk premia with the realized excess return for each of the component assets, we provide some economic interpretation of the time variation of risk premia for selected assets and factors in Section 4. Section 5 provides the decomposition of the global market total risk along the model and investigates the possible increase in global correlation by cause. Section 6 concludes the study.

[1] Bekaert et al. (2005) decompose the total variance into changing beta, factor innovation and residual caused parts. Ferson and Harvey (1993) decompose variance into changing beta, risk premia and residual caused parts.

[2] This distinction between estimating a structural form model given realizations of certain exogenous variables, and modeling the time-series properties of these exogenous variables to derive a multiple time-series reduced form system for prediction purposes is due to Zellner and Palm (1974).