

Economic and Energy Sectors Options For Libya's Future

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Abstract

The global economy is developing at an enormous rate even though every country is being faced with the problems of energy resource exhaustion and environmental pollution. Therefore, it is urgent to develop the economy and diversify eco-energy resources. Since 1976, Libya has made strategic plans for resources variation and the development of the economy to introduce a partial alternative to the traditional sources of energy (oil and natural gas). However, oil and natural gas have continued to play a major role in Libya's economy as the main source of revenues and energy.

In the last decade, the production of Libya's oil has been shut down unexpectedly due to the political tension and was significantly interrupted for much of 2011-2018. At the same time, the oil prices rebounding caused the economy to shrink accompanied by the decrease of per-capita income. Furthermore, inflation rates have jumped at record levels and still continuing.

This study is aimed to explore the effect of the price and production quantity of oil on Gross Domestic Product (GDP¹) and per-capita income. The researcher conducted a comprehensive survey that has included the reports of many originations and institutions to show the impact of fluctuations in oil prices on per capita income.

The study has found that there is an urgent need to develop a strategy to find other energy resources to cope with the high developing rates of the economy. Moreover, the

¹GDP: Gross Domestic Product, which is the total value of all goods, services, agricultural produce and minerals extracted in a country or area, usually in one year. Often the GDP divide by the population is used as a measure of relative prosperity. $GDP=C+I+G+(X-Im)$. C= Consumption Expenditure, I= Investment, G=Government Expenditure, X=Export, Im= Import.

study has shown that encouraging the private sector to find alternative resources other than oil and gas and making fundamental adjustments to the management of oil revenues will ensure the increase per capita income and the improvements in the economic, health and educational situations.

Keywords: Sustainability, Renewable energy, Gross Domestic Product and Oil.

بدائل القطاعين الاقتصادي والطاقة لمستقبل ليبيا

ملخص: يتطور الاقتصاد العالمي بمعدل متزايد بالرغم من ن كل الدول تواجه مشكلة استنفاد موارد الطاقة وما يصحبها من التلوث البيئي. لذلك ، من الضروري تطوير الاقتصاد وتنويع موارد الطاقة البيئية. منذ عام 1976 ، وضعت ليبيا خطاً استراتيجياً لتنويع الموارد وتنمية الاقتصاد لإدخال مصادر الطاقة البديلة ولو بشكل جزئي مع المصادر المماثلة التقليدية للطاقة (النفط والغاز الطبيعي). ومع ذلك ، واصل النفط والغاز الطبيعي لعب دور رئيسي في الاقتصاد الليبي كمصدر رئيسي للإيرادات والطاقة.

في العقد الماضي ، تم إيقاف إنتاج النفط الليبي بشكل غير متوقع بسبب التوتر السياسي وتوقف لفترات طويلة خلال الفترة الممتدة ما بين عامي 2011 حتى 2018. في الوقت نفسه ، تسبب تراجع أسعار النفط في انكماش الاقتصاد مصحوباً بانخفاض دخل الفرد. علاوة على ذلك ، قفزت معدلات التضخم عند مستويات قياسية ولا تزال مستمرة.

تهدف هذه الدراسة إلى استكشاف تأثير سعر وكمية إنتاج النفط على إجمالي الناتج المحلي والدخل الفردي. حيث قام الباحثان بدراسة استقصائية شاملة تضمنت العديد من تقارير مختلفة المصادر لإظهار تأثير التقلبات في أسعار النفط على دخل الفرد.

وقد وجدت الدراسة أن هناك حاجة ملحة لتطوير استراتيجية لإيجاد موارد بديلة للطاقة لزيادة معدلات النمو في الاقتصاد. علاوة على ذلك ، أظهرت الدراسة أن تشجيع القطاع الخاص على إيجاد موارد بديلة غير النفط والغاز وإجراء تعديلات جوهريّة على إدارة عائدات النفط سيضمن زيادة دخل الفرد وتحسين الأوضاع الاقتصادية والصحية والتعليمية.

Introduction

Libya as a member of the Organization of Petroleum Exporting Countries (OPEC) holds the largest proven oil (Mohamed, Al-Habaibeh and Abdo, 2013) and gas reserves and has one of the highest Gross Domestic Product per capita in Africa (Etelawi, Blatner and Mccluskey, 2017, Libya GDP Annual Growth Rate, 2019). It is located in the middle of North Africa (See Figure-1). It has a large coast, 1900 Km long on the Mediterranean Sea with six neighbors: Tunisia, Algeria, Niger, Chad, Sudan, and Egypt. It is also situated on the cancer orbit line (Geographic coordinates 25.00 N, 17.00 E). It is exposed to the sunlight during the year and all day long. Most of Libya's surface consists of coastal plains, plateaus and mountains. The desert extends deep into the south with scattered villages and small towns. The climate is Mediterranean; it is warm in summer and mild in winter. The desert climate in the South is very hot in summer with extreme diurnal temperature ranges. The average temperature is between 15°C throughout the winter and 35°C during the summer time (Staff, 2013, Mohamed, 2016). Libyan's economy is dependent on oil as the main source of energy. Oil export revenues are very important to the economic development of Libya as they represent 96% of the total revenue (Mohamed, 2016), which provided approximately 95% of all export revenue (Meyer, 2016).

In 2011, Libya went through a civil war. During the conflict, oil production was disrupted which resulted in a GDP contraction of over 40 %. However, it is expected that with the recovery of the oil industry, the high rates of growth will be back. (Libya GDP Annual Growth Rate, 2019).



Figure -1: Map of Libya
Source:(EIA, 2018).

Related Works

Previous studies state that oil and economic performance in petroleum developing countries and non-petroleum-based countries. Obviously different factors directly or indirectly affect economic growth as measured by the GDP. Population is also a significant factor in explaining changes in GDP, as well as political factors (Abbas, H, 1987, Shameah, 1996, Kilani, K, 1987, CBL, 1996) argued that the contribution of the petroleum to GDP was highest than other sectors in the Libyan economy, particularly the industrial and agricultural sectors, despite the enormous amount of money invested in them to raise their share of GDP.

In terms of GDP and per capita income in Libya, (Kilani, K, 1987) demonstrate that the growth of both was due to a rise in the petroleum revenue since 1962. In 1958, the GDP was £L52 and at the same time per capita income was £L40. In 1962, the GDP rose to £L55.5 million to attain the peak of LD 10,271 million in 1980. After 1981, it declined to reach a minimum of LD 6,577 million in 1986, then began to rise gradually. Per capita income rose gradually from LD 642 in 1970 to the peak of LD 3,154 in 1980. Then it decreased to reach a minimum of LD 1,807 in 1989 after which, the per capita income increased gradually.

Other studies indicate that the Libyan economy is heavily dependent on the oil sector, it is the main source of income for all Libyan sectors. Therefore, this study is an attempt to assess the relationship between economic growth and GDP in Libya. It was found

that it is important to determine the factors affecting GDP growth as the increasing GDP results in an increased standard of living and a decrease in the unemployment rate. Estimating the relationship among these factors provides policymakers and researchers with a better understanding of the Libyan economy and a basis for developing plans and strategies for improving the standard living within the country. While increased exports have a positive effect on the Libyan economy, policymakers should also consider different policies to rationalize local domestic fuel consumption and diversify the resources of energy and income (Etelawi, Blatner and McCluskey, 2017).

Ali and Harvie, 2013, stated that increasing oil revenue may also influence the non-oil trade of payment. The authors highlight that investment is one of the most important factors needed to improve the Libyan economy, the Libyan economy is no exception to other oil developing and non-oil developing countries. Fluctuating oil prices also have a large impact on economic growth. Akram, 2011, demonstrated that the effect of oil prices on economic growth has received considerable attention in the economic literature since the early 1980s. This is particularly true for developing countries because they do not use energy efficiently. The developing countries lack alternative energy sources compared to developed countries.

There is a strong relationship between economic growth and oil prices, (Alimi, S. R., Muse, 2013) illustrated that it is important to focus on international markets in order to attain a viable development strategy aimed at rising productive capacity. Fluctuations in world prices affect GDP and development projects for employment and economic growth.

Libya's GDP is directly affected by world oil prices. The authors consider that the non-oil sector in Libya is also influenced by fluctuating of the oil prices and that high oil prices lead to increased revenue as well as more financing for increased imports. Libya's economy has a strong positive relationship between oil price and economic growth.

The results in Mohamed, Al-Habaibeh and Abdo, 2013, Mohamed et al., 2015, and Mohamed, Al-Habaibeh and Abdo, 2016 indicated that Libya is rich in renewable energy resources but in urgent need for a more comprehensive energy strategy and detailed implementation including reasonable financial and educational investment in the renewable energy sector. The continuous growth in energy demands is one of the important challenges facing energy policymakers in Libya. The exploitation of renewable energy in Libya is becoming important to sustain people's lifestyle as well

as sustaining energy resources. Libya, similar to other countries, is seeking to boost its economy, increase and maintain its sources of income, encouraging investment, and creating new employment opportunities. In addition, the Libyan government started to address issues such as oil reserves and environmental pollution.

Research methodology

In order to gather data for this paper, the researcher conducted a comprehensive survey that has included the reports of World Bank, the United Nations, Central Bank of Libya, Organization Petroleum Export Countries (OPEC), United States Energy Information Administration (EIA), Central Intelligence Agency (CIA), Index Mundi, various papers, and books related to the subject of the research.

Results and discussion

Libyan economy background

This part gives an understanding of the importance of the discovery of petroleum on the Libyan's economic sector through providing a summary of government operations, revenues, and budgets and at the same time, the effect of this change on both Gross Domestic Product (GDP) and per capita income in Libya.

It could be argued that prior to the year 1960 it was difficult to express any development of the Libyan economy due to the country was poorly baled with skilled and educated manpower, additionally the lack of water and other natural resources. However, the country was relying heavily on advisors including technicians from the UK, USA, and UN(OMAR, 2003, Bait-Elmal, 2000). In 1951, the average per capita income was less than \$30 per year while by 1960 it increased to \$100 per year. Previous to the discovery of petroleum in 1959 and the beginning of production in 1961, Libya was one of the poorest countries in the world (Vandewalle, 1998). In 1955, the GDP was £L15 million Libyan pounds. However, post-1958, GDP had elevated to £L52 million (OMAR, 2003, Bait-Elmal, 2000). Prior to the petroleum discovery, the country became dependent on the aid from foreign states and payments for the use of military bases, particularly the UK and USA (Abbas, H, 1987). Throughout this time, Agriculture was the important mainstay of Libyan society and economy. Unlike the agriculture, the industrial sector was limited, due to lack of capital investment, power, and raw materials, although the early years of 1951 the main export was scrap metal salvaged from the debris of the

Second World War (Abbas, H, 1987). The Esso company discovered the commercial oil in Zeltenoilfield in 1959 (OMAR, 2003, Bait-Elmal, 2000). Theoilfield of Zeltenstarted to produce oil in August 1961 after which the production rose rapidly. Libya was the second-largest producer by the year 1969 in North Africa and Middle East region (Giurnaz, 1985). The Libyan economy has had improved widely as the oil production and revenues rose at a huge rate for the first time by petroleum producer. Per capita income and GDP increased considerably as petroleum revenues rose. Meanwhile, the National Income rose in the year 1962 from £LM131 (131 Million Libyan pounds) to £LM798 in the year 1968 (OMAR, 2003).

Oil and natural gas contributed 65.3 % to the real GDP and approximately 95% to Libya's export revenue in 1980 (Charles, 1985). In the 1980s, the Libyan economy was affected by the low petroleum prices. The petroleum revenues decreased at \$5 billion in 1988 from \$23.2 billion in 1980(Fishr, W. B, 1990,Ghanem, 1987).

The economic challenge

Oil is the main source of revenue in Libya, whereaccounts for about 95% of the state's total income, about 65% of GDP and oil exports accounted for 96% of the total Libyan exports(loops, 2016).

Since 2003, lifting international sanctions,Libya has maintained high levels of economic growth,taking advantage of rising world oil prices and growth in non-economic sectors.

Real GDP growth averaged about 7.5% per annum in 2004-2007, driven by a 10% growth rate in non-oil sectors. And with the collapse of oil prices in late 2008.GDP growth rate dropped to 3.8%. Domestic real GDP continued to decline to about 2% in 2009 due to a 1.5% decline in oil production and oil revenues fell by 36%. The sharp drop in oil prices in 2009 also led to a decline in the total public finance surplus to about 10% and the current account balanceto about 17% from GDP. Despite huge investments in the agricultural sector and non-oil-related industries, the share of oil in GDP remained the main factor.Diversification of economic activity remains the biggest challenge to sustainable development in Libya(Mohamed, 2016).Moreover, Libya's

economic situation is unsteady. Oil and gas typically represent 70% of Libya's GDP. In 2012, the decline in oil exports from \$60.9 billion to \$8.4 billion in 2015, has severely impacted government income, devastating public services, in particular, the education and health systems. Increasingly erratic power supply, high inflation, and food shortages became common. In 2016, suspension of some subsidies, mainly on food contributed to a sharp increase in prices, particularly in remote regions and the capital city (Programme, 2019). In 2017, real per capita GDP growth in Libya, increased by just 1.8% and projected to increase by just 2.3% and 2.9% in 2018 and 2019. The GDP rose 55.1% (GDP annual growth rate) in 2017 after declines in previous years of economic contraction, however, the output remained about a third lower than the period before the Libyan uprising in 2011. GDP grew in 2017, (See Figure -2), due to the significant increase in oil production. With the sharp decline in oil prices accompanied by the awful security, political, and humanitarian condition, real GDP in 2014 contracted more than 50% in Libya and continued to shrink through 2015 and 2016, although at a slower rate. Accompanying the OPEC agreement to cut oil production to 32.5 million barrels a day, which started early 2017, oil prices increased slightly and fluctuated between \$52 and \$60 from August to November 2017. In fact, exempt from this agreement, Libya rose oil production substantially toward the end of 2016 and throughout 2017, boosting forecasted growth in real GDP for 2017 and 2018. The economic attitude remains highly uncertain and dependent on progress in achieving stability and fluctuating oil prices.

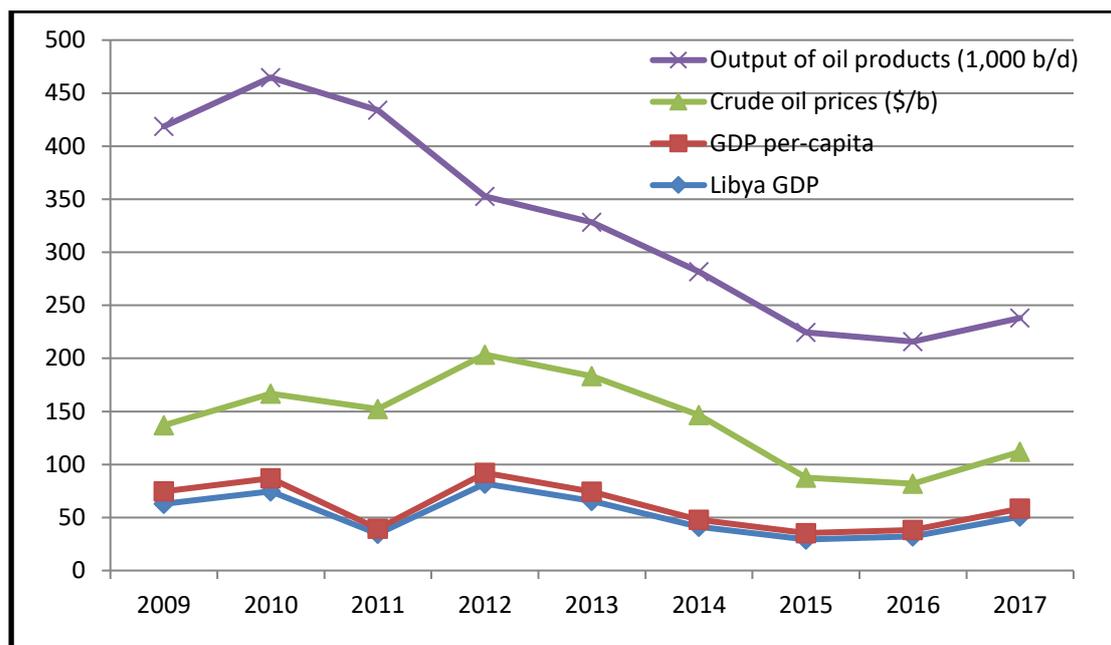


Figure -2: Libyan GDP, Libyan GDP Per-capita, Crude oil price, and output oil products.

Source: OPEC: Annual Statistical Bulletin (2013 & 2018)

Figure-2 clarifies the relationship between Libyan GDP, Libyan GDP Per-capita, Crude oil price, and output oil products, whereas, the increase in oil production or oil price have a significant impact on the Libyan economy. However, other sectors, for example, industry and agriculture outputs had continued at low levels, although the huge investment in these sectors to increase their share of the GDP, and to obtain the self-sufficiency target.

Oil sector more resilient to instability

Instability of oil production in Libya has been a theme in Libya since the events of 2011. Many distinct phases since then have been reflected in the changes in Libya's oil output.

Mid-2011 and mid-2013, a time of relative stability allowed the quick recovery of majority oil output missing throughout the war. The events of 2011 had inflicted little damage to energy production and economic growth back to more than 1.4Mb/d was attained in little more than six months. It was an astonishing recovery and witness on the wealth of professional expertise within the Libyan energy sector. This was not the last instant that the resilience of the country's oil industry would surprise outside analysts. From September 2013 to September 2016, a political split in the country was visible in several ways. Shut down the ports of the Sirte Basin's oil, the closure lasted until

September 2016. Libya's economy struggled in throughout this time, making efforts to build a post-revolutionary landscape more difficult (Etelawi, Blatner and McCluskey, 2017).

The oil production, from a daily average of about 400,000 barrels a day (b/d) in 2016 to 900,000 in September 2017, enhanced economic performance. The Libyan budget deficit is expected to turn into a surplus of 1.8% of GDP in 2017, with an estimated increase in exports of 62.5% and an estimated boost of 4% in imports, which have been falling with the decline in foreign reserves. After peaking in 2015 at 126.6% of GDP, the budget deficit dropped to an estimated 43% of GDP in 2017 (Adesina, 2018, Libya GDP Annual Growth Rate, 2019, Rpser, 2019).

After 2017, oil production has dipped periodically since then due to disruptions but has also rebounded strongly so that in October 2018, output was at 1.25mb/d. Once more, the resilience of Libya's oil sector revived and hopes that a period of sustained stability would underpin the next phase to come, in which can deliver on plans to regain 2011 output levels of 1.6Mb/d in 2019 and push towards 2mb/d by 2022. (Etelawi, Blatner and McCluskey, 2017)

Conclusions

From the literature review and secondary data, it has been found that the growth of both GDP and Per Capita Income in Libya were due to a rise in the petroleum revenue since 1962. Therefore, there is a strong relationship between economic growth and oil production and prices. The Libyan economy is heavily dependent on the oil sector, it is the main source of income for all Libyan sectors. In fact, this study has also found that the oil is the important factor affecting GDP growth, for that reason the increasing GDP results in an increased standard of living and a decrease in the unemployment rate. Estimating this factor provides policymakers and researchers with a better understanding of the Libyan economy and the basis for developing plans and strategies for improving the standard living within the country.

Libya, similar to other countries, is looking to enhance its economy, increase and maintain its sources of income, encouraging investment, and creating new employment opportunities. The continuous growth in energy demands is one of the important challenges facing the energy policymakers in Libya. Exploitation of renewable energy

in Libya is becoming important to sustain people's lifestyle and sustaining energy resources.

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References

- Abbas, H. W. (1987) *Industrial Development and Migrant labour in Libya*. Manchester University.
- Adesina, A. A. (2018) *African Economic Outlook*. African Development Bank Group. Available at: https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/African_Economic_Outlook_2018_-_EN.pdf.
- Akram, M. (2011) *Do crude oil price changes affect economic growth of India, Pakistan and Bangladesh?* HOG HOGSKOLAN DALARNA.
- Ali, I. and Harvie, C. (2013) 'Oil and economic development: Libya in the post-Gaddafi era', *Economic Modelling*, 32(1), pp. 273–285. doi: 10.1016/j.econmod.2013.01.022.
- Alimi, S. R., Muse, B. O. (2013) 'Export led growth driven exports? Evidence from Nigeria.', *British Journal of Economics Management and Trade*, 3(2), pp. 89–100. doi: org/10.9734/BJEMT/2013/2386.
- Bait-Elmal, A. (2000) 'The role of management control systems in Libyan organisations: a Libyan development policy case study with special reference to the industrial sector.', *Structure*, (January 2000).
- CBL (1996) *The Economic Report*. Tripoli- Libya.
- Charles, G. (1985) 'A Preliminary Assessment of the Distribution of Non-hydrocarbon Minerals.', in M. M. Burn, S. M. G. and K. S. M. (ed.) *Planning and Development in Modern Libya*. 178-93, London: Menas, 1985.
- EIA (2011) *No Libyan supply disruption may have both direct and indirect effects, Independent statistics and Analysis: U.S. Energy Information Administration*.
- Etelawi, A. M., Blatner, K. A. and McCluskey, J. (2017) 'Crude Oil and the Libyan Economy', (May). doi: 10.5539/ijef.v9n4p95.
- Fishr, W. B., . (1990) *Libya, The Middle East and North Africa Report*. 36 th Edit. European Publications limited, London.
- Ghanem, S. (1987) 'The Oil Industry and the Libyan Economy: the Past, the Present and the Likely Future.', in Khader, B. & El- Wifati, B. (Eds), *The Economic Development of Libya*. Croom Helm, London.
- Giurnaz, A. (1985) *Economic of Oil: A Case of Libya*. University of Keele.
- Kilani, K. A. (1987) *The Evolution and Status of Accounting in Libya*. University of Hull.
- Libya GDP Annual Growth Rate (2019) *TRADING ECONOMICS*. Available at: <https://tradingeconomics.com/libya/gdp-growth-annual> (Accessed: 20 May 2019).
- loops (2016) *The reality of Libyan oil in 2016*. Libya. Available at: <http://loopsresearch.org/media/images/photo39cbtcgz4m.pdf>.
- Meyer, T. (2016) *5 Most Oil-Dependent Economies in the World, Investopedia*. doi: <https://www.investopedia.com/articles/investing/011216/5-most-oildependent-economies-world.asp>.
- Mohamed, A. M. A. et al. (2015) 'Towards exporting renewable energy from MENA region to Europe: An investigation into domestic energy use and householders' energy behaviour in

- Libya', *Applied Energy*, 146, pp. 247–262. doi: 10.1016/j.apenergy.2015.02.008.
- Mohamed, A. M. A. (2016) *Investigation into the Feasibility of the Utilisation of Renewable Energy Resources in Libya*. Nottingham Trent University. Available at: <http://irep.ntu.ac.uk/id/eprint/29037/1/Ahmed.Mohamed-2016.pdf>.
- Mohamed, A. M. A., Al-Habaibeh, A. and Abdo, H. (2013) 'An investigation into the current utilisation and prospective of renewable energy resources and technologies in Libya', *Renewable Energy*, 50. doi: 10.1016/j.renene.2012.07.038.
- Mohamed, A. M. A., Al-Habaibeh, A. and Abdo, H. (2016) 'FUTURE PROSPECTS OF THE RENEWABLE ENERGY SECTOR IN LIBYA', *Proceedings of SBE16 Dubai, 17-19 January 2016, Dubai-UAE*, (January), pp. 195–211. doi: 10.1057/9781137034083_12.
- OMAR, A. A. (2003) *AN EVALUATION OF LOW INCOME HOUSING PROJECT IN DEVELOPING COUNTRIES CASE STUDY: TRIPOLI-LIBYA*. University of Salford.
- Programme, U. N. D. (2019) *UNDP in Libya, sustainable development goals*. Available at: <http://www.ly.undp.org/content/libya/en/home/about-us.html> (Accessed: 19 May 2019).
- Rpser, M. (2019) *Economic Growth, Our World in Data*. Available at: <https://ourworldindata.org/economic-growth> (Accessed: 19 May 2019).
- Shameah, A. (1996) 'Productivity of Public Expenditure.', in *The Productivity of Libyan Economy in Benghazi Between 25- 26/12/1996*. Benghazi.
- Staff, U. S. D. of S. (2013) *U.S. Relations with Libya, U.S. Department of State*.
- Vandewalle, D. (1998) *Libyan Since Independence: Oil and State-Building*. Cornell University Press. Ithaca. Published in the UK in 1998 by I.B.Tauris & Co Ltd.