PRODUCTIVITY PROSOPOPOEIA IN GCC'S COUNTRIES: A GROWTH ACCOUNTING PERSPECTIVE

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Abstract: *Through the past 16 years, the GCC region, testified swift changes such demographic, economic, and societal. GCC countries have taken important strides in economic development over the past, but it faces a number of challenges in the light of developments in the changing of the global economic environment, which affect the path of sustainable economic growth in the GCC countries, that rely heavily on oil. Since 2001, the GCC's GDP has risen by an annual average of 11.28% and by a cumulative total of 346.39%. Meantime, the population has increased from 30.80 million in 2001 to 51.50 million in 2014, as same period the annual average increase of gross capital grown formation by 13.41%, that accumulative total of 482%. This study aimed to outlook the productivity tendency in two dimensions as a whole country and labor productivity trend among GCC member countries through using growth accounting model. The question of this study, diversification strategies adopted by them, especially after declining of oil prices in 1998-1999, resulted seemed to have no impact on productivity performance throughout examined inputs. GCC member's countries have not achieved optimal productivity at the aggregate production level, or even at the grade of labor productivity not to all members, but with some exceptions. The productivity performance was moving in negative trend in all members specifically from 2001-2014. Unlike, the period between 2010-2014, where just the UAE achieved positive productivity growth. The contribution growth share of labor inputs was dominated from 2001-2014, unlike the spot in the SAU, where was affected mostly by the gross capital formation. In the UAE, the labor productivity per capita achieved positive growth from 2001-2014 and 2010-2014, where had the similar in the BHN and KWT just the period from 2010-2014. The performance of TFP was moving in negative direction specifically between 2002-2010.*

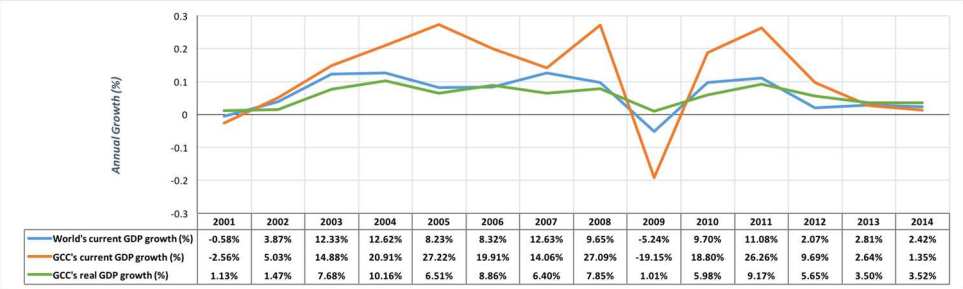
Keywords: *Productivity growth; labor productivity; TFP; growth accounting; GCC.*

JEL classification: *C23; E23; E24.*

1. Introduction

The Gulf Corporation Council (GCC) states include Saudi Arabia (SAU), Kuwait (KWT, Oman (OMN), Bahrain (BHN), Qatar (QTR), and United Arab Emirates (UAE). The economies of the GCC characterized by similarity components were largely dependent on oil production and export as a key resource for financing development operations (Olah & Pakurár, 2013). During the period 2001-2014the GCC nations have passed varying periods of growth rates, depending on the developments in the global economy due to the relevance of those economies to the outside world largely in terms of the reflection of the changes in world oil prices. That are associated with

knives recovery or recession achieved by advanced economies, as those countries with the primary consumer of petroleum produced in the GCC countries.
GCC countries have achieved during the period 2001 to 2014 high growth rates in real GDP as a result to 1.13% in 2001, raising to 10.16% in 2004, until it arrived in 2008 to 7.85 % as a consequence of higher recorded levels of oil prices until the beginning of the second half of that year, where there were signs of the global financial crisis, which affected most of the developed economies (Figure 1). And thus moved its influence to most of the economies in the nations of the world, including the GCC's countries.
By virtue of the GCC has connection to the global economic system as indicated in Figure 1, that leading to a kind of recession included all the Gulf economies, where real annual growth rate reached in 2009 to 1.01%, as a result of the decline in global demand for oil and thus lower prices, which has affected the decline in oil revenues. As an outcome of fiscal and monetary policies and procedures support taken by the governments of the GCC countries, these have been able to achieve the best growth rates in 2011 that recorded 9.17%.



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
World's current GDP growth (%)	-0.58%	3.87%	12.33%	12.62%	8.23%	8.32%	12.63%	9.65%	-5.24%	9.70%	11.08%	2.07%	2.81%	2.42%
GCC's current GDP growth (%)	-2.56%	5.03%	14.88%	20.91%	27.22%	19.91%	14.06%	27.09%	-19.15%	18.80%	26.26%	9.69%	2.64%	1.35%
GCC's real GDP growth (%)	1.13%	1.47%	7.68%	10.16%	6.51%	8.86%	6.40%	7.85%	1.01%	5.98%	9.17%	5.65%	3.50%	3.52%

Figure 1. Annual growth rate of GDP from (2001-2014).
Source: (World, 2017).

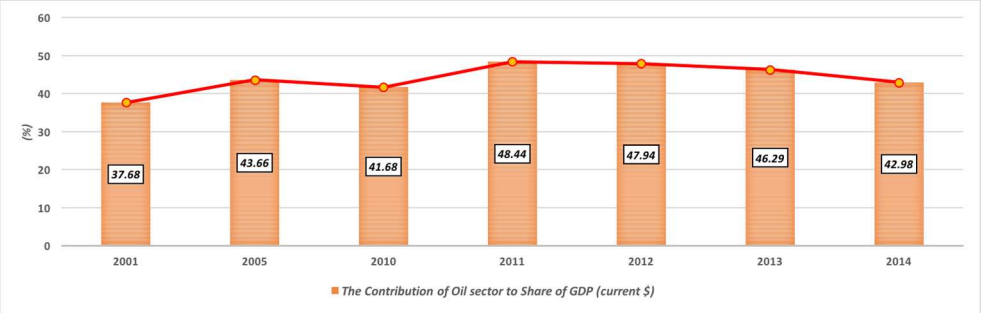


Figure 2. The contribution of oil sector to GDP's share for 2001-2014 for GCC's countries.
Source: GCC statistical center (GCC-STAT, 2017).

GCC countries have taken significant strides in economic development over the past decades but it faces a number of challenges in the light of developments in the changing of global economic environment, which affect the path of sustainable economic growth in the GCC countries relying heavily on oil commodity that suffered setbacks price in the global market during the last years, where oil has lost more

than 50% of its market price. As illustrated in Figure 2, the oil sector is considered the most effective sector in moving the Gulf economies and economic growth rates, which constitute over 40% of the GDP of the GCC countries.
In front of these challenges, the importance of economic diversification was toning up the industrial basis of production by supporting the non-oil exports, and improving the competitiveness of the Gulf economies. Thence, it confirmed future economic visions in the GCC countries on the need to adopt policies aimed at diversifying the economy and freeing it from the domination of a single sector and rely on more than a single sector for growth (Table 1). Especially in the wake of the decline in oil prices in 1998-1999. And attest to all the plans that have been developed in the recent period to diversify economic activity and increase citizens' participation in the workforce. It is worth mentioning that most of the plans emphasize the need to increase productivity and competitiveness.

Table 1. Development visions of GCC's member countries.

	Country	Development vision
1	United Arab Emirates	UAE Vision 2021
2	Bahrain	Economic Vision 2030
3	Kuwait	Kuwait Vision 2035
4	Qatar	Qatar National Vision 2030
5	Oman	Oman Future Vision 2040
6	Saudi Arabia	Saudi Vision 2030

Source: (Cabinet, 2017; BHN, 2017; KW, 2017; QNA, 2017; SCP, 2017; SAU, 2017).

Thus, the question of this study, as long as the overall development plans for the GCC countries, that included a part of strategy to increase productivity and competitiveness. The question: Did the GCC countries achieve an increase in productivity and in particular between the time period of 2001-2014? Hence, the aim of this research is to analyze the productivity in the whole economy as labor productivity between GCC member countries, to see whether the diversification strategies has made any impact in the productivity as witnessed in remarkable growth in others macro variables such country's GDP, population, and gross capital formation from 2001-2014. Respectively, this study is divided in sections, where the first section describes the GCC's GDP, population, and gross capital formation, the literature review of the production function is analyzed in the second section, data and methodology in the third section, and empirical analysis and results is included in the last section.

2. GCC's GDP Structure

The current GDP of total GCC countries grew an annual average growth rate of 11.28% or total cumulative 346.39% from 2001 to 2014. According to the Gulf Corporation Council, Statistics Center (GCC-Stat), the total output achieved at current prices for the Gulf States growth rate of 345% in 2014 compared to 2001, arising from $367 billion in 2001 to $1635 billion in 2014, an increase of $1268 billion. It is worth mentioning that the GDP at current prices lost billion dollars after the sharp decline that occurred in 2009, where the rate of decline in GDP was -19.15% (Figure 1).

Saudi Arabia's GDP total for the GCC in 2014 contributed 46%, an output of $754 billion, followed by the UAE with a contribution amounted to a quarter of the GDP of the GCC countries and the estimated value of $402 billion, and Qatar came in the third place with a contribution rate of 13% and an output capacity of $206 billion. And dissolved the State of Kuwait in fourth place with a contribution of 10% with an output capacity of $163 billion. While Oman and Bahrain contributed by 5% and 2.0% with the estimated value of $81 billion and $33 billion respectively (Figure 3).

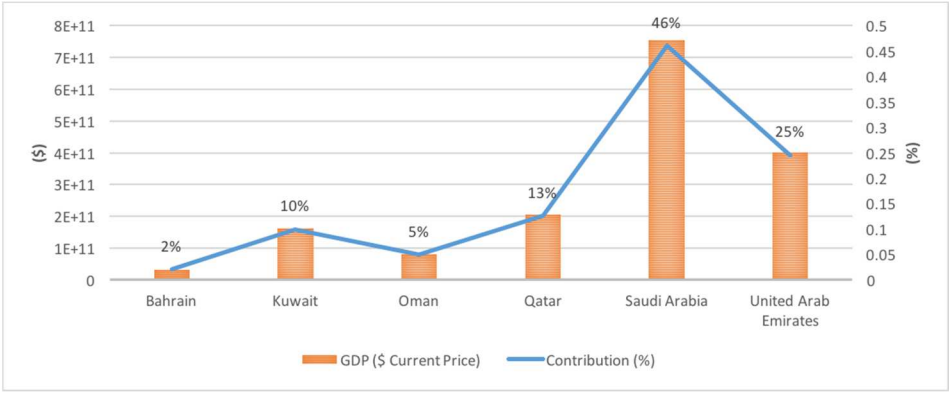


Figure 3. Contribution (%) at total GCC's GDP at current prices ($) for year 2014. Source: (GCC-STAT 2017).

GDP per capita is used to assess the level of economic development, the strength of the economy, and evaluate the economic performance of the country, where its reflecting the change in the output value of goods and services. Also, used to gauge the wealth of nations and improve the level of per capita income (Fleurbaey & Blanchet, 2013). As illustrated in (Table 2), that described the income per capita for GCC's member countries for selected years between (2001-2014), indicated an increase during the period (2001-2014) more than doubled in all GCC's countries except in the UAE. According to IMF, World Bank, and CIA, that Qatar ranked the top ten globally countries in per capita GDP.

Table 2. GDP per capita (Current US $) for period from (2001-2014)

	2001	2005	2010	2011	2013	2014	CHANGE (%)
BHN	12,917	18,418	20,386	22,034	24,114	24,515	90%
KWT	17,533	35,694	37,725	47,551	48,463	43,332	147%
OMN	8,560	12,399	19,921	21,164	20,205	19,130	123%
QTR	28,577	53,207	70,870	88,051	94,574	94,944	232%
SAU	8,316	13,274	18,754	23,256	24,646	24,406	193%
UAE	32,106	40,299	34,342	39,901	42,987	44,239	38%

Source: (World, 2017).

The oil sector remains the main driver in the leadership of economic activities. Every bit was its contribution to the GDP in the GCC 42% in the year 2014 compared to

2013, where it was 46% according to (Figure 2). In contrast, the development of non-oil activity rate rose in GDP for the GCC countries in the 2014 year rose 8.53% from a year earlier, as the value added of $949 billion in 2014, compared to $874 billion in 2013. Where, the accumulated growth rate of non-oil sectors from 2001-2014, witnessed high increased in Qatar comparing to other states according to (see Table 3).

Table 3. Accumulated growth rate of non-oil sectors (2001-2014).

	BHN	KWT	OMN	QTR	SAU	UAE
Accumulated growth rate (2001-2014)	264%	240%	294%	1284%	268%	238%

Source: (GCC-STAT 2017).

The mining and quarrying sector's share of each country's GDP as illustrated in Table 4, showed that Qatar and Kuwait, the mining and quarrying production sector contributed more than half of GDP as average figure from 2001-2014. While, state of Bahrain shared about 22.98%, followed by UAE by 32.59%. In Oman and Saudi Arabia average figures were 46.18% and 42.54%, respectively.

Table 4. Mining and quarrying sector average contribution share (%) to GDP from 2001 to 2014.

Country	Average (%) from 2001-2014
BHN	22.986
KWT	53.262
OMN	46.818
QTR	54.581
SAU	42.540
UAE	32.599
GCC	42.131

Source: (GCC-STAT, 2017).

A. Population Structure

In term of the total population in GCC countries (Table 5), statistics show a remarkable growth from 2001-2014. The growth with the increasing intensity of economic activity in the GCC countries to reach 30.8 million in 2001. As a result of the evolution in the volume of economic activity, population growth continued to increase until the population of the GCC countries in 2014 amounted to a total of 50.51 million people, an increase of 67.21% over the 14 years. According to (Table 5), Qatar and UAE had a remarkable increased in population for each from 2001 to 2014 which were 256% and 182% respectively. While, in Saudi Arabia just increased as 40% from 2001 to 2014.

In parallel, the labor force number was 11.04 million in 2001. In 2014, the number jumps to 24.99 million, which is equivalent to growth rate of 126.28% from 2001 to 2014. On the other hand, the number of engaged workers in 2001 was 10.59 million, which has risen to 17.2 million in 2007. The number rises to 23.83 million workers in 2014, which the growth rate was 125.11% from 2001-2014. In terms of group ages, the total population ages from 15-64 was recorded 19.44 million people in the year 2001, and jumped to 37.78 million in year 2014, which an increase of 94.34%.

Table 5. Total populations of GCC's member countries (2001 and 2014).

	UAE	SAU	BHN	QTR	KWT	OMN	TOTAL
2001	3.22	22.01	0.69	0.61	1.99	2.27	30.80
2014	9.09	30.89	1.36	2.17	3.75	4.24	51.50
CHANGE (%)	182	40	97	256	88	87	67

- (Numbers in millions)

Source: (World 2017).

Figure 4 describes the percentage of population group ages (15-64), labor force, and engaged workers for each member of GCC countries for year 2001 and 2014. As indicated that the total numbers of engaged workers were higher in UAE and Qatar, which 67% and 73%, respectively, of total population for year 2014. On other side, the engaged workers were lower in Saudi Arabia in year 2014 was 37% of total population and even in year 2001 was 29%. While, the population ages (15-64) indicated for most of the members a higher share than 70% especially for the year 2014, which represents the structure of populations for GCC's countries that could be involved in potential active workers.

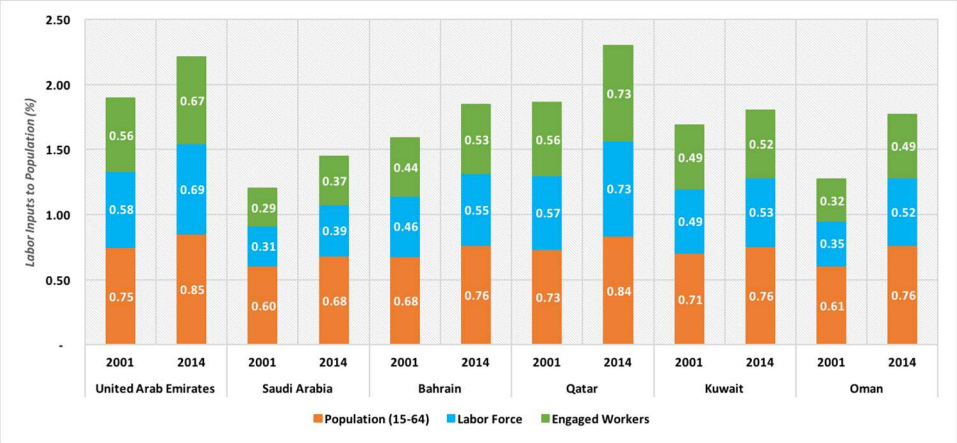


Figure 4. Percentage (%) labor inputs to populations
Source: (World 2017).

B. Gross Capital Formation (GCF)

GCC's countries invested hugely as a percentage of their surplus or outputs in capital stock. Since 2001, the annual average growth rate of GCC's gross capital formation grown 13.41% and by total accumulative 482.29% to year 2014. In year 2001, the GCF has valued $72 trillion and $429 trillion in 2014, rose 429% compared to 162% in the world according to Figure 5.

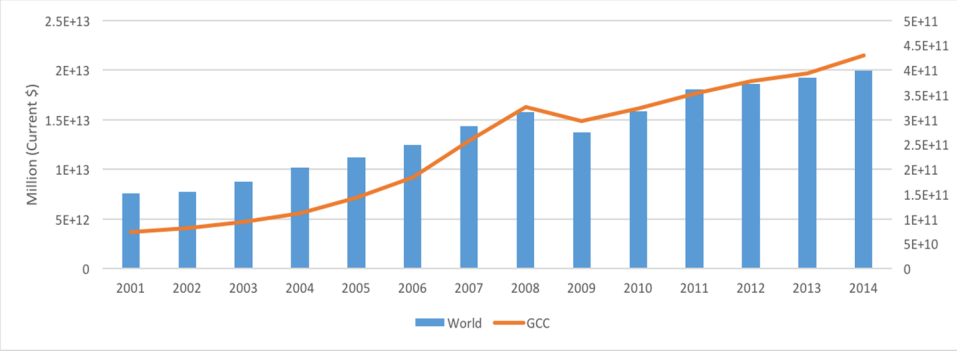


Figure 5. Gross capital formation (2001-2014)
Source: (World 2017).

The change of growth of GCF from 2001-2014, were 847%, 714%, 621%, 1180%, 431%, and 313% for Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and UAE, respectively. The previous figures indicate that the state of Qatar was the highest in growth percentage from 2001 to 2014 about 1180%, while in the UAE was 313%, which was the lowest (Figure 6). On other hand, and according to Figure 6, GCF's trend showed the Saudi Arabia the UAE, and Qatar had more valued compared to Bahrain and Oman.

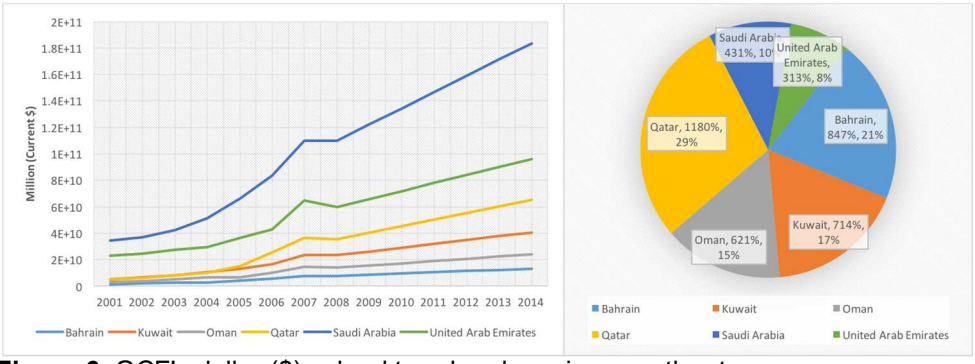


Figure 6. GCF's dollar ($) valued trend and moving growth rate.
Source: (World 2017).

C. The Production Function and Factors Input.
The productivity of any nations relies on many things such as the capital stock, the level of skills and education level of the worker, the technology used the efficiency due to good allocation and utilization of capital and labor, and so forth (Miles, et al., 2012). Following this suggests which ultimately thinking of GDP that produced with three factor inputs: capital, labor, and total factor productivity (TFP). These three inputs are combined to produced output. The relationship of inputs and output is addressed in Figure 7:

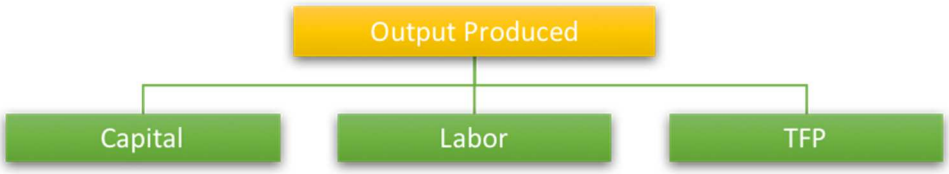


Figure 7. The production function
Source: (Miles & Scott, 2008).

2.1 Capital Stock

Capital stock is defined as durable assets that serves to generate output of goods and services, as for example the buildings and machines used in production of GDP. The capital stock is divided into three components: residential buildings, nonresidential buildings, and equipment (Miles, et al., 2012). The accumulation of capital stock happens over time, which is much larger than the flow of GDP produced within a period of one year. Mostly, the ratio of capital to GDP in OECD countries ranges between 2 and 3 (Miles & Scott, 2008). The capital takes the shape of a stock of goods and services used in the production. It includes:

- The circulating capital: inventory of goods and services destroyed or transformed in the course of the production.
- The fixed capital: inventory of durable capital goods, equipment, building, and software used more than a year in the process of production.

2.2 Labor

Labor represents the most significant factor of economic development. Especially in the past (in the classic school) it was considered an essential input of production (Harbison, 1973) contributing to the production of goods and services. Training and education of workers are the most welling investment that help to advance the productivity of the workforce (Barro, et al., 1991). Another perspective about labor is that economic growth does not only mean an increase in the gross domestic product (GDP), but a consequent increase in real per capita income, in the sense that growth to be higher than the population growth rate (Barr, 1996). Labor force as part of the population is defined as working age between 15 and 64 years old. The labor force is made up of employed and unemployed persons.

2.3 Total Factor Productivity (TFP)

TFP is considered as a source for long-run growth that measures the technological change which has increased due to technological inventions or improvements. According to Solow (1956), TFP is the most significant elements needed to achieve sustained economic growth in the long term. As called “Solow residual”, that can only be explicated by the "technical progress" in the broad sense, including essentially technology, innovations, skills, knowledge, training, etc. The measuring for TFP cannot calculated directly but it can be obtained by deducting output from inputs, or calculates the ratio of output to inputs.

In conclusion, three inputs are primarily associated with production to increase the productivity. But, raising the production of ordinary working hours by labor not the beneficial factor to elevate the productivity as labor input factor. The solution to increase the productivity is by increase the capital accumulation and improvement

in multifactor productivity (Miles, et al., 2012). According to economic growth model such as AK growth model, which pronounced the country can achieve sustained growth with an increasing in capital deepening that relies on saving rate without technical progress (Acemoglu, 2008).

3. Data and Methodology

The appropriate function of growth accounting techniques depends on the availability of reliable statistics on output and inputs. The growth accounting is a quantitative approach for understanding and assessing the contributions through the production inputs (capital, labor, and TFP), and will be used as quantitative and descriptive method in this study (McGraw-Hill 2013). The source of data is at most gathered and composed by the World Bank, Country databank and GCC Statistical Center (GCC-Stat).

As previously noted and pointed out, that the source of growth are the capital, labor, and total factor productivity (TFP). And can determine the percentage or the sum of the contribution of each of the three components of the production using the simple neoclassical Cobb-Douglas production function referred to the below equation:

$$\mathrm{Y_t} = \mathrm{A_t K_t}^{\alpha} \mathrm{L_t}^{1-a} \qquad (1)$$

Where [Y] represents the output (GDP), [K] represents the capital accumulation stock, [L] is the human capital stock, [A] denoted as technology progress impact on productivity without affect by inputs (labor and capital) such improvement in production processes, innovations, institution's practices and management, and so forth. The study takes the constant return to scale which [a] is equal 1/3 in proportion of capital and human inputs, and [t] indicates the period of time.

The total figure of active workers, mostly not available for some nations. Therefore, the researcher used approach to generate the total engaged workers from available world bank data and following to (Molnár & Máté, 2016). Known that The labor force (LF) is two parts that amount equals the employed and unemployed people. And, the labor [L] which is the total engaged workers should be equal the LF minus the number of unemployed persons which expires in the equation $[L] = LF - U$, where [U] denote the number of unemployed individuals, that estimated with $[U] = u * LF$, where [u] equaled the unemployment ratio. Put another way, $[L_t] = LF_t * (1 - u_t)$. Moreover, the labor capital can be calculated with $L_t = p_t * a_t * P_t * (1 - u_t)^{1-a}$, where [p] is participation rate that estimated with $[p] = \mathrm{LF}/N$, where [N] represented the working population in the age group of (15-64 years old), and [a] as a sample of the active to total population ratio that calculated with $[a] = N/P$, where [P] sampled the total population. Consequently, the production function equation (1) can be written as:

$$Y_t = A_t K_t^a (p_t a_t P_t (1 - u_t))^{1-a} \qquad (2)$$

From the last equation (2) we rewrite the equation in logarithm to indicate in log-liner form as follow:

$$lnY_t = lnA_t + a\ lnK_t + (1-a)lnp_t + (1-a)lna_t + (1-a)u_t \qquad (3)$$

With regard to time, and differentiations of equation (3), were typified to the changes in logarithm of GDP [Y] as productivity performance and its contribution inputs denoted with K, L, and A. And, labor productivity [y], can be approximated by dividing each side of the equation (2) to [P], as written in equation (4), where labor productivity expressed as [gy], that indicated the changes in GDP per capita, capital productivity per labor as [gk], and [gA] as TFP per labor. The purpose of labor productivity estimation to indicate was how much average value-add that generated by each employed person.

$$y = A_t K_t^a (p_t a_t (1-u_t))^{1-a} \qquad (4)$$

As used in this study a time-series analysis from 2001 to 2014, for GCC member's countries, the model used to calculate the contribution of capital, labor, and TFP in the whole economy and average value-added per capita manner. The data for variables have obtained from World Bank Countries Database from 2001-2014. As described the GDP (constant LCU), gross capital formation (constant LCU), and labor (total population, total population ages (15-64), total labor force, and total unemployment % of labor force).

4. Results of a Growth Accounting Exercise.

Figure 8 shows the output and TFP movement tendency for GCC's countries from 2001-2014 and clearly indicate the similarities between these countries due to movement of those two variables. In general, TFP movement trend fluctuated mostly in negative side specifically between 2002 and 2010 beside other spots. On the other side, the output trends explained by real GDP showed mostly hard fluctuations but in positive side, unless in the year 2009 due to the world financial crisis. It is worth mentioning here that Saudi Arabia seemed to be still in positive side, even in the year 2009, although growth rate declined from 8% in 2008 to only 2% in the year 2009.

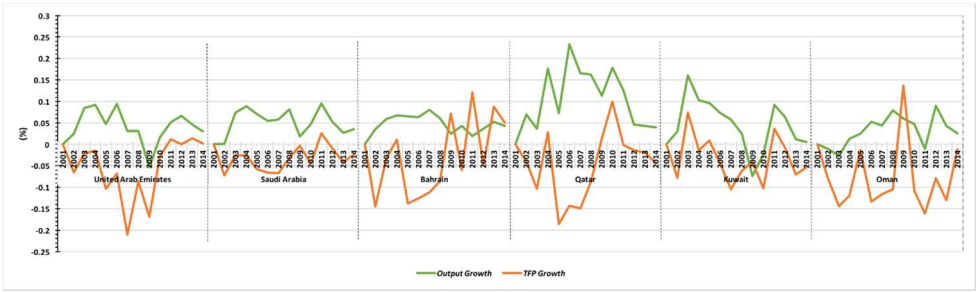


Figure 8. Output and TFP growth for members of GCC region from 2001-2014
Source: (World 2017).

In conclusion, these countries need to focus on improvement in technology, and innovations. Also, it can be stated that oil prices had more impact on the turnout of these nations suggesting the need to diversify their incomes and reevaluate the diversification strategies because their productivity were indicating poor performance as next explained.
In Table 6 that describes in average of the 5 years broken periods and a period of 14 years the annual average growth rates of testing variables and a share of growth of inputs (capital, labor, and TFP).

Table 6. Analysis descriptions of growth accounting exercise.

	Average Annual Growth Rates				**Share of Growth Due to:**		
UAE	Y	K	L	A	K	L	A
2001-2014	4.0%	9.0%	10.6%	-6.1%	67%	184%	-150%
2001-2005	6.7%	6.9%	10.1%	-2.5%	31%	106%	-37%
2005-2010	1.9%	10.8%	13.9%	-11.1%	174%	523%	-598%
2010-2014	5.0%	8.9%	2.8%	0.3%	54%	40%	6%
SAU	Y	K	L	A	K	L	A
2001-2014	5.8%	15.5%	4.3%	-1.9%	81%	52%	-33%
2001-2005	6.3%	16.3%	5.0%	-2.1%	78%	56%	-33%
2005-2010	5.3%	17.7%	3.9%	-2.7%	101%	51%	-52%
2010-2014	5.0%	6.5%	4.9%	-0.4%	39%	69%	-8%
BHN	Y	K	L	A	K	L	A
2001-2014	5.1%	9.3%	7.7%	-3.1%	55%	105%	-60%
2001-2005	5.8%	24.0%	6.3%	-5.8%	124%	77%	-101%
2005-2010	5.5%	8.2%	11.0%	-4.7%	45%	142%	-87%
2010-2014	3.9%	-3.2%	1.1%	4.1%	-24%	20%	104%
QTR	Y	K	L	A	K	L	A
2001-2014	12.8%	20.0%	13.9%	-2.9%	47%	76%	-22%
2001-2005	9.2%	26.5%	9.4%	-5.3%	86%	71%	-58%
2005-2010	16.4%	18.4%	19.3%	-2.6%	34%	82%	-16%
2010-2014	6.0%	11.6%	4.7%	-0.8%	58%	55%	-14%
KWT	Y	K	L	A	K	L	A
2001-2014	4.4%	11.7%	5.6%	-3.0%	79%	88%	-67%
2001-2005	10.4%	24.6%	3.3%	0.7%	71%	22%	7%
2005-2010	1.0%	7.7%	7.7%	-6.0%	236%	481%	-617%
2010-2014	4.2%	7.1%	5.6%	-1.9%	50%	94%	-44%
OMN	Y	K	L	A	K	L	A
2001-2014	3.9%	14.6%	8.0%	-6.1%	113%	143%	-155%
2001-2005	-0.2%	19.7%	4.0%	-8.8%	3786%	-1785%	5671%
2005-2010	5.8%	15.3%	6.8%	-3.5%	79%	82%	-61%
2010-2014	4.2%	9.7%	13.7%	-8.3%	69%	227%	-195%

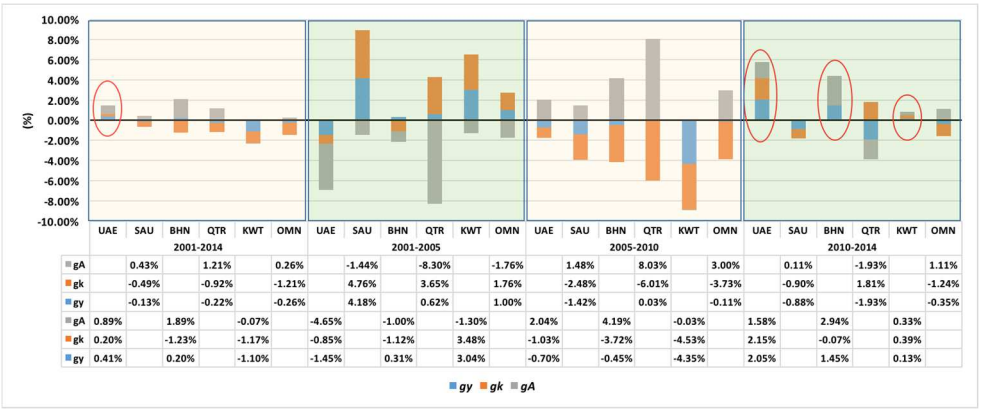
Source: Own calculation based on World Bank Database.

The annual average growth rate was 4.0% in the UAE, 5.8% in SAU, 5.1% in BHN, 12.8% in QTR, 4.4% in KWT, and 3.9% in OMN. The state of QTR was the higher recorder figure for the period from 2001-2014. On the other side, the average growth

rate for the period from 2010-2014 indicated closed figures between these countries. Given the average growth rate of productivity performance for the period 2001-2014, the figure was -6.1% in UAE, -1.9% in SAU, -3.1% in BHN, -2.9% in QTR, -3.0% in KWT, and -6.1% in OMN. Regardless, in the period of 2010-2014, this figure was 0.3% in UAE, unlike the ease of the country that gave the continuing negative indicators of productivity performance. In terms of development of gross capital formation and labor for the period 2001-2014, all countries observed more yearly average increase rate in gross capital formation, unlike the situation in the UAE where labor was more dominated.

Counting to the share of growth due to three inputs and according to Table 5, it was found that, the share contribution of labor growth was dominated with184%, 105%, 76%, 88%, and 143% in UAE, BHN, QTR, KWT, and OMN respectively, which unlike in SAU where the growth due to the capital was dominating about 81% beside 52% for the share of labor growth for from 2001-2014. Another fact observed with TFP improvement in the UAE in the period 2010-2014 was the shifting of the growth contribution of labor to capital with 40% and 54% respectively.

Figure 9 describes the labor productivity for GCC member's counties in group of periods (2001-2014, 2001-2005, 2005-2010, and 2010-2014), and classified in productivity components analysis such growth per capita (gy), capital produced per capita (gk), and TFP per capita (gA). Consequently, the UAE was deserved the positive trend for the period from 2001-2014, while other countries deserved negative figures at least in two components of the labor productivity analysis. On the other side, in specifically the period from 2010-2014, the UAE, BHN, and KWT were deserved positive labor productivity, such as 2.05%, 1.45%, and 0.13% in TFP per capita, respectively. Moreover, the growth caused by gross capital formation was between 0.20% and -1.23%, and TFP growth was between 1.89% and -0.07, for the period from 2001-2014.



	UAE	SAU	BHN	QTR	KWT	OMN	UAE	SAU	BHN	QTR	KWT	OMN	UAE	SAU	BHN	QTR	KWT	OMN	UAE	SAU	BHN	QTR	KWT	OMN
	2001-2014						2001-2005						2005-2010						2010-2014					
gA		0.43%		1.21%		0.26%		-1.44%		-8.30%		-1.76%		1.48%		8.03%		3.00%		0.11%		-1.93%		1.11%
gk		-0.49%		-0.92%		-1.21%		4.76%		3.65%		1.76%		-2.48%		-6.01%		-3.73%		-0.90%		1.81%		-1.24%
gy		-0.13%		-0.22%		-0.26%		4.18%		0.62%		1.00%		-1.42%		0.03%		-0.11%		-0.88%		-1.93%		-0.35%
gA	0.89%		1.89%		-0.07%		-4.65%		-1.00%		-1.30%		2.04%		4.19%		-0.03%		1.58%		2.94%		0.33%	
gk	0.20%		-1.23%		-1.17%		-0.85%		-1.12%		3.48%		-1.03%		-3.72%		-4.53%		2.15%		-0.07%		0.39%	
gy	0.41%		0.20%		-1.10%		-1.45%		0.31%		3.04%		-0.70%		-0.45%		-4.35%		2.05%		1.45%		0.13%	

Figure 9. Labor productivity from (2001-2014).
Source: Own calculation based on world bank database.

5. In Conclusion

We concluded after employing growth accounting exercise for time-series period 2001-2014 and divided periods of almost average 5 years that economic growth, economic diversification strategies, and the abundance of natural resources, which

undoubtedly contributed to the economic development in the Gulf Cooperation Council (GCC) have not achieved optimal productivity at the aggregate production level, or even at the level of labor productivity with some exceptions.
Gross capital formation, labor inputs, and TFP were three inputs examined in equal to total output country's constant GDP. In summarizing the results, the TFP was moving in negative trend especially between 2002-2010. The annual growth rate was higher in Qatar by about 12.8%, which the highest that compared among other members. The productivity performance was trended negatively in all members from 2001-2014. Unlike, the period between 2010-2014, when only the UAE achieved positive productivity growth. On the other side, the contribution share of labor was dominated from 2001-2014, unlike the situation in the SAU, where it was the gross capital formation. The labor productivity per capita in the UAE was positive from 2001-2014 and 2010-2014, and BHN and KWT were deserved positive in the period of 2010-2014.
In conclusion, it seemed that diversification process had made an improvement in whole economy's productivity performance only in 2010-2014 in the UAE. While, the results of labor productivity showed positive trend in the UAE from the period of 2001-2014, beside the other members such BHN and KWT, specifically between 2010-2014.

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