Proceedings Book of
9th ICEEE – 2018 International Conference on
"*Climatic Change and Environmental (Bio) Engineering*"
22nd - 24th of November, 2018
Budapest, Hungary

ISBN 978-963-449-105-7 Publisher: ICEEE, RKK Óbuda University

A COMPARATIVE STUDY ON SOME STATISTICAL INVESTIGATIONS ON POPULATION AND ECONOMIC SECTORS IN LIBYA: Past and Future

Amina A.M. DAROUGI[1], Ali ALAMMARI[2], Hosam E.A.F. BAYOUMI HAMUDA[3]

[1]Eötvös Loránd University, Budapest, Hungary,
[2]Szent István University, Gödöllő, Hungary,
[3]Óbuda University, Budapest, Hungary

Abstract

The growing international awareness about the fast pace of climate change taking place on our planet, together with the impacts that such changes are having on the natural environment, on humans and their economic activities have become evident. This study on data collection and statistics on population and economic sectors in Libya provides a preliminary inventory of the national institutions and procedures involved in the management and collection of data on population and economic status (1960-2018) in Libya and the currently available proposals for improving the systems. This statistic shows the population change in Libya from 2007 to 2017. In 2017, Libya's population increased by approximately 1.28% compared to the previous year. The CIA World estimates that the Libya Population in 2012 was 6,733,620. Based on the CIA's estimate, Libya was therefore the 101st largest country in the world. The UN's estimate in 2018 is that there are 6.47 million people in Libya, dropping it down to the 109th most populous country. It is important to evaluate how climate has varied and changed in the past (1901-2015). The monthly mean historical rainfall and temperature data can be mapped to show the baseline climate and seasonality by month, for specific years, and for rainfall and temperature. Libya is the country with the largest oil reserves in Africa, thus making the oil sector among the most successful ones in the continent, accounting for 80% of the country`s GDP and 97% of its exports. The statistic shows gross domestic product (GDP) in Libya from 2012 to 2016, with projections up until 2022. GDP denotes the aggregate value of all services and goods produced within a country in any given year. GDP is an important indicator of a country's economic power. In 2016, Libya's gross domestic product amounted to around 18.54 billion USD.

Keywords*: Libya, population sector, economic sector, relationships.*

1. INTRODUCTION

Libya is categorized by the World Bank as an upper-middle-income country. The economy is dominated by oil and gas industries. In 2010, total oil production (crude plus liquids) was approximately 1.8 million barrels/day [1].

The oil revenue allows the government to spend munificently on infrastructure, education, and job creation.

One of the most important aims is to examine the relationship between economic growth, employment, inflation, production function and the population growth in State of Libya. The second aim of this study to investigate the challenges faced a strategic policy that would aim to achieve sustainable development of the Libyan economy, particularly in view of the current official tendencies for the restructuring of the Libyan economy by increasing the role of the private economic sector in the economy under the climatic changes.

Thought of the impact of variations oil prices on the structure and performance of the Libyan economy is mostly driven by the oil sector. Saleh [2] investigated the variation of oil prices and its influence on the employment in Libya, finding a negative impact on the movement of skilled non-Libyans and a dramatic decrease in the number of non-Libyan workers in 1980, when the price of oil fell sharply. The economic growth is usually categorized by growths in actual gross domestic product (GDP) or actual GDP/capita that occur over the long-term. The Libyan economy has been exposed to numerous shocks and regime changes, such as (1) In September 1969 the new revolutionary government implemented policies to transform the economy from being capitalist-oriented to being socialist-oriented, (2) the 1973–1974 oil shock, (3) the critical eight-year (1980–1988) war with Chad, (4) the instability of the international oil market, (5) economic sanction imposed by US and United Nation from the early 1990s (Because of the Pan Am 103 crisis) which caused in the freezing of the country's foreign assets, and (6) the current state in Libya (since February 2011) and ongoing of insecurity State Conditions.

Libya's economy can be described as a socialist type, centrally managed, and relying primarily on the oil export revenue which in fact is the major foreign exchange employee and contributes over half of the nation's real GDP. Libya manages to achieve one of the highest per capita incomes in Africa, because of its low population and large oil reserves [3]. Since the elimination of the UN authorizations, Libya has realised very favourable growth rates: in 2010, it was estimated at 8.1%. The Libyan economy is still designated as having very high ranks of interdependence with the international market, especially in trade exchange. It is heavily dependent on oil export [4]. All these shocks have a negative impact on the employment and economic growth in Libya.

Economic changes in Libya are bringing beneficial outcomes to achieve sustainable investment in the non-petroleum industry sector, mainly manufacturing and agricultural practice. The main economic development aim of Libya is to reach greater variation in capital, products, and imports, the non-oil sector and raw material, it is likely that the economy will be self-sustainable and will grow at high speed, like other emerging economies [5].

The efficiency of the nation's variation's strategies can be appreciated from the fact that the influence of the manufacturing industry to the nation's real GDP was only 5% in the 1970s then had risen to 15.2% by 2005; the role of the agricultural sector to the GDP increased from 6% in the 1970s to 9% in 2005. These variations appear small but the real GDP/capita raised enormously, from 4,380 USD to 44, 820 USD, between 1970 and 2005 [6].

The country's value of import rose significantly as the real GDP increased, to highpoint in 1975 at 28.5% and settling at 18.5% in 1980s. With the UN authorizations in the 1990s the Libyan's economy practically collapsed when its capital abroad was frozen. The GDP export ratio reduced to 16.11%. The value of imports increased significantly, becoming very expensive for the nation [7].

Libya faces an unemployment rate estimated to be 30% in 2010. This high unemployment rate is mainly predominant among the younger generations. Inflation is also a problem for the Libyan economy which is currently at 10.4% in 2010 [1]. Different local and international sources for data are used:

- Central Bank of Libya (CBL), Economic Bulletin: http://www.cbl.gov.ly/en/
- Secretariat of the General People's Committee for Planning
- National Authority for Information and Documentation: http://www.gia.gov.ly/
- OPEC Annual Statistical Bulletin: http://www.opec.org/
- International Monetary Fund (IMF)
- World Bank (WB), and Penn World Table 5.6 (PWT 5.6)
- Key Indicator for Labour Market (KILM)

2. Libyan economic Background of Libya

In Libya, had long suffered from deficiencies in the economy, especially in areas such as inflation, balance of payment deficit, low rate of employment and growth, all of which has created and imbalance in the economy. Problems of irregularity in supply and demand had a negative impact on prices and balance of payments [8].

The economic sectors during the 1950s went through a period of situation and economic development, as did the agricultural sector, resulting from poor quality land, lack of water and weather conditions [8].

In the industrial sector, the manufacturing process was limited due to non-availability of raw materials, lack of a skilled labour force, local market narrowness and inability to process the product. The economy was not able to provide the necessary investments to change the backwardness into progression [9].

After discovering oil and starting to export it in 1962, the problem of development in Libya centred on the search for development alternatives for the economy specifically in relation to viability in capital and rarity in labour element.

The economic sectors during the 1950s went through a period of situation and economic development, as did the agricultural sector, resulting from poor quality land, lack of water and weather conditions. In the industrial sector, the manufacturing process was limited due to non-availability of raw materials, lack of a skilled labour force, local market narrowness and inability to process the product. The economy was not able to provide the necessary investments to change the backwardness into progression [9].

After discovering oil and starting to export it on a commercial basis in 1962, the problem of development in Libya centred on the search for development alternatives for the economy specifically in relation to viability in capital and rarity in labour element. Since the beginning of 1980s, when the oil revenues were reduced due to the problems facing the international oil market, the growth problem in Libya faced other difficulties, and efforts were taken towards providing growth and improving the continuing lack of technology and efficient workforce. This study aims at explaining the economic policy exercised by Libya and the role of private capital in the national economy. As the efficiency of the financial market is determined by the success of various productive projects, it is considered to the main factor to be established. An economic expert of the United Nations, Farley [10] mentioned that the Libyan economy before discovery of petrol was a backward economy because there were no indications of economic growth existing at that time. Libya achieved real steps towards the economic growth in recent years. In addition, there are a number of studies on Libya which emphasis that oil revenues contribute to mostly of GDP growth in Libya and represent 97% of total GDP [11].

Foreign Direct Investment (FDI) can promote the economic growth by increasing productivity, generating technologies, expanding the base of exports that can provide a long-term growth to the host economy [12]. The priority in the first development plan 1973-1975 was the agricultural sector taking precedence over the industrial sector, and the Libyan economy achieved a high growth rate during the seventies which peaked 9.2% of the GDP. The priority in the second and third plans, 1976-1980 and 1981-1985 was the development of the industrial sector which achieved growth rates equal to 21% and 23%, respectively which were less than the growth in the population rate that reached 3.5% during 1998-2001. Decrease in oil prices was one of the most important reasons behind the low production rates of the industrial sector, as its contribution to GDP declined from 77.4% in 1973 to 24.9% in 1997 and to 27.9% in 2002 [13]. One of the studies indicated that the increase or decrease in oil prices with 10% caused an increase or decrease in the GDP with 3% [14]. The investment expenditure on industrial, agricultural and staple goods sectors reached 11 million LYD in 3 decades 1970-2002, which equals 36 milliards USD by used exchange rate 3.3 as follows:

- Investment in the industrial and mineral sector equals 5.5 million LYD.
- Investment in the agricultural and livestock production sectors equals 5.5 million LYD.
- Investment in marine fisheries equals 170 million LYD.

The investment value in the industrial sector was about 4249.9 million LYD during the period 1969-1996. The level of investment rate was about 157.4 million LYD [15]. The actual growth of the sector still did not exceed 3%. The incorporation of the total local production did not reach 8% during the 1970s. This proves that the industrial sector depends strongly on the oil sector, as in investment operations or to gain raw materials due to reduction in oil revenues during the 1980s and 1990s [16].

Despite Libya's relatively strong recent (before 2012) economic growth, unemployment remains high as the country's population grows rapidly and new jobs are not created quickly enough.

On 28 June 2004 the United States renewed diplomatic relations with Libya direct and presented the interests of the United States of communication. On September 2004, USA terminated the state of emergency against Libya by executive orders. This action eliminated most of the economic sanctions imposed on Libya, and led to the release of Libyan assets frozen in the United States.

UK, eagerness to assist in the development of the Libyan economy, as it had previously assisted the Libyan government by providing a suitable environment for Libya to deal with the western world. UK praised the steps taken by the Libyan government to return to the global society, stressing on the fact that Libya would recover economically in a few years.

England was willing to play a major role in developing the Libyan economy on being the first and essential partner with Libya, and UK had achieved economic and trade revenues with Libya in the year 2003 estimated at 240 million sterling pounds, with an increase of 20% in its favour according to the trade balance with Libya. In developing the structure and the reframing of the Libyan economy, the economic and political policy on various environmental and social factors has moved forward (Table 1).

Table 1: Libya entering a new stage of its development

Libya's past	Libya's emerging future
Significant isolation from the outside world	Increasing integration with the outside world
Focus on equality of living conditions and social standards	Greater opportunities for individual achievement and involvement in the productive sector
Oil revenues as the main source of national prosperity	Oil revenues supplemented by wealth created in other parts of the economy
Government's central focus on the distribution of oil revenues to address social needs	Government increasingly working with the private sector to enable the creation of wealth in competitive markets

3. Libyan economic status during the period 1955-1969

This stage is recognised as financial to a large extent, starting in the mid-1950s when the oil companies started to enter Libyan territories for excavation and oil was believed to be there. They started exporting oil in 1962, consisting of about 30% from the local product in total. It's the main resource for the currency [17]. This sector is relevant indirectly for the other economic sectors such as education, health, electricity, construction, the building industry and agriculture, etc. The growing expenditure on these sectors comes completely from the oil and natural gas revenue, providing the economy with foreign currency to support the country's liabilities for the imports of commodities, services and exchanges. The supply of revenue to the social, economic and development allocations increased as well as the expenditure on public and private consumption which resulted in the improvement of the standard of living; the average income per person rose to 6171 dollars in 1987 and then increased to 8014 dollars per capita in 1992 [18].

Libya's economic growth rate during this period was one of the highest growth rates in the world. The gross domestic product GDP increased at an average rate of 22.6%/annum. Also, gross fixed investment had increased at an average rate of 15.6% per annum with the share in non-oil GDP reaching 63%. The two major factors that consolidate the development of the Libyan economy are:

Firstly, the Libyan economy is a growing one in the oil and gas sectors, in a geographical area of about 1087 km2. The population increased during the last decade from 3225.1 thousand in 1980 to 4524.4 thousand in 1990, and finally reached 5426.8 thousand in 2000. The annual growth rate of population during the period 1970-2000 was about 3.8% due to the improvement of standards of living [15] and it has a coastline in the about 2000 km, on the Mediterranean. The geographical depth of Libya is North Africa making it as a strategic link between east and west. It is also surrounded by a group of countries where the economy and a labour surplus provide some civilised, historical and natural resources.

Libya, as an archaeological country, has to establish and sponsor tourist activities through building tourist hotels, tourist villages, health centres, banks, companies and leisure places. The investment could be through providing political services, like travel agencies, naval transport, air and land transport.

Secondly, the Libyan economy developed within the last three decades to adopt a socialist philosophy, which encourages public ownership and variant national income due to the independence of oil wealth. This in a way has enabled the country to change to productive assets and to replace the achieved revenues from new resources instead of the oil revenues, continuously and regularly [19]. However, laws were issued from the trade economy organisation. Regulations controlling trade and economic policy are as follows:

- Law supervising the issued finance in 1955 and its item no. 1 in 1957
- Export and import law no. 59 in 1957
- Law to regulate export and import no. 59 in 1957
- Treasury minister's decision no. 2 in 1962 for the customs.
- Supervision on foreign expenditure
- Quantity limitations on imports (import permits).

4. Libyan economic status during the period 1970-2010

The planning of this period was not just a means to provide development, but was considered as a means to execute social changes happening in Libya. The social tension started to appear, as it was during the 1950s and 1960s, and the development plan 1973-1975, considered to be the first plan to provide the requirements for social changes, concentrated on basic food industries. The transformational economic plans during the period 1973-1985 gave priority to the industrial sector so that it can play a vital role. The main idea was to reduce dependence on oil, to tackle unemployment, and to decrease dependence on exported commodities. It was a plan to build a domestic industrial basis. Therefore, the government designed the economic development from 3 to 5 year plans whose major goals are:

1. The structural design of the Libyan economy limited the interest of industry and the agriculture sector.
2. It reduced the oil sector gradually and limited its exports to ensure providing the needs for other sectors.
3. It reached the point of being self-sufficient in the necessary industrial and agricultural products.
4. It established industries depending on oil and natural gas to invest in activities directed to export.
5. It created job opportunities for the nationals for the sake of reducing the foreign labour force.

However, during the first five year plan, for social and economic transformation between 1976-1980 more focus was put on the petrochemical and industrial sector. Assignments during this period were 1513.4 million LYD, continuing to 21.1% from the total objective assignments. Priority was given to food industry and consumer items (including consumption intermediate) in an attempt to reduce imports. In the second five year plan for social and economic transformation between 1981 and 1985, priority was given to investment and improvement of petrochemical and export industries such as oil refineries. During this period the gross fixed investment had increased at an average rate of 14.5% per annum within an average annual share in the non-oil GDP of about 58%. For the same period the GDP and the percentage had increased at an average rate of 12.6%/annum, respectively.

Following a strategic policy to encourage exports, the Libyan government established a board for developing exports and marketing then in foreign outlets.

But Libyan exports were subject to three basic shocks during the two decades 1970s and1980s; yet the impact of those shocks was generally positive on the Libyan economy:

Firstly, the 1973/1974 oil crisis led to the nationalisation of Libyan oil companies (Table 2). The maximum oil production capacity was 3.32 million barrels per day by 1970, and the barrel price increased from 2.2346 dollars to 26.2 dollars just one year later. The increase in oil prices increased was four times during the period between 1970 and 1973, sustaining economic growth and prosperity [20] (Table 2).

Table 2: The main political factors affecting oil production during the period between 1973 and 1992

Year	Political Factors	Results
1973	Israeli Arab war	Increased oil prices
1979	Iranian crisis	Increased oil prices
1980s	Different measures taken by industrialised countries to reduce their dependence on OPEC oil	Reduced oil production
	OPEC operation to control prices and oil production and oil exports quantities	Reduced oil production and oil exports
1986	The USA's ban on importing oil from Libya	Reduced oil exports
1992	The UN sanctions on Libyan economy	Reduced oil production and oil exports

Source:
Calculated from CBL Central Bank of Libya (1966-2000) Research and Statistics [21, 22].

Secondly, the oil prices had increased sharply during the period 1979/1980 due to the Iran–Iraq war (Table 2). Fisher [23] argued that during the 1980s, the Libyan economy has been deeply affected by the low price of oil. This in turn negatively affected the general budget of the government along with the international economic depression and most importantly, the embargo of the United States on Libya.

Because it was the first importer of the Libyan oil, the US economic sanctions affected the Libyan economy to a large extent (OPEC). This situation affected the economic transformation plans to a great extent.

During the 1970s and early 1980s, for example, the amount designated for the fifth plan 1981-1985 was to be 18.5 million LYD or equivalent to 55 billion USD; but it had to wait until 1981 so that the conditions could be met. After that, the increase in public expenditure weakened the transformation plan from 2705.1 million LYD for 1981 to 176 million LYD in the 2000. Due to the expansion in transformation plans to include projects of construction a rise between 234.5 million LYD was needed in 1980 and 1500.7 million LYD in 1999. Therefore, the Libyan government had to fill the financial gap between what was planned for and the amounts available for those projects [24].

The following Table 3 summarised the Libyan economic growth during the 1962-1990 period (Table 3).

In addition, by the end of the 2008 period, as structural and macro-economic reforms progress and the non-oil economy starts to develop, the authorities could consider the desirability and feasibility of switching to a more flexible exchange rate regime that would give them more room of manoeuvre to respond to sharp changes in oil prices. In particular, opening up the banking sector to external competition, strengthening the judicial system to speed up and improve conflict resolution and reforming the existing legislation in the areas of accounting, bookkeeping and bankruptcy are critical to strengthen the development of, and competition within, the banking sector, and improve financial deepening [25].

Table 3: Annual growth rates of the Libyan economy by sectors during the period between 1962 and 1990

Factors	1962-1969	1970-1982	1983-1990	1962-1990
Gross Domestic Product (GDP)	22.6	13.2	-2.5	11.8
Agriculture forestry and fishing	4.1	4.6	11.8	6.70
Mining and quarrying (Inc. oil)	46.7	14.3	-7.8	17.8
Manufacturing	8.4	18.6	7	13.0
Construction	19.9	15.3	-1.8	12.0
Transport and Communication	16.6	18.1	-0.4	13.1
Wholesale and Retail Trade	12.7	17	-2.1	10.9
Services Gathering	13.4	14.0	2.7	11.1

Source:
Calculated from CBL Central Bank of Libya (1966-2000) Research and Statistics [21, 22]

However, in view of the various interests on the Libyan economy, particular concern is put on, the key factors which contribute to increasing the economic growth during the reform, the relationships between major macro variables and how they behave during the special process of transition and how to evaluate the position of the Libyan economy in the world economic framework.

The applicability of the FDI-led export and Export-led growth hypothesises to Libya was tested using relevant data and analytical methods. This result supports the FDI-led export (FLE) and Export-led growth hypothesises in the case of Libya [26].

5. GDP and unemployment

However, most of the dealing with employment in Libya assumes a macroeconomic perspective, focusing on the evolution of labour demand and supply in the context of sustained growth. Moosa [27] tested Okun's proposition for Egypt, Tunisia, Morocco and Algeria and found that unemployment and output were unrelated and statistically insignificant.

When Swane and Vistrand [28] examined the relationship between GDP growth and employment in Sweden using the employment population ratio as a measure of the extent of employment generation, they found a significant and positive relationship between GDP and employment growth. This result supports the strand of theories suggesting that a positive relationship between GDP and employment is normal, and that any observed anomaly in unemployment might be a temporary deviation.

Yogo [29] mentioned that theoretical and empirical survey of the relationship between employment and growth in sub-Saharan Africa countries raises three interesting points. First, the employment subject in sub-Saharan Africa is more a matter of quality than of quantity. Secondly, no reason for weak employment acts could be found in the labour market institution. Third, the observed increase in working poor could be explained by slow economic growth and low labour demand. Kapsos [30] conferred the growth rate of GDP and employment in developed countries and estimated employment elasticity, result that the employment elasticity has reduced in some countries in the Middle East and North Africa.

6. Inflation and output

There are insufficient studies that have examined the relationship between inflation, unemployment and economic growth for Libya. Osama [31] presented a positive relationship between inflation and economic growth in Jordan by using structural break point. He determined that if the rate of inflation drops to 2%, the relationship between the variables becomes negative.

7. Aspects of the Libyan economy

A minor number of investigators have attempted to inspect the economic growth and its determinants for Libya. Their emphasis has mainly been on investigative microeconomic factors; e.g., numerous have observed the influence of oil price variations on the labour force [1, 4, 32].

8. Privatisation programme

Masoud [8] mentioned that the transfer of ownership in Libya started in 1987 by sharing the returns on investment with the employees: profits are divided among the elements of production (worker, machine, capital) according to a specific accounting system.

The transfer was governed by the People's Committee decree no.447 for 1987, which is based on a chapter from the Green Book (partners not workers), the Law no.9 for 1985, and the People's Committee decree no.313 for 2003. The transfer process was carried out as follows:

1. Ownership was transferred to employees
2. It took the form of exemplary partnerships
3. It was sold by its book value with annual instalments according to the return on the sold unit.
4. Total value of sold assets was 98 million LYD.

The most important achievements of this phase are:

1. 30% of the national labour force that were employed by the public sector, moved to the private sector.
2. Recovery of nearly 80% of the assets owned.

The number of transformed units reached 295 units; the value of their assets equalled 98.000.000 LYD. The transformation process continued from 1987 to 1992 as shown in Table 4, which had many positive results such as the retrieval of 75% of the assets' value owned by these units, including the transfer of 30.000 products to the national sector.

Table 4: Transfer of ownership of a number of factories and production units during the 1987-1992 period [33]

Sectors	Number of Units	Value of Assets
Industrial sector	150	52.000.000
Agricultural sector	50	6.000.000
Marine fisheries sector	50	29.000.000
Livestock sector	45	11.000.000
Total	295	98.000.000

During the period 1/1/2004 to 31/12/2005 many units were privatised as follows, General People's Committee [34]:

1. 46 economic units that can't be developed.
2. 10 agricultural projects were divided and sold as farms.
3. 12 units were sold to Libyan and foreign investors as joint investments.
4. 192 units will be able to continue its activities but after elevating financial burdens imposed by banking sector, social security fund, taxes, customs, and electrical power company, which hindered its production. The debts of these units will be covered by the National Production Support Fund and the State's Treasury. The total amount of public debt on these units reached 549 million LYD

9. Manpower in the government sector, private sector and foreign companies in Libya State

The majority of Libyan employees are employed in the public (government) sector and the wages levels in the public sector were not increased6 during the period 1980-2010. Table 6 shows that in 2010 approximately 80.3% of the labour force was employed in the public sector. In 2006, the proportion was approximately 85.2%. The Libyan labour force is interested in working in the government sector, especially educated youth, who will defer employment elsewhere while they wait for a public sector position to become available. According to the African Economic Outlook report [35], nearly 60% of youth will consider only a public sector job. Less than 10% of the labour force was employed in the private sector in 2009. Although there are many foreign companies in Libya, the percentage of Libyans employed by them is very low: it was approximately 10.6% in 2010 (Table 5).

Table 5: Distribution of manpower in the government, private and foreign sectors in 2010 (thousands)

Sector	Libyan labour force	%
Public	15595.2	80.3
Foreign companies	210.0	10.6
Private	180.0	9.1
Total	1985.2	100.0

Source:
Public Authority of Civil Information, 2006 and 2010, State of Libya [36]

Table 6 classifies the Gross Domestic Product (GDP) of the Libyan economy by type of the economic activity. Table 6 shows that the petroleum and mining sector is the mainstay of the economy.

Table 6: Libyan real GDP by economic activity

	1972%	1980%	1998%	2010%
Petroleum and Mining	52.5	64.2	26.7	75.4
Agriculture	2.5	1.6	11.5	3.0
Manufacturing	2.4	2.6	6.4	2.1
Constructions	10.4	9.1	5.9	3.2
Wholesale, Retail Trade	5.5	4.7	14.1	3.6
Transport & communication	5.7	3.3	5.8	3.5
Other services	21.0	14.5	29.6	9.2
GDP at Market Prices	100.	100.0	100.0	100.0
Official Exchange Rate (LD/USD)	3.040	3.377	2.2205	0.8037

Sources: Libya: National Authority for Information and Documentation (1970–2010) [36]
Libya: Ministry of planning, economic and social indicator 1970–1994. [9]
Central Bank of Libya, Quarterly Statistical Bulletin, 1970–2010, Libya [38]
World Bank 'World Tables, 1980–2011, Washington DC [45]

Oil production makes a greater contribution to GDP than all other economic activities combined. The percentage of oil's contribution to GDP differs in various periods due to fluctuations in oil price. It was high in 1980 (64.2% of real GDP) before the second oil shock, and lowest in 1998 (26.7% of real GDP) before the recovery. The percentage of oil contribution to GDP in Libya in 2010 was higher than in 1980.

10. Libyan population

Tables 7 and 8 provide statistics on the composition of the Libyan population according to Libyan and non-Libyan and then by male and female over the period 1972–2008. These data reveal that:

- The Libyan total population in 2008 was made up of more than 6.3 million nationals and about 333, 000 expatriates, compared with only 2.2 million nationals in 1972.
- Libya depended on expatriates to conduct its economic activities from 1972 until 1980.
- The proportion of non-Libyans to the total population is very small (around 5% in 2008).
- The Libyan fertility rate is among the highest in the world in 1980. This is the one of the main reasons that the proportion of Libyan nationals has increased so dramatically over the last three decades, from less than 88% of the total population in 1972 to more than 95% in 2008.
- The rise in oil prices during the eight years of the oil boom (1972 to 1980) attracted expatriates to work in Libya.
- From 1972 to 1980, the number of expatriates improved by over 340 000/annum.

Table 7: Libyan and non-Libyan population (in thousands)

	1972	Percentage of total (%)	1980	Percentage of total (%)	1998	Percentage of total (%)	2008	Percentage of total (%)
Total population	2150	100	2760	100	5060	100	6650	100
Nationals	1888	87.8	2158	78.2	3957	89.4	6317	95.0
Expatriates	262	12.2	602	21.8	511	10.1	333	5.0

Sources:
Libyan: Annual Statistical Abstract (1980-2007) [42]
Libyan: National Authority formation and Documentation (1975-2000) [36]
Libyan: Ministry of planning, economic and social indicator 1970-2008. [9]
Statistical Abstract for Arab Countries (1972-1980; 1980-1990; 2000-2007) [42-44]

Table 8 shows that the percentage of Libyan males is almost equivalent to that of females. The percentage of female expatriates is nearly half that of male expatriates; this suggests that the State of Libya attracts more males for working purposes.

Table 8: Total Libyan population according to gender and nationality (in thousands)

Years	Libyan					Non-Libyan					Total population
	M	%	F	%	Total	M	%	F	%	Total	
1972	974	51.6	914	48.4	1888	203	77.3	59	22.7	262	2150
1980	1105	51.2	1053	48.8	2158	518	86.1	84	13.9	602	2760
1998	1990	50.3	1967	49.7	3957	451	88.2	60	11.8	511	5060
2008	3133	49.6	3184	50.4	6317	302	91.0	31	9.0	333	6650

Sources:
Libyan: National Authority for information and Documentation (1975-2000) [36]
Libyan: Ministry of planning, economic and social indicator (1970-2008) [9]
Central bank of Libya, Quarterly Statistical Bulletin (1975-1980; 1990-2000) [18, 19]
Statistical Abstract for Arab countries (1972-1980; 1980-1990; 2000-2007)

Figure 1 gives the literacy rate among adults in the state of Libya. The World Bank defines the adult literacy rate as the percentage of people 15 and older who can read and write. The rate is approximately equal between males and females, with 81.3% of females literate and 94.9% of males. The illiteracy rate decreased from 31% in 1994 to 22% in 2010 due to the increase spending on the education sector [41].

Table 9 depicts the Libyan population according to age. It can be seen that the percentage of children (0–14) has decreased dramatically while that of adults (15–64) has gradually risen from 57.8% in 1998 to approximately 66.8% in 2009. This demographic change has placed pressure on the supply side in the labour market.

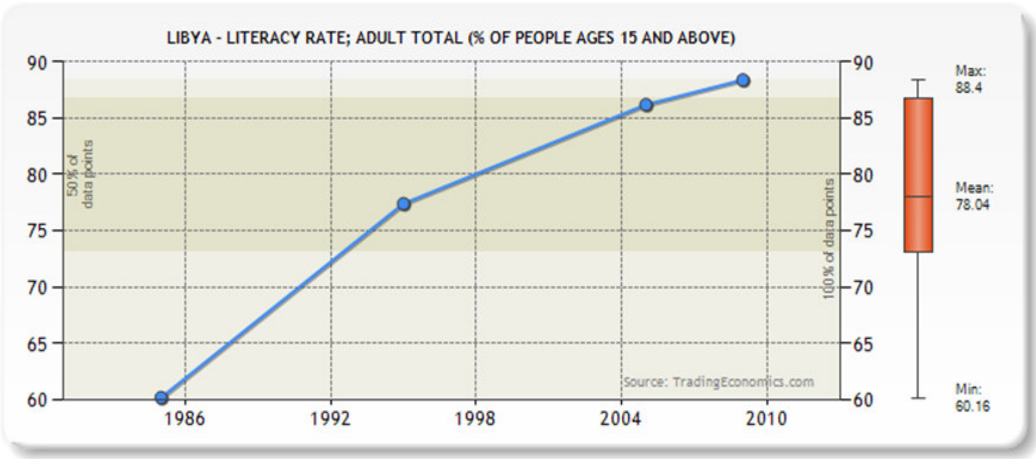

Figure 1: the percentage of literacy among Libyans aged 15 and above
(Source: http://www.tradingeconomics.com/libya/literacy-rate-adult-female-percent-of-females-ages-15-and-World-Bank, 2010)

Table 9: Percentage of population according to age

Year	0-14 Years	15-65 Years	65 and above
1998	39.2	57.8	3.0
1999	38.4	58.5	3.1
2000	33.9	62.7	3.4
2001	33.5	63.0	3.5
2002	33.1	63.3	3.6
2003	32.6	63.8	3.6
2004	32.1	63.9	4.0
2005	30.1	64.1	5.8
2006	29.5	65.4	5.1
2007	28.2	65.8	6.0
2008	27.1	66.1	6.8
2009	26.3	66.8	6.9

Source: World Bank annual report [46]

Figure 2 presents the population growth which has been declining in Libya since the 1980s, from an annual rate of 4.6% in 1980 to 1.9% in 2010. The drop in population growth has resulted mainly from a sharp decline in the fertility rate, falling from 7.3 children per woman in 1980 to 2.7 in 2010.

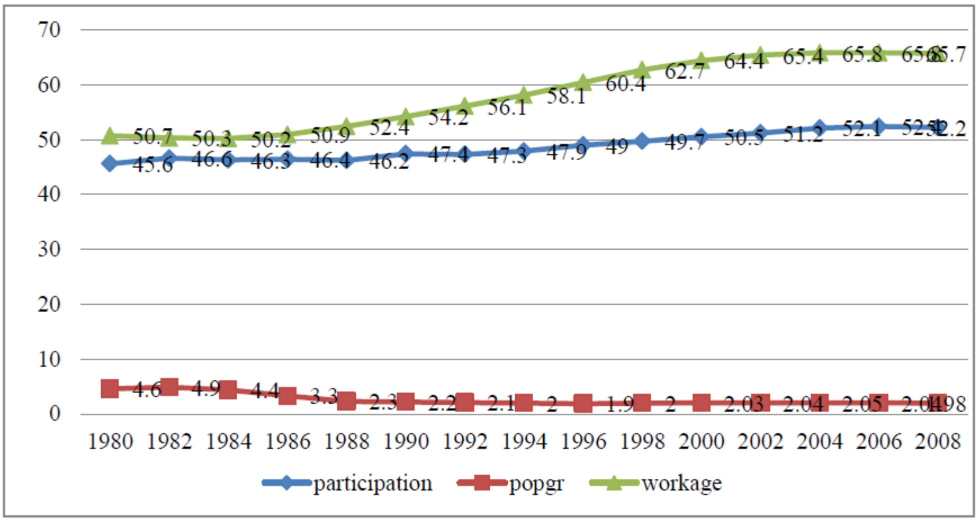

Figure 2: Percentage of working age, population growth and participation rate during 1980 and 2008.
(Source: World Bank annual report [46])

The growth of the working age population increased on average by 1.2% annually, raising the labour supply and creating the potential for employment and growth. Labour force participation also increased as young and female workers entered, putting pressure on the labour market. The participation rate increased from 45.6% in 1980 to 52.2% to 2008, mainly from the entry of young workers, but increasing female participation also has affected the size of the labour force in Libya. Table 10 reviews the main community indicators in the State of Libya. The life expectancy rate is 71 years for males and 76 for females. The infant mortality rate is actual low compared with the world average in 2010. Yasmen [47] mentioned that the main reason is the sharp drop in early marriage by women in the mid-1990s, as well as the cost of living in Libya, which has become a main problem for adults who request to marry.

Table 10: Libyan social and development indicators

	1980	2000	2010	World average in 2010
Life expectancy at birth for male and female	male (62) female (67)	male (64) female (68)	male (71) female (76)	69
Fertility rate (births per woman)	7.3	3.3	2.7	3.2
Infant mortality rate	18	23	29	59
Population per physician	457	502	601	N/A
Access to safe water (% of population)	84	92	75	N/A
Illiteracy	31	28	22	N/A

Source:
World Bank: Social Indicators of Development (1980-2010). [46]
UN Development Program, Human Development Report, (1980–1990; 2000–2010). [14]

11. Economic activity of Libyan population

The effect of the public sector on national employment is high in Libya State. The Libyan labour market is considered by strong supply-side pressures attributable to the speedy growth of the 15–65 age group, the low productivity of labour, limited employment in small-scale establishments, wages that have been frozen by the government since 1981 (law NO: 15/ 1981), and high rates of unemployment. Table 11 demonstrates the allocation of the labour force in the State of Libya by economic sectors.

Table 11: Libyan labour force by economic sector

	1972(%)	1980 (%)	1998(%)	2010(%)
Agriculture, livestock & fisheries	13.39	11.83	9.98	7.84
Petroleum & mining	1.12	1.34	1.22	1.36
Manufacturing	4.90	5.75	5.68	6.22
Electricity, gas & water	1.88	2.31	2.56	2.91
Construction	1.23	1.36	1.44	1.78
Wholesale, retail trade	7.73	7.89	8.74	10.1
Transport & communication	4.57	5.73	6.31	6.39
Finance & insurance; real estate & business	0.92	1.38	1.61	1.95
Community, social & personal services	48.88	50.85	49.71	49.88
Unclassified	15.38	11.56	12.75	11.54
Total	100.0	100.0	100.0	100.0

Sources:
Libya: National Authority for Information and Documentation (2000–2010) [36]
Libya: Annual Statistical Abstract (1980–2010) [43]
Central Bank of Libya, Quarterly Statistical Bulletin, (1972–1980; 1980–1990). [38]
Libya: Ministry of planning economic and social indicator 1970–2010 [9]
Statistical Abstract for Arab countries (1972–1980; 1980–1990; 2000–2010)

Information in Table 11 proposes the following:

- The agricultural, livestock and fishing sector employed around 7.84% of the total labour force during various years to 2010.
- The petroleum and mining sector, which produces 30–40% of the GDP, employed less than 1.4% of the labour force in the period 1998–2010.
- The percentage of the labour force employed in the manufacturing sector increased from 4.9% in 1972 to more than 6.2% in 2010.
- The percentage of the labour force employed in electricity, gas and water has increased from 2.56% in 1972 to more than 2.9% in 2010.
- The percentage of the labour force employed in the construction sector increased from 1.23% in 1972 to 1.78% by 2010.
- The percentage of workers in wholesale and retail trade increased from 7.73% in 1972 to 10% in 2010.
- The percentage of the labour force employed in the transportation and communication sector increased from 4.57% in 1972 to 6.39% in 2010.
- Other service sectors have absorbed a significant proportion of the labour force, increasingly so over the last three decades. The proportion of employment in these sectors has increased from 5.47% in 1972 to 8.34% in 2010.
- The community, social and personal services sectors are by far the biggest employers and have seen the biggest increase in the share of workers between 1972 and 2010.

12. Libyan economy in terms of the relationship between RGDP, inflation and unemployment

Table 12 compares the contribution of the Libyan oil and non-oil sectors over the last four decades. The economy depends heavily on the production and exportation of oil, which provides a greater contribution to real GDP than all other economic activities. It is clear from the table that the contribution of oil is around 57% to 61%. Producing and exporting oil is the dominant factor in the economy.

Table 12: Percentage contribution of real GDP from each sector

Period of time	Oil	Agriculture	Manufacturing	Service	Construction	Total
1962–1970	57.4	3.7	2.3	29.3	7.1	99.8%
1971–1975	56.9	2.2	2.2	28.4	6.9	96.6%
1976–1986	50.4	3.1	3.8	31.8	10.7	99.8%
1987–1993	31.8	6.5	7.3	48.5	5.6	99.7%
1994–2001	30.9	8.5	7.1	47.5	5.7	99.7%
2002–2009	61.9	2.5	4.7	25.4	5.3	99.8%

Sources:
Libya: Annual Statistical Abstract (1990–1995; 2000–2007) [43-44]
National Authority for Information and Documentation (2000–2006) [36]
Libya: Ministry of planning economic and social indicator (1970–2007). [9]

Table 13 shows the average growth of real GDP, inflation and unemployment for different time periods. The inflation rate, measured by the percentage change in the annual consumer price index (CPI), shows a decreasing trend from 7.6% to 6% in the period 1971–1975, caused by policy changes imposed by the Central Bank of Libya.

Table 13: Average inflation, real GDP growth and unemployment growth

Period of time	Inflation	real GDP growth	Unemployment growth
1962–1970	7.6%	22.8%	-6.5%
1971–1975	6.0%	7.2%	-2.6%
1976–1986	7.7%	1.6%	6.3%
1987–1993	7.5%	1.9%	14.2%
1994–2001	10.6%	4.1%	10.7%
2002–2009	3.2%	8.3%	8.2%

Sources:
Libya: Annual Statistical Abstract (1990–1995; 2000–2007) [43-44]
National Authority for Information and Documentation (2000–2006) [36]
Libya: Ministry of planning economic and social indicator (1970–2007). [9]

13. DETERMINANTS OF LONG-RUN GROWTH IN LIBYA

Economic growth is probably one of the most important research topics in modern economics. Like many developing countries, the primary focus of policies in Libya is to have a high growth rate, and for this to happen policy makers need to understand the determinants of growth as well as how polices affect growth. Over the last two decades, the performance of Libya has been disappointing in comparison with other MENA countries.

It has been remarkably volatile and, at times, lowers than that of poorly performing regions such as sub-Saharan Africa. This growth pattern is believed to be linked to several characteristics such as Libya's heavy dependency on oil and hydrocarbon exports, high population growth, dramatic increase in unemployment rates, and low rates of return on investment in physical and human capital as most investments are carried out by the public sector.

The relatively better growth performance in the 1970s and the first half of the 1980s can be largely attributed to a favourable external environment, in this case high energy export prices. This situation reversed in the second half of the 1980s and early 1990s, resulting in sharp declines in domestic investment, savings and growth.

14. Limitations of the study for further research

This review has assessed the connection between inflation, economic growth, population and unemployment in the State of Libya, and examined the balances between real GDP-unemployment, inflation-unemployment; and inflation-output. The study moves from an examination of Libya to estimate the production function in the short and long run for the period 1962 to 2009.

The results of this review are limited because of the lack of data on output, labour, physical, and population. Future study can focus on the entire economic sector and in deep the new human economic activities under the new condition in Libya after 2011.

The measurement of inputs, especially physical and human capital, is somewhat problematic and involves many assumptions. As a measure of the labour input, the total hours worked obtained by multiplying employment times the average hours actually worked serves as a reasonable substitution for the flow of labour services. However, research can make a correlation between labour force and total economically active population (population between the ages 15–64) under the climatic changes in the area of Libya.

Conclusion

This study has given a comprehensive analysis of the macro-environment of Libya and the performance and the evolution of starting the financial sector development in Libyan economy. The Libyan economy has experienced rapid expansion during the period of the 1970s and the early part of the 1980s as real GDP grew by more than 10% on average. This enlargement was largely backed by the oil revenue sector. After the lifting of the economic embargo on Libya in 2003, Libya has entered a new economic phase carrying the labels of economic openness and freedom. One of the main indicators of the transformation is the privatisation of more than 360 major economic units over three stages, starting from 2004 to 2008 within the framework of privatisation of these projects. There have been significant changes in the structure and characteristics of the Libyan population and labour force over the last two decades. The ratios of Libyan population and labour force have increased substantially; the education levels for both men and women have significantly improved, and the ratio of employees in various jobs has witnessed a moderate increase. However, the great majority of Libyan employees are still working in the public sector and their average wages and salaries are very low, regulated by law since 1980, and in fact this is causing a lot of dissatisfaction among Libyan public sector employees. The country has depended heavily on expatriate labour for the last two decades, although their numbers have decreased dramatically in most economic activities. Overall, Libya still has some way to go with its macro-economic situation such as: a high rate of unemployment, low rate of domestic saving and low ratio of investment to GDP including key governance indicators: regulatory and corruption.

References

[1] International Monetary Fund (IMF), *Financial Statistics Yearbook*, various issues, 2010. W.DC.
[2] Saleh A, 'Economic sanctions, oil prices fluctuations and employment: new empirical evidence from Libya', American Journal of Applied Sciences, vol. 2008, 5(12), pp. 1713–1719.
[3] Yousefi MG, 'The impact of oil export on the economy of OPEC countries: an empirical investigation', The Indian Economic Jouranal, 1994, 42(3), pp. 133–137.
[4] Abohobiel A, An econometric model for the Libyan economy, Ph. D thesis, 1983, Indiana University.
[5] Bergs R, 'Enhanced Trade Integration with Europe: New Prospects of Growth and Development for Libya?' Working paper, New Economic Developments and their Impact on Arab Economies, 2004, Amsterdam: Elsevier.
[6] Finger R, Kreinin M, 'Price elasticitirs in international trade', The Review of Economics and Statistics, 2007, 49(3), pp. 510-515.
[7] Bahgat G, 'Oil terrorism and weapons of mass destruction: THE Libya diplomatic coup', Journal of Social Political and Economic Studies, 2004. 29(2), pp. 373–381.
[8] Masoud NMH, A Review of Libyan's Economy, Structural Changes and Development Patterns. Bus Eco J, 2013, 4(2): 083. doi: 10.4172/2151- 6219.1000083
[9] Ministry of Planning (1989) Social and Economical Transformation Plan 1976- 1980.
[10] Farley R, Planning for Development in Libya, in the Exceptional Economy in the Developing World. 1971, Praeger Publishers, New York.
[11] Otman WA, Karlberg E, The Libyan economy: economic diversification and international repositioning Scotland, 2007, Springer Berlin Heidelberg NewYork.
[12] Ahmadi, R., Ghanbarzadeh, M. 2011a. FDI, Exports and Economic Growth: Evidence from Mena Region. Middle-East Journal of Scientific Research, 10, pp,174-182.
[13] Central Bank of Libya (2002) Research and Statistics, Economic Bulletin, 46th Annual Report, Tripoli, Libya.

[14] Human Development Report (1999) UNDP United Nations Development Programmes. Oxford University Press, New York.
[15] Central Bank of Libya (2000) Financial and Banking Statistic: 1966-2000. Economical Researches Administration, Tripoli, Libya.
[16] Abbas H, Industrial Development and Migrant Labour in Libya. PhD. 1987 Unpublished Thesis, Manchester University, UK.
[17] Alfaitori E, Nationalisation and Economic Development in Libya, Difficulties and Expected Economic Effects. Economic Magazine for Economical Researches (in Arabic) 2003, 4: 1-25.
[18] Arab Monetary Fund (2003) Economic Policy Institute Objectives and Activities.
[19] El-Qumati SM, The Role of Institutions and Financial Markets in Restructuring the Libyan Economy, 1993, pp, 1-25.
[20] Resolution Libya (1988) Export Development in Libya. The General People's Committee no. 523, Article 13.
[21] Central Bank of Libya (1966-2000) Research and Statistics, Economic Bulletin, Money and Statistics, Tripoli, Libya.
[22] Central Bank of Libya (1979) Research and Statistics, Economic Bulletin. 23rd Annual Report, Tripoli, Libya.
[23] Fisher S, Libya the Middle East and North Africa Report. (36th edn), 1990, Europe Publications Limited, London.
[24] Faiadh A, Almejairy M, Public Expenditure and GDP Growth of the Non-oil Sector Maintains Libyan Experiment 1980-1999. Paper Presented at the Conference on Economic Development in Libya: Past and Future, 14-16
[25] December, Benghazi: Libya, Journal of Economic Research, (in Arabic), 2003, 14: 145-156.
[26] IMF International Monetary Fund (2006) World Economic Outlook: World Economic and Financial Survey, IMF, May, Washington, D.C, USA.
[27] Abdulhakim AA, Trek Z, The Effects of Foreign Direct Investment on Economic Growth in Libya: A Causality Analysis. 2016, Open Science Journal 1(2)
[28] Moosa I, Economic growth and unemployment in Arab countries: is Okun's Law valid? Journal of Development and Economic Policies, 2008, 10, pp, 7–24.
[29] Swane A, Vistrand H, Jobless Growth in Sweden: A Descriptive Study, Ph.D. thesis, 2006, University of Stockholm, School of Economics.
[30] Yogo T, Growth and employment in subSaharan Africa: theoretical evidence and empirical facts. International Journal of Business and Social Science, 2008, 2(11), pp, 74–104.
[31] Kapsos S, The employment intensity of growth: trends and macroeconomics determinants, Employment Strategy Department Papers, 2005/12.
[32] Osama S, Does inflation harm economic growth in Jordan? an econometric analysis for the period 1970–2000. International Journal of Applied Econometrics and Quantitave Studies, 2004, 1(2), pp, 41–66.
[33] Al-Abbasi MA, the effect of oil revenues instability on the oil-based and labour-exporting economies: the case of the Arab region. University of Missouri Columbia, Business and Economics Statistics Section, 1991, pp. 98–103.
[34] GPC General People's Committee Decree no. 313 (2003) Approving the Public sector's Restructuring Program.
[35] GPC General People's Committee Decree 100 for 2004.
[36] African Economic Outlook 2011, Libyan economy, African Development Bank Group, Economic and Finance, Available at: <www. africaneconomicoutlook.org>.
[37] National Authority for information and Documentation (1960–1995; 1975–2000; 200-2009) Libyan Government, Tripoli.
[38] Central Bank of Libya, Annual Report, various issues, (2000; 2002; 2004; 2006; 2009), Libyan Government, Tripoli.
[39] Central Bank of Libya, Quarterly Statistical Bulletin (1975–1980; 1990–2000), Libyan Government, Tripoli.

[40] World Bank 1994, Adjustment in Africa: reforms, results, and the road ahead, Oxford University Press, Oxford.
[41] World Bank 2006, Socialist People Libyan Arab Jamahiriya Country Economic, Social and Economic development group, Report, Report no. 30295-LY.
[42] World Bank 2007, MENA economic developments and prospect: job creation in an era of high growth, Available at: <http://siteresources.worldbank.org/INTMENA/R>.
[43] Annual Statistical Abstract, (1970–1980), Libyan Government, Tripoli.
[44] Annual Statistical Abstract, (1980–2007), Libyan Government, Tripoli.
[45] Annual Statistical Abstract, (2000–2010), Libyan Government, Tripoli.
[46] World Bank Middle East And North Africa Region: Economic Developments and Prospects Report, September 2011, Mena Investing For Growth And Jobs. Washington, D.C
[47] The World Bank Annual Report 2009. Office of the Publisher, External Affairs. editor: Cathy Lip. DOI: 10.1596/978-0-8213-7946-2
[48] Yasmen K, An exploratory study on women domestic workers in Libya. (In Arabic), 2006. Available at: <www. auclibya.edu/researchatauc/org>.

Corresponding address:
Amina A.M. DAROUGI
Mathematics Doctoral School
Eötvös Loránd University
H-1117 Pázmány Péter sétány. 1/c,
Budapest, Hungary
Telephone: +3614116500
E-mail: aminaeldrougi@yahoo.com