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Dynamic relationship of oil price shocks and country risks

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ABSTRACT

This study investigates the dynamic relationship between oil price shocks and country risks using a Structural VAR framework for a sample of both net oil-exporting and net oil-importing countries over the period January 1994–December 2014. The results reveal that country risk is significantly affected by oil price shocks, but the impacts are different. Unanticipated positive oil price shocks trigger a reduction (addition) in country risk for net oil-exporting country (net oil-importing countries). As to the responses of oil prices to country risk shock, evidence show that country risk shocks have a delayed significantly positive impacts on oil price for oil-exporting country. With respect to the effects of subcomponents of country risk, we find evidence that economic and political risk have a significant impact on supply-side shocks in net oil-exporting countries like Canada, while economic and political risk have a significant effect on supply-side shocks and oil specific demand shocks in net oil-importing countries like the US. These results are particularly important to policy makers and government.

1. Introduction

It is widely recognized that many economic activities treat crude oil as the most important required input in the productive process. The crude oil price shocks have been noticeable over the past few decade due to its impressive impact on real economy, that is economic growth, firms' future plans, household expenditures, and so on (Narayan et al., 2014). A considerable amount of literature has been devoted to understanding the relationship between oil-price shocks and the aggregate economic performance of various nations ever since the pioneering work of Hamilton (1983). Movements in crude oil prices have been largely considered as a main source of business cycles and are strongly correlated with macroeconomic performance through the supply-side and demand-side channels. These mechanisms have been widely discussed and even become one of the key topics in the currently existing literature.

Literature has identified the impact of oil price shock on the macroeconomic aggregates such as economic output, investment, stock return, inflation rate, interest rate, exchange rate, as well as financial and monetary policy (e.g. Narayan et al., 2008; Tang et al., 2010; Filis et al., 2011; Lee and Zeng, 2011; Narayan and Sharma, 2011; Filis and Chatziantoniou, 2014; Narayan and Gupta, 2015; Basher et al., 2016; Zhao et al., 2016). Compared with conventional wisdom, the recent experience highlights the importance of deepening our understanding of the spillover effects between oil price (or their shocks) and external environmental factors such as economic policy uncertainty (e.g. Kang and Ratti, 2013; Antonakakis et al., 2014). This line of research postulates that oil price shock not only largely affect economic activity, but also lead an increased economic policy uncertainty. Given the importance of oil price shocks for the economic and financial activity, an interesting question immediately arises as to the issue of the appropriate response by policy makers.

Although the connections between oil price shocks and macroeconomic aggregates as well as uncertainties have been extensively analyzed in empirical literature, an important external factor, like country risk, has not yet received attention. The awareness has grown that a detailed knowledge of the role of country risk on economic activity is required to better understand. Much attention has been paid to the relationship between country risks and economic activities (Lee et al., 2013; Sari et al., 2013; Law et al., 2014; Bahadir and Valev, 2015; Brückner and Gradstein, 2015; Liu et al., 2016). Even though there have been few studies addressing the relationship between oil price and political risk, the nature of country risk is rather divergent and thus, it may not be reflected in one single dimension. Unlike the existing studies, this paper takes a fresh look at the dynamic relationship between oil price shocks and country risks. We therefore hypothesize that oil price shocks and country risk are interrelated and influence real economy.

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Thus, the purpose of this paper is to provide new insights of how country's risk responses to oil price shock in our interest and understanding, especially different dimensions of country risk appear to be influential in relation to the oil prices. To this end, we utilize the International Country Risk Guide (hereafter the ICRG) data and a Structural VAR (SVAR) framework to assess the effects of oil price shocks on country risk. The traditional VAR framework usually relies on partial identification indicating a causal ordering, but lacks to provide information of other than oil price shocks. The SVAR approach is considered superior as it explicitly provides an economic rationale behind the restrictions to identify contemporaneous relationships between variables (Loría et al., 2010; Chen et al., 2016). Thus, the SVAR model is used to quantitatively investigate the dynamic effects of oil price shocks and country risk.

The contributions of this paper are five-fold. First, we investigate the dynamic relationship between oil price shocks and country risks, which is not explored in prior studies. Our findings complement the existing research on the effect of shocks from oil prices and shed light on the influence of country risk on oil price shock. Second, to generate more informative disclosures, we distinguish three types of oil price shocks from virtue of their origin (i.e. supply-side shocks, aggregate demand shocks and oil specific demand shocks). Third, to take advantage of SVAR methodology, the impulse responses and variance decomposition enable us to explore how the complex interactions across variables have evolved each other from time to time. Fourth, since the energy policies in oil importing and oil exporting countries are different in relation to the nature of macroeconomic fluctuations, the sample countries under investigation are examined whether the aforementioned relationship is different for oil-importing and oil-exporting countries. Fifth, the multidimensional risk measures could provide a more comprehensive evaluation than the single indicator of external environmental factors. We broaden the scope of analysis by investigating the subcomponents of country risk, i.e., economic risk, financial risk, and political risk, individually to gain more interesting insight into the different relative impacts of country risk.

The rest of the paper is organized as follows. Section 2 briefly reviews the relevant literature concerning the effect of oil price shocks. Section 3 discusses the econometric methods. Section 4 introduces the data source and variable definitions. Section 5 discusses the empirical results. Finally, Section 6 reviews our conclusions and implications, while also outlining some of the implications based on the empirical findings from this extensive research.

2. Literature review

Ever since the ground-breaking work of Hamilton (1983), who concludes that unexpected oil price increases is responsible for almost all of the recessions in the post-World War II United States. The adverse impact of such oil price shocks on real economy has been extensively discussed in theoretical and empirical literature due to its relevance to an economic system (Hamilton, 1996; Brown and Yücel, 2002; Cunado and Perez de Gracia, 2003). An increase in oil price would push the production costs up, leading to higher inflation and lower production and expected earnings (Tang et al., 2010; Montoro, 2012; Natal, 2012; Jones et al., 2004). However, different economic circumstances may cushion or strengthen the effects of oil price shocks (Bernanke, 2004). There has generated a significant divergence by means of its effect of different sources of the oil price on aggregate macro-economic fluctuations.

While the aforementioned studies are important to our understanding the issue of oil price shocks on real economy, there is a growing awareness on the connection between oil price shocks and economic policy issues. Using the economic policy uncertainty index as a risk proxy, Kang and Ratti (2013) examine how U.S. economic policy uncertainty reacts to structural shocks to global oil production, global real aggregate demand and oil-market specific demand. They find that positive shocks to aggregate demand exert a significant negative effect on policy uncertainty, whereas shocks to oil specific demand have the opposite effect. However, the supply-side shocks do not find a significantly effect on economic policy uncertainty. Following this vein, Antonakakis et al. (2014) examines the dynamic relationship between changes in oil prices and the economic policy uncertainty for a sample of both net oil-exporting and net oil-importing countries. They distinguish between three types of oil price shocks from virtue of their origin. The results reveal that economic policy uncertainty (oil price shocks) exhibits a negative response to aggregate demand oil price shocks (economic policy uncertainty shocks).

Although the literature in public debate on this topic generally have a clear opinion on the relationships, empirical evidence is considerably varied and, on occasions, contradictory. Moreover, with a particular emphasis on the impact of the country risk on oil price shock, country risk is generally considered only for political dimensions, such as economic policy uncertainty or political risk. To the best of our knowledge, only one study (Chen et al., 2016) has examined the relationship between political risk and oil price shock. However, country risk is multidimensional and is more than a single political risk; it also has wider financial and economic ramifications. Knowledge is limited as to whether all types of country risk have similar impacts on oil price shock. This prompts the main motivation for our study, aiming at a rigorous analysis of the differential impact across different dimensions of country risk by handling the dynamic interactions between the endogenous variables within the SVAR framework.

In order to gain a better insight into the interrelationships between oil price shocks and country risks, it is necessary to understand how country's risk is associated with the oil price shocks. Most of the theoretical and empirical studies have acknowledged that oil price shock is often considered an important determinant of macroeconomic and policy uncertainties (Liu et al., 2016; Li et al., 2016). Changes in oil price caused by supply-side and demand-side shock can trigger fluctuations of economic activities and even incur risk. Antonakakis et al. (2014) postulate that the negative effects of oil prices on economic activity may put additional pressure on policy choice, leading economic policy uncertainty increased. From an international perspective, these macroeconomic and policy uncertainties, such as production, inflation, stock return, money supply and government expenditure, are the major manifestation of country risk (Bouchet et al., 2003; Liu et al., 2016). The adverse effects of oil price shocks on aggregate macro-economic fluctuations may ultimately lead to an increased country risk. Following these argument, our first hypothesis is:

Hypothesis 1. An unanticipated oil price shock has significant effects on countries risks.

In addition, some political risk events especially those occurred in OPEC countries, also trigger the sharp fluctuations of oil prices (Hamilton, 2009a; Wu and Zhang, 2014; Zhao et al., 2016). As Zhao et al. (2016) indicates, political risks are always expected to reduce the capacity of oil-exporting countries and reduce the availability of oil-importing countries. From the supply-side perspective, for example, it is recognized that the Iran–Iraq War, Persian Gulf War, Asian economic crisis, and 9-11 terrorist attacks all have significant effects on the global oil supply (Chen et al., 2016). From the demand-side perspective, environmental risks have a direct effect on firms' investment and production decisions, which further impact demand for oil and thus its price. Based on the exposition above, we construct second hypotheses to be tested as follows:

Hypothesis 2. The changes of countries risk have significant effects on oil price shock.

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