EFFECTS OF WORLD OIL PRICE MOVEMENT ON MACROECONOMIC PERFORMANCE IN SAUDI ARABIA

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By

MBODOU ALI YOUSSOUF

Thesis Submitted to the School of Graduate Studies, University Putra Malaysia, in Fulfilment of the Requirements for the Degree of Master of Science

March 2019

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DEDICATION

I specifically wish to dedicate this dissertation work to my entire family. An unending feeling of gratitude to my parents, siblings whose love and prayers kept me on and saw me through this most challenging part of my life.

Abstract of thesis presented to the Senate of University Putra Malaysia in fulfilment
of the requirement for the degree of Master of Science

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March 2019

Chairman : Azman Bin Hassan, PhD
Faculty : Economics and Management

This study examines the impacts of oil price shocks on the macroeconomic performance of the Kingdom of Saudi Arabia. The method used in the analysis was autoregressive distributed lag (ARDL) model and fixed proportions theory of Leontief's (1936) input-output analysis. Data were collected during a period from the year 1991 to the year 2016 from the World Bank. The ARDL approach assures the existence of a long-run relationship and the effect of world oil price movement on macroeconomic performance. The result revealed that interest rate and exchange rate have a significant negative effect on export analysis in the long run. The result further indicated that interest rate has a significant negative effect while gross domestic product has a significant positive effect on government revenue. Finally, the result showed that interest rate has a significant positive effect on employment. The second objective of this study is to investigate the use of the input-output models to assess the effect of oil price movement on export, government revenue, and employment. The result revealed that the world oil price movement has a significant effect on all sectors. The world oil price has reduced revenues, lowered export revenue, and decreased employment. The most affected sectors due to world oil movement are mining and quarrying, wholesale and retail trade, repairs, renting of machinery, and equipment. The least affected sectors are education, electricity, gas and water supply, post and telecommunications. The value added to these sectors is mainly through forward linkages, implying that the output of these sectors demands high oil price to contribute to economic growth. The implication of this research is the multiplier impact of negative oil shocks arising from depending on crude oil can be large. Thus, we recommend that policymakers implement policies that will diversify the economy and encourage the production of goods and services from other sectors.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

KESAN PERGERAN HARGA MINYAK DUNIA TERHADAP PRESTASI MAKROEKONOMI DI SAUDI ARABIA

Oleh

MBODOU ALI YOUSSOUF

Mac 2019

Pengerusi : **Azman Bin Hassan, PhD**
Fakulti : **Ekonomi dan Pengurusan**

Kajian ini meneliti kesan kejutan harga minyak terhadap prestasi makroekonomi Kerajaan Arab Saudi. Kaedah yang digunakan dalam analisis ialah model lag terdistribusi autoregresif (ARDL) dan teori perkadaran tetap (1936) analisis input-output Leontief. Data dikumpulkan sepanjang tempoh tahun 1991 hingga tahun 2016 dari Bank Dunia. Pendekatan ARDL menjamin kewujudan hubungan jangka masa panjang dan kesan pergerakan harga minyak dunia terhadap prestasi makroekonomi. Hasil kajian menunjukkan bahawa kadar faedah dan kadar pertukaran mempunyai kesan negatif yang signifikan terhadap analisis eksport dalam jangka masa panjang. Hasil kajian selanjutnya menunjukkan bahawa kadar faedah mempunyai kesan negatif yang signifikan manakala produk domestik kasar mempunyai kesan positif yang signifikan terhadap pendapatan kerajaan. Akhir sekali, dapatan kajian menunjukkan bahawa kadar faedah mempunyai kesan positif yang signifikan terhadap pekerjaan. Objektif kedua kajian ini adalah untuk menyiasat penggunaan model input-output untuk menilai kesan pergerakan harga minyak terhadap eksport, pendapatan kerajaan, dan pekerjaan. Hasil kajian mendedahkan bahawa pergerakan harga minyak dunia mempunyai kesan yang signifikan terhadap semua sektor. Harga minyak dunia telah mengurangkan pendapatan, menurunkan pendapatan eksport, dan menurunkan pekerjaan. Sektor yang paling terjejas akibat pergerakan minyak dunia adalah perlombongan dan pengkuarian, perdagangan borong dan runcit, pembaikan, penyewaan jentera, dan peralatan. Sektor yang paling kurang terjejas ialah pendidikan, elektrik, gas dan bekalan air, pos dan telekomunikasi. Nilai tambah kepada sektor ini terutama adalah melalui hubungan hadapan, yang menyiratkan bahawa pengeluaran sektor ini menuntut harga minyak yang tinggi untuk menyumbang kepada pertumbuhan ekonomi. Implikasi penyelidikan ini ialah kesan berganda kejutan minyak secara negatif yang timbul akibat kebergantungan kepada minyak mentah boleh menjadi besar. Oleh itu, kami mengesyorkan bahawa pembuat dasar

melaksanakan dasar yang akan mempelbagaikan ekonomi dan menggalakkan pengeluaran barangan dan perkhidmatan oleh sektor lain.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree Master of Science. The members of the Supervisory Committee were as follows:

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Declaration by graduate student

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Declaration by Members of Supervisory Committee

This is to confirm that:
- the research conducted and the writing of this thesis was under our supervision;
- supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) were adhered to.

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TABLE OF CONTENTS

x

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criterion
ARDL	Autoregressive Distributed Lag Model
DJI	Dom Jones Industrial
EIA	Environmental Impact Assessment
FGDP	Foreign Gross Domestic Product
JEG	Jeddah Economic Gateway
GDP	Gross Domestic Product
I-0	Input-Output
OECD	Economic Co-operation and Development
OPEC	Organization of the Petroleum Exporting Countries
MEP	Ministry of Economic Planning
PP	Philips Perron
VAR	Vector Auto Regression
USA	United State of America
SAMA	Saudi Arabian Monetary Authority
SAM	Social Accounting Matrix
SSE	Shanghai Stock Exchange
STI	Straits Times Index
UNSD	United Nations Statistical Division
UECM	Unrestricted Error Correction Model
WDI	World Development Indicator
WTI	West Texas Intermediate

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

The kingdom of Saudi Arabia producing second largest oil and gas in the market. The direct and indirect contributions of oil gas sectors to Saudi Arabia economy as stated that the petroleum sector has contributed 87% of Saudi Arabia budget income revenues, 42% gross domestic product (GDP) and 90% of total export earnings. Therefore, we recommend the government revenue have to reduce oil dependency to improve employment level. The country produces around 13.24% oil product in the entire world daily estimation of crude oil resources amount to 260 billion barrels daily. Saudi Arabia secondly largest producers proven oil yearly reserves estimated in the world around 266 billion daily barrels. The main export products include petroleum and petroleum products accounting for 90% of the total exports. It possesses about 16% of the world's proven petroleum reserves, ranks as the largest exporter of petroleum, and plays a leading role in OPEC. The petroleum sector accounts for roughly 87% of budget revenues, 42% of GDP, and 90% of export earnings.

The main source of export crude oil products included petroleum and crude oil products accounting 90% of the total exports. Its possesses estimated 16% of the world's petroleum reserves, ranks as the largest exporting petroleum, and major leading role in OPEC. The petroleum sector accounts 87% major budget revenues, 42% (GDP) of gross domestic product, and 90% of exporting roughly earnings.

Table 1.1 : Importance of Saudi Arabia in Oil and Employment Statistics

Years	2011	2012	2013	2014	2015	2016
Employment rate (%)	94.2	94.5	94.4	94.3	94.3	94.4
Oil exports to total exports (%)	88.6	88.4	64.7	85.5	33.5	79.5
Oil price Barrel (US $)	107.8	109.45	105.87	96.29	40.68	40.7
Oil sectors to GDP (%)	50.84	50.02	46.24	42.36	27.46	24.5
Oil revenue to total government revenue (%)	92.53	91.78	89.51	87.45	72.48	64.2

[Source: Saudi Arabia Monetary Authority (SAMA). GDP Gross Domestic Product]

The Table 1.1 below showed the major contribution of crude oil sector contribute to total gross domestic product (GDP) resulted as 50.84%, 50.02%, 46.24% 42, 36% and 27, and 46% from 2011 to 2015 respectively. The proportion of oil higher than total 50% of gross domestic product on 2012. On the year of 2012 and 2013 has declined proportion from 109.4 to 105.87 the prices. This proportion is sudden declined from 42.36 to 27.46 on the year 2014 to 2016. This sudden declined heavy in the oil price

of 96.29 to 40.68 on the year 2014 to 2016. The total contribution of crude oil revenue for government has been declined sudden 92.53%, 91.78%, 89.51%, 87.45%, 72.48% and 64.2% in years 2011 to 2016 respectively. The major contribution of government revenue and gross domestic product on the oil revenue and oil price declining now-days could predicted very impact for economic activities and also employment in the Kingdom of Saudi Arabia. The employment level is increasing from 94.2% to 94.5% with high oil price from US$ 107.8, US$ 109.45 and US$ 105.87 on the year 2011 to 2013. The employment rate observed stagnant in the year 2014 to 2016 with major declined in oil price from US$ 96.29$, US$ 40.68 and US$ 40.7. This result showing that the government boots in the present world oil price movement that is major burden on government budget.

Crude oil is considered as an important energy source of every economy because it is a basic resource required for production, transportation, distribution of the production output to other sectors of the economy. It is a non-renewable source of energy which deposit is finite on the earth surface. Impact in crude oil prices affects the economic performance of any country. For instance, if oil prices increase there is a greater tendency of increase in the price of other goods and services depending on whether the economy produces crude oil or imports crude oil. Therefore, changes in the oil price can be considered as a main driving force of major economic problems, such as trade imbalance, slow investment, inflation pressure, capital outflow and transfer of resources from one economy to the other (Chen, 2015).

Moreover, the effect of world oil price movement that was associated with the Middle East conflicts has received attention since the 1970s. This was obvious when the recessions in the United State and many other European countries emerged after the oil price movement and subsequently preceded with the proliferation of examine that shows attempted for draw the causal relationship between oil price fluctuations and macroeconomic performance activities. Some of the early empirical literature reported a significant opposite effects of oil price shocks on macroeconomics performance. This study as a proof that is oil price shocks can effects economic recessions (Hamilton, 1983).

Subsequently, oil price continues to fluctuate over time to time and reach a peak of US$ 145 per barrel in the middle of the year 2008. During the currently years, however, the volatile crude oil market had raised the price concerns market participants and policymakers. After the middle of year 2014 respectively, crude oil prices further experienced a major shock due to the increase of global effects of world oil price production in Saudi Arabia, Russia and United State and other countries of the Organization of Petroleum Exporting Countries (OPEC). This further leads to a proliferation of studies on the effects of crude oil price fluctuation in economic activities (Chen et al. 2016).

In 2015, the global oil production has increased from by day 1.75 million barrels to equivalent to 2.4% when compared to that of 2014. This constitutes the second largest within the last ten years. OPEC crude oil production average increased by 3.0% in

2015 with Saudi Arabia among the largest producers. Beside members of OPEC Countries, the biggest yearly has increase was from the United State, which increased by 8.3% resulting in the largest production since the 1970s. Similarly, crude oil production during 2015 increased from the United Kingdom by 13.4% for the first time since 1999 (OPEC Statistical bulletin, 2016).

The concern of the study is to investigate effects of world crude oil price movement on macroeconomics performance in Saudi Arabia. However, studies have been much more on the direct effect of oil price fluctuations on economic variables such as GDP, consumption, investment and the level of employment. Less attention given to the indirect effect of world oil price shocks on macroeconomics in the Saudi Arabian economy. The indirect effects of crude oil price fluctuation refers to the spillover effect of changes in government revenue on domestic demand and its forward linkage effects on other sectors. Therefore, examining impacts of world oil price movement on macroeconomics performance for Saudi Arabia..
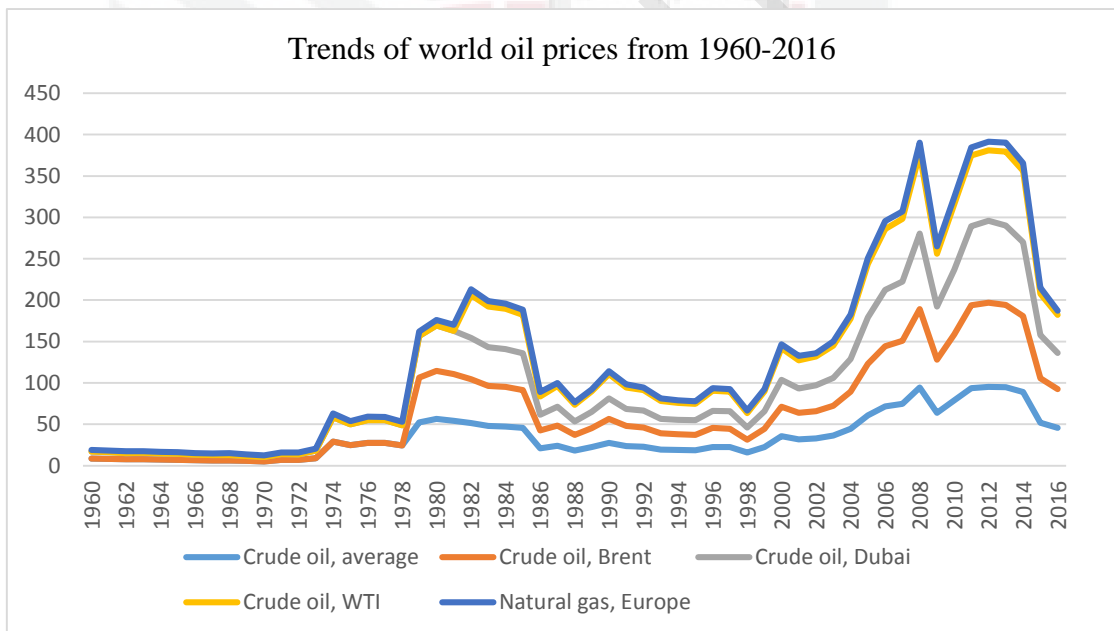
Figure 1.1 : Trends of world oil prices from 1960-2016
[Source: World Development Indicator (WDI) 2016]

The Figure 1.1 shows the result of the price trends of different types of oil such as Brent, Dubai, Natural gas and the average of the oil prices. One of the importance notable times for the Average Oil price Spot Price from 1978 until 1984 has increase in production and decrease the price alone on 1986. However, due of the financial crisis and an abrupt loss of demand for globally oil price fell from 2006 to 2008. However, because of the financial crisis effects and a short loss of demand for oil globally, the price of Average Crude drop as much at 70% off highs in January of

2009. The interactive of the charts of interactive charts of West Texas Intermediate oil price of oil shown is adjusted inflation from 2010 to 2016 production.

1.1.1   Crude oil and the Saudi Arabian economy

The crude oil production of Saudi Arabia was hold 18% of the global proven reserves of petroleum and the largest exporter of petroleum related products during the year 2013 (Saudi Arabia Monetary Authority). In the same year, Saudi Arabia is second-largest production of liquid petroleum after the United States (US) and the second most oil producer besides Russia. Based on OPEC estimation, petroleum exports of the Saudi economy accounted for 85% of its total export revenues in 2013 (World Bank Indicator Report).

The main company that dominates the Saudi Arabia's natural gas and oil operations is Saudi Aramco. The company is also the largest oil company in the number of production in the world. Supreme Council for Petroleum have a superior power over the oil and natural gas sector and Saudi Aramco (EIA, 2015). Figure 1.2 shows the petroleum and other liquid fuel production of Saudi Arabia compared to United State and Russia for the years of 2009- 2013 period. Throughout the period, Saudi Arabia produced more than Russia and United States except 2009 and 2013, which the US produce more than Saudi Arabia.
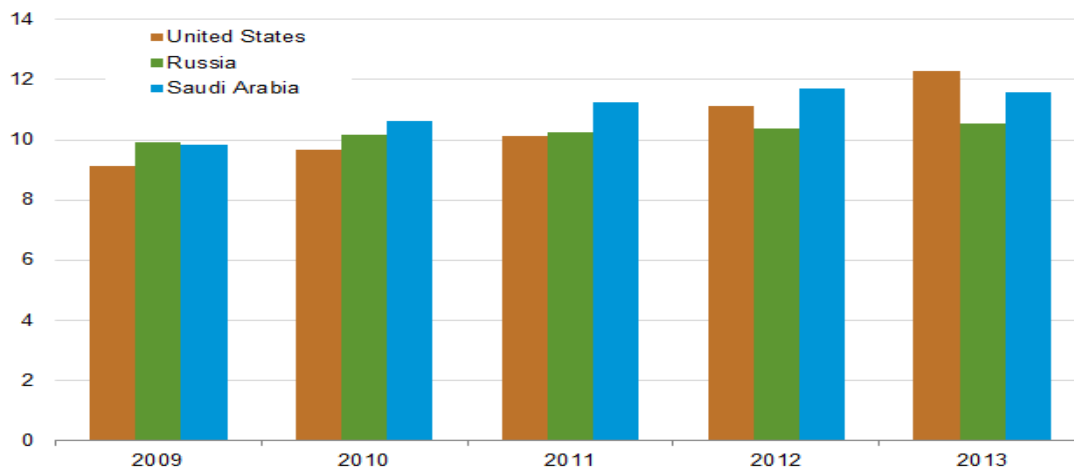
Figure 1.2 : Petroleum and other liquid fuel production (Million barrels /day)
Source: Environnemental Impact Assessment (EIA, 2015)

Thus, petroleum sector is a key sector in the Saudi Arabian economy. The Saudi economy heavily dependent on petroleum and natural gas to generate revenue to the government for both recurrent and capital expenditures (Technology and Innovation Policy, 2017). Due to this high level of dependence on crude oil, changes in global crude oil price tend to affect the economic stability. Although oil price boom generates a lot of revenue to the Saudi government, the decline in oil price tends to affect the

economy negative through fall in government revenues that affect, government budget, consumption, investment and the level of employment.

1.1.2   Oil price and employment in Saudi Arabia

World Bank in 2017 reports, crude oil revenue from oil exportation has played significant role in maintaining the standard government revenue. Furthermore, the Saudi Arabia workforce is about 11.91 million people as at 2016 employees (Rehan, M. (2017). The expatriates made up to 37 percent of Kingdom's population in regular administrative from 2013 to 2017 eventually led to decrease the rate number on 2018. The kingdom's has approximately 2.7 million foreign nationals (De Bel-Air, F. (2014).

Saudi Arabia's major number of labor force below forty years, implying less change in future supply of workforce. Roughly, 1/3 of the workforce population is employed by the public sector and the remaining workforce is employed by the private sector. Foreign workers are less employed in the country's public sector but are mostly employed in the private sector (JEG, 2016). This implies much presence of Saudi citizens in the public sector workforce. More, so, unemployment rate in Saudi Arabia had stand at about 5.5% in in year 2014 and 5.7% in year 2016 with quarterly fluctuation between the years ranging from 0.1 to -0.2% (World Bank Indicator). The petroleum sector contribution of approximately, 87% budget revenues contribution 90% of export earnings and 42% of GDP. Crude oil price changes that takes place between 2015 and 2016 may have a multiplier effect on the rate of employment in subsequent year.

1.2   Statement of the Problem

The Kingdom of Saudi Arabia dependent major oil production, with its oil and gas sector contributing up to 90% of the country's revenue and over 45% of its GDP. The oil sector has been the major foundation KSA'S economic growth and development. The oil revenue serves an essential role in the fiscal structure of oil exporting states. The oil revenue is a significant source of budget funding and the government reliance on oil revenue for budget funding cannot be overemphasized. It is thought that the instability of the oil market impact economic outcome due to government budget constituting a chief make-up of aggregate demand (Abrishami et al. 2008). Price determines the world's supply and demand of the macroeconomic variables impact of a change in oil prices. The effect of fluctuating oil prices is seen on the much broader economic activities. Also, the impact of decreasing oil price on KSA economy can be elucidated using the Dutch disease. As stated by the Dutch disease theory, oil revenue increases when rising oil price leads to an upsurge in aggregate demand and consequent increase in prices and profitability in tradable sectors in comparison to the non-tradable sector.

The oil revenue impact on foreign currency and the economic and exchange rate volatility affects the economic activities. The exchange rate describes the value of the foreign currency that the effect of the exchange rate volatility on macroeconomic variables in Saudi Arabia. Due to crude oil export being the major source of foreign exchange incomes of the KSA government, the present-day decrease in oil price led to huge fiscal deficit decline in revenue, thus fluctuating oil price may affect the rate of employment in the country. The positive oil price movement of the long run positive impact on employment due to reliance of Saudi Arabia economy on the oil prices. However, negative oil price movement has an adverse impact on employment.

Tarek et al. (2017), stated that economic growth has a positive impact on employment in the short and long run in both models. There is a landmark impact in establishing the long run relationship between oil production and economic growth by disaggregating oil production into domestic consumption of oil in the industrial sector and revenues earned export.

The robust positive of oil prices influence on the GDP rates of Saudi Arabia through to indirect impact of increasing oil prices on economic growth in the Saudi Arabia due to trading partners to the commercial transaction of oil accounts for major share of GDP. Berument et al. (2010) was of the opinion that high oil prices leads to increased economic growth through higher export earnings, while also creating the term of trade effects. Dibooglu and Aleisa (2004) investigated the extent at which Saudi's influences and real oil price to the macroeconomic drive of performance model to the economy. In the long-run, the various components of output shows tthat decreasing variance of output was a result of the term of trade balance shocks. The KSA oil policy should be directed at minimizing the fluctuations in oil prices because nominal oil price changes and government expenditure are impacted by crude oil price changes and real price oil price shocks moves the price level and exchange rates in the long-run. Abeysingle (2001), used a two sites approach, direct and indirect impact, to study the direct effect of increasing oil price and the indirect effect that works through an economy via trading partners.

The advantage of ARDL compared to traditional co-integration methods. Besides, it is more efficient in the base of small and finite sample data sizes. This technique provides unbiased estimates in the long run model. The second is commonly used for estimating the impacts of positive or negative economic shocks and analyzing the ripple effects throughout an economy.

The global crisis caused by declining global oil prices leads us to ask the following questions. To what extent the recent declining oil price affect Saudi Arabian crude oil export, government revenue and employment? The answer to this question will be provided for by this research study by combining econometric techniques autoregressive-Distributed lag and input-output estimation.

1.3 Research Question

i. What is the effect of oil price on export, government revenue and employment in Saudi Arabia?

ii. How does oil price shocks affects key sectors of Kingdom of Saudi Arabia?

1.4 Research Objective

The general objective of this is to assess the impact of oil price shocks on macroeconomic performance of the Kingdom of Saudi Arabia. Specifically, this study aims:

i. To examine the effect of oil price on export, government revenue and employment in Saudi Arabia.

ii. To analyse the impact of oil price shocks on the key sector of Saudi Arabia economy.

1.5 Significance of the Study

The significance of carrying out this work is that recent oil price shocks that set in the year 2014, marks a decade history that oil price declined more than 50%. Oil price declined from about US $100 per barrel to less than US $50 per barrel within one year. Therefore, the recent oil price decline is a recent issue that required investigation to uncover not only the direct effect but also indirect impact of the recent on oil price falls in the Saudi Arabian economy.

The second justification of undertaking this study is from the methodological point of view. This research work employed the Leontief (1936) production function as it theoretical framework while the input-output analysis of the same author is used as the empirical model. The input-output model is an extension beyond the simple national accounting that shows how each sector of the economy purchase production inputs from other sectors and how the sector sell its output as production input to other sector and also for final uses by households..

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1.6   Scope of the Study

The scope of the study focuses on effects of world of oil price movement that set in from the year 1991 to 2016 data. The recent Saudi Arabian 2010 input-output Table will be used for the analysis. Despite that, the scope focusses on effects of recent crude oil price fluctuation; additional data for previous years will be collected from various sources such as World Development Indicators (WDI), Organisation of Petroleum Exporting countries members (OPEC).

1.7   Organisation of the Study

The work area divided into five parts. The chapter one deals with the background of the main study, problem statement, objectives of the study, significance of the study, organization of the study and scope. The second chapter deals with the concepts definition, literature reviews and literature gap. The third study focused on the methods used such as the input-output. The fourth chapter deals with analysis, interpretation of result and discussion of the main findings while the fifth chapter concludes and provides some policy for recommendations based of the result findings.

REFERENCES

Abeysinghe, T. (2001). Estimation of direct and indirect impact of oil price on growth. *Economics Letters,* 73(2), 147-153.

Abrishami, H., Mehrara, M., Ghanimifard, H., & Keshavarzian, M. (2008). The asymmetric relatoinship between oil prices and macroeconomy in OECD net oil importing countries. *Journal of Economic Research*, 43(2), 1-16.

Abu-Ismail, K., Kuncic, A., Prasad, N., & Sarangi, N. (2014). An Arab Perspective on the Post 2015 Agenda: National targets, regional priorities and global goals. *In UN Economic and Social Commission for Western Asia (ESCWA)*. Lebanon: Beirut.

Akaike, H. (1978). On the likelihood of a time series model. *Journal of the Royal Statistical Society:* Series D (The Statistician), 27(3-4), 217-235.

Alfaro, L., Chanda, A., Kalemli-Ozcan, S., & Sayek, S. (2004). FDI and economic growth: the role of local financial markets. *Journal of International Economics,* 64(1), 89-112.

Algahtani, G. J. (2016). The Effect of Oil Price Shocks on Economic Activity in Saudi Arabia: Econometric Approach. *International Journal of Business and Management,* 11(8), 124.

Alkhateeb, T. T. Y., Mahmood, H., Sultan, Z. A., & Ahmad, N. (2017). Oil Price and Employment Nexus in Saudi Arabia. *International Journal of Energy Economics and Policy,* 7(3), 277-281.

Alkhathlan, K. A. (2013). Contribution of oil in economic growth of Saudi Arabia. *Applied Economics Letters,* 20(4), 343-348.

Al-Khazali, O. M., &Mirzaie, A. (2017). The impact of oil price movements on bank non-performing loans: Global evidence from oil-exporting countries. *Emerging Markets Review,* 31(C), 193–208.

Allegret, J. P., Couharde, C., Coulibaly, D., & Mignon, V. (2014). Current accounts and oil price fluctuations in oil-exporting countries: the role of financial development. *Journal of International Money and Finance*, 47, 185-201.

Al-Saleh, Y. (2009). Renewable energy scenarios for major oil-producing nations: The case of Saudi Arabia. *Futures,* 41, 650-662.

Altay, B., Topcu, M., & Erdogan, E. (2013). Oil price, output and employment in Turkey: Evidence from vector error correction model. *International Journal of Energy Economics and Policy,* 3(S), 7-13.

An, L., Jin, X., & Ren, X. (2014). Are the macroeconomic effects of oil price shock symmetric? : A Factor-Augmented Vector Autoregressive Approach. *Energy Economics*, 45, 217-228.

Anderson Jr, I. H. (2014). Aramco, the United States, and Saudi Arabia: *A Study of the Dynamics of Foreign Oil Policy*, 1933-1950 (Vol. 849). Princeton University Press.

Antonakakis, N., Chatziantoniou, I., & Filis, G. (2017). Oil shocks and stock markets: Dynamic connectedness under the prism of recent geopolitical and economic unrest. *International Review of Financial Analysis*, 50, 1-26.

Badeeb, R. A., Lean, H. H., & Smyth, R. (2016). Oil curse and finance–growth nexus in Malaysia: The role of investment. *Energy Economics,* 57, 154-165.

Baruník, J., Kočenda, E., & Vácha, L. (2016). Gold, oil, and stocks: Dynamic correlations. *International Review of Economics & Finance*, 42, 186-201.

Beck, T. (2011). Finance and oil: Is there a resource curse in financial development. *Center Discussion Paper No*. 2011-017. Netherlands: Tilburg University.

Bekhet, H. A., & Yasmin, T. (2014). Assessment of the global financial crisis effects on energy consumption and economic growth in Malaysia: An input–output analysis. *International Economics,* 140, 49-70.

Berument, M.H., Ceylan, N.B. and Dogan, N., 2010. The impact of oil price shocks on the economic growth of selected MENA countries. *Energy Journal,* 31(1), 149-176.

Bjornland, H.C. (2008). Oil Price Shocks and Stock Market Booms in an Oil Exporting Country, Norwegian School of Management (BI) and Norges Bank, *Working Papers* (16), pp. 2-39.

Blomberg, S.B., Frieden, J., Stein, E. (2005), Sustaining fixed rates: The political economy of currency pegs in Latin America. *Journal of Applied Economics*, 8(2), 203-225.

Bouchaour, C., & Al-Zeaud, H. A. (2012). Oil price distortion and their impact on Algerian macroeconomic. *International Journal of Business and Management,* 7(18), 99.

Brown, R. L., Durbin, J., & Evans, J. M. (1975). Techniques for testing the constancy of regression relationships over time. Journal of the Royal Statistical Society: *Series B (Methodological)*, 37(2), 149-163.

Brown, S. P., & Yücel, M. K. (2002). Energy prices and aggregate economic activity: an interpretative survey. *The Quarterly Review of Economics and Finance,* 42(2), 193-208.

Burakov, D. (2017), Oil price, economic growth and emigration: An empirical study of transmission channels. *International Journal of Energy Economics and Policy*, 7(1), 90-98.

Cavalcanti, T., & Tavares, J. (2016). The Output Cost of Gender Discrimination: A Model-based Macroeconomics Estimate. *The Economic Journal*, 126(590), 109-134.

Chen, H., Liu, L., Wang, Y., & Zhu, Y. (2016). Oil price shocks and US dollar exchange rates. *Energy*, 112, 1036-1048.

Chen, P. (2015). Global oil prices, macroeconomic fundamentals and China's commodity sector comovements. *Energy Policy*, 87, 284-294.

Chen, S.S. (2010). Do higher oil prices push the stock market into bear territory? *Energy Economics* 32, 490–495.

Choi, J. K., Bakshi, B. R., & Haab, T. (2010). Effects of a carbon price in the US on economic sectors, resource use, and emissions: An input–output approach. *Energy Policy*, 38(7), 3527-3536.

Cross, J., & Nguyen, B. H. (2017). The relationship between global oil price shocks and China's output: A time-varying analysis. *Energy Economics,* 62, 79-91.

Çulha, O. Y., Özmen, M. U., & Yılmaz, E. (2016). Impact of oil price changes on Turkey's exports. *Applied Economics Letters*, 23(9), 637-641.

De Bel-Air, F. (2014). Demography, Migration and Labour Market in Saudi Arabia. GLMM; Explanatory note; 1/2014; *Migration Policy Centre.*

De Santis, R. (2003). Crude Oil Price Fluctuations and Saudi Arabia's Behaviour. *Energy Economics,* 25, 155-173.

De V. Cavalcanti, T. V., Mohaddes, K., & Raissi, M. (2015). Commodity price volatility and the sources of growth. *Journal of Applied Econometrics*, 30(6), 857-873.

Dibooğlu, S., & Aleisa, E. (2004). Oil prices, terms of trade shocks, and macroeconomic fluctuations in Saudi Arabia. *Contemporary Economic Policy,* 22(1), 50-62.

Dickey, D. A., & Fuller, W. A. (1981). Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root. *Econometrica,* 49(4), 1057-1072.

Dizaji, S. F. (2014). The effects of oil shocks on government expenditures and government revenues nexus (with an application to Iran's sanctions). *Economic Modelling*, 40, 299-313.

Doraisami, A. (2015). Has Malaysia really escaped the resource curse? A closer look at the political economy of oil revenue management and expenditures. *Resources Policy*, 45, 98-108.

El-Nader, H.M., &Alraimony, A.D. (2012). The impact of macroeconomic factors on Amman stock market returns. *International Journal of Economics and Finance,* 4, 202-213.

Emami, K., & Adibpour, M. (2012). Oil income shocks and economic growth in Iran. *Economic Modelling*, 29(5), 1774-1779.

Energy Information Administration, & Energy Department (Eds.). (2015). *Annual Energy Outlook* 2015: With Projections to 2040. Government Printing Office.

Ewing, B. T., & Thompson, M. A. (2007). Dynamic cyclical comovements of oil prices with industrial production, consumer prices, unemployment, and stock prices. *Energy Policy,* 35(11), 5535-5540.

Fadaak, T. (2010). Poverty in the Kingdom of Saudi Arabia: An Exploratory Study of Poverty and Female-headed Households in Jeddah City. *Social Policy & Administration*, 44(6), 689-707.

Farzanegan, M. R., & Markwardt, G. (2009). The effects of oil price shocks on the Iranian economy. *Energy Economics,* 31(1), 134-151.

Fayyad, A., & Daly, K. (2011). The impact of oil price shocks on stock market returns: Comparing GCC countries with the UK and USA. *Emerging Markets Review*, 12, 61–78.

Ftiti, Z., Guesmi, K., & Abid, I. (2016). Oil price and stock market co-movement: What can we learn from time-scale approaches? *International Review of Financial Analysis,* 46, 266-280.

Genc, T. S. (2017). OPEC and Demand Response to Crude Oil Prices. *Energy Economics,* 66, 238-246.

Gokmenoglu, K., Azin, V., & Taspinar, N. (2015). The Relationship between Industrial Production, GDP, Inflation and Oil Price: The Case of Turkey. *Procedia Economics and Finance,* 25, 497-503.

Gronwald, M. (2008). Large Oil Shocks and the US Economy: Infrequent Incidents with Large Effects. *Energy Journal*, 29(1).

Gürer, N., & Ban, J. (2000). The economic cost of low domestic product prices in OPEC Member Countries. *Opec Review,* 24(2), 143-183.

Hamdi, H., & Sbia, R. (2013). Dynamic relationships between oil revenues, government spending and economic growth in an oil-dependent economy. *Economic Modelling*, 35, 118-125.

Hamilton, J. D. (1983). Oil and the macroeconomy since World War II. *Journal of Political Economy*, 91(2), 228-248.

Hamilton, J. D. (2005). Oil and the Macroeconomy. *The New Palgrave Dictionary of Economics*, 2.

Harris, R., & Sollis, R. (2003). Applied time series modelling and forecasting. *Wiley*.

Hassan, K., & Abdullah, A. (2015). Effect of oil revenue and the Sudan economy: Econometric model for services sector GDP. *Procedia-Social and Behavioral Sciences,* 172, 223-229.

Herrera, A. M., & Karaki, M. B. (2015). The effects of oil price shocks on job reallocation. *Journal of Economic Dynamics and Control*, 61, 95-113.

Hou, K., Mountain, D. C., & Wu, T. (2016). Oil price shocks and their transmission mechanism in an oil-exporting economy: A VAR analysis informed by a DSGE model. *Journal of International Money and Finance*, 68, 21-49.

Ibrahim, M. & Yusoff. (1999), Macroeconomics Variables and Stock Price in Malaysia: *Asian Economic Journal*, 13(2), 219-231.

Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and Control*, 12(2-3), 231-254.

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration—with applications to the demand for money. *Oxford Bulletin of Economics and Statistics,* 52(2), 169-210.

Kolodziej, M., Kaufmann, R. K., Kulatilaka, N., Bicchetti, D., & Maystre, N. (2014). Crude oil: Commodity or financial asset? *Energy Economics,* 46, 216-223.

Kwon, S. K. & Shin, T. S. (1999), Cointegration and Causality between Macroeconomic Variables and Stock Market Returns. *Global Finance Journal*, 10: 71-81.

Lardic, S., & Mignon, V. (2008). Oil prices and economic activity: An asymmetric cointegration approach. *Energy Economics,* 30(3), 847-855.

Lee, Chien-chiang, (2005), Energy consumption and GDP in developing countries: A cointegrated panel analysis, *Energy Economics,* 27, 415-427.

Leontief, W. W. (1936). Quantitative Input-output Relations in The Economic System of The United States. *Review of Economics and Statistics*, 18(3), 105-125.

Lescaroux, F., & Mignon, V. (2008). On the influence of oil prices on economic activity and other macroeconomic and financial variables. *OPEC Energy Review,* 32(4), 343-380.

47

Lewis, S. R. (1989). Primary exporting countries. Handbook of Development *Economics,* 2, 1541-1600.

Loayza, N., & Ranciere, R. (2006). Financial development, financial fragility and Growth. *Journal of Money, Credit and Banking* 38(4), 1051-1076

Maji, I. K., Saari, M. Y., Habibullah, M. S., & Utit, C. (2017). Measuring the economic impacts of recent oil price shocks on oil-dependent economy: evidence from Malaysia. *Policy Studies,* 38(4), 375-391.

Mehrara, M., & Mohaghegh, M. (2011). Macroeconomic Dynamics in the Oil Exporting Countries: A Panel VAR study. *International Journal of Business and Social Science*, 2(21), 288-295.

Michieka, N. M., & Gearhart, R. (2015). Oil price fluctuations and employment in Kern County: A Vector Error Correction approach. *Energy Policy*, 87, 584-590.

Milani, F. (2009). Expectations, learning, and the changing relationship between oil prices and the macroeconomy. *Energy Economics*, 31(6), 827-837.

Miller, J. I., & Ni, S. (2011). Long-term oil price forecasts: A new perspective on oil and the macroeconomy. *Macroeconomic Dynamics,* 15(S3), 396-415.

Mirchi, A., Hadian, S., Madani, K., Rouhani, O. M., & Rouhani, A. M. (2012). World energy balance outlook and OPEC production capacity: implications for global oil security. *Energies,* 5(8), 2626-2651.

Mohanty, S. K., Nandha, M., Turkistani, A. Q., & Alaitani, M. Y. (2011). Oil price movements and stock market returns: Evidence from Gulf Cooperation Council (GCC) countries. *Global Finance Journal,* 22(1), 42-55.

Mork, K. A. (1989). Oil and the Macroeconomy when Prices go up and Down: an Extension of Hamilton's results. *Journal of Political Economy*, 97(3), 740-744.

Moshiri, S., Banijashem, A., 2012. Asymmetric Effects of Oil price shocks on Economic Growth of Oil-Exporting Countries. *Social Science Research Network* (SSRN).

Murshidi, M. H., & Aralas, S. The impact of price shocks of crude oil, palm oil and rubber towards cross domestic product growth of Malaysia. *Proceedings of International Conference on Economics* 2017 (ICE 2017).

Nabli, M. M. K., & Arezki, M. R. (2012). Natural resources, volatility, and inclusive growth: Perspectives from the Middle East and North Africa (No. 12-111). *International Monetary Fund*.

Narayan, P., Smyth, R., & Nandha, M. (2004). Interdependence and dynamic linkages between the emerging stock markets of South Asia. *Accounting & Finance,* 44(3), 419-439.

Narayan, S. (2013), Foreign exchange markets and oil prices in Asia. *Journal of Asian Economics,* 28, 41-50.

Nazlioglu, S. (2011). World oil and agricultural commodity prices: Evidence from nonlinear causality. *Energy Policy*, 39(5), 2935-2943.

Nazlioglu, S., & Soytas, U. (2011). World oil prices and agricultural commodity prices: Evidence from an emerging market. *Energy Economics*, 33(3), 488-496.

Neary, J. P., & van Wijnbergen, S. (1985). Natural resources and the macroeconomy: a theoretical framework (No. 198536). *School of Economics,* University College Dublin.

Nusair, S. A. (2016). The effects of oil price shocks on the economies of the Gulf Co-operation Council countries: Nonlinear analysis. *Energy Policy*, 91, 256-267.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics,* 16(3), 289-326.

Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American Statistical Association,* 94(446), 621-634.

Phillips, P. C., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika,* 75(2), 335-346.

Prasad, A., Narayan, P. K., & Narayan, J. (2007). Exploring the oil price and real GDP nexus for a small island economy, the Fiji Islands. *Energy Policy*, 35(12), 6506-6513.

Rao, S. G., Gondal, M. A., & Dastageer, M. A. (2013). Thickness dependent morphology of Au and TiO 2 and optical study of TiO 2 thin films on patterns of self-assembled monolayers. *Surface and Coatings Technology*, 231, 412-417.

Rehan, M. (2017). Workplace Safety and Health Conditions and Facilities in Small Industries in Jeddah Saudi Arabia. *Journal of Safety Studies*, Vol.3, No.1

Rosser Jr, J. B., & Sheehan, R. G. (1995). A vector autoregressive model of the Saudi Arabian economy. *Journal of Economics and Business,* 47(1), 79-90.

Saari, M. Y., Alias, E. F., & Chik, N. A. (2013). The importance of the agricultural sector to the Malaysian economy: Analyses of inter-industry linkages. *Pertanika Journal Social Science and Humanifes*, 21, 173-188.

Saari, M. Y., Dietzenbacher, E., & Los, B. (2016). The impacts of petroleum price fluctuations on income distribution across ethnic groups in Malaysia. *Ecological Economics*, 130, 25-36.

Saari, M. Y., Shuja, N., & Rahman, I. A. (2013). Evaluation of impacts of the rise in energy prices on costs of production and living expenses in Malaysia. *Malaysian Journal of Economic Studies,* 50(1), 1-20.

Samargandi, N., Fidrmuc, J., and Ghosh, S. (2014). Financial Development and Economic Growth in an Oil-Rich Economy: The Case of Saudi Arabia. *Economic Modelling*, 43, 267278.

Sickles, Robin C., and Peter Hartley. 2001. "A Model of Dynamic Oil Extraction: Evidence from a Large Middle Eastern Oil Field." *Journal of Productivity Analysis* 15: 59-71.

Solaymani, S., & Kari, F. (2014). Impacts of energy subsidy reform on the Malaysian economy and transportation sector. *Energy Policy,* 70, 115-125.

Sugiura, N. (1978). Further analysts of the data by Akaike's information criterion and the finite corrections: Further analysts of the data by Akaike's. *Communications in Statistics-Theory and Methods*, 7(1), 13-26.

Turhan, M. I., Sensoy, A., Ozturk, K., & Hacihasanoglu, E. (2014). A view to the long-run dynamic relationship between crude oil and the major asset classes. *International Review of Economics & Finance*, 33, 286-299.

Unite Nation Division. (2015). *Unite Nation Division Statistical Annual Report 2015*. UN.

World Bank. (2013). *The World Bank Annual Report 2013*. The World Bank.

World Bank. (2015). *The World Bank Annual Report 2015*. The World Bank.

World Bank. (2017). *The World Bank Annual Report 2017*. The World Bank.

World Bank. International Economics Dept. Development Data Group. (2015). *World Development Indicators*. World Bank.

Wu, L., Li, J., & Zhang, Z. (2013). Inflationary effect of oil-price shocks in an imperfect market: A partial transmission input–output analysis. *Journal of Policy Modeling,* 35(2), 354-369.

Zhang, C., & Chen, X. (2014). The impact of global oil price shocks on China's bulk commodity markets and fundamental industries. *Energy Policy*, 66, 32-41.

Zhang, C., & Tu, X. (2016). The effect of global oil price shocks on China's metal markets. *Energy Policy*, 90, 131-139.

Zhang, D. (2017). Oil shocks and stock markets revisited: Measuring Connectedness from a Global Perspective. *Energy Economics*, 62, 323-333.

Yousef Alkhateeb, T. T., Sultan, Z. A. S., & Ahmad, N. A. A. (2017a). Oil price and employment nexus in Saudi Arabia. *International Journal of Energy Economics and Policy,* 7(3), 277-281

Zhao, L., Zhang, X., Wang, S., & Xu, S. (2016). The effects of oil price shocks on output and inflation in China. *Energy Economics*, 53, 101-110.

Zimmermann, F., & Smith, K. (2011). More actors, more money, more ideas for international development co-operation. *Journal of International Development, 23(5), 722-738.*