Oil prices and the global economy: Is it different this time around?

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ABSTRACT

The recent plunge in oil prices has brought into question the generally accepted view that lower oil prices are good for the US and the global economy. In this paper, using a quarterly multi-country econometric model, we first show that a fall in oil prices lowers interest rates and inflation in most countries, and increases global real equity prices. The effects on real output are positive, although they take longer to materialize (around 4 quarters after the shock). We then re-examine the effects of low oil prices on the US economy over different sub-periods using monthly observations on real oil prices, real equity prices and real dividends. We confirm the perverse positive relationship between oil and equity prices over the period since the 2008 financial crisis highlighted in the recent literature, but show that this relationship has been unstable when considered over the longer time period of 1946–2016. In contrast, we find a stable negative relationship between oil prices and real dividends which we argue is a better proxy for economic activity (as compared to equity prices). On the supply side, the effects of lower oil prices differ widely across the different oil producers, and could be perverse initially, as some of the major oil producers try to compensate their loss of revenues by raising production. Taking demand and supply adjustments to oil price changes as a whole, we conclude that oil markets equilibrate but rather slowly, with large episodic swings between low and high oil prices.

1. Introduction

Oil markets have experienced frequent episodes of boom and bust, ever since oil was produced in large commercial quantities in Pennsylvania back in 1859. Real oil prices (WTI in 2015 US dollar) have fluctuated between highs of $145 to lows of $15 per barrel over the period 1946M1 and 2016M6 (Fig. 1). The control of oil markets by the major international oil companies, the so called Seven Sisters, backed by the UK and US governments, meant low and relatively steady oil prices until the late 1960s. However, a new era began with the foundation of OPEC in 1960, the 1968 coup in Libya which led to new agreements initially with the independent oil companies and then with the Seven Sisters across all major oil producers in the Middle East and elsewhere, not to mention the start of a downward trend in US oil production in 1971. As a result, oil markets entered a new phase as the Seven Sisters lost control to markets and oil producers, oil prices quadrupled, ushering in an era of high oil price volatility and frequent periods of boom and bust often triggered by military and political events.

In fact, since 1986 there have been six episodes of sharp decline in oil prices (30% or more in each episode), in a relatively short period of time (within seven months), and with relatively large effects on the global economy (see Fig. 1 and Baffes et al., 2015).
Therefore, while the fall in oil prices since June 2014 is large, it is by no means unprecedented, and there is an extensive literature on the economic consequences of oil shocks for the global economy in terms of their impacts on real output and real equity prices, see for instance, Hamilton (2009), Kilian (2009), Cashin et al. (2014), Mohaddes and Pesaran (2016), and Mohaddes and Raisi (2015) among others. Overall the literature suggests that the initial impacts of oil price changes differ widely across different countries, with oil importers benefiting from the fall in oil prices (once demand conditions are controlled for) and oil exporters losing from the price fall.

The recent plunge in oil prices has, however, brought into question the generally accepted view that lower oil prices are good for the US and the global economy. It has been argued that near-zero interest rates in most industrialized economies, and the fact that the US has started to export crude oil again, have altered the traditional channels through which the benefit of lower oil prices gets transmitted to the real economy (Obstfeld et al., 2016). Moreover, it has been suggested that the positive correlation between oil prices and equity markets in the past few years provides evidence of a slowdown in global economic activity, as a softening of global aggregate demand has reduced firms' profits and demand for oil (Bernanke, 2016). Therefore, it is argued that the decline in oil prices this time around is not good news for the US economy, and by implication for the rest of the industrialized global economy.

But the overall net outcome for the global economy is far more complicated and depends on domestic political economy considerations and the feedback effects of oil price changes on global energy demand, interest rates, financial markets, and world trade. It is worth noting that much of the literature on oil and the macroeconomy does not use a multi-country framework, and instead uses a single-country VAR model, as representing the global economy. The majority of such studies in fact consider the effects of oil shocks exclusively on the United States, with the analysis being done mainly in isolation from the rest of the world. See, for instance, Kilian (2009). Unfortunately, these single-country models not only fail to take account of economic interlinkages and spillovers that exist between different regions, but more importantly their single-country framework does not allow them to consider heterogeneities across and within oil importers and exporters, which are arguably essential to analyzing the global oil market.

Given that there are many channels through which oil prices can affect economic activity (both real and financial) in the US and elsewhere, one could for instance use the Global Vector Autoregressive (GVAR) modeling approach to capture the complicated patterns of global economic interactions; taking into account not only the direct exposure of countries to the shocks but also the indirect effects through secondary or tertiary channels. The GVAR is a multi-country framework which links country-specific models in a coherent manner using time series and panel data techniques and has been used in bank stress testing, the analysis of China's emergence on the rest of world economy, international transmission of real and financial shocks, and forecasting (for a recent survey see, for instance, Chudik and Pesaran, 2016). To this end, we use the GVAR-Oil model developed in Mohaddes and Pesaran (2016), estimated using quarterly data between 1979Q2 and 2013Q1, and investigate the effects that a negative short-term oil price fall has on the US and the rest of the world economy. We find that the fall in oil prices tends to lower interest rates and inflation in most countries, and increases global real equity prices, with these effects showing up relatively quickly, typically within two quarters. However, the positive real output effects, both at the global level and at the country levels, take longer to materialize following an oil price fall, with the positive median impulse responses generally manifesting themselves in the medium-term, around four quarters after a negative oil price shock.

To investigate whether there has been a change in the macroeconomic effects of recent falls in oil prices, we need to consider the output-oil price relationship over a number of sub-periods, including the recent post-2008 episode of oil boom and bust. Unfortunately, however, quarterly macro time series that exist are not sufficiently long for a reliable analysis of output-oil price relationship over different sub-periods, particularly the post-2008 crisis period. Therefore, it is not possible to use the GVAR-Oil model for this purpose, and an alternative modeling strategy is required. Instead we consider bivariate relationships between oil prices, equity prices, dividends and monthly industrial and manufacturing output, as alternative proxies for real economic activity. Using such monthly observations from the US, we illustrate that there is no stable relationship between real oil prices and equity returns over the last 71 years and so the perverse response of equity markets to oil price changes should not be taken as evidence that lower oil prices are no longer beneficial for the US and the world economy. In fact, using relatively long time series on dividends and oil prices we show that, as in previous episodes of falling oil prices, lower oil prices improve profit opportunities and dividends in the oil importing economies which is overall good for the world economy. This supports the findings from the GVAR-Oil model. However, due to uncertainties over the Brexit negotiations, economic and trade policies under the new US administration, the threat of terrorism, and the surge in financial market volatility (to mention but a few), it is likely that there will be a delay in the materialization of any economic benefits of lower oil prices for the global economy as a whole.

The remainder of this paper is organized as follows. Section 2 outlines a multi-country approach to examine the effects of lower oil prices, namely the GVAR-Oil model, and investigates the global macroeconomic consequences of a fall in oil prices using quarterly data between 1979Q2 and 2013Q1. Section 3 re-examines the effects of low oil prices on the US economy, particularly over the post-2008 period, using monthly regression analysis based on data on oil prices and indicators of market (S&P 500) and real economic activity (proxied by dividends on the S&P 500) over the 1946–2016 period. Finally, Section 4 offers some concluding remarks and argues that the response of oil producers (OPEC and non-OPEC) to price changes this time around differs markedly, mainly due to the US oil supply revolution.

### 2. Analyzing the oil market using a multi-country model

We use the global quarterly econometric model recently developed in Mohaddes and Pesaran (2016) to investigate the effects of oil price shocks and their transmission in the global economy. This framework is particularly suited to our purposes since it models global oil markets separately from the country-specific vector autoregressive models, by specifying an oil price equation which takes account of global demand conditions as well as oil supply conditions across some of the major oil producing countries. The model...
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