

The causal link between benchmark crude oil and the U.S. Dollar Value: in rising and falling oil markets

Aqueela Ahmed
Coventry University
Department of Geography, Environment and Disaster Management
aqueela.ahmed@coventry.ac.uk

Abstract— This paper researches the link between benchmark crude oil prices and the U.S. dollar exchange rate, in rising, stable and falling oil markets. The methods used to explore the relationship in various markets were cointegration testing and Granger causality tests. The method allows the author to analyse the link in the short run and long run. The results found that in the long run a relationship does exist between oil prices and U.S. dollar exchange rate in stable markets. In rising and falling markets there is no long run relationship. The study did find evidence of a short relationship in rising, stable and falling oil markets.

Keywords—oil price, U.S. dollar, Granger causality, cointegration

1. INTRODUCTION

The topic of oil price formation is becoming increasingly complex in the current global market. The numbers of variables attributing to global oil prices are extensive and range from OPEC (Organization of Petroleum Exporting Countries) policy changes, to economic cycles and the U.S. dollar exchange rate. The variables that impact oil prices are ever changing and their relevance at various points in time will also change. For example, in an economic recession demand figures may hold more importance than supply figures, in a boom it may be reversed. Also certain variables may hold more importance at different time frequencies. For example, some variables such as economic activity indicators may have a long-term impact, where as a supply shortage may have a short-term impact.

Oil prices often experience rising trends, falling trends and stable trends, where prices ‘bounce’ between a range (high and a low price). Prices may rise when the oil demand is greater than oil supply. This may happen when economies are growing leading to high levels of oil demand or when supply is short due to events such as geopolitical conflicts in oil producing or oil transit nations. Prices may fall when supply significantly outstrips demand. This may happen due to an increase in supply due to new and vast discoveries, falls in demand due to a decline in global economic activity or a suitable alternative to oil products becoming available.

One of the key variables for oil markets is the U.S. dollar exchange rate, as crude oil transactions are predominately

completed in U.S. dollars. Poor understanding of this relationship can lead to poor decision making by businesses and governments. An example of this may be if changes in the U.S. dollar exchange rates impact crude oil prices, any policies released by the US Federal Reserve that impact the U.S. dollar might impact global crude oil prices.

The overall consensus of the academic literature to date is that there is a negative correlation between the U.S. dollar value and benchmark crudes such as West Texas Intermediary (WTI) and Brent North Sea (BRE) (Lizardo and Mollick, 2009). Research has now progressed and econometric analysis is being utilized to further assess this relationship. It is widely evidenced that there is a relationship between the two variables (oil price and U.S. dollar), however there are mixed views on how changes in global oil prices impact changes in US exchange rates or vice versa. Brahmairene, Huang and Sissoko (2014) described the oil prices and exchange rate dynamic as inconclusive. The literature tests the relationship with a variety of methods however the outcomes tend to be mixed.

Huang and Tseng (2010) detect a significant two-way causal relationship between oil price disturbance and the U.S. dollar exchange rate, over a 20-year period. Ding and Vo (2012) used a multivariate stochastic volatility and a GARCH model to investigate volatility interactions between oil prices and exchange rates and found that during calm market times, both variables reacted simultaneously. However in turbulent times, a shock in one variable will impact the other variables at a later date. Uddin et al. (2013) found that exchange rate changes affect oil prices in the short run. Brahmairene, Huang and Sissoko (2014) finds that, in the short run, changes in the exchanges rates’ Granger causes changes in crude oil prices and in the long run changes in the oil prices’ Granger causes changes in exchange rates. On the other hand Basher et al. (2012) finds that oil price shocks tend to depress U.S. dollar exchange rates in the short run. Lizardo and Mollick, (2009) find in a long run forecast that increases in oil prices lead to a depression of the US exchange rate against net oil exporter currencies. Chen and Chen (2007) found that in the long run changes in oil prices cause changes in exchange rates. Reboledo and Rivera_castro (2013) used a wavelet approach and found that oil prices led exchange rates at negative dependence in crisis period. Mensi, Hammoudeh, Yoon