



Do OPEC announcements influence oil prices?



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HIGHLIGHTS

- The impact of OPEC's production decisions on both BRENT and WTI is examined.
- We adopt the event study methodology.
- An EGARCH model is used to capture some features characterizing oil prices volatility.
- OPEC decisions effect changes over time and depends on production decisions and oil prices.
- OPEC is less influential when prices are high and unconventional resources are viable.

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ABSTRACT

This paper investigates the effect of OPEC production decisions (increase, cut, maintain) on both WTI and Brent crude oil prices between Q1 1991 and Q1 2015 by employing the event study methodology and by using two indices as benchmarks (BCI and S&P GSCI). We employ an EGARCH model to take into account the high volatility of oil prices and some stylized facts characterizing this volatility. We find that the impact of OPEC's announcements on oil prices (i) evolves over time and among decisions, (ii) is more significant for production cut and maintain, (iii) is different for WTI and Brent prices, and (iv) is sensitive to the benchmark index. Moreover, OPEC's decisions depend on the exploration and extraction cost of more expensive/unconventional oil resources.

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1. Introduction

The 1973 oil crisis and the major economic and geopolitical events (see, for instance, [Salameh \(2014\)](#)) since then shed light on the economic vital importance (see [Bollino \(2007\)](#)) of oil prices and their high level of volatility, as well as the role played by the Organization of Petroleum Exporting Countries (OPEC) in oil markets. Indeed, its members produce 40% of the world's crude oil and their exports represent about 60% of the traded oil internationally (see [Matsumoto et al. \(2012\)](#)). The impact of OPEC

decisions about the production level (increase, cut or maintain) on oil prices is a controversial issue among policy makers, regulators, and academics in particular. For some, this impact is weak or has been declining over time, especially lately as more and more non-OPEC producing countries increase their market share. For others, the impact is strong as prices deviate from their competitive level when members modify their oil production. Finally, there are some who support the viewpoint that OPEC's impact changes over time as a result of prevailing market conditions.

The role of OPEC may also be scrutinized through the lens of the recent evolution of oil prices and the exploration of new oil resources. Indeed, we have seen oil prices not only breaking the \$40 bbl long-run level but staying for a long time at \$80 bbl, which is the level that makes the exploration and extraction of more expensive/unconventional oil resources economically viable (for

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instance, US shale oil, Canada's tar sands, Brazil's deep-sea offshore oil, Venezuela's heavy oil, and Arctic offshore oil, among others). Moreover, it is estimated that these resources represent about 50% of the global oil and gas proven reserves, thus increasing the importance of other non-OPEC producing countries still more on the global energy scene and reducing the influence on global oil prices of OPEC announcements. In this paper, we investigate the informational role of OPEC and its (potential) contribution to oil price formation. Our aim is to examine, by using the event study methodology (see, for instance, MacKinlay (1997)), how OPEC announcements can affect oil prices, which are characterized by a time-varying volatility.

The consequences of OPEC power on oil prices have been analyzed, through the market structure, in the literature (Bina and Vo, 2007; Fattouh and Mahadeva, 2013). Models often consider OPEC as a cartel, whose members can collude, manipulating prices through production quotas, resulting in monopolistic profits (see, among others, Ezzati (1976), Pindyck (1978), Adelman (1980, 1982), Salant (1982), Aperjis (1982), Griffin (1985) and Smith (2005)). An alternative view is based on market competition, suggesting that the oil market is competitive and therefore OPEC has little influence on oil prices by operating as a cartel (Crémer and Salehi-Isfahani, 1980, 1989; MacAvoy, 1982; Teece, 1982). Empirical evidence for these two explanations of OPEC behavior has yielded conflicting results (see, for instance, Loderer (1985), Griffin (1985), Gulen (1996), Alhajji and Huettner (2000), Kaufmann et al. (2004) and Smith (2005)). Geroski et al. (1987), Griffin and Neilson (1994), Brémond et al. (2012) and Fattouh and Mahadeva (2013) argue that OPEC's behavior varies over time depending on economic, market, and geopolitical conditions and cannot be represented by a single model. The 2000s, characterized by the financialization of commodity markets, brought the role of information in price formation to the fore. Thus, instead of directly modeling OPEC's behavior, another strand in the literature empirically studies the effect of OPEC's announcements of production changes on oil prices.

Few papers deal with the OPEC announcements and even fewer employ the event study methodology¹. The first attempt to examine this topic was made by Draper (1984), who, by means of an event study on heating oil futures prices returns between fall 1978 (when NYMEX first introduced these futures contracts) and 1980, concluded that investors anticipated OPEC's announcements. However, the period is very short and the contract under scrutiny does not represent the OPEC basket of crude oil contracts. Deaves and Krinsky (1992) analyzed crude oil as well as heating oil futures returns over a longer period, distinguishing favorable and unfavorable news for investors who take long positions. They found that traders earn economically and statistically significant abnormal returns after an OPEC conference conveying "good news." They conclude that their results do not support the market efficiency hypothesis.

More recent studies have been conducted by several authors. Guidi et al. (2006) separated the whole period, 1986–2004, into conflict and non-conflict sub-periods. However, not only are the sub-periods short but also the authors are mainly interested in the impact of OPEC conferences on stock markets. Although their results seem to validate market efficiency, they detected an asymmetric reaction to OPEC's decision during periods of conflict between United States and United Kingdom stock markets. Hyndman (2008) studied how crude oil spot and two-month futures prices, as well as prices of oil-related company stocks, reacted to OPEC's announcements during 1986–2002. His results indicate that abnormal returns are statistically significant. However, he did not

specify the model that allowed him to calculate abnormal returns. Lin and Tamvakis (2010) enriched the analysis over a long period, 1982–2008, by examining the impact of OPEC's announcements on OPEC and non-OPEC crude oil, and for different oil qualities. Their empirical evidence suggests that the effect of OPEC's decision depends on the production quotas (increase, cut, or status quo) and on the price trend. In contrast, they did not find a significant difference between OPEC and non-OPEC crudes or between oil qualities. The computation of abnormal returns is not based on any model, but rather on the average daily return of the estimation period. By examining both OPEC's and US Strategic Petroleum Reserve (SPR) announcements over the period 1983–2008 on spot and futures prices, Demirer and Kutan (2010) found positive significant cumulative abnormal return (CAR) differences for OPEC production decreases during the post-event period, whereas SPR announcements did not affect these differences. Although the authors used three different models to assess abnormal returns (the market model, the autoregressive conditional heteroscedasticity (ARCH) model, and the three-factor Fama–French model), they did not indicate how the Fama–French model might be applied to spot and future oil prices. Moreover, by performing a statistical test on the difference between the CARs of the last and the first day of the post-announcement period, the authors examined a form of a static persistence. Finally, instead of studying OPEC's announcements, Brunetti et al. (2010) analyzed the effect of OPEC members' "fair price" statements on nearby futures crude oil prices from 2000 to 2009. They found that these statements have a limited influence on crude oil prices.

The dramatic fluctuations in oil prices have led some authors to investigate the relation between OPEC's announcements and the volatility of oil prices. Taking the period from 1989 through 2001 and employing an event study period, Horan et al. (2004) explored how and whether the implied volatility of crude oil option prices react to OPEC's announcements. Their results suggest that implied volatility increases before announcements and decreases the first day following OPEC's meetings. Other authors have opted for a study of realized volatility of oil price returns. Using intraday returns of crude oil and natural gas futures contracts over a five year period (1995–1999), Wang et al. (2008) found strong evidence of a positive impact of a production increase announcement on weekly volatility, but no evidence of impact on daily volatility. Bina and Vo (2007) tried to detect the effect of OPEC production decisions on spot and futures oil prices as well as in the OPEC production quota changes following oil price fluctuations (1983–2005). They argued that OPEC decisions cannot reduce oil price volatility and that production adjusts to spot and futures oil price fluctuations in an expected manner. Schmidbauer and Rösch (2012), for the period 1986–2009 and for daily data, concluded that the impact of OPEC's decisions on volatility is anticipated by investors, as there is a positive effect before the announcements and an asymmetric effect on expected returns after the announcements.

The purpose of this paper is to investigate the influence on oil prices of OPEC's announcements in a framework of event studies. Our dataset covers the period from March 1991 to February 2015, including, unlike existing papers, the sharp fluctuations in oil prices of 2008 (a sharp increase followed by an important decrease before another pronounced increase), characterized by a high level of volatility. We divide the period into two sub-periods (1991–2004 and 2005–2015): during the first sub-period, prices uniformly increased, while the second sub-period was much more turbulent and prices were much higher. This allows us both to examine if oil prices reacted distinctly to OPEC's announcements during these two periods and to assess the robustness of our results. We consider daily returns of West Texas Intermediate (WTI) and Brent returns and OPEC's announcements of drop, status quo,

¹ See also Kaufmann et al. (2004), Wirl and Kujundzic (2004) and Mensi et al. (2014), who use other econometric methods to examine the same topic.

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