



Oil price shocks and stock market activities: Evidence from oil-importing and oil-exporting countries



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ABSTRACT

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While the relationship between oil prices and stock markets is of great interest to economists, previous studies do not differentiate oil-exporting countries from oil-importing countries when they investigate the effects of oil price shocks on stock market returns. In this paper, we address this limitation using a structural VAR analysis. Our main findings can be summarized as follows: First, the magnitude, duration, and even direction of response by stock market in a country to oil price shocks highly depend on whether the country is a net importer or exporter in the world oil market, and whether changes in oil price are driven by supply or aggregate demand. Second, the relative contribution of each type of oil price shocks depends on the level of importance of oil to national economy, as well as the net position in oil market and the driving forces of oil price changes. Third, the effects of aggregate demand uncertainty on stock markets in oil-exporting countries are much stronger and more persistent than in oil-importing countries. Finally, positive aggregate and precautionary demand shocks are shown to result in a higher degree of co-movement among the stock markets in oil-exporting countries, but not among those in oil-importing countries. *Journal of Comparative Economics* **41** (4) (2013) 1220–1239. Antai College of Economics & Management, Shanghai Jiao Tong University, Fahuazhen Road 535, Shanghai, PR China; School of Banking and Finance, University of New South Wales, Sydney 2052, Australia.

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1. Introduction

Given the essential role of crude oil in the world economy, the impact of crude oil price shocks on economy has been a matter of great concern to economists since the seminal work of Hamilton (1983) (see, e.g., Barsky and Kilian, 2004; Hamilton, 1996, 2003; Hooker, 1996; Kilian, 2008, 2009; Kilian and Park, 2009). Nevertheless, most studies in the literature have paid attention to the economy of the US, the largest oil importer, rather than those of oil-exporting countries. A possible concern is that the impact of oil price shocks on the national economies of oil-exporting countries can be different from those of oil-importing countries. For example, while the linkage between oil price and macroeconomic activities has been always reported as negative,¹ increases in oil prices may induce positive effects on the national economies of oil-exporting countries.

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¹ See Bjørnland (2009) for a general literature review.

Although higher oil prices may induce increases in industry costs and inflation rates, as well as a reduction of expenditure on non-oil goods (e.g., Barsky and Kilian, 2004) in oil-importing countries, they may generate more income for oil-exporting countries due to the low price elasticity of crude oil demand (e.g., Bjørnland, 2009; Jung and Park, 2011). Given this heterogeneity, the response of stock market returns to oil price shocks in oil-exporting countries can be determined by the relative significance of positive and negative impacts on these countries.

In this paper, we focus on the effects of oil price shocks on stock markets in both oil-importing and oil-exporting countries. Our main findings indicate that the response of stock market returns to oil price shocks in a country greatly depend on the country's net position in crude oil market and on the driving forces of oil price shocks. In addition, the total contribution of oil price shocks to variations of stock market returns in a country is shown to depend on the relative importance of oil to its national economy.

There is a vast body of studies which contribute to the analysis of relationship between changes in oil prices and stock market returns. Most studies focus on the stock markets in oil-importing countries, especially the US market. There is a consensus among these studies about the existence of negative relationship between oil prices and stock market activities (e.g., Basher et al., 2012; Chen, 2010; Elder and Serletis, 2010; Jones and Kaul, 1996; Kilian and Park, 2009; Masih et al., 2011; Sadorsky, 1999; Wei, 2003), although a few studies show that the impact of oil price changes on stock markets is not always as significant as one generally believes (e.g., Huang et al., 1996; Apergis and Miller, 2009; Miller and Ratti, 2009).

On the other hand, investigation of the relationship between oil prices and stock markets in oil-exporting countries can be found in few studies. Bjørnland (2009) shows that a 10% increase in oil price can result in an approximately two point 5% increase in stock prices in Norway, an oil-exporting country. Park and Ratti (2008) also find that increases in oil prices have positive effects on the Norwegian stock market, in contrast to those in oil-importing countries on which increases in oil prices have negative effects. More recently, Jung and Park (2011) compare the significance of response to oil supply and demand shocks by stock markets in an oil-exporting country (Norway) and an oil-importing country (Korea). Their findings show that the response of stock market returns to oil price shocks in these two countries differ greatly to each other. Overall, the results in these three studies indicate that the impacts of oil price shocks on stock markets in oil-exporting and oil-importing countries are heterogeneous to each other. One limitation of the above-mentioned studies is that they focus only on a single oil-exporting country (Norway) or on developed countries. Some countries produce and export more crude oil than Norway (e.g., Saudi Arabia and Russia), and several emerging economies such as China and India may be more responsible for the oil price increases in recent years (e.g., Hamilton, 2009; Kilian, 2009). Thus, it is of great importance to investigate the impacts of oil price shocks on stock markets in other oil-exporting economies and in developing oil-importing economies. The relative importance of oil to different economies is heterogeneous. A question motivated from the existing studies is whether the differences of the impacts on stock markets are widely existed between oil-exporting economies and oil-importing economies.

In this paper, we will answer this question from several perspectives. First, we examine whether the relationship between oil price shocks and stock market returns is nonlinear. We employ two types of nonlinearity tests and find that there is no significant nonlinear relationship between changes in oil price and stock market returns for most countries in our sample. This finding ensures that the use of a linear VAR specification is reasonable in this study.

Second, using the structural VAR model specification proposed by Kilian and Park (2009), we decompose oil price shocks into oil supply shocks, aggregate demand shocks, and other oil-specific shocks, and then investigate their impacts on stock market returns in nine oil-importing countries and seven oil-exporting countries. Based on the impulse response analysis, we compare the direction, magnitude, timing, duration of response from stock market returns to oil price shocks. Our findings indicate that the response of stock market returns to oil price shocks in a country depends on the net position of the country in global oil market and the driving forces of oil price shocks. Specifically, the impact of oil supply shocks on stock markets in oil-exporting countries is insignificant, while the impact in some of oil-importing countries is significantly positive but short-lived. The response of stock markets in most countries to aggregate demand shocks is significantly positive. Moreover, the response of stock markets in oil-exporting countries is more persistent and stronger than in oil-importing countries. In addition, oil price increases driven by precautionary demand shocks significantly stimulate stock market returns in some oil-exporting countries, while they insignificantly depress stock market returns in oil-importing countries.

Third, using the method of forecasting variance decomposition, we compare the contributions of oil price shocks to stock return variations in different countries. We find that the explanatory power of oil price shocks for stock return variation in a country again depends on the net position in oil market and the driving forces of shocks. Overall, the contributions of oil price shocks to both short-term and long-term stock return variations are larger in oil-exporting countries than in oil-importing countries. A possible explanation is that crude oil is of greater importance for oil-exporting economies than for oil-importing economies. Differences between the contributions of oil price shocks to stock return variations in oil-exporting countries and those in oil-importing countries can also be partly explained by differences in the level of importance of crude oil for each country.

Fourth, we investigate the effects of oil price uncertainty on stock market returns. Although there are a number of studies on the relationship between oil price and stock market returns, much fewer studies examine the impact of oil price uncertainty on stock markets (see, e.g., Park and Ratti, 2008; Elder and Serletis, 2010; Masih et al., 2011). Moreover, a common limitation of previous studies on this issue is that they only focus on oil-importing economies and do not differentiate the effects of supply uncertainty and aggregate demand uncertainty. In this paper, we use the structural VAR framework to address this limitation. Our results imply that the effects of oil price uncertainty differ depending on a country's net

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