The Journal of Economic Asymmetries xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

The Journal of Economic Asymmetries

journal homepage: www.elsevier.com/locate/jeca

Asymmetry and break effects of oil price -macroeconomic fundamentals dynamics: The trade effect channel

Ibrahim D. Raheem

School of Economics, University of Kent, Canterbury, UK

ARTICLE INFO

JEL classifications:
F1
F4
Q43

Keywords:
Oil price
Trade
ARDL
Structural break

ABSTRACT

This paper seeks to examine the relationship between oil price change and trade components (import, export, and total openness). Essentially, we inquire if countries respond, in the same manner, to oil price changes. To this end, our estimation is based on both symmetric (linear) ARDL and asymmetric (nonlinear) ARDL models. These models also take account of structural breaks using the Bai and Perron (2003) test. The selected countries are China and Germany (high trading), U.S. and India (oil importing) and Russia and Canada (oil exporting). Using a monthly dataset from 01/1992 – 06/2016, the following results were estimated: there is the existence of an asymmetric effect on the export component of the high trading economies (long run), import of the oil importing countries (short run) and import of the oil exporting countries (long run). These results are robust to changes in data frequency and measurement of oil prices. Policy implications were designed based on the obtained information.

1. Introduction

Oil, as a source of energy, as demonstrated it's importance to the economy. This might not be unconnected to the assertion that the entire value chain of economic activities, ranging from production to consumption, entails the use of energy. Even though concerted efforts have been channeled to providing alternative and cleaner sources energy, oil has continued to prove its dominance in the energy market. Statistics from United Nations Conference on Trade and Development (UNCTAD) database have shown that oil accounts for over one-fifth of the global commodity trade. Since oil has been considered to be an international commodity, its pricing mechanism would be subjected to volatility and as such have effects on macroeconomic fundamentals.

The influential study of Hamilton (1983) led the discourse on the effect of oil price change on macroeconomic variables. Through his study, he was able to show how an increase in oil price fuels economic growth drag. Several other studies have towed this line of argument, based on different estimation techniques, scopes, and macroeconomic variables choices among others. As an analogy, among the macroeconomic fundamentals used, include inflation, unemployment, exchange rate, stock return, business cycle, real interest rate and industrial production.[1]

A strand of studies recently emerges to criticize the widely celebrated paper of Hamilton on its failure to account for the important role of asymmetric effect. For instance, all but one of the five major recessions in the United States of America (U.S.) between the end of World War II and 1973 preceded oil price rise. Barsky and Kilian (2004) argued that the major oil price crash in the 1970s was not the major cause of stagflation but the due to monetary factors. Mork (1989) pin-pointed that for the mere fact that oil price increase has negative effect on growth does not necessarily mean that oil price reduction would lead to economic growth, at least for the U.S. Of specific importance is the failure of oil price collapse in 1986 to translate into economic growth, which now

E-mail address: idr6@kent.ac.uk, i raheem@email.com.

[1] Literature survey of oil price modeling includes but not limited to Barsky and Kilian (2004) and Hamilton (2005).

http://dx.doi.org/10.1016/j.jeca.2017.04.002
Received 7 October 2016; Received in revised form 23 April 2017; Accepted 24 April 2017
1703-4949/ © 2017 Elsevier B.V. All rights reserved.

serves as a pointer to asymmetry effects. Mork and Olsen (1994) concluded that asymmetry effect is present in most OECD countries. In fact, Lee, Ni, and Ratti (1994) expressed that increasing oil price volatility contributes to the asymmetry effect especially when economic activities are being deflated by oil price volatility. Hooker (1996) concluded that the linear relationship between oil price and the economy appears to be much weaker after 1973. As such, the symmetry relationship appears to be a mere illusion. Interestingly, another source of flaws for the symmetry and by extension serves as an advantage of asymmetry is based on ignoring the effect of 1986 Tax Reform Act (in the U.S.) on fixed investment and the aggregation of energy and non-energy related investment (see Edelstein & Kilian, 2007 and 2008).

Globalization has led to the emergence of increase in trade volume among countries. However, the benefits of trade liberalization in not even across countries. Some countries such as India, Nigeria, Mexico, and most Caribbean countries have a high incidence of trade deficit. Since oil accounts for over one-fifth of trade, it is important to examine the contribution of oil to trade dynamics. Also, recent developments in the crude oil market and emergence of large global trade imbalance has reignited the urge to seek more clarification on the oil price change and trade dynamics (Kilian, Rebucci, & Spatafora, 2009; Le & Chang, 2013; Rebucci & Spatafora, 2006). Rafiq, Sgro, and Apergis (2016) stated that the "net trade" channel of oil price pass through an asymmetric effect. Another reason for the emergence of an asymmetric effect is based on the fact that the exact effect of oil on trade is conditional upon different components of trade. Hence, the decision to find an asymmetric effect becomes inevitable. This asymmetric effect can be grouped into two major sub-headings and each can be further decomposed into two sub-classifications. In the first layer classification is price and country asymmetry. The price asymmetry can then be further decomposed into positive and negative shock or change, while country asymmetry can be disaggregated into oil- importing and exporting countries. In this study, we augment the country asymmetry to account for high commodity trading countries.

Another important issue worth mentioning is related to structural break. There is no gainsaying the fact that theoretical underpinning and empirical studies on oil price change have confirmed the existence of structural break in oil prices (see Salisu & Fasanya, 2013; Narayan & Liu, 2015 and Salisu & Oloko, 2015). This is due to evidence of significant shift in the trend of the series employed. This decision, to examine if break(s) is being inferred because both series are high volatile and as such subject to breaks, which if not accounted might bias our results when they actually exist.

This paper makes the following contribution to the literature: first, we add to the relatively low number of studies that have modeled oil price change and trade balance (see Backus & Crucini, 2000; Rebucci & Spatafora, 2006; Bollino, 2007; Kilian et al., 2009; Bodenstein, Erceg, & Guerrieri, 2011; Le & Chang, 2013 and Rafiq et al., 2016).[2] Second, studies that have considered the asymmetric effect only consider, at best, oil importing and exporting countries without considering the importance of high trading economies like China, India, Germany among others. Third, unlike the extant literature, excluding Le and Chang (2013), that have ignored the long-run dynamics between oil price and trade balance, this study made attempt to fill this gap by investigating both long-run and short-run dynamics. Fourth, existing studies have erroneously ignored the importance of structural break and asymmetry effect simultaneously. We considered total trade in our analysis. This is due to the fact that oil only accounts for about 20% of total trade. Hence, ignoring the overwhelming 80% might not be a fair representation of the trade effect. Also, decomposing the total trade balance could reveal some information about the nature of incomplete financial markets, hence helps to design models of the oil demand and supply shocks under incomplete markets (Le & Chang, 2013; Rafiq et al., 2016). What's more, we estimated a time series analysis for the countries under investigation, rather than estimating a panel data analysis. Hence, the study would be able to have country-specific results and policies would be designed to best suit such countries, rather than generalizing results for the panel based sample. Lastly, the scope (in terms of time coverage) covers period that has witness drastic changes in oil price. Hence, this would further bring out the beauty of the asymmetric effect in modeling oil price and trade dynamics.

The two studies closely related to ours are Le and Chang (2013) and Rafiq et al. (2016). The major differences lie on the scope and methodological arguments. In terms of the scope, we expanded the decomposition of trade to include high trading country, while Le and Chang (2013) made case for an oil-refining country (Singapore). On the methodological approach, we made use of nonlinear autoregressive distributed lags (NARDL) approach proposed by Shin, Yu, and Greenwood-Nimmo (2014). The advantage of this model over other models lies on is ability to simultaneously capture the short- and long-run asymmetries through positive and negative partial sum decompositions of changes in the independent variable(s), which is oil price in this case (Van Hoang, Lahiani, & Heller, 2016). The fact that the approach has less computational technicalities as compared to other models (such as Bayesian VECM or various other specifications of the error-correction models and smooth transition autoregressive models), particularly in terms of dealing with time series of different orders of integration, is another beauty of this study. It should also be noted that we conducted the symmetric version of Shin et al. (2014) developed by Pesaran, Shin, and Smith (2001) in order to justify whether asymmetry matters for oil price shock-growth volatility nexus. Also, we applied Bai and Perron (2003) structural break test, which endogenously determines up to five possible breaks.

Due to our intention to disaggregate trade into oil- importing, exporting and high overall trade openness, two countries are selected from each of these decompositions/ classifications. These countries are Russia and Canada (oil exporting country), U.S. and India (oil importing country) and China and Germany (high trading economy).[3]Coincidentally, these countries also rely on trade for

[2] The older works include Bruno and Sachs (1982) and Gavin (1990 and 1992).

[3] This is in sharp contrast Le and Chang (2013) who primarily focused on Asian economies. Also, it is acknowledged that Saudi Arabia is the highest exporting country in the world. Their omission in this study is strictly due to data availability. Hence, we settled for Russia, which occupies the second position in the league of oil exporting countries. Another point to note is that U.S. is also the highest trading economies in the world. We settled for China as the highest trading economy because the dispersion of oil import and trade activities between China and the U.S. is high for China.

Download English Version:

https://daneshyari.com/en/article/7358350

Download Persian Version:

https://daneshyari.com/article/7358350

Daneshyari.com