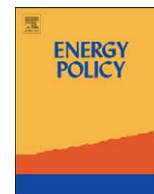




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journal homepage: [www.elsevier.com/locate/enpol](http://www.elsevier.com/locate/enpol)OPEC announcements and their effects on crude oil prices<sup>☆</sup>Sharon Xiaowen Lin<sup>\*</sup>, Michael Tamvakis

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## ABSTRACT

We investigate evidence on the effects of OPEC announcements on world oil prices by examining announcements from both official conferences and ministerial meetings on major international crudes, including the key benchmarks and several other heavy and light grades. With data from 1982 to 2008, we use event study methodology and find differentiation in the magnitude and significance of market responses to OPEC quota decisions under different price bands. We also find some (weak) evidence of differentiation between light and heavy crude grades.

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## 1. Introduction

The Organisation of Petroleum Exporting Countries was set up in the mid-1960s with the aim to promote the interests of some of the world's key producing countries, many of them located in the Middle East. Since its inception, OPEC's influence on world oil prices has been mixed. From the oil price hikes in 1973 and 1979, to the reverse oil price shock of 1986, and to the more recent roller-coaster story from 2005 to 2008, OPEC has been both vilified for exerting quasi-monopolistic control over surging oil prices, and dismissed for being unable to exert any control over tumbling oil prices. Adelman (2002) provides an excellent review of the oil history and the OPEC role.

This paper does not set out to discuss the role of OPEC in an economics context and whether it exerts any kind of monopolistic, oligopolistic or other type of influence. Instead we follow a number of authors who look at OPEC purely as a source of news, which may affect supply-side fundamentals and, hence, oil prices.

We do this by looking at empirical evidence on how major international crudes react to OPEC announcements. More specifically, we use event study methodology on a database covering sixteen major international oil grades over the period from 1982 to 2008. We look at oil price returns and we differentiate among various types of announcements, taking into account the relative level of oil prices around each announcement. We also examine the effects on OPEC and non-OPEC crudes, and on different crude qualities (heavy and light grades). By using this relatively long data

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series, we are able to provide evidence of changing OPEC behaviour and its varying impact on world oil prices. It is, to our best knowledge, the first time OPEC conference influences are examined in the context of relative oil price levels; and in sub-divisions of OPEC versus non-OPEC grades, as well as heavy versus light grades. These empirical results are important as they would help quantify the effects on world oil prices from OPEC conferences under varying market conditions and shed light on potential differential effects due to varying characteristics of the crudes.

The rest of the paper is organised as follows. Section 2 reviews the literature pertaining to the effects of OPEC announcements on oil markets and the procedure of OPEC announcements. Section 3 explains the methodology adopted for this study and the data used. Section 4 discusses the results of the study and the range of comparisons made, with Section 5 drawing conclusions.

## 2. Review of literature

Existing literature on the effects of OPEC meetings on oil and oil related products has dealt with two main issues. The first is the information content of the meetings. Draper (1984) analyses the behaviour of heating oil futures prices around OPEC meetings and concludes that investors have correctly anticipated meeting results and reflect their expectations on oil prices before OPEC meetings take place. Draper carries out his analysis using an event study framework. However, the data and context of his analysis are somewhat different to ours. Firstly, his data span only the first few years (fall 1978 to December 1980) after the launch of the heating oil contract on NYMEX.<sup>1</sup> Secondly, the OPEC effects are

<sup>1</sup> Interestingly, this period coincides with the second oil price shock, at the height of OPEC's power, during which almost all OPEC meeting decisions were probably expected to result in high market prices.

examined through their impact on the heating oil contract, a refined product whose relationship to OPEC crude prices is likely to be distorted by refining economics and government policies (for example taxation).

Deaves and Krinsky (1992), on the other hand, by classifying good (bad) news as first day positive (negative) market reactions after OPEC concluding announcements at the end of their meetings, find evidence that traders systematically under-react to OPEC conferences that convey bullish news, leading to abnormal profits for certain investors. We differ in our approach in that we do not make a judgment on whether a particular announcement constitutes good or bad news. Instead, we look at the effect the result of the announcement (i.e. a quota increase, cut or no change) has on oil market returns.

Guidi et al. (2006) look at the significance of OPEC meetings, but mainly from the point of view of the impact they have on stock markets, rather than on crude oil returns. Their approach involves division of the data (from 1986 to 2004) in periods of 'conflict' and 'non-conflict'. They then compare the reaction of the stock markets in the US and UK to OPEC quota decisions between conflict' and 'non-conflict' periods. Our approach is different in that we focus on the oil prices themselves, not on stock indices. However, an interesting result of Guidi et al., that of an apparent asymmetry of information incorporation is similar to our results, when we compare quota cuts and quota increases.

The second issue relates to the debate whether OPEC is an effective cartel. Loderer (1985) tests the hypothesis of OPEC's cartel power for each of the OPEC meetings that take place during the period of 1974–1983. The author finds mixed evidence of OPEC influencing oil prices. Literature on this issue is rich and goes far beyond the analysis of OPEC conferences. For example, Gülen (1996) examines whether OPEC is an effective cartel by controlling output and influencing oil prices and finds causality from OPEC production to oil prices while Alhajji and Huettner (2000) review OPEC behaviour models and find no clear evidence that OPEC can be characterized as a dominant producer in the world crude oil markets.

Contrary to the above, Kaufmann et al. (2004) use a VECM methodology to examine Granger causality between real oil prices and a number of other variables, such as OPEC capacity utilisation, OPEC quotas, the degree to which these quotas are violated, and OECD oil stocks. They find evidence that these variables Granger-cause oil prices, but not vice versa, implying that OPEC does influence oil prices.

In a more recent study, Horan et al. (2004) examine the implied volatility of crude oil options and provide evidence on the pre-meeting rise in implied volatility followed by a post-meeting drop in implied volatility, implying OPEC has a significant impact on oil price.

### 2.1. The mechanics of OPEC announcements

OPEC conferences are the supreme decision-making authority of the organisation, and consist of national delegations, normally headed by the member-state ministers with a portfolio including oil, energy or mining. There are at least two meetings scheduled every year. Extraordinary meetings can also be initiated, if market conditions call for them. These additional meetings normally need to be approved by the OPEC secretariat, usually during the course of regular OPEC conferences.

Among the many outputs of OPEC conferences, those most significant to oil markets are "market reviews" and subsequent "decisions on quota adjustment". These decisions are announced at press releases after the meetings. Although OPEC has rules in place, which trigger quota changes automatically, in reality this

has only happened once, and quota changes are normally regarded in the market place as "exogenous" events.

OPEC conferences can be as short as one day or as long as one week. The first and last meetings are open to the press. The first press meeting normally sets the tone of the meeting and usually triggers market speculation. The most interesting press releases usually take place at the end, when members formally announce any decisions to adjust production quotas—whether to increase, decrease, or leave them unchanged. It is not unusual, however, that some news on the *in camera* negotiations should reach the public domain as participating officials sometimes talk to the press informally. This may result in market reaction because of changes to expectations on oil prices. We expect, however, that any new information content is assimilated into oil prices at the end of the conferences when the formal announcements are made. Since OPEC meeting dates are well publicised, expectations of quota changes may vary shortly before and during meetings Horan et al. (2004), pp. 106–107, but normally settle after the announcement of the quota decision. Therefore we choose the end of the meeting as the event point.

### 3. Data and methodology

Daily price data from Thomson Datastream for the period from 1st May 1982 to 31st December 2008 are analysed in this study. We use subsets of these data, which are built around OPEC conferences and corresponding announcements. The crude oils under investigation are listed in Table 1 and classified according to their provenance, broad physical characteristics (gravity and sulphur content) and whether they are constituents of the OPEC basket of crude grades. Among the sixteen crude grades listed, four are OPEC-basket constituents; the rest are non-OPEC. This natural division enables us to examine whether there is any differential behaviour of OPEC and non-OPEC crude grades. Another division of the crudes is by their gravity, so we also differentiate between heavy and light crudes. The decision whether to use heavy or light crude depends on factors such as refining technology, with light crudes are generally more popular among importers. The majority of the grades under investigation are light sweet, with seven being heavy sour ones. Analysis of the above mentioned sub-groups may provide empirical evidence on whether OPEC countries have superior information on oil prices, and whether OPEC effects of quota changes are experienced

**Table 1**  
Crude description.

Crude grade	Provenance	Gravity	Sulphur	OPEC basket?
Alaska North Slope	USA	Heavy	Sour	No
Brent blend	UK	Light	Sweet	No
Bonny Light	Nigeria	Light	Sweet	Yes
Dubai Fateh	UAE	Heavy	Sour	Yes until 15/06/05
Flotta	UK	Heavy	Sour	No
Forties	UK	Light	Sweet	No
Iranian Heavy	Iran	Heavy	Sour	Not until 15/06/05
Iranian Light	Iran	Light	Sweet	No
Minas	Indonesia	Heavy	Sour	Yes
Oseberg	Norway	Light	Sweet	No
Sahara blend	Algeria	Light	Sweet	Yes
Tapis	Malaysia	Light	Sweet	No
Urals	Russia	Heavy	Sour	No
CPC <sup>a</sup>	Kazakhstan	Light	Sweet	No
WTI	USA	Light	Sweet	No
West Texan Sour	USA	Heavy	Sour	No

<sup>a</sup> With the exception of CPC, all data are quoted on FOB basis. CPC is quoted on CIF basis. This difference around events days is considered trivial.

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