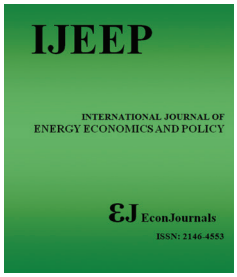

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Oil Price Dynamics Forecasting: An Indicator-Pivoted Paradigm

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ABSTRACT

Changes in the price of crude oil have significant impacts on a company's production cost. Therefore, research on forecasting the movement of oil prices is imperative to obtain a profound yet forward-looking idea regarding their future direction. Contributing to this effort, this paper endeavours to design and build an oil price indicator that incorporates the ability to determine lead time and has great predictive power and directional accuracy. Applying the indicator construction approach, the present study successfully constructed an OPI with an average leading time of 3.6 months, moving ahead of West Texas Intermediate, a main crude oil benchmark used across the globe. The results revealed that OPI achieves as high as 75.0% accuracy. The main goal of this paper is to determine whether the indicator approach can be applied in predicting global oil prices. Upcoming research endeavours can extend the current model to out-of-sample forecasting of oil prices.

Keywords: Oil Price, Forecasting, Indicator Approach
JEL Classifications: C14, E32, Q47

1. INTRODUCTION

The year 2017 had a good start for global crude oil when the Organisation of the Petroleum Exporting Countries (OPEC) finally agreed to trim production by 1.2 million barrels per day (hereafter b/d); this announcement came in November 2016 and marked the first drop in production since the subprime mortgage crisis in 2008. Russia also expressed support by cutting 300 thousand b/d. Such a sound compromise again renews hope among oil producers and investors to pick up the pieces of oil price recovery. The recent oil price slump after June 2014 had some Wall Street oil experts pointing to shale oil producers as the culprits because they produce an enormous amount for the crude oil market. Publicly known as shale oil, or tight oil as the US Energy Information Administration (EIA) calls it, it is produced only in certain US states and has emerged since the early 2000s. This synthetic crude oil is mainly used as heating oil, marine fuel and as a chemical for railroad wood preservative, which may offer an alternative for producers in these fields, who have traditionally relied solely on conventional crude oil. The sudden emergence of the very low-permeability oil is mainly due to technological advancements that can reduce the costs of drilling activity as well as improve the drilling efficiency. However, its feverish production, especially from 2010 onwards, has started to worry Saudi Arabia and Russia as they have always led in global crude oil production. Their worries have finally matched with the Reference Case in the Annual Energy Outlook 2016 as released by the US EIA (2016), which indicates that US tight oil production is expected to reach 7.1 million b/d in 2040. The report even estimates that the world tight oil production will double between 2015 and 2040, growing from 4.98 million b/d to 10.36 million b/d, with most of the projection anticipated to come from the US.

Another possible reason for the oil price remaining low is the mighty return of Iran to the crude oil market. When the economic sanctions on Iran were lifted in the first quarter of 2016, Iran picked up the pace in producing crude oil. Iran ran wild in crude oil production right after that because it was attempting to regain its market share in the crude oil market, as well as increase its economic revenue because the economic sanctions had actually hit the country hard in an economic and financial sense. However, it was bad timing to have Iran come back aggressively into the global oil market when the oil price was plummeting. OPEC's attempts to secure and stabilize global oil prices appear to have