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THE IMPACT OF WORLD PRICE CHANGES OF OIL ON ECONOMIC GROWTH IN JORDAN

Econometric Study for the Period 2008 - 2019

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ABSTRACT

The study aims to showing how changes in the world oil prices affect the economic growth in Jordan, as well as to measure how these changes are passing through on the last prices of oil products such as gasoline, diesel, and kerosene. To meet the research goals, a set of econometric models that using monthly, quarterly and annual data. The study found a set of essential results, most notably that the oil consumption as a percentage of GDP has grown during the period of the study by 30.2% as measured by imported oil value, also it found that the ordinary and emergency price changes have no effects on oil's share of the economy, while it found that the low prices have a critical effect on the economy. The results also clearly showed that the government passed through 125% of the increases in the world oil prices to both types of gasoline, while the prices of diesel (kerosene) depend on its price recorded in the last month only. The results also, show that the fair prices for each liter of the gasoline 90 and 95 are $0.5829 and $0.9903 respectively while reaching $0.2758 to the diesel (Kerosene). The price gap of the diesel reached 201%, while it reaches 82% and 40% for gasoline 90 and 95 respectively. Finally, the study presents a set of essential recommendations in the pricing of oil products, such as the sectoral pricing according to the end-user, and it is becoming very necessary of issuing the benchmark list prices by consumer protection association as well as the price lists of other commodities in the local market.

KEYWORDS: *oil prices, economic growth, gasoline, diesel, oil consumption, oil products,*

1. INTRODUCTION

The changes in oil prices have many economic, social and political effects that reflected in all life activities related to people, institutions, government and private sectors alike. These effects can damage the pillars of economic stability and sustainable development of any country, regardless of its economic size large or small. There is no doubt that many countries, especially oil importers, have become aware of the economic risks arising from changes in oil prices, and trying to forecast and predict their future behavior, because of the expected constitutions and the risks they may have reduced the local economic activities. Many researchers have argued that forecasting the changes in oil prices is important issue.

Many studies have decided the positive impact of the decline in world oil prices on the economies of the importing countries, but the price increases remain the subject of debate and argument. Frankly, the price increases have a negative additional cost may be reflected in reducing the imported quantities of oil, in addition to the impact on producers (Huntington,2005). However, this price increases may have a positive effect on economic growth and social welfare of the economy, and this will be the main reason to use the oil quantities available efficiently , effectively, and optimal reallocation of such quantities among the economic sectors (Gately & Huntington, 2001).

From a historical perspective, oil prices have changed dramatically at different times, and these prices have become a permanent economic challenge is facing the budgets of many countries, especially the importing and poor countries, and it becomes a reason to apply the economic reform programs and change the growth priorities in such countries. For such reasons the need to reallocate the financial resources efficiently is a must. The oil prices increased on average from $ 69.8 in 2007 to $ 94.45 in 2008, before it falls to $ 61 and $ 77.2 in 2009 and 2010, respectively. The oil prices have new daily prices, and on August 2019, it reaches $59.69 (www.opec.org). The data also show that the increase in oil prices in October 2008 exceeds the accumulated price increases for more than ten years, where the price up from $16 in 1995 to $131 in June 2008. These price fluctuations is changed continuously until 2012 and reached $109, before the high decrease in 2016 which reaches $ 28.4, but the price after this year reaches $59 in September 2019.

In Jordan, the oil price changes are behaving similarly to the other importing countries, with the emphasis that the constitutions of the price increases may be clear in most economic sectors, so it seems one of the main reasons responsible of declining in the economic growth rates to less than 1.9% annually. The three-dimensional dilemma: budget deficit, the trade balance deficit, and public debt are pressured factors in the economy as well. The macroeconomic indicators show that the high inflation rate in 2018 reaches 4.65% and it causes a hyper increases in costs of production and investment. As a result, the foreign direct investment falls by 54%, the oil imports increases by 20% in 2018 which reached to JD 2.86 billion. The total value of imports reaches to JD14.35 billion in 2018. All of these constitutions are working under the main structural assumption says that 96% of energy sources in Jordan are imported (Ministry of Energy and Mineral Resources,2018). This situation requires deep thinking and measuring the real impact of price changes in oil on the domestic economy.

We add the governmental laws and regulations of oil pricing are not adequately organized, and the evidence of distortion in the market mechanism is proved, especially in the oil grants by GCC countries. The Jordanian government doesn't take these grants in the monthly pricing equation. The prices of oil products are sold at higher prices than equilibrium prices, and the end consumer afford the largest proportion of the cost, while the financial surpluses seems a net cash flow of the budget. The data estimates that net profits (cash flow) reaches to JD 1 billion annually (Minister of Finance, 2019). For example, the average price of oil barrel on July 2008 reaches $131.22, and the one liter of gasoline octane 91 and octane 95 are sold at $1.03667 and $ 1.18476, respectively, while the price of barrel on September 2019 reaches $59, but the one liter of the types of gasoline are sold at $1.064 and $1.387 respectively. The annual average of oil prices in 2019 (59$) is less than the average in 2008 by 54%.

Therefore, under these changes and causal ambiguity in the pricing equation of oil products, the most important and debated question clearly shown about how final oil products are priced in Jordan? This dilemma has the attention and thinking the Jordanian economists and researchers. The deep understanding of how the world oil prices affect the prices of local final products increase possibilities of the accurate forecasting of changes in domestic economy such as economic growth, type of social policies and cut the negative effects of living standards of the poor and low-income people.

Finally, it is noted that the price chaos in the economy mainly resulted from liberalization policy and the increases in the price of final oil products, in additions to the tax effects of fiscal policy on the exchange rate of JD and its purchasing power, and costs of production and investment in the economy. Under such conditions, there is a massive need for protection policies of the low-income groups, businesses and SME's is the economy.

2.LITERATURES REVIEW

2.1Introduction

The research show that the continuous rise in oil prices affects the economic performance of countries worldwide and the causal relationship is proved. The differences in the research results depending on the case of country itself. The results differ between the importing and exporting counties of oil in addition to the volume of oil consumed. Hamilton (1983) showed a negative correlation between the changes in the oil price and the growth rate in the real output of the US economy during the post-World War II. Huntington (2005) also noted that the recession in the last nine years of the US economy due to an increase in crude oil prices.

Not only the fully agreed of the previous studies on the negative impact of high oil prices on the economic activity, but also they differed in determining the size and type of effect. The increases in the crude oil price have many effects on the costs of production, transportation, energy, and raw material prices. The increases in cost of raw material consider the most affected factor and may it cause the supply shock in the economy. In detail, the increases in oil price have negatively affected most of macroeconomic indicators such as inflation, balance of payments, uncertainty, and economic stability (Mork1989). Despite the negative impact arguments of the increases in oil price in the economy, but there is a new optimistic point of view focuses on the positive role of such increases (Gately&Huntington,2001), especially in reducing the quantities consumed of oil, the effect on climate and environmental conditions, reallocate the quantities used, and use the oil more efficiently from an economic perspective.

The demand of energy sources (including oil) in the exporting countries is more elastic for price changes, but there is no agreement on the effects of such changes on the importing economies. It is argued that the elasticity of the low price in the non-oil countries requires designing public social policies for end-consumer protection against the hyper price increases (Gately&Huntington,2001;2007,Dargay,2001). According to the economic theory, the increase in the oil prices is enough reason to reduce the quantity of demand assuming that oil is a normal good (demand increase go with the increase in the level of income).

A group of researchers has tried to decide the actions and responses of different economies to the increase in oil prices. Some people confirm the efficiency and better allocation and best uses of oil it will happen, but the fewer quantities of oil may cut the level of national output and productivity. The first point of view is the best alternative to cut the volume of oil required, which may negatively affect the level performance and economic growth (Dargay, Gately & Huntington, 2007; Gately & Huntington, 2001).

Elsewhere, to assess the consequences of high oil prices in the Latin American countries, it finds that no effect of the high price on non-oil exporting countries, while there is clearly affected in non-oil exporting countries, and this is explained according to the inverse relationship in the demand law in such countries. Finally, there is no correlation between the price and the quantity of oil consumed in non-oil and middle-income countries and the previous results confirm the efficiency of use of oil consumption in non-oil exporting countries, while there are no reductions in the level of oil consumption in the middle-income and non-oil-exporting countries (Alaim&Lopez,2008).

The results above are economic evidence that governments don't need to show the price changes in oil on the local markets and end consumers. There is an agreement on how these changes affect the consumed quantity of oil, especially in importing countries. The price increase in such countries will lead to high levels of efficiency, better use, and allocation among different economic priorities and goals. It is also found

that there is a causal relationship between price change and the consumed quantity of oil in high-income or exporting countries, while it has no effect on the quantity demanded in middle and low-income countries. It clearly shows that the impact of price increases; there is an agreement on how impact price increases, but there is no relationship between price cuts and quantity demanded of oil (Alaimo&Lopez2008).

2.2Adaptation in Oil Consumption

The literatures show that the South American oil-exporting countries allowed a limited percentage of change in the crude oil prices to pass through the price of final oil products, especially gasoline. It also finds that the increases on the end-user is much more than price increases in the crude oil price in importing countries. To calculate the price changes of final oil products (gasoline and diesel) according to changes in world crude oil prices. The Eight Latin American countries have shown that there is an impact of world crude oil prices on the local consumer during 2004-2006, despite the varied changing ratios among different final products. For example, countries such as Venezuela, Argentina, and Mexico didn't pass any price changes of oil into final products, while countries such as Bolivia and Honduras imposed relative prices of final oil products by 60% and 80% of changes in the crude oil prices on gasoline and diesel, respectively. The highest pass rates are in Guatemala, Nicaragua, and Chile, with rates ranging between 95% and 115% on gasoline and diesel, respectively (Bacon & Kojima, 2006).

The previous results are consistent with the findings of World Bank studies (2006) that showed the countries such as Argentina, Mexico, Ecuador and Venezuela didn't pass the changes of crude oil price on their final oil products. These results are different in Brazil, Colombia, Dominican Republic, El Salvador, and Guinea. The increase in oil products reaches 100% of changes in crude oil prices (World Bank, 2006). To determine the rate of changes in the prices of final oil products based on the Tax Wedge. This tax wedge is an indicator of local governments that depend heavily on their end-users to increase the financial benefits and generate revenues through increases in the world crude oil prices. The final consumer in such countries affords the high percentage of changes in crude oil prices. The research worldwide show that the tax wedge clearly shows in Costa Rica and Guatemala on diesel item, and weakly applied of tax wedge in El Salvador and Nicaragua on gasoline, finally there is no evidence of the tax wedge in Guatemala and Honduras (Artana et al, 2007). Hence, the tax wedge is highly applied in importing countries, with poor evidence in exporting countries, so there is a high correlation between the price changes of crude oil and price changes of local oil products.

In Jordan, the monthly pricing method of final oil products designed by the government since 2008; doesn't take the consistency between world prices of crude oil and local prices of final oil products as well. This pricing method doesn't serve the economic activity because it depends heavily on the pure financial considerations that government looking for, and it aims at maximizing the financial revenues as well. This conclusion says that there is a long gap between the world price of crude oil and the final selling price of oil items. The net profit of oil trading reaches more than one billion JD yearly.

Therefore, the decision of liberalizing the prices of oil products in Jordan includes financial and political perspectives more than the economic benefits. This decision doesn't consider the economic stability perspective, economic development, best use of economic resources, and protect the national economy. The liberalizing decision is a key tool to decrease the fiscal deficit in the public budget and generate new revenues. This practice is against the rules of the free-market mechanism and it is a major source of economic recession and economic crises. In recent decades, the performance of the government doesn't pay the attention of the perspective of the Jordanian economy and the traditional and modern problems.

2.3 The Energy Problem in the Jordanian Economy

The Jordanian economy, like other developing economies, has a lack of natural and economic resources. The average volume of imported energy is 97% for 2017, and it varies much between different economic priorities. It reaches 100% in crude oil, 89.8% in gas and 88.3% in electricity (Ministry of Energy and Mineral Resources, 2017). The Jordanian market is relatively small and has a shortage of natural resources needed for growth, and the energy sector is one of the most problematic challenges, in light of the decreasing in the oil grants and immigrations from other closer countries such as Syria and Iraq, and in conclusion, the population size has increased to 10.5 million in 2019.

Despite the growth in the domestic demand for energy sources, Jordan is witnessing the impoverishment of all energy sources expected to be discovered, forgetting the exploitation of oil stones estimated at 130 billion barrels of oil can meet the needs for more than 100 years, and the privatization of energy sources. On the contrary, there is an excessive dependence on importing abroad. The high growth rate of primary demand on energy sources during 2008-2020 by 5.5% annually and the annual growth in electricity consumption reached 7.4% in the same period (Ministry of Energy and Mineral resources,2018), and the household sector has the highest percentage of energy consumption in 2018 reaches 45.4%.

The data show that the total cost of imported energy (with crude oil) reaches $17.8 billion during 1996-2008, and 2008 is the peaked reaches $3.6 billion. This growth in imports doesn't reflect the growth of the quantity demanded, but it is due to an increase in the level of world prices reached $ 147 a barrel. On the other hand, we find that the growth rate in the money value of oil imports between 2003 and 2004 reached 126% due to the constitutions of the war on Iraq, and the decline in subsidies and oil grants. The money value of imported energy in general and crude oil in particular, are increasing. At 2018, the money value of oil imports reaches $4.02 billion, up from $2.9 billion in 2010 and $5.24 billion in 2011 due to the constitutions of Arab Spring and the Egyptian gas explosions at the time.

Theoretically, the Jordanian economy is based on free-market mechanism, which has made it highly open to the world economy; and this makes it more vulnerable to the international changes and crises in peace and war, and subject to change according to international and regional relations and situations. All of this, in addition to other structural economic problems that become a part of the general structure of Jordan economy, such as unemployment, public debt, budget, and trade balance deficits.

Despite the last challenges, the Jordanian economy has achieved acceptable indicators in growth and development more than other large and rich surrounded countries. However,

the economic policies adopted by Jordanian governments are designed in isolation from the perspective of the Jordanian economy. These policies are reflected in the failure of planning, regulation, and implementation, and in achieving the desired goals.

Finally, the modern economic problem in Jordan can be formulated. It stems mainly from a political and military problem at all. Jordan is the same as other small countries that have no influence on the international political map. National currencies are used in the local market only, and their economic strength and stability heavily depend on the policies and decisions of those countries. So the Jordanian economic decision is subject to change for many factors, the most important factors are the international and regional conflicts and the expansion of economic interests of great powers in the world.

3.ECONOMETRIC MODEL AND ESTIMATION RESULTS

3.1 Econometric Model and Estimation Results: Causal Relationship between the prices and Quantity Required of Crude oil

The literatures suggest that oil-exporting countries have no reflected the price increases of crude oil on the local prices of final oil products. The causal relationship between oil prices and demand is one of the important goals of this study, so we will use the following formula:

$$\ln (E)_{it} = v_i + \acute{\alpha}_1 t + \acute{\alpha}_2 \ln (E)_{I,t-1} + \acute{\alpha}_3 \ln (y)_{I,t-1} + \beta \ln P_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

Whereas:

- E: Oil Consumption as a Percentage of GDP (Oil Contribution to Economic Growth).
- y: GDP at Current Market Prices in US $.
- P: The average annual price of Brent Crude $ / barrel.
- vi: fixed effect (syllable).
- i, t: random error.

The model (1) is used to estimate the value of the coefficient ê (the elasticity of change in the price of crude oil), with some necessary determinants for applying (Lopez&Alaimo,2008).

- If the coefficient value is less than zero ($\beta < 0$), the change in oil prices is considered to affect the consumption of oil.
- If the value of the coefficient is greaterthanzero ($\beta > 0$), the price changes of oil are not considered to affect the consumption of oil.

$$\ln (E)_{it} = 48.505 + 0.302\, t + 0.092 \ln (E)_{I,t-1} - 4.658 \ln (Y)_{I,t-1} - 0.1 \ln (P)_{i,t-1}$$

Table 1: Estimators of Model No.1.

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	48.505	78.464		6.618	0.043
	T	0.302	0.566	3.007	8.534	0.016
	LagLnE	0.092	0.727	0.101	3.127	0.004
	LagLnY	-4.658	8.079	-3.287	-0.577	0.589
	LagLnP	-0.100	0.719	0-.118	-3.139	0.045

a. Dependent Variable: LnE

Model	R	R Square	Std. Error of the Estimate	Durbin-Watson	F	Sig.
1	0.644[a]	0.415	0.31248	2.155	4.886	0.033

The results show that there is no auto-correlation among research variables according to the value of the Durbin Watson test (2.155). The statistical rule says that there no auto-correlation if the test value is close to (2). The ordinary least squares method OLS can be applied to get independent and unbiased estimates. The comparison between calculated (0.033) and tabulated (0.05) values of analysis of variance ANOVA indicates that there is a highly acceptable degree of fitness in the model. It has been shown that the timeline t for oil consumption as a percentage of GDP is increasing annually at a constant rate of 30.2%. This reflects the high dependence on oil within the economy. There are factors caused this growth such as: use the oil to generate electricity during the Egyptian gas crises and the increase in the household demand due to increases in the growth rate of the population. The migrants from Syria, Iraq, Yemen, and Libya. This migration movement raised the population growth from 6.49 in 2008 to 10.5 million in 2019.

The study noted that the dependence on imported oil doesn't reflect the economic growth in Jordan, but we find that the economy is strongly declined and recessed. Governmental policies have encouraged the oil consumption through some practices and laws. The government reduced the dependence on alternative energy sources and canceled exemptions to renewable energy projects and hybrid cars. Therefore, depending on imported crude oil is the first choice for the Jordanian decision-maker for financial purposes (Ministry of Finance, 2019). The increase in the consumed quantity of oil may partially reflected in the money value of oil imports.

It is clear that the time lag coefficient in the productivity of the economy (t-1) explained by the percentage of oil consumption of GDP has strong positive relationship and statistically significant with the dependent variable (Oil Contribution to Economic Growth). It is clear here that the percent of economic growth (level of productivity) heavily depends on the final contribution of oil in the economy. This explains that the economic growth is a cumulative process and can't be considered a special case for a certain year, but we find that the time effect on many economic variables is clearer in following years. For example, the decline in foreign direct investment in 2017 by 54% caused the raising the unemployment rate by 19.2% in 2019. Although the increase in the money value of oil imports may consider as leakage

source of foreign currencies, but on the other hand it is a key engine of economic growth and development, because oil is the engine of the economy at all.

The effect coefficient value ϑ as the ratio of oil consumption to GDP (expressed as oil productivity of output) indicates that this value is less than zero ($\vartheta < 0$) in accordance with the main assumption in the econometric model (formula 1). The oil is an influencer factor on the productivity of the Jordanian economy. According to the demand law, the increase in oil prices in the earlier year will cut the volume of oil consumed in the next year for hedging purposes. This hedging will improve the efficiency of oil consumption in the household sector reaches 40% of total consumption and increase of economic growth by less than 2% over the past years. On the contrary, the increase in oil prices is the main reason for the increases in costs of production, investment, energy, raw material, uncertainty, and the inflation (4.65% in 2018) (Department of Statistics, 2018). Finally, all constitutions are causing the supply shock in the economy, and it reduced the level of economic stability (Mork,1989).

In the end, the volume of consumption is declined, the economic growth is modest, and the level of output decreased compared to last year (Dargay et al, 2007).

Most of the variables mentioned in Formula 1 are affected the oil productivity (contribution) to the economic growth in Jordan, except the growth rate in the GDP which recorded a modest rate of 1.9% in spite of the oil price changes according to the comparison between the tabulated and calculated significance values of the ANOVA. It is also found that the independent variables in the formula explained for 41.5% of the changes in the oil productivity, and there is a middle relationship among them reached 64.4%.

3.2Testing the Price Changes on the Demanded Quantity of Oil

Estimating the parameters of the formula 1 helps to decide whether higher oil prices will improve the efficiency, invest in instruments that may use energy more efficiently, and maintain capital equipment. The decline in world oil prices could lead to an intensive use of capital, and the theory is that the probability of such a test is through the following formula:

$$\Delta \ln P^{+} = \begin{cases} \Delta \ln P \text{ if } \Delta \ln P > 0 \\ 0 \text{ if and only If } \Delta \ln P \leq 0 \end{cases} \qquad \Delta \ln P^{-} = \begin{cases} \Delta \ln P \text{ if } \Delta \ln P < 0 \\ 0 \text{ if and only If } \Delta \ln P \geq 0 \end{cases}$$

By rewriting formula (1) using the condition of probability, we get the following:

$$\ln(E)_{it} = v_i + \acute{\alpha}_1 t + \acute{\alpha}_2 \ln (E)_{I,t-1} + \acute{\alpha}_3 \ln (y)_{I,t-1} + \beta_1 \ln P^{+}_{i,t-1} + \beta_2 \ln P^{-}_{i,t-1} + \varepsilon_{i,t} \quad (2)$$

Formula 2 requires that $\beta_1 < 0$ and $\beta_2 < 0$, and this condition leads to more flexibility (Gately&Huntington,2002;2007). It has been assumed that this formula is based on harmony and consistency, and the inverse relationship with the price inelastic. The model considers that oil price increases have different sub effects (not the same at all), and therefore don't give the same effect on the demanded quantity of oil. Here the model explains that emergency increases in world oil prices don't have the same effect of normal increases. To clarify the last idea more accurately, some studies have classified price levels in several types, and after compensating the three types of prices described in the formula No. 3, as follows (Gately & Huntington, 2002):three types of prices described in the formula 3 below, as follows (Gately & Huntington, 2002):

$$\ln P = \ln P_0 + \ln p_{Max} + \ln P_{Cut} + \ln P_{Rec} \quad (3)$$

Where:

- P_0: Brent Crude at the Beginning of the Year.
- P_{Max}: The Ordinary Cumulative Increases in the Price of Crude Oil.
- P_{Cut}: The Cumulative Declines in the Price of Brent Crude Oil.
- P_{Rec}: The Unordinary Cumulative Increases in the Price of Brent Crude Oil.

All of the above data use the quarterly basis and using the natural logarithm. By formula 3, the price of Brent crude oil can be substituted in formula 1.

$$\ln (E)_{it} = v_i + \acute{\alpha}_1 t + \acute{\alpha}_2 \ln (E)_{I,t-1} + \acute{\alpha}_3 \ln (y)_{I,t-1} + \beta_1 \ln P_{Max,t-1} + \beta_2 \ln P_{Cut,t-1} + \beta_3 \ln P_{rec,t-1} + \varepsilon_{i,t} \quad (4)$$

Formula 4 has three price coefficients $\beta_1 > \beta_2 > 0$ and $\beta_3 < 0$. Thus, price increases generate different effects on the required quantity of oil. The previous formula shows that the time lag of price increases (the largest value of the price increase) differs from the price increase, which may be more or less than the normal deviation in a given period (Gately&Huntington,2002) which showed that $\beta_1 > \beta_2 > \beta_3$.

Using quarterly data for the period 2008 - March 2019 to give a clear picture of the sources of changes that occur in the dependent variable as follow:

$$\ln (E)_{it} = -5.887 - 0.055t + 0.462 \ln (E)_{I,t-1} + 0.647 \ln (y)_{I,t-1} + 0.507 \ln P_{Max,t-1} - 0.352 \ln P_{Cut,t-1} + 0.927 \ln P_{Rec,t-1}$$

It is found that oil contribution to economic growth is decreasing every three months by 5.5% during the period 2008 - 2019. This decrease is due to one of two reasons; the first reason is the decrease in the money value of the crude oil consumed. This decline in the average prices of Brent crude oil affects the monthly pricing list of final oil products. The second reason is that the high rate of imported crude oil is higher than the rate of economic growth in Jordan, This is due

to the increase in household uses more than industrial or commercial. This stimulates the non-productive consumption patterns of the household sector and would negatively affect the productivity of the economy.

Most of the factors, in the formula 4 are statistically significant in terms of the impact on the oil contribution in the national economy except the rate of economic growth (Y). Therefore, it is found that there is no effect of the time lag of growth in GDP on its value in the next years according to the level of statistical significance (0.154). It should be noted that the three changes that may occur in prices are inelastic and have different effects on the quantity consumed of oil. This conclusion is consistent with the assumptions of formula 4, which considers all price increases that occur are different (not the same) and don't give the same effect on the quantity of oil required or on its contribution to economic growth. The theory shows the inverse relationship under the law of demand is not proved, and this relationship is inelastic according to the coefficients of influence, so all three price increases have given different results on the productivity of the consumed quantity of oil.

The ordinary (normal) price changes in crude oil (P_{Max}) correlated positively with the quantity consumed (against the law of demand theory), and this explains that the price increase caused the same increase in money values to obtain the same amount of oil (oil bill), in addition to the lack of alternative sources of energy and the bad purchasing behaviors and responses toward higher prices are discussed. According to the decision rule, it is found that the value of elasticity (impact factor) is greater than zero. So this is evidence that the price increase of oil doesn't affect the level of productivity in the economy and has no, reflect on the efficiency of use or better allocation of resources according to inelastic impact factors. The normal (Ordinary) price increase causes an increase in the required quantity of oil, but less than the increase in the price, which means that the relationship between efficient use of oil and price increases is not proved. The above result also clearly shows in the effect of the unordinary price increases (P_{Rec}) on the oil contribution to the economy, in spite of such increases (0.927) is greater than the ordinary (normal) price increase (0.507), so this conclusion is consistent with the main hypothesis of the model $\beta_1 < \beta_3$.

Table 2 : The Estimation Results of Formula4 .

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-5.887	4.157		-1.416	0.166
	t	-0.055	0.010	-1.914	-5.617	0.000
	LagLnE	0.462	0.119	0.453	3.893	0.000
	LagLnY	0.647	0.444	0.386	1.456	0.154
	LagLnPmax	0.507	0.143	1.026	3.545	0.001
	LagLnPcut	-0.352	0.148	-0.592	-2.379	0.023
	LagLnPrec	0.927	0.259	1.125	3.577	0.001

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
1	0.896[a]	0.803	0.769	0.16799	23.779	0.00

Finally, it is found that the decline in oil prices on the consumed quantity consistent with the demand law, where the value of the impact factor is less than Zero ($\beta < 0$). The economy will benefit from the economies of scale that may be created by price decreases, as it may be directed towards industrial production or improving the overall productivity of the economy and its contribution to economic growth. Although the value of elasticity indicates that the low price will increase in the consumed quantity of oil by a percent less than the price decline. Perhaps the big advantage of the economy is the decrease in the money value of oil imports and this support the balance of foreign currencies and cut the deficit in the balance of trade.

The results show that the independent variables in the amended formula 4 explain for 76.9% of the variation in oil productivity in the economy. The formula is statistically accepted according to the tabulated and calculated significance values and there is a strong positive relationship reaches 89.6% among variables. It is found that the results of two variables didn't meet the model assumptions: $\beta_1 < 0$ and $\beta_3 < 0$, while found that $\beta_2 < 0$ has met the decision rule and the value is less than zero. The ordinary and unexpected (unordinary) price changes (P_{Rec} and P_{Cut}) have no effects on oil productivity to economic growth in Jordan.

3.3 Passing The World Price Changes to Oil Products:

In this study we will decide the degree to which the price changes in crude oil are passed to the end consumer (oil derivatives), using the following formula:

$$\ln (PG)_{it} = v_i + \alpha_2 \ln (PG)_{I,t-1} + \alpha_3 \ln (PO)_{I,t} + \beta \ln (PO)_{I,t-1} + \varepsilon_{i,t} \quad (5)$$

Whereas:

- PG: The Final Monthly Selling Price of Oil according to the Jordan Pricing Committee of Oil Products.
- PO: Brent Crude Oil Price in US Dollars.
- vi: fixed effect (syllable).
- i, t: Random Variable.

To estimate this model using the monthly data available during the period 2008 - September 2019 as follows:

A. The Passing Ratio on Gasoline octane 90:

$$\ln (P_{Octane90})_{it} = -0.367 + 0.882 \ln (P_{Octane90})_{I,t-1} + 0.367 \ln (PO)_{I,t} - 0.282 \ln (PO)_{I,t-1}$$

It is found that the price of gasoline octane 90 in the current month is affected by all the variables included in the last formula. It is found that there is a positive relationship with the price of gasoline 90 recorded in the last month t-1, as well as with the world oil price in the current month and all of such variables are statistically significant. While there is a significant negative relationship with the world oil price recorded in the last month ($\ln (P_O)_{I,t-1}$). The government passes \$0.367 on the final consumer price of gasoline 90 according to the pricing method of final oil products in Jordan, which uses the world oil price recorded in the last month, while the price cuts by 0.282 are a must. Therefore, the prices on this item grow by \$0.882 per month. The result is that the price of gasoline 90, based on the prices of Brent crude oil is supposed to decline during the study period by 36.7%, but we find that the government is passing \$ 0.882 of the increase in the world oil prices through this item. The gasoline 90 is the lowest price and the more demanded by Jordanians. However, the results show that the price of gasoline 90 should decline on average by 36.7% during the study period.

B.The Passing Ratio on Gasoline octane 95:

$$\ln (P_{Octane95})_{it} = -0.134 + 0.974 \ln (P_{Octane95})_{I,t-1} + 0.368 \ln (PO)_{I,t} - 0.335 \ln (PO)_{I,t-1}$$

It is found that the price of gasoline 95 in the current month is affected by all the variables in the formula. There is a positive statistical relationship with the price recorded in the last month t1, and highly correlated with the world oil price in the current month. While the negative statistical relationship with the world oil price in the last month (time lag) proves. The government passes \$0.368 through the last price of gasoline 95, but the fair price should be reduced monthly by \$0.335 according to the oil price in the last month. So the prices of this item, grow by \$0.974 per month. We find that the increases on gasoline 95 is greater than gasoline 90. The gasoline 95 targets the rich people in Jordan and the high tax rates also imposed. The result is that the Jordanian government passes 36.8% of the changes in the world crude oil price through the final consumer of gasoline 95. However, the results show that the price of gasoline 95 should decline on average by 13.4% during the study period compared with the actual price.

C. Estimating The Passing Through Ratio on Diesel (Kerosene):

$$\ln (Pker)_{it} = -1257 + 0.554 \ln (PKer)_{I,t-1} + 0.175 \ln (PO)_{I,t} + 0.089 \ln (PO)_{I,t-1}$$

The results show that the current and last prices for Brent crude oil have no impact on the price of kerosene or diesel in the current month ($\ln (P_{ker})_{i,t}$). This result can be noted according to the monthly data obtained. The Jordan government always fix the monthly prices of kerosene and diesel in winter. Hence, the current price of kerosene (diesel) is based on the price recorded in the last months without taking into consideration the price changes in the world oil price. On average, the kerosene (diesel) prices grew monthly by \$ 0.554 during the study period. The conclusion says that the government doesn't pass the changes in the world oil price, but it depends heavily on the last month prices of kerosene (diesel) to measure the current price, the average monthly charge by 55.4% of this item. However, the results show that the price of kerosene (diesel) should be reduced on average by 125.7% during the study period.

Table 3: The Estimation Results of Formula5.

The Item	a	P(G)t-1	P(0)	P(0)t-1	Statistical Indictors	F	The Fair Prices Per Gallon (20 Liters In US$)
Gasoline 90	-0.367 *(-2.292) **(0.003)	0.882 * (21.536) ** (0.00)	0.367 * (4.326) ** (0.00)	-0.282 * (-3.181) ** (0.002)	R^{-2}=0.87 R=0.935 D-W =2.409	246.55 (0.00)	13.4224
Gasoline 95	-0.134 *(-1.732) **(0.001)	0.974 * (41.394) **(0.00)	0.368 * (6.213) ** (0.00)	-0.335 * (-5.575) ** (0.00)	R^{-2}=0.949 R=0.975 D-W =2.215	672.042 (0.00)	24.02845
Diesel (Kerosene)	-1.257 *(-6.128) **(0.00)	0.554 * (8.126) **(0.00)	0.175 * (1.566) ** (0.12)	0.089 * (0.716) ** (0.476)	R^{-2}=0.762 R=0.876 D-W =1.871	118.164 (0.00)	6.1742

*t tabulated value . **Significant Value of Variable. The Significant Level of Test 0.05.

The table 4 below, shows that the fair prices of final oil products added all taxes and fees imposed by the Jordan government. The fair price of one liter of the gasoline 90 and 95 are \$0.5829 and \$0.9903 respectively, while the price of each liter of the kerosene (diesel) is \$0.2758 during the study period. The comparison between the fair and real prices shows that government maximizing the profit through kerosene (diesel) because the gap between the fair price and real priced reaches 201%. The gasoline 95 is generating the low revenues because the gap between the two prices reaches 40% only.

Table 4: The Fair Price of Oil Products in Jordan

The Item	Average Price During The Period	Impact Factor During The Period	Fair Price Per Liter In US	The Fair Prices Per Gallon (US$)	The Fair Prices Per Gallon (JD)	Actual Price Per Gallon (JD)	% Δ
Gasoline 90	0.920866	- 0.367	**0.5829082**	11.658164	8.2773	15.1	82.427
Gasoline 95	1.14357	-0.134	**0.9903316**	19.806632	14.062709	19.7	40.086
Diesel (Kerosene)	0.7426	-1.257	**0.2758759**	5.51752	3.917439	11.8	201.217

*The Gallon = 20 Liters.

4.RESULTS DISCUSSION AND RECOMMENDATIONS

The literature suggest that the behavior of oil-exporting countries may differ from importing and the difference shows in their ability to adapting with the external price changes. Despite the negative impact of the increase in oil prices on economic activity, but there is another point of view believes that the positive role may occur in reducing consumption, protecting the environment, efficiency of use and better allocation of consumption. Jordan, as one of oil-importing counties has similar behavior to other oil-importing countries. Although the increase in the consumption of crude oil has no positive effect on the economic growth in Jordan, and the bill of imported oil and balance of trade deficit are increased. Conversely, it causes the shock supply of the economy due to an increase in the costs production and investment, inflation, uncertainty and in conclusion, the economic stability is declined.

In more detail, the ordinary and emergency price changes (P_{Max} and P_{Rec}) in Brent crude have no impact on the macroeconomic productivity. The theory supposes that such increases should be reflected in the efficiency of use, the better allocation, and distribution among the different economic priorities in Jordan. On the other hand, the impact of the price decreases have a strong statistical impact on the quantity of oil. So the household consumption is higher than the industrial and production sectors. The decreasing in bill of oil imports, the foreign currencies and the balance of payments are overall benefits as well.

Countries behave differently from others on how price changes in crude oil pass on the final selling price in the local country. Originally, oil-importing countries find price levels on the items greater than the changes in the price of crude oil. The local government is well aware of that, and in spite of the clear trend in decreasing world oil prices, the government is increasing the prices of final oil products rapidly, especially gasoline with two types of octane 90 and octane 95. The estimation shows that the increases reached 88.2% and 36.8% respectively, and such increases are not consistent with the changes in the price of Brent crude oil. It appears that the price of kerosene (diesel) is not affected by the price of Brent crude oil, but it depends on the price of diesel or kerosene recorded in the last month. It is clearly shown that the gap between fair and actual price tends to diesel (Kerosene). This gap reaches 82% and 40% for gasoline 90 and 95 respectively. Through Kerosene (diesel) the government can maximize the public revenues.

Finally, the study recommends that the current pricing of oil products should be reviewed, and the sectoral pricing may be more efficient, since it is not possible to impose an equal price ratio on all sectors without taking into considerations the purchasing power, volume of investment, nationality, and the purpose of purchasing for each consumer. It is also necessary for the government to include grants and oil subsidies in the pricing formula for oil products, to cut the negative impact on the economy due to price increases. In addition to the need for the Consumer Protection Association to issue an index of oil prices similar to other sectors in the local market.

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