



Assessing the impacts of oil price fluctuations on stock returns in emerging markets

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ABSTRACT

This paper investigates the effects of oil price shocks on stock market returns in emerging countries. It differs from previous works in three main aspects: *i*) we distinguish three groups of countries, the largest net-oil importing countries, the moderately oil-dependent countries, and the largest net-oil exporting countries; *ii*) The potential influence of bullish and bearish market conditions on the causal relationship between oil and stock returns is controlled for in our analysis; *iii*) The empirical investigation is based on an analysis of long-term correlation and a conditional multifactor pricing model. Using data from twenty-five emerging countries, our results suggest that oil price risk is significantly priced in emerging markets, and that the oil impact is asymmetric with respect to market phases.

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1. Introduction

Oil price movements are always closely watched by policymakers and investor community as oil is considered as an important driver of the economic and industrial activity. Since there is now evidence to show that oil prices negatively affect economic growth through a number of channels such as rising production cost, inflation, and investor confidence (e.g., Hamilton, 2003; Kilian, 2008; Lardic and Mignon, 2008), one would expect some degree of interdependence between oil prices and stock market performance (Huang et al., 1996). Further, for portfolio managers and in particular global investors seeking for international diversification benefits by adding assets of emerging markets into their portfolios, new insights about the impact of oil on the equity's risk-return profile in these markets are of paramount importance as they can properly manage the risk inherent to their portfolios.

Analyzing the effects of oil price volatility on the behavior of emerging stock markets is a main research question given that most of emerging economies have expanding energy demand to build their infrastructure and to insure their rapid economic growth. Several indications may approve this argument. First, in contrast to previous crisis periods, economic growth in emerging countries outperformed growth in developed economies during the recent international

financial crisis, sparked off by the U.S. subprime crisis. With reference to official statistics by the International Monetary Fund, the GDP of developed countries in 2009 declined –3.6% on average, while the GDP in emerging countries grew by 1.7%. In addition, some further forecasts indicate that emerging economies will account for about 50% of the global GDP by 2050 and be a predominant driving force for the world economic growth (Cheng et al., 2007). It should be stressed that over the period 1990–2005 China and India exhibited a higher rate of growth than the major OECD countries. These two countries grew at average annual rates of 7.7% and 7.2% respectively, while OECD economies only reached an average annual rate of 2.5% during the same period. Along with this rapid economic growth within the emerging universe and especially in India, China, Brazil and Russia (BRIC), global demand for oil grew annually by an average of 1,153 million barrels per day over the period 2001–2010.¹

In this paper, we attempt to examine the extent to which emerging market returns are associated with oil price fluctuations. As discussed above, the fast economic growth of emerging economies over the recent decades suggests that they consume an important quantity of energy and may thus be heavily dependent oil production and supply. Unfavorable changes in oil prices would reduce their economic performance, leading to lower their diversification benefits because of less cash-flow generated by firms' activities. On the other hand, the heterogeneity of emerging markets in terms of economic structure, economic and market development levels as well as

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¹ See BP Statistical Review (2012).

international market integration could result in country-specific behavior in response to oil shocks.

Many studies of the energy finance literature have recently investigated the relationship between oil price movements and stock markets around the world. The study of Jones and Kaul (1996) reveals that stock market returns in the US, the UK, Canada and Japan respond negatively to the changes in oil prices. This result is however not confirmed by Huang et al. (1996) who are unable to establish a significant link between oil futures returns and stock returns at the aggregate level using the US data. By contrast, in a more recent study, Sadorsky (1999) investigates the impact of oil price shocks on a set of several economic variables including real aggregate stock returns in the US, represented by the difference between the continuously compounded returns on the S&P 500 index and inflation rate. The author shows that changes in oil prices and oil price volatility have significant negative impact on stock returns. Further, the oil impact on stock returns was found to be more important than do T-bill interest rate after 1986. The empirical findings of subsequent studies focusing on developed countries are globally consistent with those of Sadorsky (1999).² For example, Park and Ratti (2008) examine the oil-stock market relationship for the US and 13 European countries over the period 1986–2005 and document that oil prices significantly affect real stock returns contemporaneously and/or within the following month. There is, in addition, some evidence that stock markets in oil-importing countries are more affected by oil price movements than those in oil-exporting countries. Jawadi et al. (2010) employ a nonlinear adjustment framework to investigate the relationship between stock and energy markets and provide some evidence of regime-switching behavior for stock-oil price deviations as well as a nonlinear mean-reverting adjustment mechanism in the joint dynamics of oil and stock prices.

Some papers have addressed the issue of oil price shocks and stock markets in developing countries, but inconsistent with prior research on developed countries they do not always find evidence of significant oil price impact on stock market returns. Choi and Hammoudeh (2006) examine the long-run interaction between five stock markets of the Gulf Cooperation Council (GCC) and three global factors including oil spot price index, and report that oil prices changes have no direct effects on any GCC markets. Meanwhile, oil prices are found to affect stock returns in the GCC markets in a nonlinear manner according to Maghyreh and Al-Kandari (2007). Using data from 21 emerging markets, Basher and Sadorsky (2006) find strong evidence that oil price risk is relevant for explaining variations in stock returns based on both unconditional and conditional analysis, but the impact direction depends on the frequency of data used (daily, weekly and monthly). There is also evidence to support nonlinear relationship between oil risk and stock returns. These results are however not corroborated by Maghyreh (2004) and Cong et al. (2008) who do not find any significant impact of oil prices on stock returns of 22 emerging markets and China respectively. To a lesser extent, Nandha and Hammoudeh (2007) conclude that of the 15 countries in the Asia-Pacific region only stock markets in the Philippines and South Korea are sensitive to oil price changes in the short run. Possible explanations for this divergence of empirical results may include the differences across studied countries in terms of levels of energy-consumption efficiency as well as of economic and market development. It should be noted that at the empirical level, econometric methods such as vector autoregressive (VAR) models, error-correction models (ECM), cointegration, Markov switching regime models as well as univariate and multivariate GARCH-type models are often employed to shed light on the interactive linkages between oil and stock markets.

In this study we also examine the impact of oil price volatility on emerging market returns using a long-term correlation analysis and a conditional international multifactor pricing model in the spirit of Basher and Sadorsky (2006).³ To the best of our knowledge, this is the first study that performs long-term correlation between oil and stock returns conditionally on the findings of asset pricing models. The combination of these approaches permits to test whether oil shock represents a risk factor of emerging stock market returns, with respect to the nature of their long-term comovement.

Our results, drawn from a sample of 25 emerging markets, show a significant and positive relationship between oil-related beta and stock returns in moderately oil-dependent countries during bullish markets, and a negative relationship during bearish markets for the largest net oil-exporting countries. The largest net oil-importing countries are however insensitive to oil's beta whatever the market phases. Moreover, when rolling-correlation method is estimated and analyzed with respect to conditional oil-related betas, we find that emerging countries are particularly affected by oil price increases. Accordingly, oil price is likely to be a systematic risk factor for the pricing of emerging market assets, which is consistent with the results of Mohanty et al. (2010) that oil price exposure of some oil and gas listed firms in Central Eastern European (CEE) countries changes through time. Note however that our findings are sensitive to the models and sample periods being used.

The remainder of the paper is organized as follows. Section 2 presents the data and empirical modeling strategy. Section 3 discusses the results obtained from our analysis. Section 4 concludes the paper and provides some practical implications of the results.

2. Data

Our sample covers 25 emerging market countries including Egypt, Morocco, South Africa, China, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Taiwan, Thailand, Jordan, Turkey, Czech Republic, Hungary, Poland, Russia, Argentina, Brazil, Colombia, Chile, Mexico, Peru, and Venezuela. The data consist of daily closing index prices on individual emerging markets and World stock market, collected from MSCI Barra database (Morgan Stanley Capital International). The 10-year study period runs from September 29, 1997 to November 2, 2007 for a total of 2,512 daily observations. The period 2008–2010 is intentionally excluded from our analysis in order to avoid serious distortions in the oil-stock market links, potentially caused by the global financial crisis. Compared to Basher and Sadorsky (2006), we have a shorter, but a more recent dataset that allows us to consider countries such as China, Russia, Hungary and Czech Republic. This is important because economic growth and market development of these countries seem to have a high degree of dependence on oil and refined products. All data are expressed in U.S. dollars in order to consistently gauge their homogeneous features and to avoid the impact of currency risks on empirical results.

As for oil data, we employ daily closing prices of West Texas Intermediate (WTI) crude oil futures contract, available from the U.S. Energy Information Administration (EIA), and compute oil returns using the log difference of oil prices. Note that this contract is provided by

² Examples include Ciner (2001) for the US stock markets, Papapetrou (2001) for the Greek stock market, and El-Sharif et al. (2005) for the UK evidence, Aloui and Jammazi (2009), and Jammazi and Aloui (2010) for G7 countries.

³ Our analysis focuses on aggregate market level, and thus does not cover the impact of oil prices on sectorial stock returns and companies' returns as well. The interested readers can, however, refer to, among others, Henriques and Sadorsky (2008), Nandha and Faff (2008), Aroui and Nguyen (2010), Ramos and Veiga (2011), and Lee et al. (2012) for a detailed discussion of these topics. For example, the findings of Aroui and Nguyen (2010) suggest that the reactions of stock returns to oil price changes differ greatly depending on the activity sector, and that introducing oil asset into a diversified portfolio of stocks allows to significantly improve its risk-return characteristics. Using four-variable VAR model to analyze the empirical linkages among energy stock prices, technological stock prices, oil prices and interest rates, Henriques and Sadorsky (2008) show that oil prices Granger cause stock prices of alternative energy companies.

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