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Oil and stock returns: Evidence from European industrial sector indices in a time-varying environment



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ABSTRACT

The time-varying correlation between oil prices returns and European industrial sector indices returns, considering the origin of the oil price shock, is investigated. A time-varying multivariate heteroskedastic framework is employed to test the above hypothesis based on data from 10 European sectors. The contemporaneous correlations suggest that the relationship between sector indices and oil prices change over time and they are industry specific. In addition, the supply-side oil price shocks result in low to moderate positive correlation levels, the precautionary demand oil price shocks lead to almost zero correlation levels, whereas the aggregate demand oil price shocks generate significant changes in the correlation levels (either positive or negative). Both the origin of the oil price shock and the type of industry are important determinants of the correlation level between industrial sectors' returns and oil prices. Prominent among the results is the fact that during the financial crisis of 2008 some sectors were providing diversification opportunities to investors dealing with the crude oil market.

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1. Introduction

A wealth of literature has investigated the relationship between oil price returns and economic activity since the seminal paper published by Hamilton (1983).¹ A recent detailed theoretical description of this relationship is given by Iwayemi and Fowowe (2011). Nevertheless, the literature of the relationship between oil prices and stock market developments is still growing.² Even more, the findings on the relationship between oil prices and industrial sector indices are scarce. According to Arouri et al. (2012, p. 2) “the use of equity sector indices is, in our opinions, advantageous because market aggregation may mask the characteristics of various sectors”. Adding to this growing literature, the aim of this study is to examine the effects of the oil price returns on industrial sector indices in Europe, in a time-varying framework. The recent evidence show that the relationship between oil price returns and aggregate stock market returns is indeed time-varying (Sadorsky, 2012; Chang et al., 2013; Filis et al., 2011; Bharn and Nikolovann, 2010; Choi and Hammoudeh, 2010; Aloui and Jammazi, 2009). Nevertheless, the focus of this paper is on the industrial sector indices rather than aggregate stock market returns, which was the focus of all aforementioned studies. In addition, it is also evident by the same studies that the unconditional correlations cannot capture the dynamics of the said relationship.

The vast majority of the literature has focused on the effects of oil price changes on stock market returns. The current evidence suggests that oil price changes are associated with fluctuations in stock prices, although the results are mixed. Part of past studies maintains that there is an adverse and asymmetric impact of oil price shocks on the financial markets (see, inter alia, Filis, 2010; Chen, 2009; Miller and Ratti, 2009; Park and Ratti, 2008; Driesprong et al., 2008; Gjerde and Sættem, 1999; Jones and Kaul, 1996). Nonetheless, the effects of oil shocks on stock markets for a specific country can be positive or negative depending on whether the country is a net producer or net consumer of oil resources, see Mohanty et al. (2011). Thus, the negative relationship which was established in the previous studies does not hold for stock markets operating in oil-exporting countries, but rather a positive relationship exists, as shown by Arouri and Rault (2012) and Bjornland (2009), among others.

There are authors, though, who voice the opinion that there is not any relationship between oil price shocks and stock market returns (Jammazi and Aloui, 2010; Cong et al., 2008; Huang et al., 1996). An extensive recent review on the literature in this research topic can be found in Filis et al. (2011).

Furthermore, Hamilton (2009a,b), Kilian (2008b) and Kilian and Park (2009), opine that different shocks in the crude oil market have different effects on the stock market, thus the origin of the oil price shocks should be considered. According to Hamilton (2009a,b) there are demand driven, as well as supply driven oil price shocks. Kilian (2009) disentangles demand-side oil price shocks, into aggregate demand oil price shock and precautionary demand oil price shocks (or oil specific demand shocks) and he argues that “the response of aggregate stock returns may differ greatly depending on the cause of the oil price shock” (p.1268). For example, according to Kilian and Park (2009) the supply-side oil price shocks and the oil specific demand shocks trigger a negative response from the stock markets, whereas the reverse is true for the aggregate demand oil price shocks. In the same line of reasoning, Lippi and Nobili (2009) show that supply-side oil price shocks exercise a negative effect in the economy, whereas a positive effect is observed from demand-side oil price shocks. Other authors who have considered the origin of the oil price shocks in their studies include Kilian and Lewis (2011), Filis et al. (2011), Apergis

¹ There are two views on the role of oil prices to the economy: (1) the microeconomic view (e.g. effects of oil prices on pricing and production), and (2) the macroeconomic view (impact of oil prices on aggregate demand through, for example, inflation – monetary policy responses), see Segal (2011). Some important studies on the relationship between oil price shocks and economic activity include Baumeister and Peersman (2012), Blanchard and Galí (2007), Hamilton (2008), Hamilton and Herrera (2004), Barsky and Kilian (2004), Brown and Yücel (2002) and Bernanke et al. (1997). Recent studies include Rahman and Serletis (2010), Tang et al. (2010), Jbir and Zouari-Ghorbel (2009) and Jones et al. (2004).

² See, Park and Ratti (2008), Henriques and Sadorsky (2008), Basher and Sadorsky (2006), Huang et al. (2005), Hammoudeh and Huimin (2005), Hammoudeh et al. (2004), Hammoudeh and Aleisa (2004), Sadorsky (2001), Papapetrou (2001), Faff and Brailsford (1999), Huang et al. (1996), Jones and Kaul (1996), Kaneko and Lee (1995), Ferson and Harvey (1994, 1995), Sadorsky (1999), among others.

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