



Do oil producing countries offer international diversification benefits? Evidence from GCC countries



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ABSTRACT

This paper provides evidence of the existence of diversification benefits in international stock markets when oil producing countries are included in a global portfolio. Moreover, it examines whether recent oil shocks and financial events have significant impact on the conditional correlations and diversification benefits. Using stock returns from developed, emerging, GCC countries and a global portfolio, the empirical findings show that while developed and emerging stock markets have experienced increased correlations over relatively long periods of time, the correlation in GCC stock markets remained low and constant offering high diversification benefits. Interestingly, the paper also finds that, during 2012–2014, the rising conditional correlation levels have reversed trends in developed and emerging markets alike offering more potential for international diversification. Our results are robust to model selection, data frequency, and innovations distribution.

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1. Introduction

Over the past few decades, diminishing benefits resulting from international diversification has been an imperative topic for academic researchers and international investors (Berger et al., 2011; Arouri and Rault, 2012; Balli et al., 2013; Narayan et al., 2014; Balçılar et al., 2015).¹ This phenomenon was first observed and documented within stock markets in developed countries but quickly spread to emerging countries as well (Longin and Solnik, 1995; Lahrech and Sylwester, 2011; Christoffersen et al., 2012; and more recently Christoffersen et al., 2014).² The literature identifies many contributing factors such as financial liberalization, international trade, lower market restrictions, reduced transaction costs, and advances in communication technologies (Longin and Solnik, 1995). While the overall literature found persistently increasing correlations within developed and emerging markets, stock markets in developing economies remained somehow independent (Berger et al., 2011; Arouri and Rault, 2012; Balli et al., 2013; Narayan et al., 2014, and more recently Balçılar et al., 2015). These

findings open new potential avenues for international diversification particularly with the inclusion of developing countries in global portfolios.³

Recent studies show that fluctuations in oil prices are among the most influential determinants of stock movements (see for instance Creti et al., 2014; Filis et al., 2011; Hamilton, 2009a,b; Kilian, 2009; Kilian and Park, 2009). Usually, an increase in oil prices translates into higher costs of production, lower earnings; and thus a fall in stock prices. The effects of oil price movements, however, are not symmetric and depend on whether the stock market is in an oil-exporting or in an oil-importing country (see Guesmi and Fattoum, 2014). Moreover, the origin of the shock itself plays an important role in determining co-movements in stock markets (Filis et al., 2011; Hamilton, 2009a,b; Kilian, 2009; Kilian and Park, 2009). For instance, a reduction in oil supply by the OPEC is likely to reduce stock prices in oil-importing countries and increase stock prices in oil-exporting countries. In contrast, an increase in aggregate demand for oil during economic expansions would result in higher stock prices. Filis et al. (2011) offer a thorough discussion about the effects of oil price shocks on stock returns. It follows from their results that major events affecting the aggregate demand such as the housing market boom, the Chinese economic growth, and

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¹ See also (Christoffersen et al., 2012, 2014; King et al., 1994; Bekaert et al., 2009) among others.

² See also (Carriero et al., 2007; Baumöhl and Lyócsa, 2014; Goetzmann et al., 2005) among others.

³ Some recent empirical studies find that the inclusion of commodities in a portfolio could result in substantial diversification benefits. See (Arouri et al., 2015; Sadosky, 2012).

the latest global financial crisis may cause a significant higher correlation between stock market prices and oil prices. Moreover, important precautionary demand shocks such as the second war in Iraq and the terrorist attacks of 9/11 tend to cause higher correlations between oil and stock prices (see [Creti et al., 2014](#)).

This paper builds on the fact that oil price shocks may have asymmetric impacts on stock markets to explore successful diversification strategies through the inclusion of oil producing countries, mainly the countries of the Gulf Cooperation Council and thereafter the GCC countries, in global portfolios. Our results shed light on potential avenues to mitigate the increasing correlations among stock markets in developed and emerging countries. In this paper, we are able to dynamically quantify the diversification benefits on a daily basis and to understand the drivers and shocks that impact these benefits.

Many considerations are taken into account when constructing the global portfolio. First, the inclusion of the oil producing countries such as the GCC countries is motivated by the fact that their stock markets are affected differently by shocks in oil prices compared to the other countries in the portfolio. Second, when constructing the global portfolio, we include markets which are able to offer a reduction in risk due to their low levels of dynamic correlations. Third, we ensure some geographical diversification within the global portfolio (North America, South America, Europe, Asia and Middle East).

This paper aims to answer the following questions: (1) What is the current state of cross-country correlations among stock markets in the developed, emerging and GCC countries? (2) Do cross-country correlations among stock market returns still follow upward trends? (3) Do stock markets in oil producing countries such as the GCC markets offer diversification benefits? (4) What kind of shocks explains the reverse (breaks) in the correlation dynamics among the different indices used in this study?

Despite that stock market correlations and diversification benefits have been thoroughly examined in developed and emerging markets, fewer studies have investigated these issues in the GCC countries. As discussed above, oil producing countries and their stock markets have distinct characteristics and represent potential avenues to extend the previous literature. [Aroui and Rault \(2012\)](#), for instance, conclude that the GCC markets offer diversification benefits as they have the potential to yield different stock returns. The authors further conclude that international diversification benefits can be achieved by including assets from both net oil-importing (developed countries) and net oil-exporting countries (such as the GCC countries). While the macroeconomic indicators of the GCC countries depend heavily on international oil prices making their stock markets vulnerable to international shocks, these countries remain partially segmented from the rest of the world due to several restrictions on foreign ownership. The literature typically suggests that the restrictions on foreign ownership appear to outweigh the susceptibility of the GCC markets to international shocks. That is, the GCC markets are segmented from the international markets and thus offer diversification benefits. For instance, [Berger et al. \(2011\)](#) examine the structural changes and time variations in the integration of Bahrain, Kuwait, Oman, Qatar, United Arab Emirates, and Saudi Arabia. The authors show that, in contrast to developed and emerging markets, the GCC markets have low integration with the world markets and offer no indication of increasing integration through time thereby offering significant diversification benefits. [Balli et al. \(2013\)](#) study eight sector-based indices from the GCC countries for the period 2005–2012 using GARCH and time-varying spillover models and find that the GCC markets are driven by their own volatilities rather than the local or global shocks. [Balci et al. \(2015\)](#) analyze nine GCC sector-based indices in Bahrain, Kuwait, Oman, Qatar, United Arab Emirates, and Saudi Arabia taking into account the regime specific and time-varying nature of returns for the period 2006–2013. Two dynamic factor models and regime switching spillover models employed by the authors show that the GCC markets display segmentation from global markets during

periods of high volatility and thus offer substantial diversification benefits.

In this paper, we estimate four different specifications of the multivariate GARCH models namely Diagonal BEKK–GARCH model of [Engle and Kroner \(1995\)](#), the DCC–GARCH model of [Engle \(2002\)](#), the DECO–GARCH model of [Engle and Kelly \(2012\)](#), and finally the ADCC–GARCH model of [Cappiello et al. \(2006\)](#) to explore the dynamic behavior of the correlations as well as the potential benefits from diversification in international stock markets. Our choice is mainly driven by the flexibility and parsimony of these models as they yield time-varying correlations for every pairwise of countries.⁴ These conditional correlations represent the main ingredient in determining and quantifying the conditional diversification benefits. Estimating each pairwise correlation separately is crucial when one aims at studying the individual impact of the inclusion of each country to a portfolio containing the US index as a base. We believe that the DCC–GARCH of [Engle \(2002\)](#) is simple, flexible, parsimonious, and more importantly appropriate for our research question. We also include its asymmetric version (ADCC–GARCH) which allows for asymmetries in the conditional correlation dynamics. While it is well accepted that stocks and indices show asymmetries in the variance dynamics,⁵ it would be interesting to investigate the presence of asymmetric responses to negative returns in the conditional correlations using the ADCC–GARCH. As a robustness exercise, we estimate the dynamic equicorrelation (DECO–DECO) model of [Engle and Kelly \(2012\)](#). This model does not yield the cross-section of pairwise correlations at each time step, yet it remains parsimonious, easy to estimate, and suitable when the number of countries in the portfolio is large. It is worth noticing that this model remains a good benchmark when the researcher is not interested in the individual contribution of each pairwise of countries to the portfolio risk reduction as it sums all these correlations leading to an average (“equi”) effect. We also contrast our results with those of the diagonal BEKK–GARCH model of [Engle and Kroner \(1995\)](#). The relatively low number of dependent variables in our analysis allows for an efficient estimation of the diagonal BEKK parameters. For further robustness, we conduct all estimations using the Gaussian and Student-t error innovations. We also test whether the results are robust when the data frequency is modified from daily to weekly.

This paper is different from previous studies in many aspects. First, it reveals important new patterns on cross-country correlations of stock market returns. To the best of our knowledge these trends have not been documented in previous literature. Second, it uses a novel measure of international diversification benefits proposed by [Christoffersen et al. \(2014\)](#) to quantify the diversification potential patterns. Third, using four multivariate GARCH models (the diagonal BEKK–GARCH, the DCC–GARCH, the DECO–GARCH and the ADCC–GARCH) this study allows capturing the contribution of each country to the benefits resulting from diversification at each point of time. Ultimately, this allows investors and fund managers rebalancing their portfolios dynamically according to the marginal contribution of each market. Fourth, it dates the breaks in the conditional correlations and diversification benefits dynamics and shows that changes in trends are usually associated with major events such as the Russian crisis in 1998, the 2001 bursting of dot-com bubble, the 2008 global financial turmoil (the subprime crisis), the bailout of Greece default in 2012, and the recent 2014 crude oil price fluctuations, among many others.

The paper also conveys several new findings. First, some potential diversification benefits are still present, largely unexploited, may gain momentum again, and might be cyclical. This result brings new insights to several studies which find supportive evidence that diversification benefits have diminished recently (see [Christoffersen et al., 2014](#)). Interestingly, we find that the rising levels of conditional correlations

⁴ Except for the DECO–GARCH model.

⁵ See for example ([Kroner and Ng, 1998](#)).

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