World Journal of Social Sciences
Vol. 2. No. 4. July 2012. Pp. 208 – 217

Crude Oil Prices and Economic Growth: Are They Truly Interdependent?

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The problem of consistent economic growth became the major debate theme in the last several decades of economists and politicians due to growing price and demand for energy. The oil business related industries has been changing substantially in the market considering constantly fluctuating prices which systematically disrupts economic growth targets set up by different governments. This research paper examines the truthfulness of the statement that oil price movement impacts on economic growth. It demonstrates that the conception has already moved out from the frame of classic market model of supply and demand and it is now relying on irrationally moving oil prices resulting in lost connection with actual economic indicators. The interdependence of crude oil price and economic growth is not obvious in all sectors of economy, however the price of crude oil has direct impact on related fields whereas other sectors of businesses do not have such huge dependence neither on crude oil sector nor its price.

Field of Research: Impact of oil prices on economic growth of countries

1. Introduction

One of the most discussed topics among academicians, economists and politicians is the issue of impact of energy price volatility on economic growth of countries. The trend of economic growth has vital effect on major indicators such as employment, inflation, etc. of any country whereas energy cost has been under focused attention since it is major cause of fluctuating demand for products and services. This subject has turned to be much more serious since the financial crises of 2008 as rising cost of crude oil and its derived commodities has been putting pressure on different sides of national economies. This paper shall be reviewing oil related energy market development during the last decade underlining its impact on economies of developed countries. There shall be highlighted several important factors in price formation of crude oil since it has a tremendous effect on economic growth pointing out the importance of consideration of supply sources of oil.

The findings presented in this article are confirming major conclusions that have been made so far underlining that economic performance of countries both exporting and importing crude oil are heavily relaying on oil related commodity prices. However, the deeper investigation reveals that against common liberal market economy perception the price of oil is not formed based on supply and demand model, but, it is established on trading floors of major commodity exchanges that are actually create the price.

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In the beginning part of the paper, it shall be illustrated the crude oil market overall and its role in market segmentation. In the next part, the basic understanding of crude oil price impact on economic growth shall be underlined whereas the last part will be the description of changing market tendency from oil based to alternative energy generation resources. The final part shall conclude that existing link between energy prices and economic performance is not true reflection of existing supply and demand in the market. Taking into account present rules of trading in world market with oil and its derivatives, it should be presumed that actual suppliers and receivers of goods refer to prices formed at trading floors by speculators who are actually disrupting principally the important link of supply and demand price formation leading to incorrect indicators of economic performance and unreasonable economic downturn reflected in rising unemployment rate, inflation, etc.

2. Literature Review

The noticeable fact to mention in this study is that there is lack of fundamental academic works studying the particular effect of cost of oil on economic growth. Nevertheless, it is analyzed everyday and discussed in leading financial news agencies as well as publications how rising cost of energy is dragging down economies. It is even widely perceived that the one of the causes of European financial turbulences of 2011 was raising cost of oil due to politically motivated reasons in oil exporting countries. Therefore, the major source for analyses in this paper would be those recently published articles from such leading newspapers as ‘Financial Times’ and the journal ‘The Economist’ in addition to separate researches conducted by different academics.

The role and importance of crude oil pricing is well described by Shah (2008) and Smil (2004) who pointed out the great effect of rising oil prices for oil exporting countries whereas the beginning of era of price speculation is believed to start from 70s of the past century. The examination of Parra (2010) and Downey (2009) in this field opens new horizons for research looking into perspectives of price settlement since establishment of OPEC (Organization of Petroleum Exporting Countries). Moreover, the dramatic rise in price during the last decade is another topic for study as the price went up from 30 US dollars to 140 US dollars per barrel. However, none of these works have actually contributed into understanding of price formation in the market. It is still unclear how exactly it is changing today in the market considering the fact that the sense of the market, dependence on supply and demand, has been lost.

The complexity of the system does not allow having a straight answer to a simple question of dependence of economic growth over oil prices. Nevertheless, different perspectives of this problem offer for consideration analysis information only from top of the iceberg. The comprehensive view of oil industry demonstrated by Downey (2009) cover partially the process of exploration and production further distribution into the market whereas the subject of valuation of crude oil is not indicated in any part of research. Taking into account certain influence of petroleum products price on overall economic performance, this part is omitted from academic study. Despite the fact of existence of certain reports and research in this sphere, the lack of academic work is partially the result of non-provision of information from government sources, multinational companies, etc. in reference to actual cost of crude oil production, refining cost, distribution and taxation.

3. Methodology

The broad view of energy market and economic growth provides opportunity to apply different methodologies to understand the problem. It has been widely used the methodology of quantitative analysis referring to the figures of energy price on the one hand and gross domestic product figures of different countries on the other. This paper shall be based on qualitative analysis to underline that quantitative arguments are not right indicators studying impact of energy prices on economic growth. Although, it shall be argued that qualitative reflection must be made in the beginning, it shall be further applied quantitative method so that to demonstrate that the connection of energy prices and economic development indicators must be reviewed from new angle.

The oil industry does not have long history as energy source however, recent progress in different sectors of economy is the outcome of events of relatively short period. It is worth highlighting that the oil price movement has very short term effect on economic performance of the countries and therefore there is not any reasonable ground to assume that price fluctuations in the beginning of this century might be considered to be ground for reflection of existing economic performance. Thus, the period to be covered in the analyses is referring recent decade since those figures are building today's unemployment rate, inflation, interest rates, etc. whereas analysis of previous period might be offered for contemplation only to underline historical development of the industry.

It has been studied the case of rising crude oil prices and supply of crude in the market and Noreng (2007) who found out that once the price is falling, it does not mean that there is excess of supply. In the same way, observing rising price of crude in the market, there is not found any indication that there is shortage of supply. Nevertheless, it is assumed that the correlation of the price in accordance with supply and demand in the market might be observed only in the short term. It is argued that one of the main reasons of such unfairness in price formation of crude oil and its derivative commodities is the fact of diversified delivery into the market is leading to different price formation. Based on this conception, this paper is following the notion that true impact on economic growth by changing crude oil prices is observed only in the short term. Furthermore, the lost connection of the link with true market indicators such as oil supply and demand has resulted in misbalance between crude oil price and economic growth.

4. Oil Business History

The Beginning, Supply Crisis and OPEC

It is necessary to review oil industry overall so that to build picture of how oil sector of economy operates. While it is commonly known that process begins with exploration and production, the basic point of evaluation of the performance is the actual price of the commodity in the market. This is a leading factor which covers cost of production, delivery of physical oil into the market, refining, distribution of petroleum products and finally the price is mirroring market perception of real supply and demand.

It is mentioned by Shah (2004) that oil prices and its increase has impact on infrastructure and road building as well as the development of all related industries in energy sector. It is however, a quite interesting fact that the biggest oil exporter Saudi

Arabia is falling behind Romania and Thailand in such vital spheres as life expectancy, education and income in the beginning of last decade oppose to common view that oil exporting countries do not need investments. Lavish flow of petrodollars to Gabon till 1990s made the country one of the largest per capita importer of champagne whereas inability of authorities to direct oil money into the future end badly and now Gabonese are struggling for basic needs as food, house, education, etc. On the other hand, there are some small countries exporting crude oil into world oil market which managed to establish strong economic growth. It is worth mentioning that UAE and Brunei are among countries that made quite significant achievements in major areas of economies.

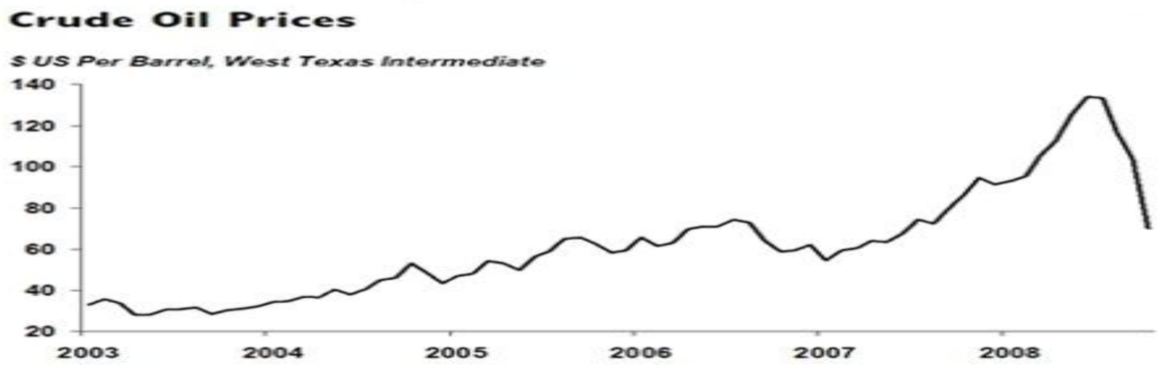
The importance of price settlement mechanism is described by Smil (2008). It is pointed out that one of the fundamental and important characteristics of oil business is the price of this commodity as well as petroleum products which impacts at the end cost of production. It must be underlined that there were such events which disrupted supply of oil into the market as Saudi Arabia embargo in 1973 and Iranian revolution of 1979. Nevertheless, the diversity of the market has turned out to be so big that relatively recent development created very complicated system of price establishment. It has been founded paper market where exists opportunities to hedge risks of physical buy and sell via paper trading of options, swaps and futures. The financial crises of 2008 allowed open debates concerning validity and truthfulness of the crude oil price in the market from the perspective of supply and demand model. Thus, there are different opinions and arguments regarding recent price movements when it skyrocketed up to 140 US dollars per barrel in mid 2008.

In line with this conception Parra (2010) also underlines that the main element of oil industry is price arrangement. This issue was researched highlighting several interesting facts. First of all, it is pointed out that there were several cases in the past when oil exporting countries took advantage of unique position in the market as single suppliers and fixed sale prices. This opportunity was adopted by oil cartel OPEC members established in 1960 in Baghdad whereas unexpected events in Iran in 1979 demonstrated that the price might be hitting high even without agreement among exporting countries. Iranian revolution of 1979 drastically cut supply of oil to the market. Thus, it became necessary for developed oil importing countries to ensure that there is no price fixing by exporting countries whereas there should also be built oil reserved capacity to avoid situation occurred during late 1970s. According to latest estimations, the US today possesses strategic oil reserve of 727 million barrels (The Economist [4], 2011). Although, the price of oil and its derivates are believed to be reflection of supply and demand in the market, the mechanism of hedging risks opened the way for much more open trading opportunities where the process of buys and sells are occurring with no actual consideration of supply in the market.

Price Movement, Why it is Rising and Falling?

There is very interesting tendency reviewing price movement and crude oil production rate. Despite the fact of constantly rising production rate since the beginning of 1970s from 50 million to 85 million barrels in 2010, price has been very volatile during mentioned period. It is observed that during two oil crises between 1970 and 1980 the price hiked astronomically high from 10 US dollars per barrel to 90 US dollars per barrel in 1980. Nevertheless, further price evolution did actually prove the theory that increase in supply impact on prices. In the next twenty years till the beginning of 2000 the price fell from peak of 90 US dollars to 20 US dollars per barrel. However, sharp rise of price to all time peak of 140 US dollars in 2008 according to the figures of Graph 1 might be interpreted in different ways. First of all, it might be claimed that economies were growing at much higher rate than oil production might cover. Secondly, trading opportunities to buy and sell oil commodities openly with no actual supply gave ground for speculators to create market bubble where price uncontrollably moves to the sky high or to down bottom (Downey 2009).

Graph 1



Source: Ontario Ministry of Finance 2008

So, the short overview of oil industry from the moment of its industrial production demonstrated that there has been a constantly rising demand for crude oil. Although, supply and demand are believed to be in the core of price establishment, the history of price movement showed that in the beginning supply cut provoked huge price rise. The increase in supply later pushed the price down whereas this scenario might be considered as a classic economic case of supply and demand. Furthermore, the price hike beginning from early 2000 also became evidence of economic growth and undersupply of oil into the market. However, the financial crises of 2008 and subsequent sharp downfall of prices raised question regarding truthful reflection of price of crude oil. Thus, it became necessary to research in depth the link of between price of crude oil in the market and economic growth both developed and developing countries.

5. Oil Prices and Economic Growth

What Sectors of Economy Depends on Crude Oil?

It is the common perception that the increase in price of oil by 10 per cent cut quarter to a percentage point of economic growth (The Economist [1], 2011). The study of crude oil marketing should begin with reference to estimation of oil share in energy generation around the globe. According to Downey (2009) crude oil is in the first position with 38 per cent from total pie of global energy production whereas the coal in the second place with 26 per cent shares. It is also interesting to notice that crude oil has only 7 per cent share in global electricity generation whilst a lion part belongs to coal with 40 per cent whereas 19 and 16 per cents fall onto natural gas, hydro and nuclear reactors. There is an absolutely immense volume of crude oil is used for transportation keeping this market totally dependant on gasoline, diesel, jet fuel and fuel oil. It is calculated that 64 per cent of oil produced globally are directed to transportation industry. Since transportation is considered to be vital part of economic development, there are several theories studying interdependence between costs of transportation and economic growth. As per one theory examining rising oil prices the higher the price, there would be more stimulus for economic growth. However, it should be pointed out that there was increase of import of oil into the major developed countries of the world whereas according to Pfeifer (2011) there was rise by 70 billion US dollars into EU, 72 billion the US and 27 billion in Japan in 2010 at the time when oil cost around 100 US dollars per barrel in figures in comparison with figures of early 2000. Furthermore, according to latest report of International Energy Agency the import cost of oil in 2012 shall be 1,5 tn this year subject to price of crude oil stay at level 120 US dollars per barrel. It is also assumed that this scenario shall drag oil importing countries into recession (Chazan, 2012).

Shah (2004) argues that massive investments into oil exploration and production business stimulate economic growth. One of the areas which need heavy investments is upstream projects. According to the information of 2003 there was invested more than 136 billion USD in Saudi Arabia into exploration and production phase which also included the usage of the newest technological innovations such as three-dimensional seismic survey. The case of Middle East oil industry itself is paving the way for the argument underlining that oil exporting countries are returning their petrodollars back to developed countries to receive from them finished products (Blas, 2011). This circulation model partially proved itself as workable mechanism since there is no shortage in supply, related industries are actively involved into the process establishing very reliable investment environment whereas employment is also secured for short and mid term future.

What is Forming Crude Oil Price?

It must be underlined that the price of actual oil which is physically available and supplied vary since there are different locations where it might be sold. It is demonstrated by Downey (2009) that crude might be sold on wellhead, at refinery gate, at pipeline end, on rail tank cars, on vessels and certainly delivery provision agreed between buyer and seller would be primary source of price settlement. It would be quite right to mention at this stage that demand for petroleum products depends not only on cost of production of oil or its price, there is a very serious player as governments which impose taxes on petroleum sale. There is very interesting statistic comparing price of petrol in the US and in the UK subject to condition that crude oil price and refining cost is the same in both countries. According to the information of January 2009 distribution and marketing cost of petrol in the US was 0.27 US whilst in the UK it is slightly higher standing at 0.40 US dollars. However, the most noteworthy point that government tax in the UK is almost ten times higher than in the US where the tax is 0.39 US dollar oppose to 3.40 US dollars government tax in the UK.

In addition to taxes that are imposed by different government on petrol sale prices, there are also other additional taxes that are implemented by crude oil exporting countries. This tax is levied by host countries to companies producing hydrocarbon resources under the frame of production sharing agreements. It has been broadly analyzed by Noreng (2007) who pointed out that the mechanism of taxation began in early years of production from Saudi Arabia and North Sea. It was practiced that taxes on oil production was between 10 and 20 per cents during 1950s. However, the system of taxation later changed at the time when dependency on oil was rising and exporters gained much more advantageous position in the market. Therefore, in the next decade when oil cartel was already established, tax mechanism changed and producer must had share 50/50 per cent with land owner which in most of the cases was the government. There were even some circumstances when governments managed to agree on 60/40 per cent share between company and government. It is clearly defined by Noreng (2007) that the taxation mechanism is different for oil exporting and importing countries. Considering rapid development of Asian market especially China and India, it is stressed that the taxation principles in these countries are very difficult. There are two doctrines that are applied in these circumstances whilst welfare argument presumes that the burden of price should be falling on shoulders of final consumers. However, under this scenario there is fear for developing countries since economic activity might fall. As it was pointed out oil is primarily used for transportation and disruption in this sphere of economy might have very disastrous consequences. On the other side, there might be applied the principle of subsidies by the government partially covering cost of petroleum products. However, the major negative effect of this mechanism is that general economy would be misleading as untruthful prices might disrupt entire economies, the balance of export/import and finally energy consumption under this case shall loose its entire relevance.

Thus, referring to the studies and arguments it might be concluded that there is only partial connection between energy prices and economic performance. In addition to identification of cost of transportation in one or another country, the availability of resources, refining capacities and finally supply chain management are among major factors that impact on energy prices. It is quite rightly stressed: “The oil industry is extremely complex: getting the right sort of oil to the right place at the right time is crucial” (The Economist [1], 2011). In contrast to general perception that economic growth depends on oil and its derivative prices, this estimation must take into account number of factors since not all pre-conditions are the same to make correct evaluation of the link between energy prices and economic performance.

6. Alternative Energy Generation Industry

Why Do We Need Alternative Energy?

Considering the specific characteristics of energy industry as well as cost of oil production and price, it is not surprising that the development of renewable energy generation sources came to an agenda. It should be highlighted that oppose to perspective of economic growth in the frame of oil industry, on the other side of the coin there is also negative side of oil exploration. There have been a number of incidents which have had devastating effects on the environment. Whilst BP oil spill in Mexican Gulf in the beginning of 2010 is considered to be one of greatest disasters in recent history, during first gulf war at the territory of Kuwait, there were more than 700 oil and gas wells which were extinguished in nine months (Smil 2008).

The development of alternative energy sources aimed to reduce oil dependency and establish a much more environmentally friendly energy generation industry and it has been under focused attention of different developed countries’ governments. While George W Bush was president and at the time when Californian Governor was Schwarzenegger, they planned to develop alternative energy generation in 2003 via application of research and development in hydrogen fuel cells investing into this project around 2 billion US dollars. Moreover, the same policy was implemented and the same amount of investment was approved by European Commission to adopt in

EU. It might also be underlined another fact, considering opportunities existing in Iceland, the country put forward very ambitious plan to become country with 'hydrogen economy' (Shah, 2004).

The discussions around reducing carbon emissions and working in much more friendly environmental conditions are top priority now. It was estimated that during 1980s more than 5.5 billion tons of carbon dioxide were released which means that on average there was dropped into atmosphere 5 pound pack of carbon from every car after every 20 miles drive. One of direction of energy industries is that oil importing countries are searching alternative sources of energy. In this regard, it must be pointed out the fact that as per evaluations of ExxonMobil there must be spent between 100-200 US dollars to generate energy from sunlight worth energy of 25 US barrel of oil (Shah, 2004). These figures imply that current market circumstances are favoring more crude oil production rather than developing an alternative energy generation. At the same time, nevertheless, it is demonstrating that stimulation for investment are relying not only oil industry, but to those sectors of economy which actually releasing market from oil dependence.

7. Conclusion

The oil industry has several very specific characteristics and they must be considered in the frame of analyses when studying connection between price of commodity and its impact on economic performance of the countries. The historical overview demonstrated that the industry was relying on supply and demand principles when market was establishing price for crude and therefore economic growth was dependant on basic market principles. Further development showed that rising oil prices was linked with expanding economic activities outlining that supply and demand was keeping the pace of importance in history till 2008. The financial crises and dramatically falling prices of crude oil opened a number of questions whether there is real bond between crude oil market and economic performance.

It was underlined that this energy sector market segment has direct impact on such sectors of economy as transportation, exploration and production as well as it is provoking also investments into alternative energy generation industry. The cost of oil is supposed to be building on these factors whereas it was also mentioned that the taxation mechanism adopted by governmental bodies is also one of the main elements establishing the price of oil.

So, the brief overview of dependence of economic growth over oil prices demonstrated that the commodity price is no longer based on supply and demand in the market. The price is not the reflection of true market indicators and therefore it would be wrong to study economic growth performance based on crude prices. Secondly, oppose to common conception that economic growth depends on oil prices, there are actually only several sectors of economy directly impacted by fluctuating prices of oil. Thirdly, it must be noticed that it is not fundamental economic indicators directing crude oil market, vice verse it is the price of crude oil established at commodity exchanges is leading the market and thus indirectly affects economic growth.

The arguments presented in this paper might be further developed studying each separate country, its GDP growth, petroleum products prices, crude oil purchase price, etc. The main limitation of this work is that it does not refer to actual figures of countries and their statistical figures to support the argument. Moreover, the wide variety of elements must be taken into account in this analyses beginning from oil exploration moment until the last sale point so that to follow price formation mechanism from its early stage.

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