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IS OIL FOREVER? SAUDI GOVERNMENT REVENUE DIVERSIFICATION IS NOW NECESSARY

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ABSTRACT: *This research aims to identify the potential government revenue diversification sources in Saudi Arabia. The purpose behind this was the fact that the Saudi economy rely on oil as main source of export and fiscal revenue. That said, the shock in oil prices directly affect government revenue. The current Saudi economic model has weaknesses due to its over-reliance on oil revenue. Therefore, an increasing economic divarication is paramount as it would reduce exposure to volatility and uncertainty in oil market. To achieve above stated aim, secondary data is collected from the Saudi Ministry of Finance, IMF, world bank and OPEC from 2000- 2015. The data analysis approaches used in this research is a great contribution to knowledge as it covers three main analysis tools: Trend analysis, Correlation and Contribution analysis. Trend analysis revealed that although Saudi revenues are showing an increasing trend but the high proportion of oil revenues cause a fall in total revenue due to dropping oil prices in global market. This finding was further supported by correlation analysis. The results show strong positive correlation between total revenue, oil revenues and non-oil revenues before financial crisis 2007-2008 however, the situation changed to a negative correlation between total revenues and non-oil revenue sector signalling to a presence of revenue diversification effort. Similarly, the correlation between oil prices and revenues show high positive correlation but negative correlation with production proving the fact that oil production increases in Saudi Arabia when oil prices drop to cover the revenue need of the economy. These results led the researcher to examine the potential sources that can help Saudi policy makers to diversify revenues and reduce revenue volatility. Contribution analysis is employed to examine the proportion of other sectors in total revenues. Investment, document fee and taxes are recognized as main predictors of total revenues other than oil revenues. This research concluded that revenue diversification is necessary not only for Saudi economy but the results can be generalized to those economies too which are relying on only one or few revenue sources. The study shows great implications for policy makers, government and authorities responsible for stabilizing the economy.*

KEYWORDS: Diversification, Oil, Saudi Arabia, Revenues

INTRODUCTION

Countries are facing tremendous economic and social challenges in the twenty-first century, especially after the recent financial crisis. Changing political situations, demographic changes, and economic changes are creating fiscal stress for countries all around the world. Within all these challenges, frequent economic fluctuations are the most important ones that are creating a fiscal instability (Carroll, 2005; Hou, 2001). These economic fluctuations are more harmful for those countries which rely on one major source of revenue, such as Saudi Arabia where approximately 90% of government revenue comes for oil sector.

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Indeed, the kingdom of Saudi Arabia was one of the poorest countries with limited sources when it was founded in 1932 (Al-Dukheil, 2013). The Saudi government faced a shortage in the revenue where revenues were reported to be approximately $7 million. This shortage in revenues was due to limited sources including agriculture and income generated from the religious pilgrims in Makkah and Al-Madina (ibid). In short, five years later, the turning point in the government revenue was when the oil was founded and the government over-relied on oil as main source of revenue. This reliance grew extensively and today, nearly 90% of its revenue comes from oil.

Researchers such as Khabazi et al (2014) and Al-Dukheil (2013) agree that the Saudi wealth and living standards were improved due to oil exploitation. The effect of this can also be seen in government's policy attitudes where, government used oil as a weapon in political affairs by increasing or decreasing oil production. The evidences for such policy changes can be clearly witnessed in three distinct periods between 1973 and 1986.

In 1973, Saudi Arabia and its allies decided to lay an embargo on exporting oil to USA and most of the Europe countries as an expression of their rejection of the Israeli occupation of the Palestinian lands (Hamilton, 2011). This shortage in oil supply, which formed nearly 8% of the global output, led to an increase in oil prices. In addition, the Iran-Iraq war between 1977 and 1981 played its role in doubling the oil prices due to the shortage in oil production. This increase in oil prices, consequently led to a prosperous period in the oil producing countries, particularly Saudi Arabia, reporting budget surplus from 1977 to 1981. The end of Iran-Iraq war also put a stop on increasing oil prices as both Iran and Iraq also joined the race of oil production and supply. These new competitors in the market affected Saudi monopoly resulting a decline in oil revenue due to decreasing prices. Consequently, to keep the prices high, Saudi Arabia declined its production nearly ¾. However, according to Hamilton (2011), reducing oil production was not sufficient to maintain oil prices. Thus, Saudi revenues started declining along with its market share.

This policy of reduced production did not stay for long and in 1986 the Saudi policymaker decided to flood the market by increasing oil production also named as bone-breaking battle, to regain market share in oil market (ibid). However, the overproduction led to a surplus in oil market, resulting in dramatic fall in oil prices from $28 to $12 per barrel (ibid).

This reduction in oil prices had knock on effect on Saudi budget where a deficit was reported in the following year (Al-Dukheil, 2013). In order to address the deficit, the government was forced to issue government bonds and to increase its debt. In addition, the government stopped offering free services such as, electricity and water by imposing fees. In addition, the government lifted subsidies on the petroleum products, such as the car fuel, which rose from 0.45 SAR to 0.90 SAR per liter and the diesel form 0.15 SAR to 0.35 SAR (Aljazeera, 2015).

The boom in the oil prices from 2003 to 2013 led to prosperity in the Saudi economy which placed it as the 19th largest economy in the world. This boom increased the GDP, the householder income by 75%, and nearly 2 million jobs were created. In addition, the government invested heavily in the infrastructure, health and education (McKinsey Global Institute (MGI, 2014). However, Arezki and Blanchard (2015) argue that although Saudi government increased its production of oil to create more revenues but eventually led to pushing the oil prices down. Since, 90% of revenues come from oil, the declining oil prices led to creating instable and volatile revenue (Maleckaite, 2012). Thus, showing a high association between oil prices and revenues as researched by Al-Dukheil (2013).

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Similarly, as reported by the Ministry of Finance in their national budget statement (2016), the government revenue declined nearly 50% in 2016; from 1,046 billion, in 2015, to 608 billion SR in 2016, due to the fall in the oil prices. Consequently, this drop in the government revenue increased government debts and puts a pressure on the policymaker to control the government expenditures. To avoid such an issue, researchers such as Shamsub and Akoto (2004); Yan (2008); Maleckaite (2012) have argued that increasing revenue diversification is paramount to avoid overcoming a revenue instability.

In this regard, revenue diversification has become a prevalent practice (Brien, 2006; Carroll, 2007), where, according to portfolio theory, diversification can bring stability in the cash flows which is an important policy objective for both state and local government administrators (Felix, 2008). Revenue diversification, according to Hendrick (2002), is often advocated as a strategy underlying effective fiscal management. However, it should not be confused with making them more complex (Carroll, 2009). Therefore, revenue diversification, especially the complexity side, is often associated with pursuit of government expansion.

As it seems that the history might repeat itself, researchers such as Al-Dukheil (2013) raise the question that to what extent volatile oil prices can affect the ability of government to raise revenues and control their expenditures.

That said, according to Shamsub and Akoto (2004), the concept of revenue diversification decreases the revenue volatility even while controlling for changes in country's economic activity and the composition of revenues. Therefore, this study analyses the concept of revenue diversification in case of Saudi Arabia where 80% of government revenue comes from oil sector.

Aim and Objectives

The aim of this study is: "To identify the potential government revenue diversification sources in Saudi Arabia"

To achieve the above stated aim of this study, following objectives are set:

- To examine the changing government revenues trend from 2000-2015
- To identify the determinants of the government revenue
- To analyse the relationship between oil price, oil and non-oil and total revenues employing correlation analysis.
- To examine the effects of other revenue sources on government revenues through Contribution analysis.

Revenue Diversification

The concept of revenue diversification is dated back to great depression in 1970s when state began to reduce their reliance on property taxation. This reliance was since property tax was viewed as most stable and visible source to finance public service provision. However, the reduction in property value affected the tax level, which ultimately reduced government revenues. In response, local government began to diversify their revenue structure away from reliance on property taxation (Yan, 2012). Revenue diversification, according to Suyderhoud, (1994), is described as revenue structure relying on a variety of revenue sources.

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This diversification hence leads to more stable revenue source and reduce the risk of volatility and instability. However, there is a serious debate that the revenue diversification can lead to either revenue volatility or, economic stability. The argument in favour of diversification and stability is based on the ways and methods employed by government to diversify. As researchers such as Carroll (2009) and Yan (2008) found that to achieve greater revenue and economic stability, the way to diversify government revenue is more important. Indeed, Carroll (2009) and Yan (2008) further assert that the revenue structure has "an active influence on revenue volatility". Theoretically, according to Yan (2008, p.26), to minimize the risk by minimizing the volatility, governments should create a portfolio, which includes multiple revenue sources (with less interrelationship). Consequently, failure to create such a portfolio could affect the county's economy stability (ibid). Carroll's (2009) study also investigated the effect of tax and non-tax revenues. However, he acknowledged the different effects of diversification and complex structure on those sources. In short, Carroll's (2009, p48) research suggests that to reduce the revenue volatility, the policymaker should consider both tax diversification and non-tax diversification as isolation. Conversely, if they consider diversification and complexity simultaneously, the result shows a disappearance for the non-tax diversification.

Booz Allen Hamilton's report (2014) believes that Gulf Cooperation Council (GCC) countries, particularly Saudi Arabia can more likely diversify their economies easier than other nations due to its strong foundation and the fact that majority of the required elements are already in place, (i.e. airports, modern office buildings and political stability, additionally to the oil revenue which provides high income to fund in new business and training).

Doing so and having diversified revenue structure will avoid the imbalanced use of a given revenue source at the cost of other revenue sources (Suyderhoud, 1994). Moreover, revenue diversification manifests reduction in the non-systematic risk (ibid). This is because uncertainty or fluctuations of revenue sources could lead to disruption in the development process (Hendrick, 2002).

RELATED STUDIES

The concept of revenue diversification is widely researched where researchers such as Hendrick (2003); Krane et al (2004); Carroll (2005); Gylfason (2006); Conybeare (2011); Frumkin and Keating (2011) explored the concept in many developed economies and different sectors. The financial sector revenue diversification is a much-debated area after the recent financial crisis. The concept of revenue diversification has become a prevalent practice in banking where researchers such as Lee (2014), Gamra and Plihon (2011), Odesanmi and Wolfe (2007) and Stiroh (2002) examined potential diversification benefit in financial sector along with examining the fact that unrelated diversification may lead to variety of risks.

Similarly, revenue diversification concept is also assessed in non-profit organizations by Carroll (2009) Yan (2008), Chang (1994), and it was concluded that it reduces the revenue volatility and leads to financial stability.

Having said that, the concept of revenue diversification is not limited to the above-mentioned banking and non-profit organization, but the idea is also extended to government revenue diversification by Yan (2012), Chernick (2011), Schunk and Porca (2005), Carroll and Johnson

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(2010). These researchers considered the fact that balanced revenue system is better equipped to handle downturns, thus balanced revenue system lead to greater revenue growth stability. In this regard, Suyderhoud (1994) investigated the importance of revenue diversification trends in 240 municipalities in Chicago. The research revealed that higher revenue diversification lead to increased economic growth. The recent study by Conybeare (2011) asserts that developing countries may have more diversified tax bases than developed economies but they are unable to exploit them due to administrative weaknesses.

The aforementioned studies mostly focus on developed economies relative to tax revenue which influence revenue fluctuation across state. However, there is a lack of research in developing economies specifically the ones with concentrated revenue structure. Although it is argued that revenue structure remains a political choice but it is important to examine the impact of revenue diversification in economies with more authoritative political system such as Saudi Arabia. To the best of author's knowledge there is no such research conducted in Saudi Arabia examining the impact of revenue diversification. Therefore, considering this gap in literature it might be appropriate to examine this concept in Saudi Arabia.

In addition, the above discussion revealed that revenue diversification is possibly one of the solutions to revenue instability in those economies which are heavily relying on one or few specific and exhaustible sources. Thus, considering Saudi Arabia which is more oil dependent, it is important to identify if this is the case then how revenue diversification can help to reduce revenue volatility by identifying potential revenue sources. Hence, the aim of this study.

Importance of Diversification in Saudi Arabia

Economists such as Al-Dukheil (2013) and McKinsey Global Institute (MGI) (2015) believe that changing the Saudi government trend from the reliance on the oil revenue could not just lead to economic growth and stability but it might also be considered as a solution to solve several economic issues in Saudi Arabia. Currently, it can be said that the Saudi economy suffers from several economic issues, such as a high level of unemployment and inflation in the basic goods, due to the lack of productivity leading to increased imports. Furthermore, lack of participation from the private sector, which is deeply depended on government tenders and subsides, is another issue (Al-Dukheil, 2013; and McKinsey Global Institute (MGI) (2015). McKinsey's report (2015, p.13), also, warns that even if energy prices rise again, and says that "a transformation would be needed to put Saudi Arabia's economy on a more sustainable footing".

The good news is that there is a serious focus from Saudi policymakers recently who understood the risk and the challenges faced by the government from the reliance on the oil revenue to finance its budget. Hence revenue diversification is now a priority. For that, they are creating the National Transformation program 2020 which aims at achieving the Saudi Vision 2030 through a number of "domains-strategic objectives, targets, outcome-oriented indicators, and commitments that are to be achieved by the public, private, and nonprofit sectors"; however, there is a serious debate about the efficiency of this program (Project Development & Finance, 2016, p.01).

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RESEARCH METHODS

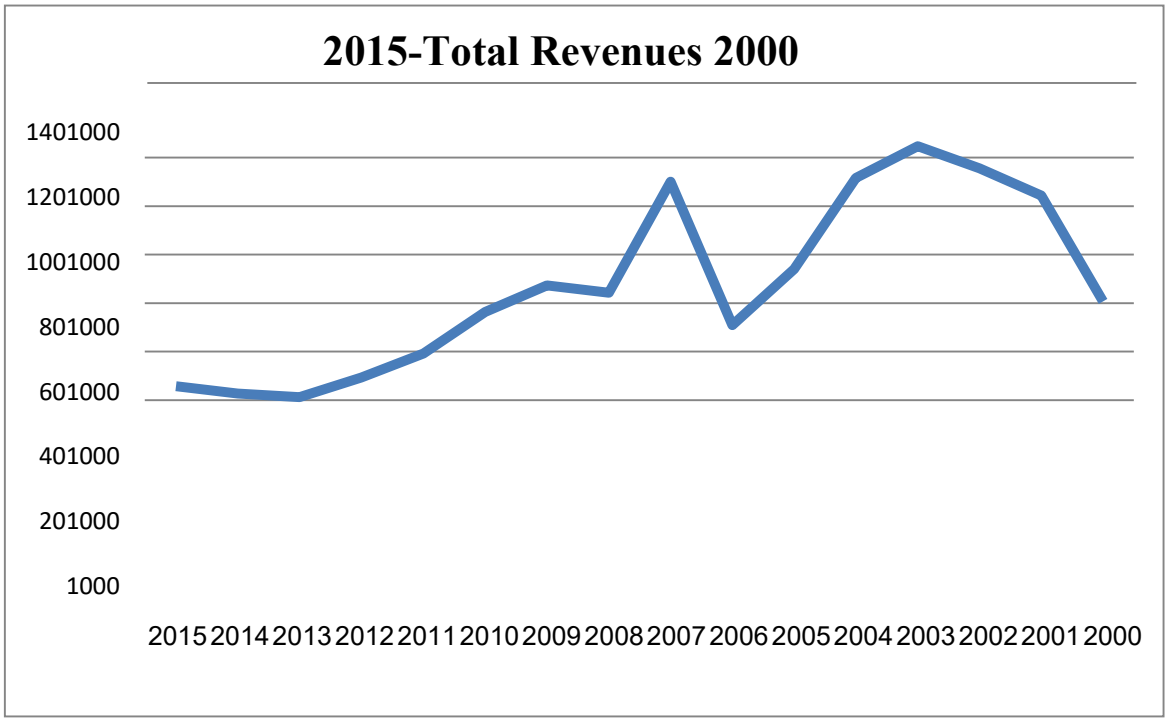
The study was a quantitative-exploratory research, which sought to observe and discover the relationship between the determinants of the Saudi Arabia government revenue. In addition, it explored the possible sources that might help in government revenue diversification. This research used secondary data which were collected through published government reports, company reports, books, journals and newspapers for the literature review. For the main analysis, this research collected the revenue data from Saudi government reports which were published annually by Saudi

Arabian Ministry of Finance (SAMF) and Saudi Arabian Monetary Authority (SAMA). The problem of missing data cannot be ignored. In this regard, the missing data from these reports were filled from some financial company reports such as Al-Dukheil Financial Group (AFG), IMF and World Bank reports. The World Bank reports are published especially for oil production and supply sources, which includes the Kingdom of Saudi Arabia's revenues. Moreover, while analysing the data using the software programs, such as SPSS, the data analysis tool takes care of missing data by predicting the data based on historical figures.

Revenue Trend from 2000-2015

The total revenues from 2000-2015 show an increasing trend with some fluctuations over the period. The trend can be divided into three main periods; the period from 2000-2006, 2007-2009 and 2010 to 2015. The figure 1 below shows an increasing trend over the period.

2015-Figure 1 Total Revenues from 2000



The period between 2000 and 2006 is the period of prosperity, which was fuelled by rising oil prices taking Saudi economy at inflection point. The total revenue increased by 161% from SR

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258065 to SR 673682 from 2000-2006. This was the period when real opportunities for the country to inject more in the economy through a productivity and investment led transformation leading to higher growth and GDP. This period witnessed oil prices boom that took Saudi Arabia as 19th largest economy in the world where the GDP doubled new jobs created and the household incomes rose by 75%. The increasing revenue helped government to invest heavily in education and health and infrastructure. The period of prosperity did not last for long when the oil prices dropped during the period 2007-2009. The financial crisis reduced oil revenues due to the lower demand of the industrialized economies. This led to a huge reduction in oil prices from $145 per barrel to $40 per barrel. This drop-in oil prices reduced the total revenues from SR 1100993 million to SR 509805 million within two years from 2008 to 2009. The reduction in oil prices reduced the total revenues by 53% within a year.

This shock to global economy in shape of financial crisis and to Saudi economy in shape of oil price drop changed the dynamics of revenue generation. Saudi economy still considered the oil revenue as the main source and despite the falling oil prices, the production increased to gain the revenue which economy demand back. Therefore, the third period between 2010 and 2012 show an increasing total revenue trend with some hiccups. This increase in total revenue can be linked to increasing oil production from 8 million to 10 million barrels per day (OPEC, 2015 p.28). This increase in total revenue shows a declining trend from 2013 to 2015. There are multiple reasons behind this drop; firstly, the increase in production increased the supply and hence pushed the prices down, secondly, the Arab revolution and the war on Iraq is over hence, added new oil suppliers, finally, the restrictions on Iran from international authorities are taken off which leads to an increase supply of oil from Iran too.

This trend analysis revealed some expected results where it can be argued that although the oil production level is higher in Saudi Arabia but the declining prices are signalling reduction in revenues even more if Saudi authorities fail to take necessary steps to diversify.

Revenue Determinants

1,90% of Saudi revenues come from oil sector which can also be seen in figure 2 below. These results are in line with the literature as the major proportion of total revenues are composed of oil revenues.

Figure 2 Total revenue determinants

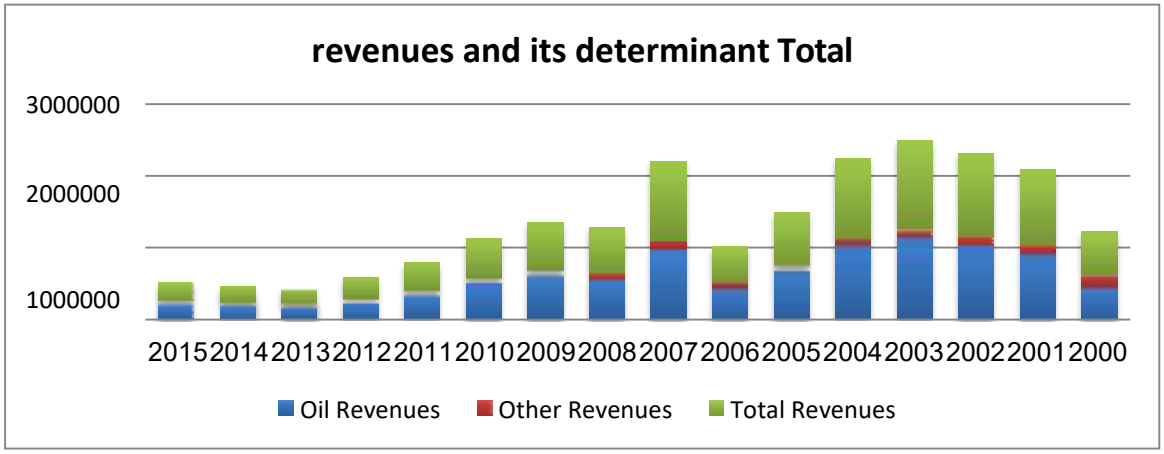

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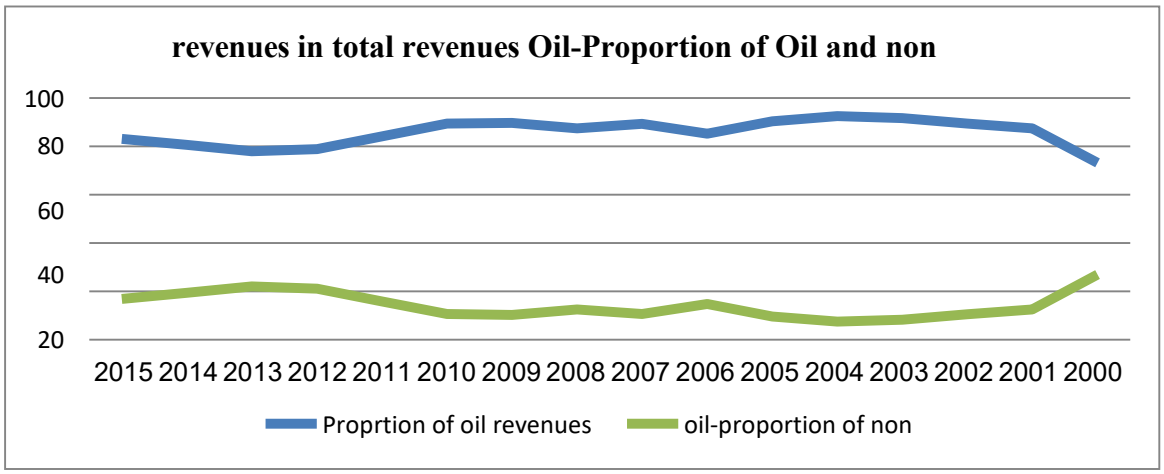
Figure 2 above clearly confirm the findings reported in figure 1 where increasing revenue trends are reported however, it is obvious in figure 2 that the increasing trend is basically due to increasing oil revenues. Although the non-oil sector contribution is present but this contribution is less than what could be expected from a well-diversified economy. These assertions can be justified from figure 3 below that shows the proportion to oil and non-oil revenues contribution in total revenues for the period 2000-2015.

oil sector contribution-Figure 3 Proportion of Oil and Non



The period beginning 2000 report a high contribution of more 80% from oil sector as compare to non-oil sector which is not more that 20% this is since oil prices were booming as discussed before. Surprisingly, the later years were expected to show higher non-oil revenues especially during the period of financial crisis when the oil prices reduced and revenues were reported to be half but Saudi government did not put any effort to maintain the revenues from other sources as oil is the only and easy source to get the revenues from. During the period of crisis, the non-oil sector revenues contribution remained under 10-15% whereas, the oil sector contribution also reduced from 89% to 85% and more.

Having said that, some surprising results can also be seen from figure 3 above. The period 2014 to 2015 shows some transformation in economy and policy maker's attitude. The section above revealed the fact the declining oil prices are reducing oil revenues in Saudi Arabia are also in line with the findings in figure 3 but non-oil revenue shows some unexpected and surprising results. It can be seen that government finally started putting some efforts to reduce their reliance on single revenue source and hence non-oil sector revenues increased from 12% to 26% where these are reported to be higher than 20% for the first time in 15 years.

MAIN FINDINGS

The above analysis confirms the role of oil revenue in Saudi revenue by justifying the assertion that more than 80% of revenues come from oil sector. The results also revealed that the non-

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oil revenue is increasing in the last two years from 12% to 26% showing a changing attitude of policy makers.

Correlation Analysis

As stated above, one of the objectives of this research is to examine the relationship between the main determinants of revenues in Saudi Arabia from 2000-2015. To achieve this stated objective, the correlation analysis is divided into two main periods to get in-depth analysis of changing revenues, the impact of determinants and association between them. These two periods are from 2000-2008 and 2009-2015. The rationales behind selecting these two periods were, to investigate the changes in the relationship between revenues and its determinants pre- and post-crisis period. As it is reported in literature review that the booming oil prices from 2000-2008 added high revenues to Saudi economy however, after the crisis the situation changed completely. This section in this regard examines the above mention relationship and highlights the potential reasons behind them.

2015-Table 1 Summary statistics from 2000

2015-Summary statistics 2000					
Variable	.Obs	Mean	.Std. Dev	Min	Max
Revenues	16	674478.9	359221.8	213000	1247398
Oil_Revenues	16	591047.4	337130.8	166100	1144818
Non_oil_revenues	16	83431.5	34627.36	43641	163500

The table above illustrates the mean, standard deviation, minimum and maximum values of the selected data for sixteen selected years from 2000-2015. The summary statistics for individual periods can also be seen in appendix [A] attached.

Correlation Results

The trend analysis and literature review in this research supported the fact that Saudi economy is heavily dependent upon oil as a main source of revenue. Al-Dukheil, (2013) also reported that 90% of Saudi revenues are composed of oil which can be supported by trend analysis results shown in figure 2 and figure 3 . Therefore, it is paramount to understand the relationship between oil revenues and total revenues particularly the relationship between non-oil revenues, oil revenues and total revenues is of the interest to many. The correlation results are displayed below in table 2 below.

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2015-oil and total revenues from 2000-ween oil, nonTable 2 Correlation bet

2008-Correlation 2000			
	Revenues	Oil_Revenues	Non_oil_revenues
Revenues	1.000		
Oil_Revenues	0.999	1.000	
Non_oil_revenues	0.945	0.936	1.000

2015-Correlation 2009			
	Revenues	Oil_Revenues	Non_oil_revenues
Revenues	1.000		
Oil_Revenues	0.993	1.000	
Non_oil_revenues	0.033	0.081-	1.000

The correlation results above present some interesting and unexpected results. The high dependence of revenues on oil revenue sources is clear from the correlation results in 2000-2008 period however, the later period from 2009-2015 shows the results which are in line with trend analysis but different than what was expected.

The correlation between oil revenues and total revenues in reported to be 0.999 showing strong high correlation which can be interpreted as 1 unit increased in total revenues is composed of 0.999 units of oil revenues. This high correlation can be supported by by Arezki and Blanchard (2015), Al-Dukheil, (2013) and Al-Khulaifi (2012) arguments presented in chapter 1 and 2, who is of the view that Saudi oil production increased drastically when the oil price boom started from 2000-2008. Furthermore, these results are also in line with the results reported in trend analysis figure 2 where the proportion of oil revenues in total revenues were higher than 80% in more than 10 years.

In contrast, it is interesting to report that non-oil revenues also show higher positive correlation of 0.945. One of the possible explanations behind this unexpected result can be the fact that although oil is the main determinant of revenues in Saudi Arabia but the fact that non-oil revenue sources by then were oil derivatives. Therefore, when the oil production increases the production of these derivatives also increase, hence contributing positively to total revenues.

The period between 2009 and 2015 although show similar results as 2000-2015 for oil revenues and total revenues relationship but the non-oil revenue association presents a completely different story. These results show that oil is still the main revenue source in Saudi Arabia but the fact that total revenues show a decreasing trend (see figure 1) confirms that the declining oil prices affect the revenues too. These results can be supported by Arezki and Blanchard (2015), Al-Dukheil, (2013) and Al-Khulaifi (2012) assertion, arguing that the declining oil

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prices badly affected Saudi revenues but the policymakers compensated this decline by increasing oil production.

Interestingly, the non-oil revenue correlation with total revenues decreased from 0.945 to 0.033 from the period 2000-2008 to 2009-2015. This fall in correlation can be explained by the fact that the non-oil revenues are expanding and they no longer are the oil derivatives. Therefore, as a matter of fact these revenue sources are in their early and undeveloped stages which demand high expertise that are not currently provided by the government.

Furthermore, the correlation between oil revenues and non-oil revenues fall from 0.936 to -0.0.81 between two periods under consideration. This fall from highly positive correlation to weak negative correlation supports the aforementioned arguments. Although these are some unexpected results but one of the possible explanation behind this fall could be the declining oil price that affect the economy overall hence reduce the demand for other sources too. The economy is heavily oil dependent, the fall in oil prices affect the overall economic performance of the country with increased government expenditure, reduction in household income, decreased aggregate demand create those economic distresses which attract less foreign investment. This overreliance reduces country's ability to fulfil the social requirements hence justifying the revenue diversification concept based on Resource based theory. Furthermore, the negative correlation between oil and non-oil revenues can also be explained by the fact that when the oil revenues increase the attraction from another sector also shifts. This shifting attention doesn't only come from policymakers but also from the investors in another sector.

Oil Prices, Production, Export, Domestic Demand and Saudi Revenues

The above discussion revealed that oil prices affect the total revenues generated within the economy due to the fact that high proportion of total revenues come from oil sources. Therefore, it is necessary here to analyse the relationship between oil prices and revenues. However, the fact that these two factors do not work in isolation, therefore the production, export level and total domestic demand is also included to examine the effect on total revenues and their inter-relationships.

The data collected from OPEC (2015-2016: See Appendix B) is used to run correlation between above mentioned variables. The table 3 below shows the correlation results.

Table 3 Correlation between revenues, oil prices and other factors

	Revenues	Price	Saudi_~n	Saudi_~t	Saudi_~d
Revenues	1.0000				
Price	0.9699	1.0000			
Saudi_oil_~n	0.1627	0.0732-	1.0000		
Saudi_export	0.7116	0.5369	0.7206	1.0000	
Saudi_demand	0.2447-	0.4403-	0.8502	0.3427	1.0000

Table 3 demonstrates the results from correlation which are in line with above discussion in section 4.2 and 4.3. The total revenues and oil price show strong positive correlation of 0.9699

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supporting the argument presented above that over-reliance on single revenue source adds revenue when the prices increase which is oil in case of Saudi Arabia. Moreover, the oil production and oil price show weak negative correlation of -0.0732 proving the fact that when price increases production doesn't increase as existing production level shows the ability to increase revenues with higher prices. Another explanation behind this negative correlation is that when price decrease, Saudi government increase oil production in order to meet their revenue deficits and gain enough revenue to fulfil the expenditure requirements which can be witnessed in current situation when prices dropped to $47 per barrel in 2015, the oil production increased from 9713 million barrels per day to 10192.6 million barrels per day (OPEC, 2016).

Consequently, the export of the country increases which adds to the total revenue. The high positive correlation of 0.7116 between revenues and exports justify this assertion. Moreover, Saudi domestic demand shows negative correlation with both revenues and price with -0.2447 and -0.4403 subsequently. This negative correlation of price and demand follows the law of economic where demand decreases when price increase. However, the negative association of revenues and Saudi domestic oil demand is an interesting finding. One of the possible explanations is the subsidies given by Saudi government to local consumers to buy oil at low prices. Thus, when Saudi demand increases the total revenue decreases as the export decrease to fulfil local demand. Looking at these findings and as mentioned by Aljazeera (2015) that Saudi government reduced the level of subsidies available to local consumers which ultimately increased the prices to push the revenues to increase by reducing local demand for oil.

Main Findings of Oil Prices and Saudi Revenues

Having said that, the increasing trend in non-oil revenues and the negative relationship between oil and non-oil revenues highlighted a fertile ground for revenue diversification in Saudi Arabia. The high correlation between oil revenues and total revenues is signalling the problems Saudi economy can face when the oil prices decline. However, the weak correlation between total revenues and non-oil revenue sources are demanding for government attention to provide sources and attention in order to well diversify the revenue sources. Oil prices also show a strong positive correlation with total revenues but negative correlation with production confirming the assertion that increased oil prices increase Saudi revenue but not necessarily increase the production of oil. However, low oil prices push the government to increase production to meet their budget requirements.

The next section examines and identifies the potential sectors for Saudi policy makers to diversify the revenues.

Revenues Diversification: The solution

The above analysis and the literature review set the basis for Saudi economy to diversify the revenues. The trend analysis in this study highlighted that Saudi economy is solely dependent upon oil as main revenue source hence any fluctuation in oil prices directly affect the total revenue. Correlation results also support this assertion. These finding are in line with the literature and can be supported the idea of revenue diversification in Saudi Arabia. Past studies by Stott, (2015); Basnett and Garang (2015); Dukheil (2013); and Nour (2011) in this area investigated that well diversified revenue sources can help the economy to reduce systematic risk and other economic imbalances. Suyderhoud (1994) in this regard also agree. As reported that having diversified revenue structure will avoid the imbalanced use of a given revenue source at the cost of other revenue sources. Moreover, revenue diversification manifests

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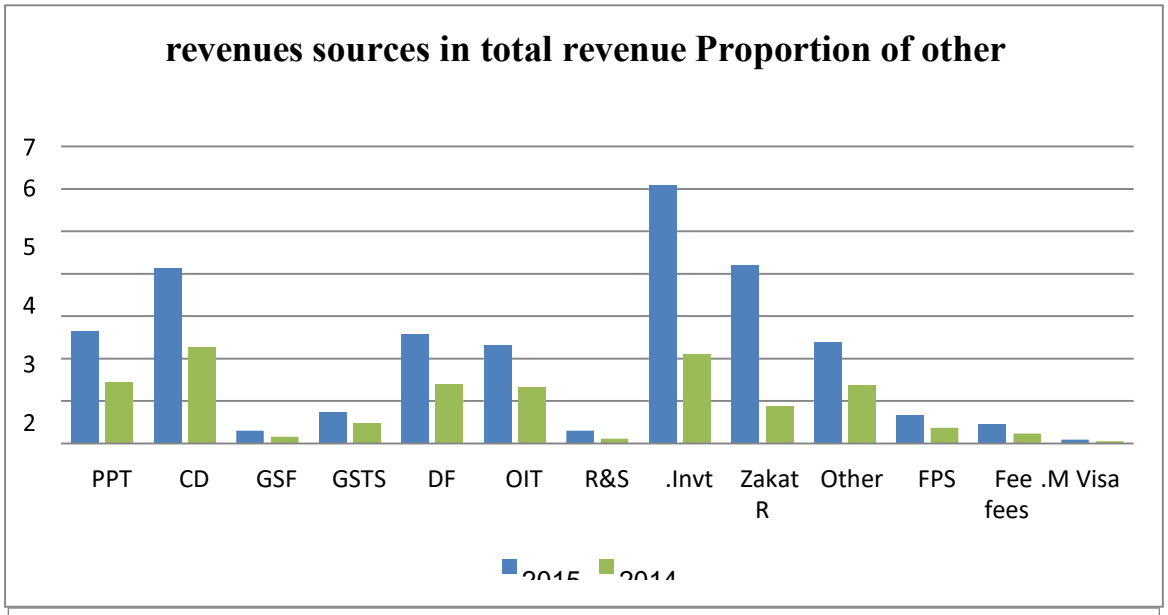
reduction in the non-systematic risk (ibid). This is because uncertainty or fluctuations of revenue sources could lead to disruption in the development process (Hendrick, 2002).

Two main issues highlighted in this research lead to revenue diversification as a solution. Firstly, the over-reliance on oil revenues and secondly, the fluctuating and dropping oil prices. Therefore, keeping Yan's (2012, section 2.6) research in view where over-reliance on property tax and falling property prices were set as a base for revenue diversification, this research recommends revenue diversification for Saudi economy based on two aforementioned issues (reliance on oil revenue and dropping oil prices). However, the question arises is that what other sources can be potential and beneficent enough to diversify?

To answer this question and achieve the stated aim and final objective of this study, contribution analysis is employed for two distinct periods where Saudi economy started reporting other revenue sources (2014-2015). The figure 4 presents the contribution of other revenue sources to total revenues for the year 2014-2015.

Figure 4 Proportion of other revenue sources



- PPT (Petroleum products tax) - (R&S) Rents and sales - (R Other revenues (Other -(Invt.) Investments
- Customs duties (CD) - (GSF) General service fees - (DF) fees Documents (OIT) Other income taxes -
Fees of port services (FPS) - (Zakat) Zakat Visa fees (Visa fees) - Mining fees (M.fee) -
Government share in the telecommunications sector (GSTS)

The proportion of other revenue sources in total revenues show an increasing trend from 2014 to 2015. The two years determines the importance of increasing trend in non-oil sector revenues. This increase can be linked to decreasing oil prices from $100 to $45 per a barrel in 2014-2015 (NASDAQ, 2016). Custom duties, Other revenue and Investment sector show a highest contribution followed by Zakat, Petroleum taxes and Document fee in total revenues. However, Investments stands out with highest contribution which increased from 2.09% in 2014 to 6.06%. Although it can be argued that this is not a big contribution compares to other developed economies but the fact that Saudi economy is oil dependent economy and diversion from this sector takes time and cost. Other revenues show a drastic increase from 0.88% to

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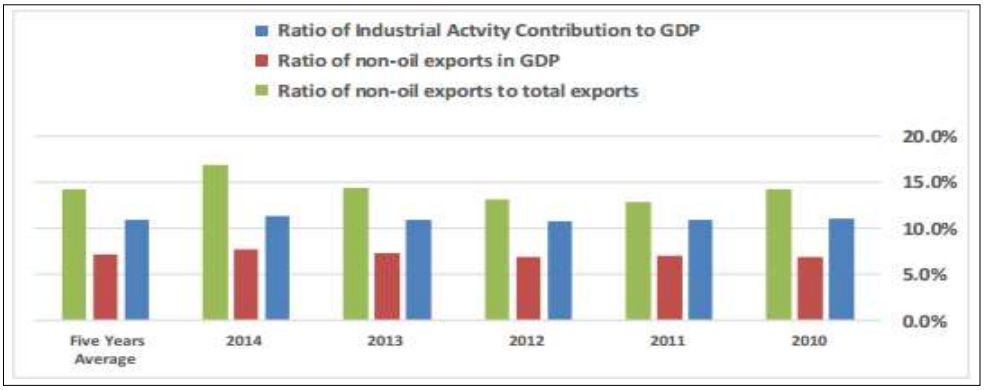
4.19%, competing as second best potential revenue source where government can diversify the revenues. However, the fact that the other revenue sources are not showing the breakdown makes it difficult to recommend specifically on which sources are included in this. One of the explanations provided by Al-Dukheil (2013) is that these revenue sources potentially include financial sector including banks, insurance companies and stock market. These results can also be explained by current action taken by Saudi policymakers to open the stock market internationally in July 2014. Furthermore, this state control over the banking sector also needs to be lessened to bring investment and productivity transformation. To enable this transformation Saudi Arabia needs to accelerate the shift from its current government led economic model to market based approached. Thus, diversification mainly production based diversification can be a solution.

The figure 4 above revealed some unsatisfactory results as few potential sources are highlighted that contribute less than 10% to total revenue. Therefore, looking at country's current economic structure which is heavily dependent on oil, there is no other alternative better than production based diversification that can provide more jobs in private sector boosting productivity and competitiveness. Such diversification can also lead to gain sustainable growth which will be significantly more stable and less volatility particularly when oil revenues begin to decline. Lack of such diversification would hinder development. Although the non-oil sector is contributing to total revenues and GDP of the country as can be seen from figure 4 above and Figure 5 below but this contribution is less than 15% in the last five years.

oil sector to total GDP-Figure 5 Contribution of non



The economic future of Saudi Arabia depends on building human capital and innovation and technological development, while the current model only depends on two factors; intensive production and generous government spending. Most of the output of this growth is represented by high property prices and a huge foreign labour import which does not generate human capital, technological development or contribute to build knowledge based economy. Perhaps this situation may end up in a bubble leading to a recession until the oil prices raise again.

Main findings of Revenues Diversification

The contribution analysis identified the potential non-oil sources contribution to total revenue showing Saudi Arabia as effort to diversify the economy away from dependence on oil industry. Although, it is found that investment and other revenues are the main predictors of total revenues from non-oil revenues but it is easy to see why this is not really diversification.

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The reason behind this is the fact that investment is attracted in oil sectors and other revenues are mainly the minerals and petrochemicals which are by products of oil. Thus, increase in oil prices increases revenues from these sources and vice versa. Alternatively, the financial sector is reported to be also included in other revenue sources which contributing positively to the total revenue sources. Document fee, general sales tax and other taxes is also good contributor to total non-oil revenues.

CONCLUSION

The correlation between oil prices, total revenues, oil production, export and local demand displayed some interesting results. The oil prices show positive correlation with revenues but negative correlation with production. In contrast, the local demand is negatively correlated with both prices and total revenues, while exports remain moderately positive with production; price and revenues. These results were further supported by contribution analysis to achieve the last objective of this research. Contribution analysis highlighted investment as the potential revenue sources that can add more revenue along with customs duties. However, the contribution is far less than oil revenues but as a matter of fact it will take the country some time to completely diversify their sources. Although the opening of stock market for international investor is assumed to be a big step towards diversification and transforming the economy.

RECOMMENDATIONS

From the above data and findings some recommendations are made to Saudi Authorities in order to diversify their revenue sources. These recommendations are listed below.

- The contribution of oil sector in the total revenues of Saudi Arabia is a known fact which is also reported in the literature (Al-Dukheil, 2013) and shown in this study This over reliance is exposing the economy to different types of risks such as market risk with increasing inflation and inequality. The positive correlation between oil prices and revenue sources clearly demonstrate that any shock to oil prices will equally transfer to the total revenues of the country. Therefore, the concept of revenue diversification can be set as the only solution to this economic issue.

- The over reliance of economy on oil also lessened the importance of other sectors. Oil sector is generally perceived as the only profitable sector in Saudi Arabia. Therefore, the diversification needs to consider those sectors that can add long term sustainability. Therefore, production based diversification is one of the solution recommended by researchers such as Martin (2013) to economies with abundance of only a few natural resources. Thus, Saudi Arabia also needs to consider production based diversification to come out of oil trap.

- The taxes as reported are also one of the potential revenue sources. Although the contribution is less as compare to others but the fact that researchers (Devereux et al, 2004; Anderson, 2006) reported taxes are major

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sources of revenues in most developed economies imposed in shape of corporation taxes, property tax and income tax, can support the idea of income tax and import taxes in Saudi Arabia to diversify their revenues and add a more stable revenue stream.

- Import quota and subsidies can also be recommended to Saudi economic policy makers. Agreeing with Bell and Henry (2003) both import quota and subsidies can help to increase domestic productivity.
- Better education, infrastructure and government support is also recommended to increase Foreign Direct Investment (FDI) in the country which will help to increase both potential and real GDP.
- Finally, Government support to skill development is also required to increase labour productivity leading to higher GDP and revenues from another sector.

Future research

This research presented the quantitative perspective of revenue diversification however; analysing the concept from qualitative perspective will add rigor to the research. Thus, it is recommended that future research should conduct interviews with higher authorities responsible for policy formulation to dig the facts behind slow movement of economy towards non-oil sector. Also, a wider data set should be studied to support the qualitative data analysis.

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Statistics Appendix A: Summary

2015-Summary statistics 2000

```
. summarize Revenues Oil_Revenues Non_oil_Revenues
```

Variable	Obs	Mean	Std. Dev.	Min	Max
Revenues	16	674478.9	359221.8	213000	1247398
Oil_Revenues	16	591047.4	337130.8	166100	1144818
Non_oil_Re~s	16	83431.5	34627.36	43641	163500

2008-Summary statistics 2000

```
. summarize Revenues Oil_Revenues Non_oil_Revenues
```

Variable	Obs	Mean	Std. Dev.	Min	Max
Revenues	9	485147.2	292222.7	213000	1100993
Oil_Revenues	9	420000.4	270430.6	166100	983369
Non_oil_Re~s	9	65146.78	23153.53	43641	117624

2015-Summary statistics 2009

```
. summarize Revenues Oil_Revenues Non_oil_Revenues
```

Variable	Obs	Mean	Std. Dev.	Min	Max
Revenues	7	917905.4	292984.3	509805	1247398
Oil_Revenues	7	810965	293807.3	434420	1144818
Non_oil_Re~s	7	106940.4	33713.13	71351	163500

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Data Appendix B: OPEC Oil

year	Revenues	Arab (heavy)	OPE Reference Basket (ORB)	Saudi production (average)	Saudi export	Saudi demand
2010	741616	75.65	77.82$	8,165.60	6,644	2,599.50
2011	1117792	104.06	107.82	9,311.00	7,218	2,727.10
2012	1247398	108.32	110.22	9,761.00	7,557	2,872.70
2013	1156361	103.99	106.35	9,637.00	7,571	2,994.00
2014	1044366	93.68	97.18	9,713	7,153	3,163.40
2015	608000	47.1	49.49	10,192.60	7,163.30	3,318.70

b/d 1,000

Sources: (OPEC, 2016

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