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Improving international diversification benefits for US investors

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ABSTRACT

There are two main questions that have attracted considerable attention in the financial literature over the last few years: whether international diversification benefits are still substantial in the current context of increasing market correlations and which approach provides better results in terms of out-of-sample returns and risk. In this context, the aim of this study is to provide empirical evidence about the economic gains that a US investor could obtain with a dynamic strategy based on the use of time varying returns and volatility forecasts from a multivariate VAR–DCC approach for the exchange trade funds of US, UK and Japan which are the most actively traded on the New York Stock Exchange in recent years. These findings are relevant not only for academics, but also for practitioners, especially for professional portfolio managers.

1. Introduction

International portfolio diversification has been the subject of a large number of empirical studies since the 70s, when globalization and international investing started to become important (Grubel, 1968). More precisely, understanding and quantifying the co-movements between equity markets has attracted considerable attention because it determines how the diversification benefits of international investing have changed. However, recent empirical evidence on the time variation in cross-country

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correlations provides mixed results. Bekaert, Hodrick, and Zhang (2009) find an upward trend in return correlations only among the investment area of European stock markets. However, other authors such as Baele and Inghelbrecht (2009), You and Daigler (2010) and Christoffersen, Errunza, Jacobs, and Langlois (2012) observe that correlations have increased markedly in a large number of markets, although to a much larger extents in developed markets than in emerging markets. Moreover, they conclude that the benefits from international diversification have reduced over time and even more so for developed markets.

In another strand of the literature, the practical application of Markowitz's (1952) portfolio theory has numerous critics. It requires implementing the expected return and the covariance matrix of the asset under consideration in the optimization programming problem. In this sense, the traditional approach has been based on computing the sample mean and covariance matrix of asset returns up to time t and uses them as the required inputs to the optimization program. However, this model-free approach performs poorly in an out-of-sample period due to estimation error.[1]

It is commonly accepted that estimation error in the sample mean is much larger than in the sample covariance matrix (Merton, 1980). For that reason, researchers have primarily focused on improving the estimation of the covariance matrix and analyzing the economic value of volatility timing (Chan, Karceski, & Lakonishok, 1999; DeMiguel & Nogales, 2009; DeMiguel, Garlappi, Nogales, & Uppal, 2009; Fleming, Kirby, & Ostdiek, 2001; Fleming, Kirby, & Ostdiek, 2003; Ledoit & Wolf, 2003, 2004). In this sense, diverse authors have proposed various multivariate GARCH specification to model the dynamic dependence structure of multivariate time series and, more precisely, to parameterize the dynamic equation of the conditional covariance. One of the most popular multivariate specifications is the BEKK model, introduced by Baba, Engle, Kraft, and Kroner (1991). Although it has been widely used in previous years, in practice it suffers from a number of problems.[2] An alternative multivariate GARCH model that overcomes these computational issues is the Dynamic Conditional Correlation (DCC) model proposed by Engle (2002) which describes the correlation dynamics among different asset classes and markets.

This line of research has important implications for investors because it gives them the opportunity to solve the classical allocation problem with forward-looking correlation forecasts obtained from these dynamic correlation models. Some examples of these empirical applications for international investment purposes are those of Engle and Colacito (2006) and Jondeau and Rockinger (2012). However, these previous works have analyzed the implications of volatility timing on international diversification decisions but have avoided the prediction of expected returns. The reason for this choice is that there is little information content in past variables regarding future returns at short horizons. More precisely, Jondeau and Rockinger (2012) argue that for such horizons, estimation uncertainty of predictive regressions may also do more harm than good.

Nevertheless, information transmission across markets has been widely studied (In, Kim, Yoon, & Viney, 2001; Liu & Pan, 1997; Singh, Kumar, & Pandey, 2010). More precisely, these studies have focused on the short-term interdependence among stock markets employing vector autorregressive (VAR) models to capture serial dependence across markets. It allows expected returns over every market index to depend linearly on past realized returns on every market index, and therefore, it is general enough to capture any linear relation between market returns in consecutive periods, irrespective of whether its origin can be traced back to cross-covariances, autocovariances, or both.

In this context, the main contribution of this study is to reflect the economic value of employing not only time-varying volatility forecasts but also time-varying return forecasts from a multivariate model which considers the dynamic relationships in return series as well as in volatilities and correlations for international diversification purposes employing a multivariate VAR–DCC approach. Moreover, instead of using market indexes from different investment areas with the consequent non-synchronous problem, we employ exchange trade funds (ETFs) actively traded on the New York Stock Exchange (NYSE) in recent years which track the most relevant stock markets indexes of the US, UK and

[1] As documented by Hodges and Brealey (1972), Michaud (1989), Best and Grauer (1991) and Litterman (2003), among others.

[2] It is computationally arduous because it involves the estimation of a large number of parameters. Consequently, multi-step ahead forecasts require a laborious effort.