6-1-2016

Capital formation, capital rate of return and economic inequality in Middle East and North Africa

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The American University in Cairo

School of Global Affairs and Public Policy

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A Thesis Submitted to the

Public Policy and Administration Department

in partial fulfillment of the requirements for the degree of Master of Public Administration

By

Marmar Mohamed Reda Farid Abdou

Spring 2016

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Acknowledgments

I would like to express my sincere gratitude to **Professor Hamid Ali** for his continuous guidance and motivation throughout my thesis. His availability and wealth of information were definitely of great help to me. His patience, support and encouragement have always pushed me to work harder.

I also thank the readers of my thesis, **Dr. Ghada Barsoum** and **Dr. Shahjahan Buhiyan** for their time, valuable comments and constructive feedback.

I would also like to thank **Professor Hamid Ali**, **Dr. Shahjahan Buhiyan**, **Dr. Moataz Abdel Fattah** and **all my professors** from the Public Policy and Administartion Department at the American University in Cairo for all what they taught me and for being helpful and supportive throughout my MPA.

My profound gratitude goes to my beloved mother and the soul of my precious father. Your faith in my capabilities and endless encouragement throughout my life is what pushed me to where I am today. No words can ever express my love and gratitude to you.

I deeply thank my beloved daughters, **Farah and Hana**, for their understanding and patience despite their young age to support my studies. Both of them had to study independently to help me achieve my MPA degree. I would not have done it without your support. You beard so much for me to accomplish my work.

Besides, I extend my thanks to my dear friend, **Dina Adly,** for sharing my frustrations during our studies. Without your push and encouragement I couldn't have made it.

Last but not least, I would like to thank my sisters, **Shahira** and **Hanan** and my brother, **Saleh**, for their concern and support to me during the thesis and for believing in me through the way.

Lastly, I hope this thesis will stimulate further research and data collection in MENA.

Marmar Farid

Dedication

My work is dedicated to

my precious parents

and

my lovely daughters

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Marmar Mohamed Reda Farid Abdou

Supervised by Dr. Hamid Ali

ABSTRACT

Economic inequality is turning into one of the most pressing issues in the 21st century. The inequality gap between the rich and the poor raises red flags to the world's economic, social and political well-being. A small minority is controlling the world's economy and has the most influential power, which will result in more political instability and lower social inclusion within the world. This was witnessed by the reasons studied behind the rise of the Arab Spring and the turmoil in the MENA region. The literature exhibits a wealth of studies and ongoing debate for the reasons behind inequality among and within the countries in the world. However, there is a dearth in literature on MENA Region when it comes to analyzing the causes leading to inequality and the factors that determine its level in the region, with an emphasis on the effect of the capital and the rate of returns. This study analyzed panel data from 1963 to 2012 for MENA countries to empirically investigate the effect of the capital formation, rate of returns on capital, controlling for the economic growth and natural resources rent on economic inequality in MENA. The empirical results showed that that the factors used to measure the capital formation such as Gross Domestic Savings and Gross Fixed Capital Formation are positively related to economic inequality and hence heighten the inequality gap. Conversely, the factors used to measure the capital rate of returns such as the real interest and the deposit interest rate are negatively related to economic inequality. When the deposit interest rate increases, the economic inequality decreases. Policy recommendations are made to develop comprehensive strategies for inclusive development and better wealth distribution. Revised fiscal and monetary policies to reform tax and benefits are needed to increase fair and redistributive effects and avoid the effect of capital and power accumulation.

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Chapter One: Introduction

According to Galbraith (2013), the economic inequality debate has been going on since the Industrial Revolution in the late 18th and 19th century. This study further elaborates that the great industrialists reaped the rewards of the transition to the new manufacturing processes causing a spread of the monopolistic power and capitalism. This has led to widening the inequality gaps not only among the different countries but within each country depending on where that country stands from the development ladder. As a result, various theoretical and empirical researches in different social science disciplines were directed to study the factors of production and the reasons of inequality. The topic remained an important one for research by influential economists, such as Adam Smith, David Ricardo and Karl Marx, until the two decades following World War II, when this topic turned to be poorly looked into after economies appeared to be growing steadily and the middle class was at its largest, especially in the United States.

Later in 1970, and for the following thirty years, income inequality became more marked as it headed in the opposite direction. According to the two labor economists, Harrison and Bluestone (1988), the stage was characterized by changing economic conditions at a different pace than the change in growth caused by the globalization and the new technologies that replaced repetitive jobs with automated machinery and robots. This unparalleled change of direction was what they called the "Great U Turn" (Harrison & Bluestone, 1988). The trend started with the global debt crisis in Latin America and Africa, central and Eastern Europe, and moved on to Asia. The change in direction brought back the interests of the researchers from different disciplines to study and test diverse hypothesis to explain the causes and effects of economic inequality.

Globally, inequality is turning into one of the most pressing issues in the 21st century. Recently, Economic inequality is the subject of debate not only for economists, but for societies at large. It is studied equally by economists, politicians, social activists, public policy officers, media people as well as sociologists.

Piketty (2014) argued that the fundamental force for divergence is the usually greater return of capital (r) than economic growth (g), and that larger fortunes generate higher

returns. The study further highlighted that we live in what Piketty called "Patrimonial Capitalism" as a result of inherited wealth dominated by an oligarchy (Piketty, 2014, p. 534). The global pressing issue now is not only that the gap between the rich and the poor is quickly escalating, but most importantly is that the gap between the richest 1% and the rest of the world is widening. According to Oxfam Report (2016), pre Davos Economic Summit, stated that 1% now own more than the rest of the world combined and that 62 individuals versus 388 individuals in 2010 and 80 individuals in 2015 own as much as the poorest half of the world's population (Oxfam, 2016). President Barack Obama claims that "the growing gap between the very wealthy and everyone else is the defining challenge of our time" (Rugaber & Boak, 2014).

The inequality gap between the rich and the poor raises dozens of red flags to the world's economic, social and political well-being. A small minority is controlling the world's economy and has the most influential power, which will result in more political instability and lower social inclusion within the world.

In a global survey conducted by UNDP, policy makers from around the world acknowledged that inequality in their countries is generally high and potentially a threat to long-term social and economic development (United Nations, 2016). In recent years since 2011, the turmoil in the Middle East and North Africa (MENA) region, what has been known as the Arab Spring, was the biggest witness on how much threat the inequality and poor social conditions can pose on the stability and development of many countries in the region. The political unrest brought social justice and equality to the forefront. The revolution was not simply a struggle against the authoritarian rule of some dictators but it was mainly driven by the rise in economic inequality and the widening gap between the autocratic ruling regimes that were, or still are, governing the Middle East and the people of this region.

The literature exhibits a wealth of studies and ongoing debate for the reasons behind inequality and the factors that influenced the level of inequality to exist among and within the countries in the world. However, there is a dearth in literature on MENA Region when it comes to analyzing the causes leading to inequality and the factors that determine its level in the region, with an emphasis on the effect of the capital and the rate of returns. There is a limitation on the availability and reliability of the data on inequality in MENA. Ali (2012) states that "Studying inequality in MENA countries provides an opportunity to assess factors

that shape the countries' level of economic well-being, which has greater public policy implications in terms of how society allocates its scarce resources among competing needs" (Ali, 2012, p. 575).

Thus, the purpose of this thesis is to empirically fill that research gap by addressing the effect of capital formation and rate of returns on the level of economic inequality in MENA, controlling for economic growth and natural resources rent. Those variables were chosen since the political unrest in the region was mainly due to economic and social reasons as proven by the Arab Spring's slogan: "Bread, freedom and social inclusion". The slogan shows how citizens of the Arab countries suffer from deteriorating living conditions in food, education and health. In addition to the growing gap among the different societal classes which led to social exclusion for the poor and middle classes. The situation escalated when capital accumulation of the top and richest class was exaggerated and supported by the corrupted autocratic rulers' power.

Capital accumulation in MENA, especially the Gulf countries, mainly comes from their abundant natural resources of oil reserves. However, the huge dependence on oil returns in turn jeopardize their capital and resources when oil prices went down leading to a decline in their growth and a heightening for their economic inequality gap. That also affected the other MENA countries which have benefited from the capital and the natural resources available in the rich oil countries when their people have migrated and worked with higher salaries in the Gulf countries. Hence, whether an oil exporter or not, countries in MENA region were highly affected by the volatility of the oil sector in recent years.

According to Achcar (2013), ""rentierism" and "patrimonialism" are pivotal features of how capitalism operates in MENA and it is expressed by high levels of social inequality, low levels of investment, an informal workforce, high levels of unemployment, particularly among young people, and low levels of women's participation in the labour market" (Achcar, 2013, p. 77). The concept of a "rentier state" is a way of explaining the perseverance of the Arab undemocratic regimes. According to his analysis, the revenues of a "rentier state" are "largely generated through access to rents (such as income derived from control of natural resources including oil and gas reserves, or income the state derives from foreign powers by granting them access to strategically important locations such as land for military bases), rather than by appropriating some of the surplus value created in production from capitalists

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and workers through taxation" (Achcar, 2013, p. 77). Beblawi argues that this "arrangement concentrates economic and political power in the hands of a tiny minority whose redistribution of wealth becomes the provision of "private favours through the ruler's benevolence" rather than an expression of a social contract between citizens and government. Without the need for taxation to fund the state's activities, citizens become "far less demanding in terms of political participation" and a "rentier mentality" spreads through society breaking the relationship between "work and reward"" (Luciani, 1990). Achcar (2013) adds that the idea of a "rentier state" is often combined with the concept of patrimonialism which he classifies as a label for "an absolute, hereditary type of autocratic power", which "appropriates the state for itself". Hence, the military and the government administration become the property of the ruler and owe allegiance to him alone, not to the state or the citizens and the ruler considers the country's economic assets as his own heritage which of course opens the door to deeper corruption (Achcar, 2013, p. 77).

According to Herrala & Turk-Ariss (2016), political instability controls capital accumulation in MENA in the past years during which the region has suffered from political unrest. They further state that political instability tightens borrowing constraints and impedes capital accumulation, thereby adversely affecting economic growth. This reinforces that financial development is key to economic development in MENA, which will eventually lead to economic equality (Herrala & Turk-Ariss, 2016, p. 1).

1. Objective of the study

The objective of this study is to empirically investigate the effect of the capital formation, rate of return on capital, controlling for the economic growth and natural resources rent on economic inequality in MENA region.

2. Research Question

Using panel data from 1963 until 2012 for MENA countries, the research question addressed in this thesis is: What is the effect of capital formation and capital rate of return on the level of Economic inequality in MENA?

The purpose of this thesis will be to measure the magnitude and direction of the relationship between inequality and capital formation and rate of return in MENA.

3. Conceptual Framework*
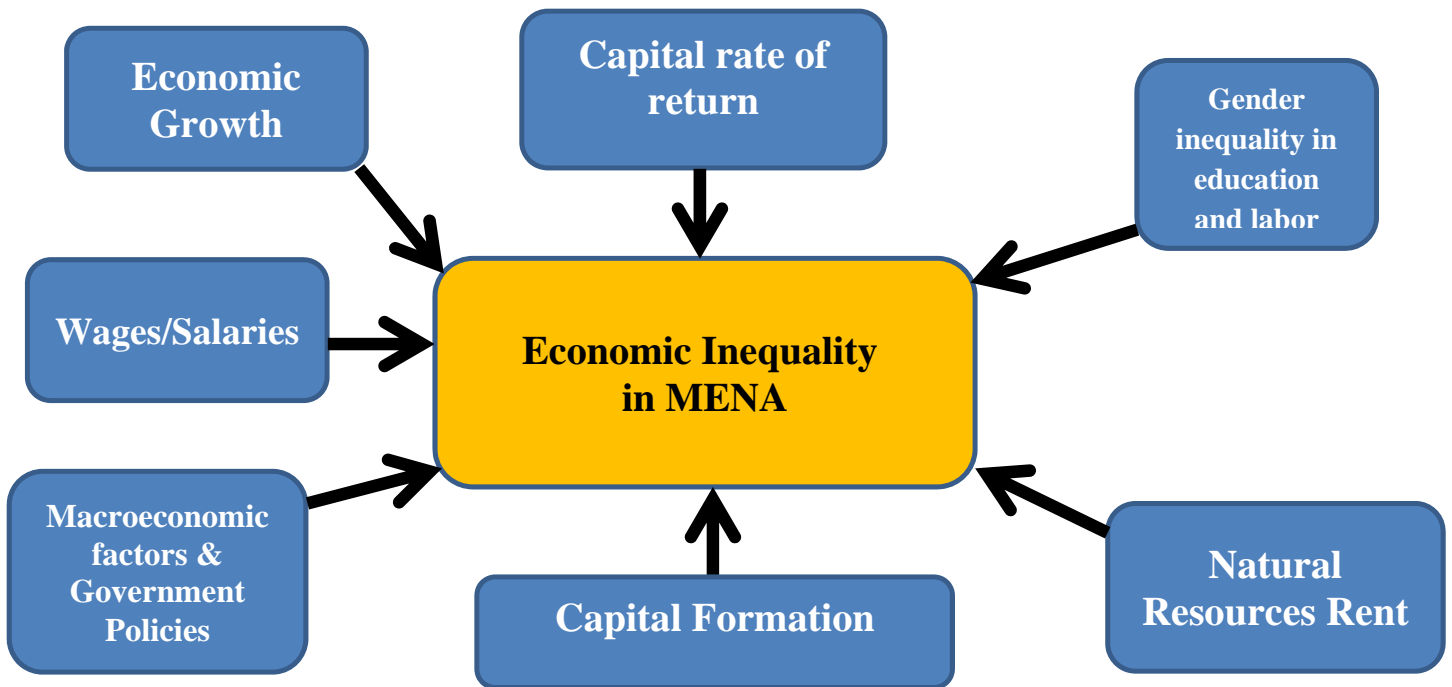
The above conceptual framework shows the factors that lead to economic inequality in MENA based on the discussed literature in this study. These factors include the salaries/wages earned by the residents; the macroeconomic policies adopted by the governments; the economic growth; the natural resources rent; the gender inequality in education and labor; the capital formation and accumulation over the years and the rate of returns on capital. The latter two factors are the focus of this study and their effect on economic inequality is empirically tested using the said panel data in MENA. Additionally, the other factors of economic growth and natural resources rent are used as controlling factors in the analysis.

4. Significance of the study

This research is a contribution to the literature sparsely available in MENA to understand the effect of capital formation, rate of returns, economic growth and natural resources endowment on inequality. Thus, it will help policy makers and governments in formulating wealth redistributive policies and tax reforms to curtail inequality in the region.

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5. <u>Outline of Research</u>

     This thesis is made up of six chapters. Chapter one introduces the topic. Chapter two reviews the available literature on inequality and its relationship with return on capital controlling other factors such as economic growth and other social factors. Chapter three discusses the data used in the analysis of this research thesis and its sources. Chapter four discusses the methodology and the empirical model. Chapter five discussed the results from the empirical model used in this study. Finally, chapter six draws the overall conclusion from the thesis and provides some policy recommendations with regards to the findings discussed.

Chapter Two: Literature Review

1. Defining Economic Inequality

Dye (2016) believes that having a society in which everyone has or owns the same amounts of financial and material resources and in which all the people are classified in the same economic class is totally un-common and almost impossible. He further elaborates that the common is that people have wealth and income differences, this is what in literature and social sciences referred to as economic inequality (Dye, 2016).

Soubbotina and Sheram (2000) discussed that a country's per capita income is not the only indicator for how poor the inhabitants of this country are. They added that two countries might have very close Gross Domestic Product (GDP), yet poverty is clearer in one than the other. They believe that the distribution of income in a country is a more important factor to measure the quality of life and the level of poverty of that country than its per capita income. Inequality happens when equal percentiles of individuals or households don't get equal percentage of total income. For example, the richest 20 percent (quintile) receives more than the poorest quintile (poorest 20%) (Soubbotina & Sheram, 2000, p. 27).

According to Dye (2016), economic inequality refers to financial disparity. "Some may be living in abject poverty, while others live in extreme luxury...The financial disparity is not only among the different classes but the top class has significantly more than each of the other classes, especially the lowest." (Dye, 2016)

The American President Andrew Jackson once said:
"We should measure the health of our society not at its apex, but at its base." cited in (Era, Kochhar, Ricka, Suphaphiphat, & Tsounta, 2015).

There are several ways used by economists to measure income inequality in a country or compare it to other countries. Amongst those ways is the Gini Index which is calculated as the area between a Lorenz Curve and the absolute equality line and it is used when comparing among countries. The more deep a country's Lorenz Curve gets, the less equal it is. A Gini index of zero indicates perfect equality, while an index of one represents perfect inequality (Soubbotina & Sheram, 2000). However, Galbraith & Kum (2004) stated that the use of Theil Index as a measure of inequality is better for MENA countries due to the inconsistency of the

data in MENA countries. They further discussed that Theil index is part of a larger family of measures referred to as the General Entropy class and it has the advantage of being additive across different subgroups or regions in the country. Theil index avoids many of the difficulties inherent in the use of the income distribution measures by Deininger and the Squire data by providing comparable and consistent measurements across space and through time (Galbraith & Kum, 2004).

2. Inequality and Economic Development

In 1955, Simon Kuznets argues that as an economy develops, a natural cycle of economic inequality occurs, represented by an inverted U-shape curve called the Kuznets curve visualized in Figure 1 below. From the curve, one can infer that as the economy develops, inequality first increases, then decreases after achieving a certain level of average income. In early development, investment opportunities for those who already have wealth multiply so owners of capital can accumulate wealth. Therefore, in early development, inequality increases.

Figure 1: Kuznets Curve
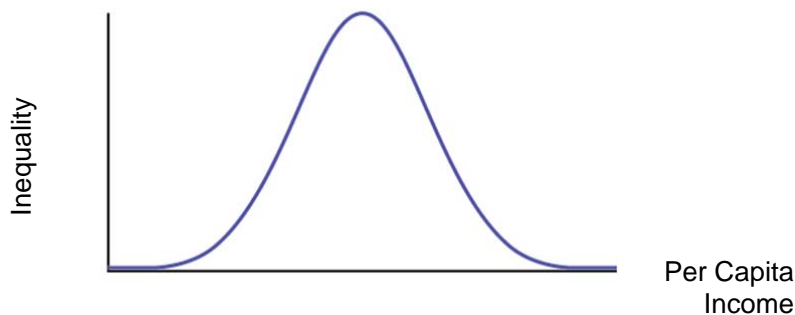
Source: Author's explanatory drawing

When the economy becomes mature, there is democratization and various redistribution mechanisms such as social welfare programs and hence countries move back to a lower level of inequality. Additionally, as economies experienced growth, mass education provided greater opportunities which decreased the inequality and the lower income portion of the population gained political power to change governmental policies (Nielsen & Alderson, 1997, p. 15). Scandinavian countries prove Kuznets' theory as they have the smallest income disparities, with a Gini coefficient for disposable income of around 0.25. This is as opposed to the emerging economies which are more unequal than rich ones (Beddoes, 2012, p. 13).

As opposed to Kuznets, Stiglitz (1996) criticized the validity of Kuznets curve theory by what is called the East Asian miracle (EAM). He further explains that the EAM refers to the rapid economic growth of eight East Asian countries – Japan, South Korea, Hong Kong, Taiwan, Singapore, Indonesia, Thailand, and Malaysia – between 1965 and 1990 where manufacturing and export grew quickly and powerfully. Yet simultaneously, population levels living in absolute poverty decreased and the benefits of rapid economic growth were distributed broadly among the population. So, there shouldn't be a trade off in the short run between economic growth and inequality (Stiglitz J. E., 1996, p. 161).

Stiglitz (1996) argued that "the East Asian experience of an intensive and successful economic development process along with an immediate decrease in population inequality can be explained by the immediate re-investment of initial benefits into land reform (increasing rural productivity, income, and savings), universal education (providing greater equality and what Stiglitz calls an "intellectual infrastructure" for productivity), and industrial policies that distributed income more equally through high and increasing wages and limited the price increases of commodities. These factors increased the average citizen's ability to consume and invest within the economy, further contributing to economic growth. The high rates of growth provided the resources to promote equality, which acted as a positive-feedback loop to support the high rates of growth. The EAM defies the Kuznets curve, which insists growth produces inequality, and that inequality is a necessity for overall growth." (Stiglitz J. E., 1996, p. 157)

On the other hand, Galor and Zeira (1993) looked differently at the relationship between inequality and economic growth. The model suggests that the initial level of inequality of income and wealth affects the future economic growth and not the other way around discussed above that the growth is the one affecting inequality. The model supported the argument that the initial distribution of wealth or income affects the aggregate economic growth of a country in spite of facing capital market failures. It also emphasized that to stabilize the economic growth, it is imperative to have and maintain a large middle class. So, it looked at income distribution (economic inequality) within a country as the influencing factor on growth and not vice versa (Galor & Zeira, 1993, p. 35).

The relationship between inequality and economic growth is still on debate and revisited by scholars in their empirical and theoretical studies with varying results noted:

Forbes and Partridge support the hypothesis that there is a positive relationship between inequality and economic growth and that the increase of inequality in the short and medium term has a positive implication on future economic growth in rich countries (Forbes, 2000, pp. 869-887); (Partridge, 1997, pp. 1019-1032). As opposed to them, another found that inequality is negatively correlated with economic growth (De la Croix & Doepke, 2003, pp. 1091-1113); (Clarke, 1995, pp. 403-427); (Perotti, 1993, pp. 755-776).While a third group of scholars concluded that there is a changing non-linear relationship between inequality and economic growth (Barro, 2000, pp. 5-32); (Castello-Climent, 2010, pp. 293-321); (Pagano, 2004). Some scholars also believe that there is no relationship between inequality and economic growth (Lee & Roemer, 1998, pp. 217-240); (Panizza, 2002, pp. 25-41).

Smith (2012) argued that advocates of neoliberalism state that neoliberalism often reduces absolute inequality, promotes a free market economy that has economic prosperity as its ultimate target. "Yet, numerous scholars argue that economic liberalism is itself a cause of inequality" (Smith, 2012).

3. <u>**Natural Resources Abundance**</u>

A debate is continuously going in literature to investigate if having abundant natural resources is a blessing or a curse. According to Sachs and Warner (1999), "The resource curse", or "the paradox of plenty", refers to the idea that countries with an abundance of natural resources, specifically non-renewable resources such as minerals and fuel, tend to develop less and have a slower economic growth than countries with fewer natural resources (Sachs & Warner, 1999, pp. 43-76). Their study further added that this could be a result of a decline in how competitive the other economic sectors are and the fact that the revenues from the natural resource sector are volatile depending on the commodity market swings worldwide. Adding to that these natural resources is mismanaged by the government or by corrupted institutions (Sachs & Warner, 1999, pp. 43-76).

International Monetary Fund (IMF) classifies 51 countries as "resource-rich", these are countries which derive at least 20% of exports or 20% of fiscal revenue from nonrenewable natural resources." (International Monetary Fund, 2011). 29 of these countries are low and lower-middle-income. These 29 countries have extreme dependence on resource wealth for fiscal revenues, export sales, or both, low saving rates and poor growth performance (Venables, 2016, pp. 161–183). In support of the "resource curse" hypothesis,

Ali and Abdellatif (2015) claim that the abundance of natural resources, especially oil, encourages military spending and hence it has a negative impact on the country's economy (Ali & Abdellatif, 2015, p. 5). Additionally, Sami and Ali (2015) viewed the natural resource abundance as a curse in the Arab World region since this part of the world is characterized by lack of democracy and political rights, centralization of the government and the lack of freedom rights in addition to being characterized by high level of gender, education and opportunity inequality (Sami & Ali, 2015).

Henderson (2016) said that the idea of rent-seeking was developed by Gordon Tullock in 1967 and is connected to the natural resources. The word "rent" does not refer to payment on a lease but rather to gaining control of land or other natural resources (Henderson, 2016).

The theory of a "rentier state" was proposed by Mahdavy in 1970 (Mahdavy, 1970). Beblawi and Luciana (1990) further described it in the Arab World by the country that has "only a small proportion of the working population actually involved in the generation of the rent and where the state's government is the principal recipient of the external rent" (Beblawi & Luciani, 1990, p. 87).

Ulfelder (2007) stated that "Countries with substantial resource wealth are more autocratic and this effect is robust to other measures proposed to explain the dearth of democracy in the Middle East or the Muslim world." (Ulfelder, 2007)

Additionally, Ross (2008) added that research links gender inequality in the Middle East to resource wealth (Ross, 2008 , pp. 107-123). Simmons (2016) said that a study on the US finds similar results: resource wealth leads to lower levels of female labor force participation, lower turnout and fewer seats held by women in parliaments/congress (Simmons, 2016, pp. 115-152).

4. <u>Determinants of Economic inequality</u>

There is debate in literature explaining the causes of income inequality or different levels of wealth. Those factors are summarized below:

4.1. <u>Wages/Income</u>

People are not paid similar wages or income. According to Hazlitt (1988), wage is determined by the market price of the skills required for the job. The wage is a function

between the demand and supply laws governing the needed job skill. The more skills needed, the higher the wage. Some get millions while others are only paid minimum wage (Hazlitt, 1988).

Becker and Murphy (2007) added that education level is one of the very important factors that affect wage determination since individuals with higher education will have more advanced skills to offer, justifying a higher wage (Becker & Murphy , 2007).

Moreover, Chiu (1998) stated that individuals possessing different innate abilities will have different levels of wealth, leading to economic inequality "Factors like innate ability instead of a better starting point are the most important determining factors in the wealth accumulated by a person." (Chiu, 1998, pp. 44-59). A lot of people believe that smarter people tend to have higher income and hence more wealth. So, equally capable individuals may have totally different priorities and savings patterns, resulting in a difference in their levels of accumulated wealth (Boserup, Kopczuk, & Kreiner, 2016).

Most importantly, in 2007, the research department of the International Monetary Fund (IMF) acknowledged that technological advancement has widened the income gap (Jaumotte, Lall, Papageorgiou, & Topalova, 2007). Technology causes damage at all skill levels but especially for the un-skilled workers. Machines replaced the un-skilled workers and decreased the available job opportunities since machinery works more effectively and efficiently in repetitive tasks. Education and skills become interrelated with the technology and automation factor as technology requires skilled educated workers. The increase in the demand for skilled labor, that will operate those machines, led to an increase in their relative wages. Thus, it widened the income gap among those skilled workers and the relatively un-skilled ones. The demand for more skilled workers due to technological booming is referred to in literature as "Skilled Biased Technological Change (SBTC)" (Galor & Tsiddon, 1997, pp. 363-382).

Martin Ford (2009) argues that:

"income inequality is likely to continue increasing as more jobs become susceptible to automation. As robotics and artificial intelligence develop further, even many skilled jobs may be threatened. Technologies such as machine learning may ultimately allow computers to do many knowledge-based jobs that require significant education. This may

result in substantial unemployment at all skill levels, stagnant or falling wages for most workers, and increased concentration of income and wealth as the owners of capital capture an ever larger fraction of the economy" (Ford, 2009).

4.2. Gender inequality in education and employment, age and type of family

In many countries, there is an income gap based on gender in the labor market. Men and women having the same job most probably don't earn the same wage. For example, as per a report of the US Census Bureau, in America, the median full-time salary for women is 77 percent of that of men (U.S. Census Bureau, 2004). Adding to that, Dollar and Gatti (1999) say that gender discrimination in education slows economic growth and lower income leading to higher inequality (Dollar & Gatti, 1999).

It is well understood and expected also that older people tend to earn higher income than younger workers, especially when the job requires some kind of experience.

Additionally, Rugaber and Boak (2014) also note that some social factors such as the type of families and the qualifications of its members affect economic inequality. "Single-parent families are more likely to be poor than other families and less likely to ascend the income ladder. Finally, men and women with college degrees and high pay are more likely to marry each other and amplify income gaps." (Rugaber & Boak, 2014)

4.3. Globalization trends

Paul Krugman (2008) supports the proposition that globalization or international trade is an important cause of inequality. "Because of increasing trade among countries, workers in richer countries face a higher level of competition from those in poorer countries, especially in jobs that do not require a high level of skill" (Krugman, 2008, p. 105).

Rugaber and Boak (2014) argued that Globalization has "created "superstars" and concentrated pay among corporate executives, Wall Street traders, popular entertainers and other financial elite. At the same time, factory workers now compete with 3 billion people in China, India, Eastern Europe and elsewhere who weren't working for multinational corporations 20 years ago. Many now make products for Apple, Intel, General Motors and others at low wages. This has depressed middle-class pay. And pay has risen much faster for college graduates than for high-school graduates. These trends have contributed to a

"hollowed out" labor market, with more jobs at the higher and lower ends of the pay scale and fewer in the middle." (Rugaber & Boak, 2014)

4.4. Macroeconomic factors and Government policies

Vitez (2016) said that the type of economies that the government follows affects its level of inequality. Although the socialist economies restrict the growth of individuals promoting equality, it ends up creating inequality. Also, in capitalist economies, economic inequality will be intensified the more the government intervention is curtailed (Vitez, 2016).
In countries with lack of social service systems offered by the government, some people are extremely wealthy, while others suffer inhumane situations including starvation lack of basic necessities. On the other hand, in countries with adequate social service systems, the gap between the poorest and the richest class of people is narrower (Dye, 2016). Additionally, in the latter countries, poor children will have an opportunity for a better future than their parents.
Additionally, Vitez (2016) added that inequality can be fostered by implementing poor fiscal or monetary policy.

> "For example, allowing increases to the money supply through loose central banking can create rampant inflation, which eats away at the purchasing power of a nation's currency. Lower-income individuals can experience more problems with inflation as they have fewer dollars by which to create a standard of living." (Vitez, 2016)

5. Wealth Concentration

Wealth concentration is an ongoing process. Newly created wealth concentrates in the hands of already-wealthy individuals through capital inheritance. According to this note, those who already hold wealth have the means to invest in new sources of creating wealth or to otherwise leverage the accumulation of wealth, thus are the beneficiaries of the new wealth. Over time, wealth condensation can significantly contribute to the persistence of inequality within society and widening the gap to its utmost.

During the past few years, economists view that economic inequality, nowadays, is not simply caused by the traditional and largely studied causes. However, it is a result of what is known as "Wealth Concentration". The new trend in studying the determinants of economic inequality is now focusing on the effect of capital rate of return on the level of inequality.

According to Dye (2016), when assessing economic inequality, one has to consider a person's wealth. Wealth is measured by the amount of money (capital) and possessions a person own. It determines the standard of living and the purchasing ability of the person. It doesn't only determine what they can do now, but it also determines their future standards (Dye, 2016).

He added that "It is common to find that those with the most wealth and the best standards of living are also those with substantial inflows of money." (Dye, 2016)

As per Karl Marx (1867), Capital accumulation (also termed the capital formation) is "the dynamic that motivates the pursuit of profit, involving the investment of money or any financial asset with the goal of increasing the initial monetary value of said asset as a financial return whether in the form of profit, rent, interest, royalties or capital gains" (Marx, 1867) .

Pierson and Hacker (2010) believed in the note of ""The rich get richer; the poor get poorer" is not just a cliché but rather a concept by itself. Under certain conditions, newly created wealth is concentrated in the possession of already-wealthy individuals." (Pierson & Hacker, 2010)

The above note on wealth concentration is to be extended to include the children of rich families as per the publication of the National Bureau of Economic Research implies. Boserup, Kopczuk, & Kreiner (2016) claim that the Children born in a rich family have economic privileges as their inherited wealth will not only affect their starting capital but possibly extend that advantage and offer them better education opportunities, which may increase their chances of earning a higher income than their peers. This wealth transfer through the different generations creates a vicious cycle for economic inequality (Boserup, Kopczuk, & Kreiner, 2016)**.**

Potter (2014) discussed that the effect of wealth accumulation on widening the economic inequality is heavily supported by Piketty. He added that Piketty particularly relates increasing inequality to high income earned by wealth (or capital) and steep increases in CEO salaries (Potter, 2014).

Piketty (2014) shows that in almost every country in his study, the wealth gap has widened since 1980. He anticipates that inequality will remain as long as the aforementioned

wealth concentration process persists through generations. He conveys that the top have excelled in their ability to get a larger share of the pie. He specified that "wealth persists over time, particularly due to inheritances." (Piketty, 2014, pp. 432-6)

Piketty (2014) also added that the statistics show economic inequality is not just the top 10 percent of the population is richer than the bottom 20 percent. Rather, it is "1 percent versus the remaining 99 percent," i.e. the top 1 percent of the population has the vast majority of wealth in the economy and control of financial markets. (Piketty, 2014, p. 346).

Rugaber and Boak state that a large gap always existed between the richest people and the poorest. What's puzzling is the widening gap between the wealthiest and the rest of the economic classes (Rugaber & Boak, 2014).

World Bank researchers Lakner and Branko agree with Piketty's preposition that inequality in rich countries has been deteriorating since 1988 (Onselen, 2014). In Oxfam's Working Paper, statistics show that in 24 of 26 countries researched, indeed the richest 1 percent increased their share of income between 1980 and 2012. The share of national wealth owned by the wealthiest 1 percent in the U.S. greatly increased after 2008, meaning the top 1 percent has captured 95 percent of post-financial crisis growth since 2009, whereas the low-income population became poorer (Fuentes-Nieva, Ricardo, & Galasso, 2014).

Hudson (2014) builds on Piketty's capital theory of wealth accumulation and intensifies the effect of capital by noting that
"economic inequality persists because the top 1 percent exploits the remaining population and makes the latter "in debt" to the former." (Hudson, 2014)

Additionally, Piketty and Saez (2003) have argued that tax policy in the post-World War II era has indeed increased income inequality by enabling the wealthiest Americans far greater access to capital than lower-income ones (Piketty & Saez, 2003). Taxes cause an ongoing debate between politicians and economists over the role of tax policy in dealing with wealth inequality. Politicians use taxes as a tool in their political campaigns to gain the votes of the wealthiest by lowering capital gains' taxes.

6. <u>Is Inequality good or bad for a country's development?</u>

This question remains the most important to ask:

"Is a more equal distribution of income good or bad for country's development?" (Soubbotina & Sheram, 2000)
The answer to this question in practical life varies. An excessive equal income distribution is not in favor of economic efficiency and long term growth (Clarke G. , 1995, pp. 403–27); (Temple, 1999, pp. 112–56); (Stiglitz J. , 2009, pp. 1-2); (Edsall, 2014). Low inequality in socialists' countries removed all incentives needed for the citizens to engage in economic activities. This led to poor quality, limited variety of goods and services and slow technical progress. This has in turn lowered the pace of the economic growth and led to more poverty. As opposed to that, excessive inequality also hindered the quality of health and education that citizens are getting. Furthermore, higher inequality threatens the country's political stability as more people become dissatisfied with their economic status causing unrest and curtailing the investment opportunities by the investors who refuse to bear the added risk for the turmoil to generate revenues and create capital (Becker & Murphy, 2007). This in turn lowers the development potential and the growth for that country.

> Vitez (2016) said that "Economic inequality is not always a bad thing. It can create a desire to improve one's life and move from one economic class to another. On the other hand, it may also drive individuals into the political arena, where they become involved in voting and changing poor macroeconomics policies" (Vitez, 2016).

Some inequality is needed to reward hard work, talent and innovation. But a wealth gap that's too wide is usually unhealthy as it can slow economic growth.

> Sivy (2012) mentioned that "Total equality is neither possible nor desirable, since it would require a completely stagnant society — one without growth opportunities or economic incentives to succeed. But to increase future prosperity and restore historical social mobility, policymakers need to focus on reducing the bad causes of inequality" (Sivy, 2012).

7. <u>Consequences of economic inequality</u>

> Soubbotina & Sheram (2000) declared that high inequality threatens a country's political stability because more people are dissatisfied with their economic status. They

added that this will make it harder to reach political consensus. This instability will in turn increase the risks for investment and lower a country's development potential (Soubbotina & Sheram, 2000). Werfhorst (2011) added that increasing income inequality resulted in lower engagement of the less wealthy in all forms of social, cultural, and civic participation (Werfhorst, 2011).

Agreeing with Soubbotina & Sheram and Werfhost, Birdsong says that high economic inequality is associated with instability, both politically and socially. Societies with high economic inequality suffer from lower long-term GDP growth rates, higher crime rates, poorer public health, increased political inequality, and lower average education levels. He clarifies that since wealth will be concentrated in the hands of a small number, political power will incline in favor of that small wealthy group which may manipulate government through both legal processes and corrupt practices. Wealthy groups receive political advantages in several different ways. Average or poor working class groups will be less able to become educated or participate in the political process since they have no money to finance their studies and education (Birdsong, 2015).

According to Dye (2016), income and wealth disparities affect the citizens' access to services that should be made available by governments to everyone. This list of necessities includes food, health care, and education. Another problem often connected with economic inequality is the ability for the wealthiest class to influence the political stage, which will directly affect all of the economic classes.

8. **Inequality in MENA**

According to Ncube & Anyanwu (2012), the region is classified as one of the fastest growing regions in population reaching an estimate of 357.3 million in 2014 (Ncube & Anyanwu, 2012).

Sample MENA countries in year 2005	Income share held by lowest 10%	Income share held by highest 10%
Iran	2.54	29.55
Tunisia	2.52	29.07
Turkey	1.95	31.73
Yemen	3.28	29.99
West Bank	2.93	26.70
Egypt	3.96	26.57

Source: Author's Calculations based on analysis of data from World Bank Indicators (World Bank, 2016)

8.1. MENA Political Outlook

MENA region is in turmoil. Syria, Iraq, Libya and Yemen are in high conflict, causing severe damage the country's infrastructure and reset its development achievement back by decades. "Fifteen million people left their homes to fragile or economically strapped countries such as Jordan, Lebanon, Djibouti and Tunisia, giving rise to the biggest refugee crisis since World War II. Blockades and repeated cycles of violence have made Gaza's unemployment rate the highest in the world and with Gross Domestic Product at only 40 percent of its potential." (World Bank, 2016) Countries undergoing political transitions, such as Egypt, Tunisia, Morocco and Jordan, have to prioritize security issues over growth-promoting policies. The relatively peaceful oil exporters, such as Algeria, Iran and the Gulf Countries (GCC), are suffering low oil prices with high youth and female unemployment and undiversified economies.

8.2. MENA Economic Outlook

As per the World Bank data, Growth in MENA is expected to be about 2.9 percent in 2015, considerably below the 4-5 percent growth the region enjoyed from 2000-2010. This is as a result of the prolonged political instability in the countries in conflict; the terrorist incidents in Tunisia; the low oil prices that are dragging down growth in oil exporters; and the slow pace of political and economic reforms that delays the return of investment climate (World Bank, 2016).

In addition, the World Bank estimated that the Gulf countries could lose about US$215 billion in oil revenues, equivalent to 14% of their combined GDP, in 2015. The Economic Growth for this group is estimated at 3.2 in 2015. Fiscal deficits continue at a level of 8.8

percent of GDP in 2015. Growth in developing MENA countries will be about 2.3 percent in 2015, one percentage higher than 2014, owing to better-than-expected growth in oil importers- estimated at 3.7 in 2015 and 2016. Among developing oil exporters, Iran's economic prospects could improve following the lifting of sanctions and the nuclear deal signed in 2015. The eventual increase in Iran's oil exports could boost economic activity and accelerate growth to an estimated 5.8% in 2016.

For the countries in conflict, Iraq, Libya, Yemen, and Syria, economic prospects are low. They direct a huge portion of their military expenditures to combat ISIS. This increase in military expenditures coupled with low oil prices and the decline in economic activity in the areas occupied by ISIS have hit their economies (World Bank, 2016).

As per Soubbotina and Sheram (2000), the inequality ratio is 6:1 in MENA countries i.e. the richest 20% quintile gets 6 times what the poorest 20% quintile in that region (Soubbotina & Sheram, 2000).

MENA countries vary into how unequal each country is. Some of MENA Gulf countries benefit from having abundance in the natural resources especially in oil reserves. However, according to Stijns (2006), their increased dependence on that natural endowment transformed the blessing into a curse when this caused a limitation in their diversification of economies and a leaning towards gender inequality in education and employment (Stijns, 2006, pp. 1060-1083). This huge dependence on oil returns in turn dramatized their capital and resources when oil prices went down leading to a decline in their growth and a heightening for their economic inequality gap. The other MENA countries have also benefited from the capital and the natural resources available in the rich oil countries. Their people have migrated to those oil-rich countries and worked with higher salaries than their originating countries. Hence, whether an oil exporter or not, countries in MENA region were highly affected by the volatility of the oil sector in recent years.

Ncube, Anyanwu and Hausken (2014) have studied the patterns of inequality in MENA from 1985-2009. Their empirical research concluded that income inequality reduced economic growth and increased poverty rates in the region (Ncube, Anyanwu, & Hausken, 2014, pp. 435-453).

The region was characterized by a divergence of wealth and power leading to high autocracy. Rulers and elite businessmen augmented their wealth and suppressed any local opposition to their formulated socio-economic policies aiming to reserve their capital, authority and autocratic power. By the end of 2010 and early 2011, the rise of the Arab Spring brought all the economic, political and social deficiencies in MENA region to the forefront and all of the consequences of economic inequality discussed above proved on the grounds of reality. According to Ortiz and Cummins (2011), the region has a relatively high rate of income inequality, 38.2% (Ortiz & Cummins, 2011).

Sami & Ali (2015) stated that the research conducted to study the inequality in MENA is very limited compared to the one done to study the same concept in other regions of the world especially, the developed ones in US, OECD and some of the Asian countries. This is may be related to the limited data available on MENA in addition to the negligence of MENA autocratic governments to collect data and adhere to transparency with their people before anyone else (Sami & Ali, 2015); (Ali, 2012).

According to World Bank Lead Economist, Ianchovichina (2015), most of the wealth data should come from tax records which are misstated, if not faked, in the region. The extent of wealth inequality in MENA is always underestimated or distorted. One can only read about the size of wealth of the region's billionaires (1% highest people income bracket) in Forbes. Adding to this, the wealth size of the richest is hidden in tax haven bank deposits. However, in spite of the limited data available about wealth and income in MENA countries and the questions raised around its accuracy, some notes can be inferred from the corporate data. Most of the largest companies in the region have government officials or royal family members as boards of directors. Additionally, most of the largest companies in Egypt, Lebanon, and Morocco are not listed on the stock exchanges of these countries. Instead, they are either firms privately owned by prominent families or state-owned firms (Ianchovichina, 2015). "Wealth appears to have been accumulated by a few private citizens who've taken advantage of their positions at work or their affiliations with powerful families and members of the elite." (Ianchovichina, 2015) In short, ordinary people don't have capital accessibility or don't share in the profits generated by these prosperous companies. The middle class and the lower social classes of people, which are the largest percentage of the population in the region, are positioned at a huge gap against the wealthiest class (Ianchovichina, 2015).

According to Schiffbauer et al. (2015), wealth or capital inequality is greater but difficult to measure than income inequality. In MENA, the capital accumulation for publicly traded companies in stock markets does not seem to be higher than the rest of the world. Most of the large companies are either privately-owned by few well known families or government-owned. He added that these large companies are few since most of the companies are informal and small-size (Schiffbauer, Hussain, Sahnoun, & Keefer, 2015).

Alvaredo (2011) stated that measuring economic inequality is a difficult task, where comprehensive administrative information on income and wealth are generally unavailable. "Inequality measures are often based on household surveys that suffer from several well-known shortcomings. Apart from the difficulty of recalling income and wealth information correctly, survey respondents may under-report expenditures or deliberately leave out income and wealth that result from illegal or informal activities. In addition, these surveys typically include few individuals at the very top of the income distribution, although capturing accurately the "top one percent" is crucial to estimating inequality….. In MENA, these difficulties are compounded by the fact that access to household surveys is limited" (Alvaredo, 2011).

Figure 2: Economic Inequality Measured by Theil Index for sample countries in MENA
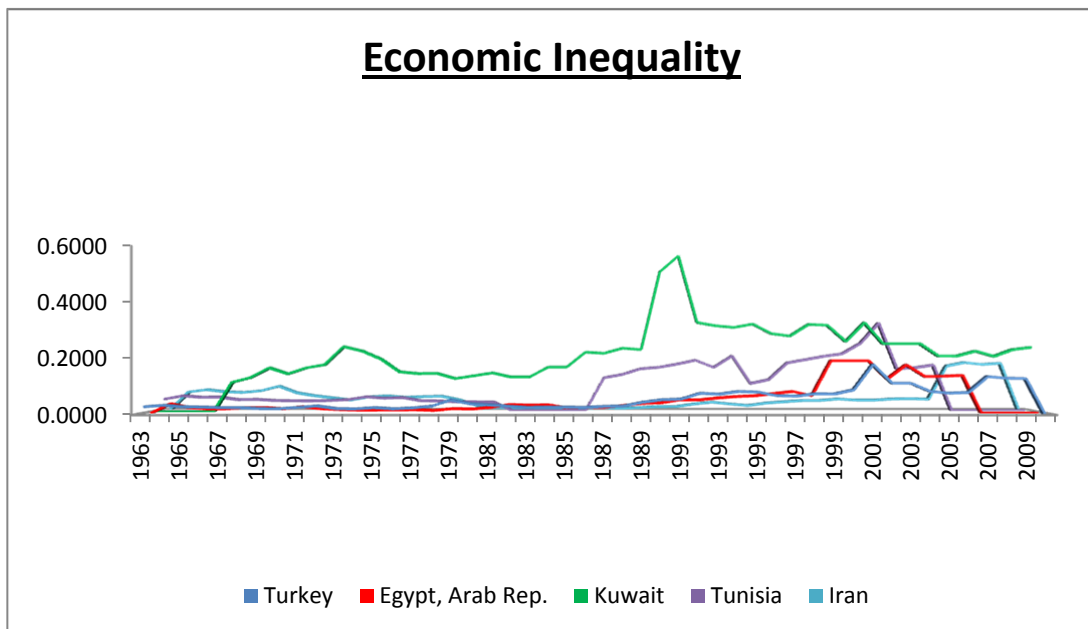
Source: Author's Calculations based on analysis of data from UTIP-UNIDO, 2016

As per Atkinson, Piketty and Saez (2011), using data from household surveys to measure the economic inequality has well-known drawbacks due to the tendency for the top tail of the distribution to be underrepresented. This urged the researchers to use administrative data such as tax records to estimate the income of the very rich (Atkinson, Piketty, & Saez, 2011, p. 44). However, Alvaredo and Piketty (2015) added that the use of administrative data, typically tax records, to estimate the income of the very rich cannot be used in MENA since the availability of proper tax record data is still limited due to tax evasion in Arab Countries (Alvaredo & Piketty, 2015).

Chapter Three: Data

This research uses panel data for countries representing the MENA region for 49 years starting from 1963 until 2012.

1. Dependent Variable

The dependent variable is the economic inequality measured by Theil Index, which was computed following the methodology applied by the University of Texas Inequality Project (UTIP)-UNIDO. It is a global data set that calculates the industrial pay-inequality measures for 167 countries from 1963-2008. It has a total of 4054 observations based on the UNIDO Industrial Statistics (Galbraith J. , 2016). Some of the missing values for Theil were filled in using Sara Sami's calculations from UNIDO CD-ROM as part of her data collection for her study about the relationship between inequality and economic growth by applying the formula:

$$\text{Theil} = \frac{y_i}{y} \log \left(\frac{y_i}{y/N}\right)$$

Where: N is the total employment, y_i is multiplication of total wages and total employees per year, and Y is the total sum of multiplications of wages by employees (Sami & Ali, 2015).

2. Independent Variables

The independent variables are different measures that indicate capital formation, rate of return on capital, economic growth and socio-economic aspect. All independent variables' data in this research were downloaded from the World Bank online database (World Bank, 2016).

2.1. Capital Formation variables

2.1.1. Gross domestic savings as a percentage of GDP

According to the World Bank, gross domestic savings are calculated as gross domestic product (GDP) less final consumption expenditure (total consumption) (World Bank, 2016). As was discussed earlier in the literature review, an individual's earnings (income/wage) is one of the crucial determinants of inequality and the more the person earns, the more is his probability to save and hence improve his economic class among his peers.

Figure 3: Gross Domestic Savings in sample MENA countries
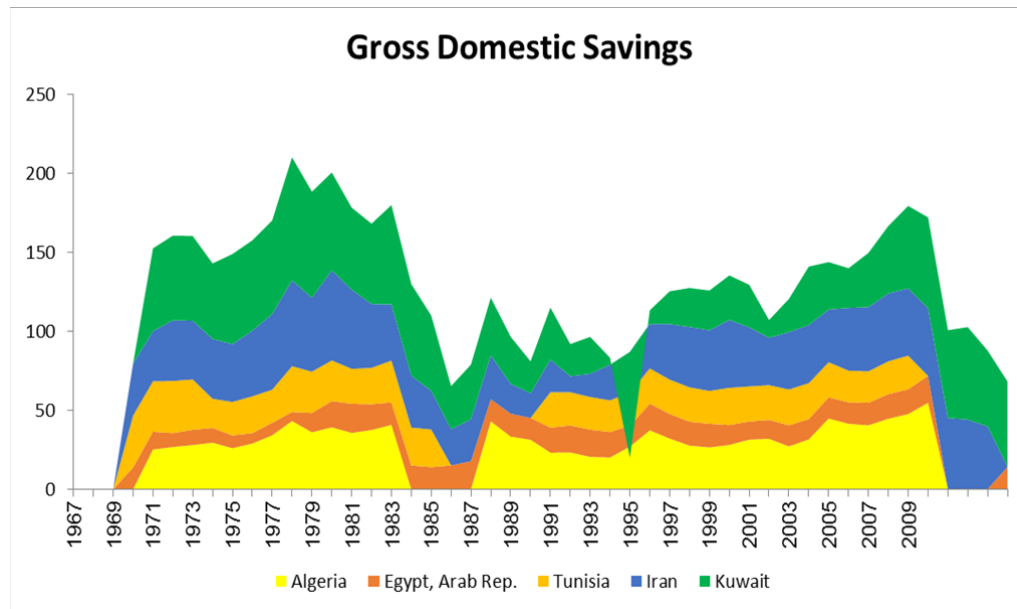
Source: Author's Calculations based on analysis of data from World Bank Indicators database

As shown in Figure 3 above, the Gross Domestic Savings over the years for the chosen countries seem to carry a similar pattern with Iran and Kuwait as the highest two countries for their large share in natural resources endowment, especially oil as will be shown later in figure 5.

2.1.2. Gross fixed capital formation in constant Dollars

According to the World Bank, gross fixed capital formation (formerly gross domestic fixed investment) includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Net acquisitions of valuables are also considered capital formation (World Bank, 2016).

Therefore, in this study, our model will use the above two independent variables on capital formation to test the hypothesis that the increase in capital formation will increase the economic inequality. This is consistent with what the literature about Piketty's model on impact of capital formation on inequality and what his model tested on the effect of accumulated savings across generations. His model concluded that children of wealthy people have a higher chance of accumulating capital, which will increase the inequality

gap. One limitation to this test is that we have no way for differentiating the capital formed by the individual's own resources or through inheritance from his wealthy ancestors.

It is expected from the literature that the above capital formation variables would have a negative impact on economic inequality in MENA i.e. when these variables increase, the inequality would increase simultaneously.

2.2. <u>Rate of return on capital variables</u>

2.2.1. <u>Real interest rate (%)</u>

According to the World Bank, real interest rate is the lending interest rate adjusted for inflation as measured by the GDP deflator. The terms and conditions attached to lending rates differ by country, however, limiting their comparability (World Bank, 2016).

2.2.2. <u>Deposit interest rate (%)</u>

According to the World Bank, deposit interest rate is the rate paid by commercial or similar banks for demand, time, or savings deposits. The terms and conditions attached to these rates differ by country, however, limiting their comparability (World Bank, 2016). It is widely known that deposit interest rate is one of the measures of rate of return on capital. In other words, the deposit interest rate (nominal rate) is the announced percentage of deposit rate without taking inflation into account. It can refer to interest earned, capital gains returns, or economic measures like GDP (Gross Domestic Product) (Petch, 2016)

Hence, in this model, we will test the hypothesis that increasing rate of return on capital (deposit) will increase the economic inequality. This is to conclude if Piketty's hypothesis is valid for countries of the MENA region.

In addition, methodologically, real interest rate and deposit interest rate are interacting. Higher deposit rate means higher real interest rate. So, creating interaction term between the two variables is warranted.

It is expected from the literature that the above variables, used as indicators of capital rate of returns, would have a negative impact on economic inequality in MENA i.e. when these variables increase, the inequality would increase simultaneously.

Figure 4: Deposit Interest Rate in sample MENA countries
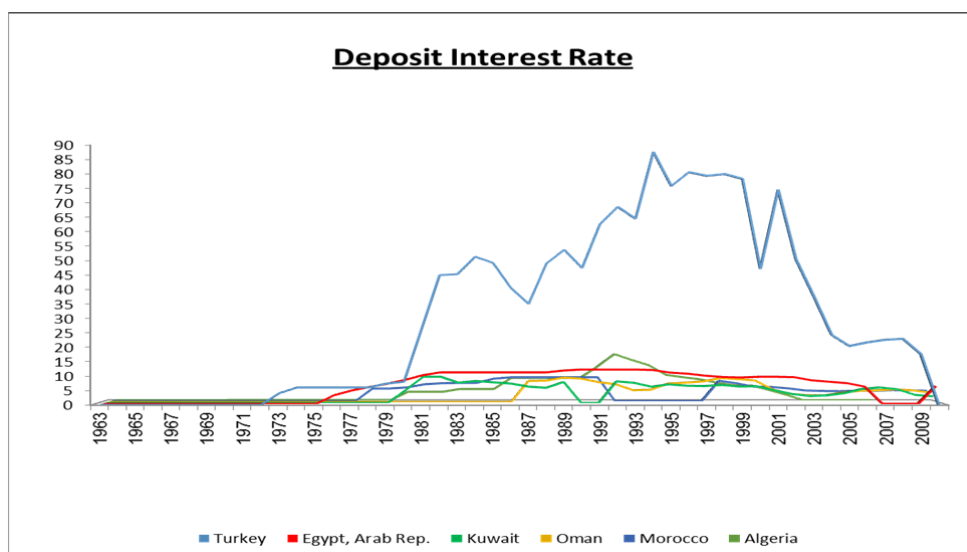
Source: Author's Calculations based on analysis of data from World Bank Indicators database

2.3. Economic Growth Variables

2.3.1. GDP growth

According to the World Bank, annual percentage growth rate of gross domestic product (GDP) at market prices based on constant local currency. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources (World Bank, 2016).

It is expected from the literature on GDP Growth that this variable would have a positive impact on economic inequality in MENA i.e. when it increases, the inequality would decrease simultaneously.

2.3.2. Oil rents as a percentage of GDP

According to the World Bank, oil rents are the difference between the value of crude oil production at world prices and total costs of production (World Bank, 2016). The literature identifies that the abundance of natural resources in MENA, especially oil and gas, is a Curse and that oil rents have a negative and slowing impact on economic growth. Thus, it heightens economic inequality. This hypothesis will be tested in our model of study.

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It is expected from the literature of "resource curse" that this variable would have a negative impact on economic inequality in MENA i.e. when it increases, the inequality would increase simultaneously.

Figure 5: Oil Rents in sample MENA countries
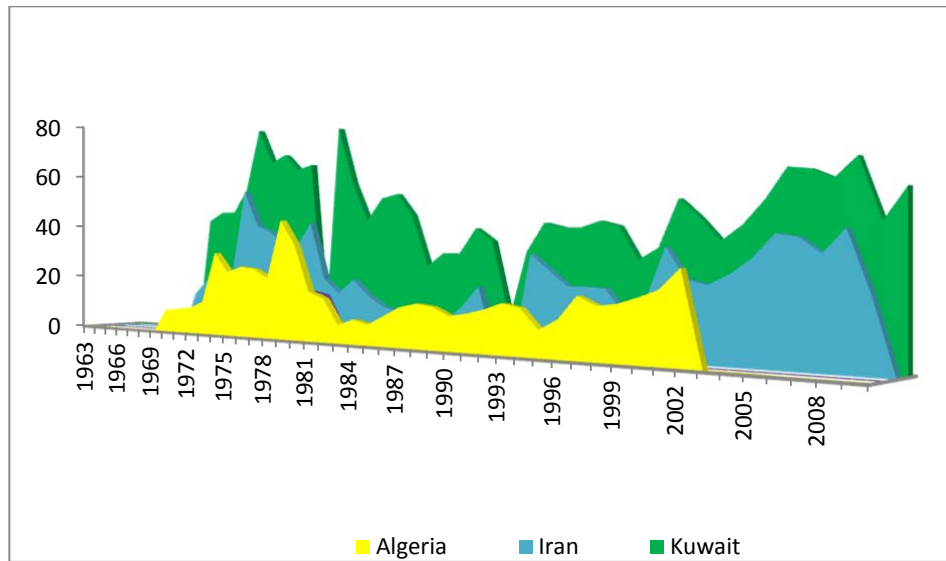
Source: Author's Calculations based on analysis of data from World Bank Indicators database

As shown in Figure 5 above, the Oil rents over the years for the three chosen countries seem to carry a similar pattern for their large share in oil natural endowment which is considered as one of the main wealth drivers of these countries.

2.3.3. GDP per capita in constant Dollars

According to the World Bank, GDP per capita is gross domestic product (GDP) divided by midyear population. GDP is, as mentioned above, the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources (World Bank, 2016).

2.3.4. Trade as a percentage of GDP

According to the World Bank, trade is the sum of exports and imports of goods and services measured as a share of gross domestic product (World Bank, 2016).

2.3.5. <u>Manufacturing, value added as a percentage of GDP</u>

According to the World Bank, manufacturing refers to industries belonging to ISIC divisions 15-37. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. The origin of value added is determined by the International Standard Industrial Classification (ISIC), revision 3 (World Bank, 2016).

2.4. <u>Socio-economic Variable</u>

2.4.1. <u>Out-of-school children of primary school age, female</u>

According to the World Bank, out-of-school children of primary school age are female children in the official primary school age range who are not enrolled in either primary or secondary schools (World Bank, 2016). For this study, this is control variable used to capture socioeconomic status, a determinant of how gender inequality can affect inequality in the region.

The purpose of this study is to add to the limited research and data analysis available in MENA to understand the effect of capital formation and capital rate of returns for MENA countries on inequality, holding other variables including economic growth, natural resources rent and education for girls.

Table 1 shows a sample list of the data used in this study. The sample contains a randomly selected year for each of the twenty MENA countries we studied. It lists the Theil Index as well as all the other independent variables we studied for capital formation and capital rate of return along with the controlling variables for Economic growth and socio-economic factors. For example, the lowest Theil Index in the selected sample was reported for 0.002 in the United Arab Emirates (UAE) in 1996 i.e. in 1996, UAE had an almost economically equal population. On the other hand, the largest Theil Index in the random sample was reported for 0.40 in Bahrain in 1992 i.e. in 1992, Bahrain had a very high economic inequality among its population. Another example is the Gross Domestic Savings; the highest rate in the sample was almost 70% of GDP and was found in Qatar in 2005. The worst in the sample was in Lebanon in 2007.

Table 1: Sample of the Panel Data

Country	Year	Inequality measued by Theil Index	Gross domestic savings (% of GDP)	Gross fixed capital formation	Real interest rate (%)	Deposit interest rate (%)	Interaction Variable between Real Interest and Deposit Interest	GDP growth (annual %)	Oil rents (% of GDP)	Interaction Variable between Oil rent and GDP growth (annual %)	GDP per capita	Interaction Variable between GDP growth (annual %) and GDP per Capita	Trade (% of GDP)	Manufacturing, value added (% of GDP)	Out-of-school children of primary, female (number)
Algeria	1997	0.010198	32.015686	15717655552	8.136645	12.604167	102.555634	1.1	15.28403	16.812429	2381.3516	2619.486816	52.24391	8.720453	440458
Bahrain	1992	0.403546	17.05665	-	15.818044	3.625	57.340408	6.689998	22.22177	148.663605	16433.541	109940.3594	181.124	13.92588	636
Egypt, Arab Rep.	2001	0.190262	13.409534	13762065408	11.214485	9.458333	106.070335	3.535226	4.975489	17.589479	1121.6852	3965.410645	39.81043	19.09011	199091
Iran, Islamic Rep.	2003	0.039793	40.681107	55948705792	-	11.675	-	8.639298	26.66991	230.409332	2950.8499	25493.27344	50.67911	14.96152	267183
Iraq	1987	0.005925	-	-	-	-	-	9.305281	21.089	196.239075	1371.7805	12764.80273	49.34943	-	216967
Jordan	1999	0.136824	3.700834	2355069696	12.777503	8.304167	106.106514	3.408517	0.002446	0.008337	1894.3326	6456.864746	104.6174	15.63868	4935
Kuwait	1994	0.311558	24.674797	-	14.319428	5.700833	81.632668	8.436166	39.96651	337.164124	-	-	93.18428	-	18647
Lebanon	2007	0.103297	-0.723347	5268568064	6.976414	7.974167	55.631092	9.404087	-	-	5791.9883	54468.36328	101.2875	7.543199	32496
Libya	1971	0.019678	-	-	-	4	-	-	-	-	-	-	-	-	60919
Morocco	1982	0.073590	19.228117	6867410432	1.334689	6.375	8.508642	10.17346	0.021048	0.214131	1146.2411	11661.23828	56.39723	18.18573	743072
Oman	1988	0.056790	24.50303	-	7.972871	7.57	60.354633	5.964028	28.01864	167.103943	10115.988	60332.03516	71.3599	3.805241	52124
Qatar	2005	0.319196	69.732437	15277472768	-18.301317	3.185	-58.289696	7.492759	37.94233	284.292755	53207.332	398669.7188	94.74554	9.867297	-
Saudi Arabia	2005	0.067648	52.322243	63433322496	-	-	-	7.256018	51.70171	375.14856	13273.653	96313.86719	81.95408	9.544099	-
Sudan	1993	0.039150	18.703442	1019916224	-	-	-	4.568749	0.111404	0.508977	479.09714	2188.874512	11.46605	5.495333	-
Syrian Arab Republic	1997	0.114640	19.718504	-	2.819285	4	11.27714	1.8	22.67595	40.816708	1420.6046	2557.088135	66.22298	-	95374
Tunisia	1978	0.036027	22.984016	3266773760	0.737398	2.5	1.843495	6.440474	7.871018	50.693085	1706.7957	10992.57324	69.70087	12.92568	170011
Turkey	1974	0.019662	12.343687	-	-	6	-	5.594474	0.719352	4.024396	3524.3672	19716.98047	17.00283	17.09952	587586
United Arab Emirates	1996	0.002398	-	-	-	-	-	5.798404	19.44906	112.773514	45547.188	264101	-	-	11876
Yemen, Rep.	2005	0.059775	23.549973	3104410112	-	-	-	5.591748	41.28029	230.82901	817.0824	4568.918945	76.77329	7.131181	593703

Source: Author's Calculations based on analysis of data from World Bank Indicators database and UTIP-UNIDO, 2016

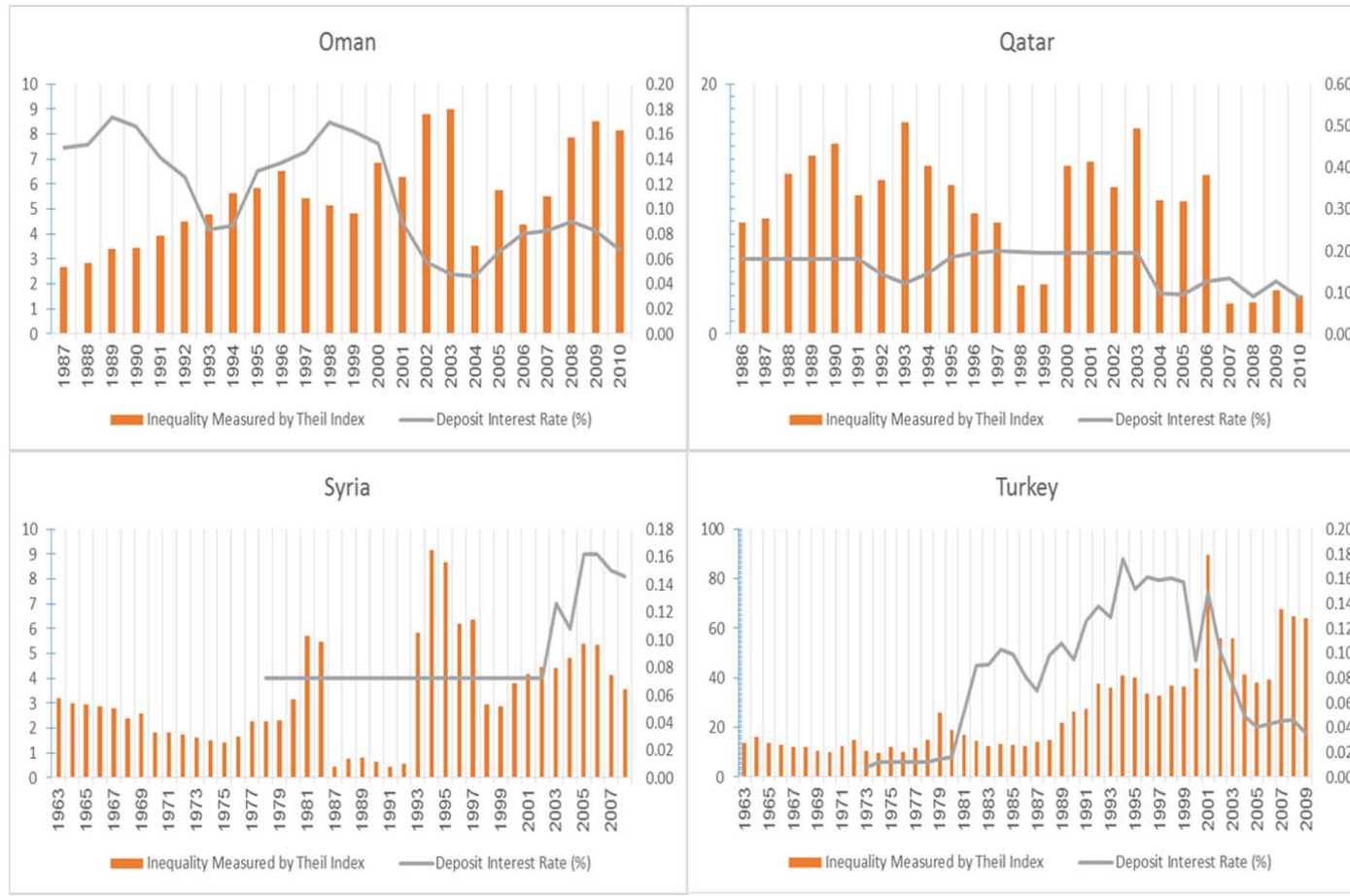# Figure 6: Inequality and Deposit Interest Rate in MENA
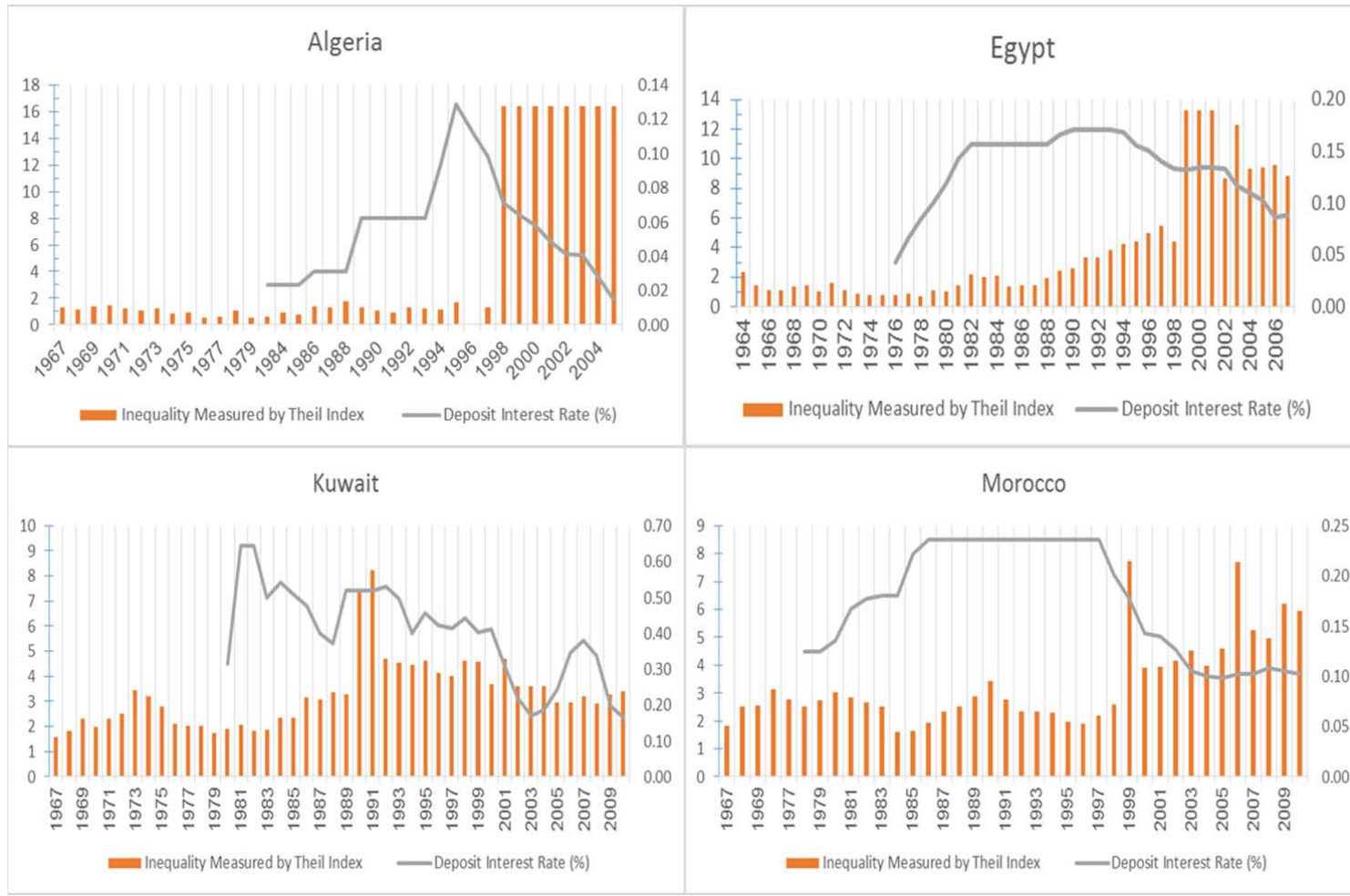
Source: Author's Calculations based on analysis of data from World Bank Indicators database and UTIP-UNIDO, 2016

Figure 6 (Cont'd): Inequality and Deposit Interest Rate in MENA

Source: Author's Calculations based on analysis of data from World Bank Indicators database and UTIP-UNIDO, 2016

Figure 6 illustrates the relationship between inequality and deposit interest rate in selected MENA countries. The available data on deposit interest rate is very limited and starts in late1970s and early 1980s. All graphs illustrated in figure 6 show that there is an inconsistent relationship between inequality and deposit interest rate across the selected countries. The inconsistence ranges from having no relationship whatsoever to having changing relationship between the variables depicted by the graph across the years within the same country.

For Algeria, the graph shows that no relationship exists between the variables under study. From 1984 until 1996, Theil index was almost constant while deposit rate was rising. Even when the deposit rate changed direction from 1996 until 2004 and started a declining trend, Theil index had a sudden increase in 1998 then resumed being constant. As for Qatar, the graph shows that no relationship exists between the variables under study as well. Theil index was constant regardless of the variation in the deposit rate. In Syria, Theil index was constant from 1979 until 2002, moving independently of the changes in deposit rate. However, from 2003 until 2007, the variables followed the same direction of change.

In Egypt, Turkey and Kuwait, the graph depicts a relationship between the two variables. For Egypt, the graph shows that inequality and deposit rate move in the same direction from 1976, both variables were increasing steadily and reached peaks until 1994. Then, from 1995 until 1999, they started moving in opposite directions when Theil was increasing, deposit rate was decreasing. In 2000, they changed direction and started following a decrease pattern. In Kuwait, the variables were moving in opposite directions until 1988 when they started following the same pattern. Additionally, Turkey's graph also shows a relationship between the two variables as inequality and deposit rate were almost constant from 1973 until 1980 and then moved in the same change direction whether increasing or decreasing. As for Oman, Theil and deposit rate kept moving in opposite direction until 2002 when they started moving in the same direction.

As opposed, in Morocco, Theil and deposit rate started by increasing along from 1978 until 1981. Then they moved in opposite direction until 1984 when they started following the same direction of increasing until 1988. For the following nine years until 1997, the variables had no relationship. Deposit was stable while inequality kept declining. From then, they were both declining.

Figure 7: Inequality and Gross Domestic Savings in MENA
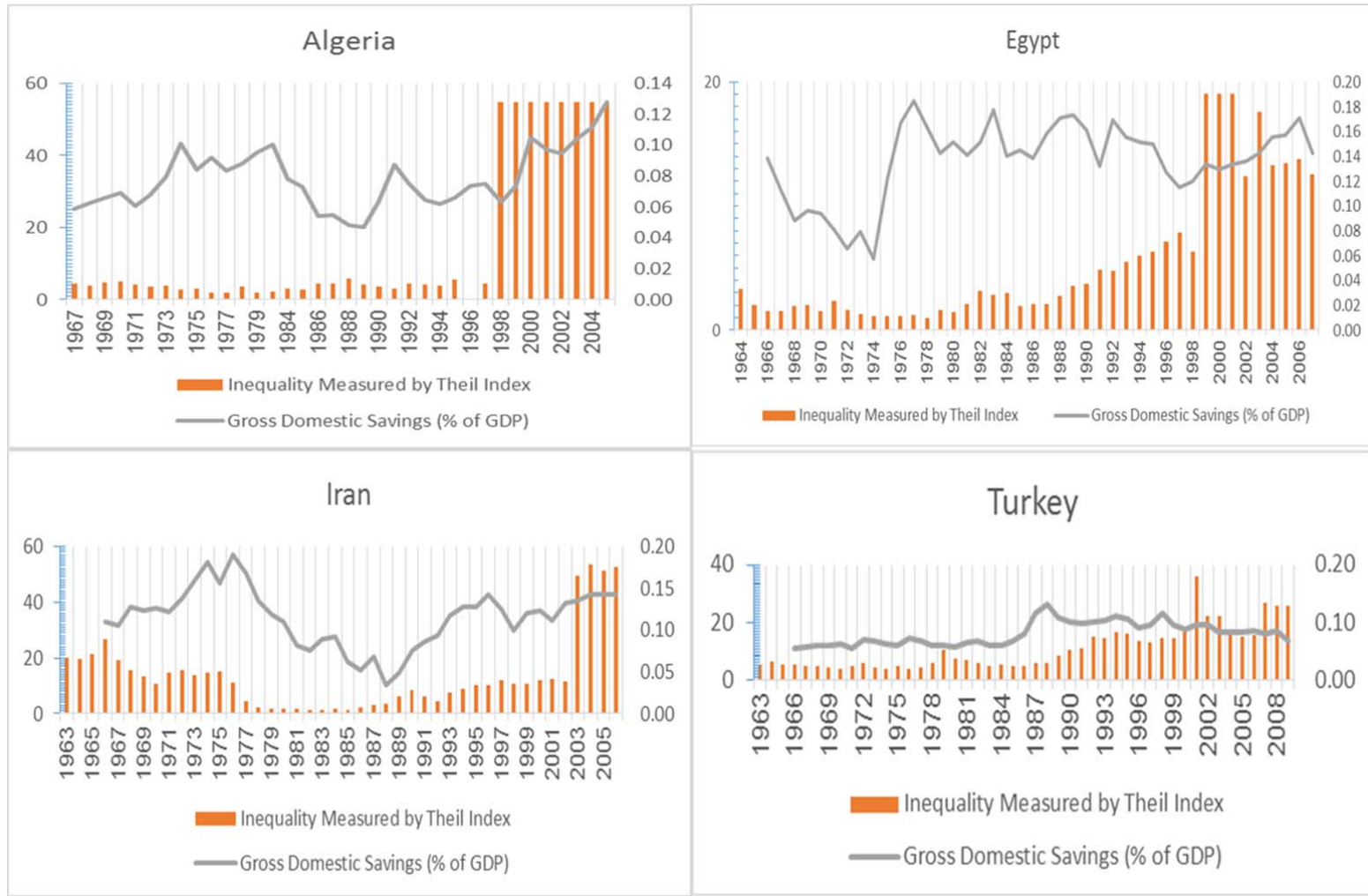
Source: Author's Calculations based on analysis of data from World Bank Indicators database and UTIP-UNIDO, 2016

Figure 7 (Cont'd): Inequality and Gross Domestic Savings in MENA

Figure 7 (Cont'd): Inequality and Gross Domestic Savings in MENA

Figure 7 illustrates the relationship between inequality and gross domestic savings in selected MENA countries. All graphs illustrated in figure 7 show that there is a relationship between inequality and gross domestic savings across the selected countries with few exceptions.

For Algeria and Tunisia, the graph shows that the variables under study are not related. For Algeria, from 1984, Theil index was constant while deposit rate was changing with an exceptional increasing move of Theil index in 1998 and then it remained constant from then until 2004. As for Tunisia, Theil was constant until 1984 when the inequality started slightly increasing accompanying a slight decrease in gross domestic savings until 1994. This was followed by a changing move by Theil that was not accompanied by a change in gross domestic savings level. Same happened in Egypt from 1966 until 1998, Theil was almost constant regardless of changes in deposit rate with a sudden constant jump from 1999 to 2001 then Theil started moving in opposite direction to the savings.

As for Morocco, the graph shows that the relationship exists between the variables under study with both of them increasing in small steady moves. Only two peaks of unusual increase in Theil took in 1999 and 2006. In Iran, both variables under study were moving in opposite direction with Theil index decreasing and gross domestic savings increasing from 1966 until 1970. Then, afterwards, they followed the same change direction from parallel decrease to increase ending with stability. In Oman, both variables followed the same change direction until 2003 when they started moving in opposite directions.

In Sudan, Syria and Turkey, Theil was following the same direction of the changing moves of the gross domestic savings with the exception of an increase peak in 1990 in Syria and in 2002 in Turkey where the jump in inequality was not accompanied by a change in gross domestic savings. In Saudi Arabia, Theil was increasing with gross domestic savings until 1995. Then, Theil stabilized while gross domestic savings kept increasing.

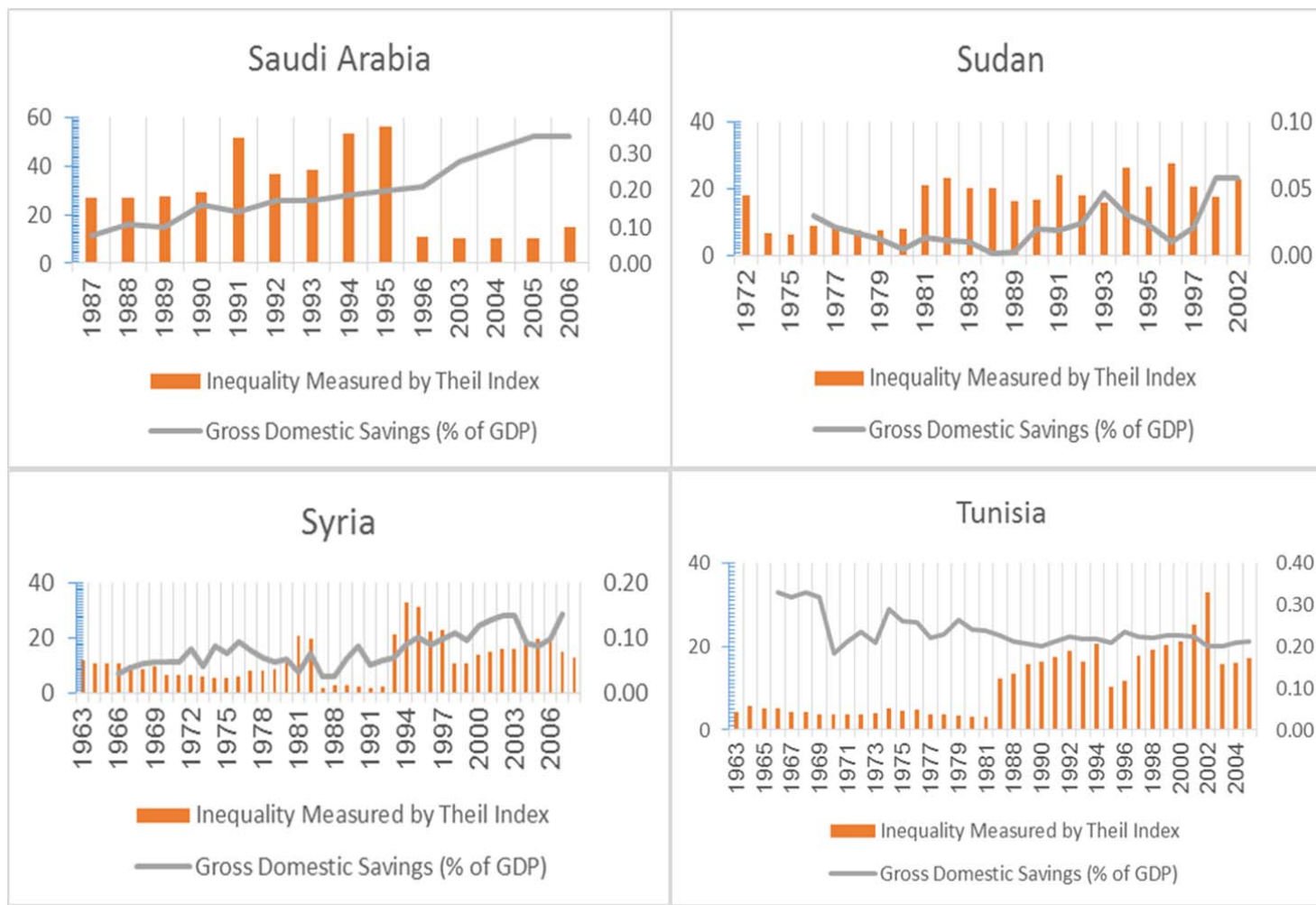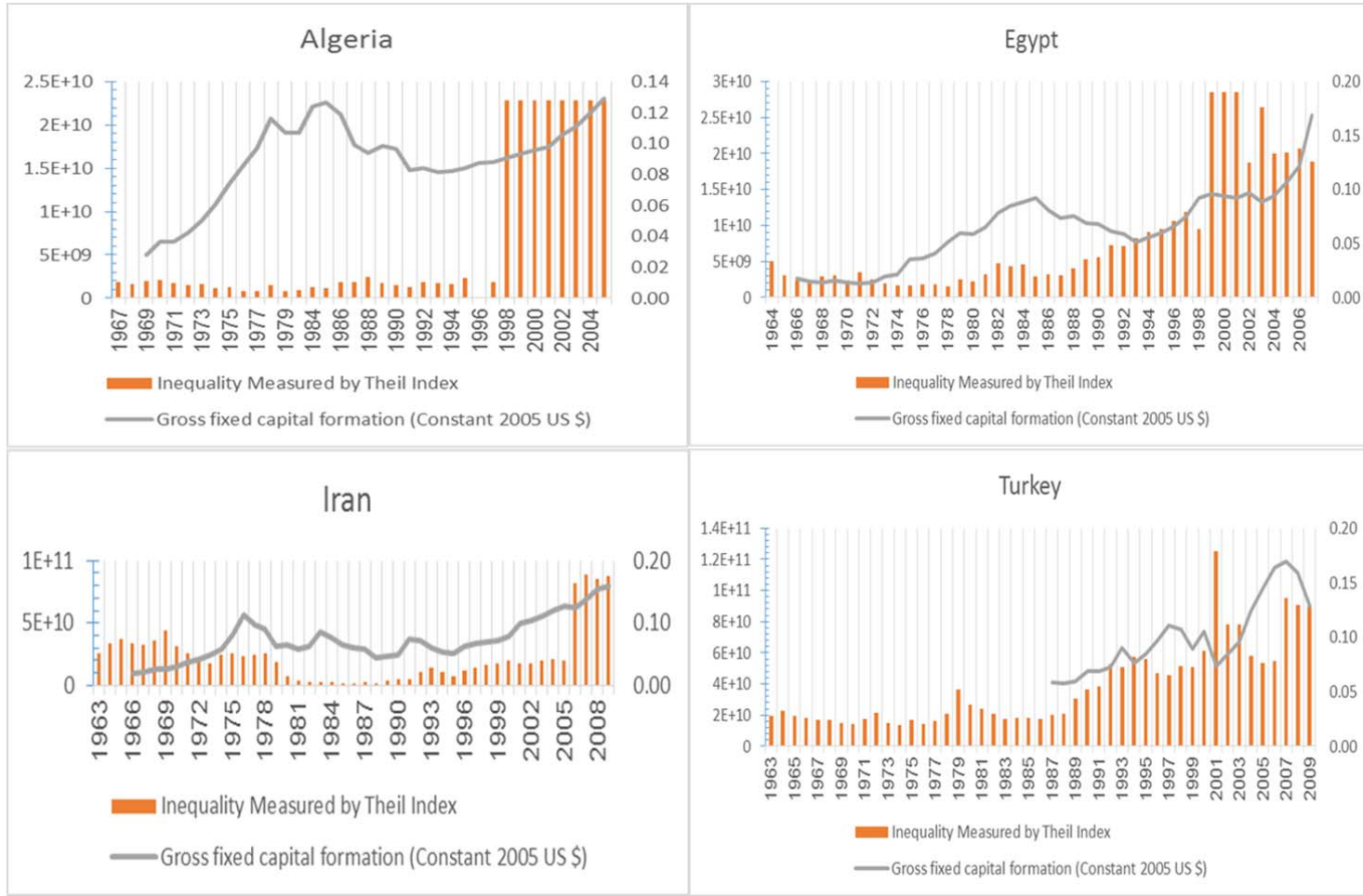**Figure 8: Inequality and Gross Fixed Capital formation in MENA**

Source: Author's Calculations based on analysis of data from World Bank Indicators database and UTIP-UNIDO, 2016

Figure 8 (cont'd): Inequality and Gross Fixed Capital formation in MENA
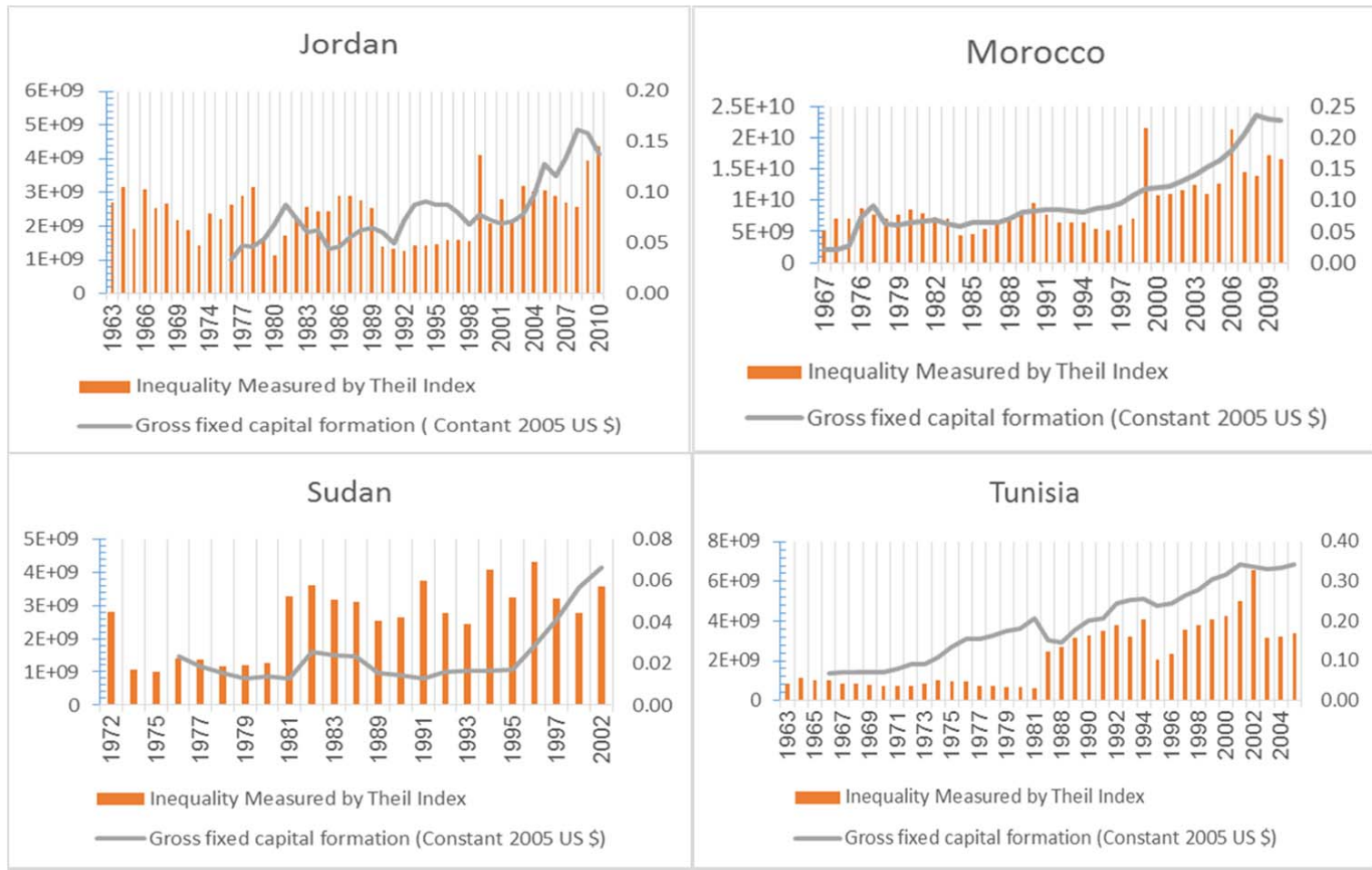
Source: Author's Calculations based on analysis of data from World Bank Indicators database and UTIP-UNIDO, 2016

Figure 8 illustrates the relationship between inequality and gross fixed capital formation in selected MENA countries. All graphs illustrated in figure 8 show that there is a relationship between inequality and gross fixed capital formation across the selected countries with few exceptions.

For Algeria and Tunisia, the graph shows that the variables under study are not related. For Algeria, from 1969 until 1998, Theil index was constant while gross fixed capital was changing: increasing from 1969 until 1978, followed by a decrease until 1983, then an increase until 1985, then a decrease until 1988 and constant until 1997. In 1998, an exceptional increasing move of Theil index and then it remained constant from then until 2004. In this same period, from 1998 until 2004, gross fixed capital was increasing incrementally. As for Tunisia, Theil was constant until 1984 when it started to slightly increase until 1994. This was followed by a changing decrease by Theil from 1996 to 1998. Then, it kept increasing until 2002 where it had a sudden decrease followed by being constant afterwards. Those changes were independently going on without being affected by the increase in the gross fixed capital. Same happened in Egypt from 1966 until 1998, Theil was almost constant regardless of changes in the gross fixed capital with a sudden constant jump from 1999 to 2001 then Theil started moving in opposite direction with one exceptional peak in 2003.

As for Sudan, Iran and Morocco, the graphs show that the relationship exists between the variables under study with both of them increasing in small steady moves. Only two peaks of unusual increase in Theil took place in Morocco in 1999 and 2006. In addition to an increase in this factor in Iran that was not affecting Inequality that remained stable from 2005 onwards. In Oman, both variables followed the same change direction until 2003 when they started moving in opposite directions.

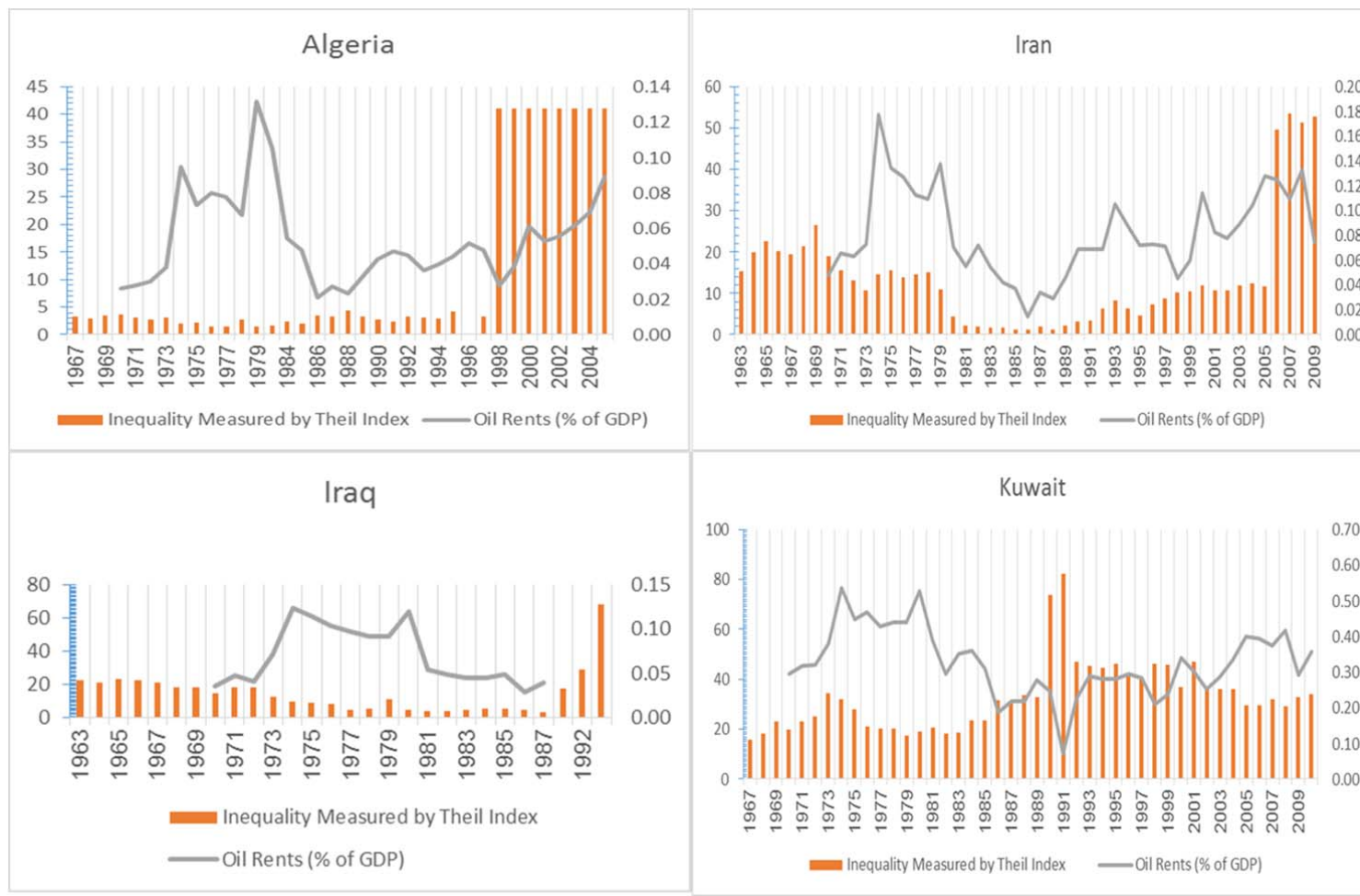In Turkey, Theil was following the same direction of the changing moves of the gross fixed capital formation with a small time lag for the change between the two variables. As for Jordan, both variables moved in opposite directions.

Figure 9: Inequality and Oil Rents in MENA

Source: Author's Calculations based on analysis of data from World Bank Indicators database and UTIP-UNIDO, 2016

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Figure 9 (Cont'd): Inequality and Oil Rents in MENA

Source: Author's Calculations based on analysis of data from World Bank Indicators database and UTIP-UNIDO, 2016

Figure 9 (Cont'd): Inequality and Oil Rents in MENA
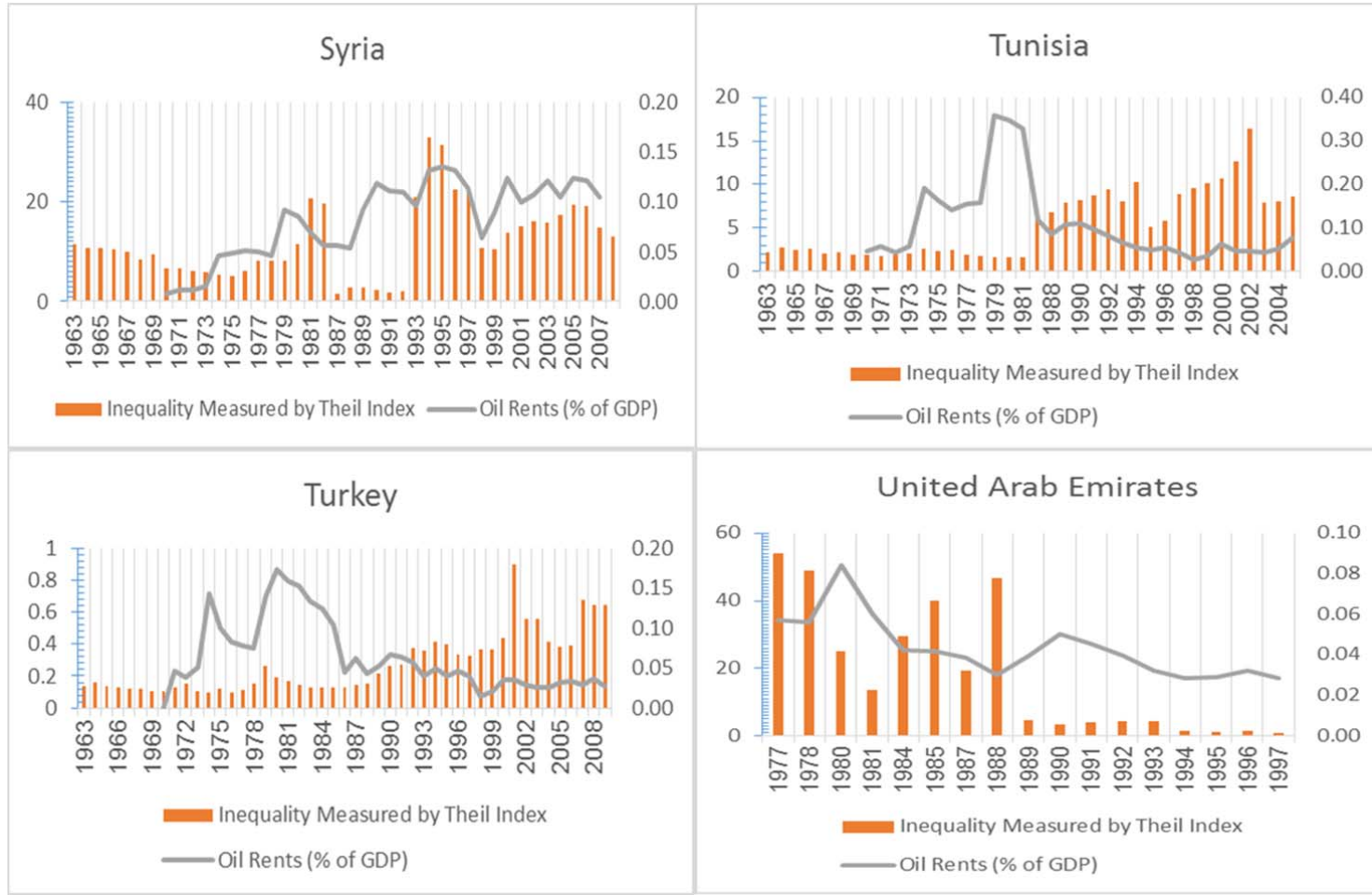
Source: Author's Calculations based on analysis of data from World Bank Indicators database and UTIP-UNIDO, 2016

Figure 9 illustrates the relationship between inequality and oil rents in selected MENA countries. All graphs illustrated in figure 9 show that there is an inverse relationship between inequality and oil rents across the selected countries.

For oil rich countries, such as Iran, Kuwait, Iraq and Saudi Arabia, the graph shows that the variables under study are indirectly related. When oil rents revenues increase, Theil index decreases signaling a lower economic inequality. This reflects the fact that having abundance of oil as a natural resource is considered one of the main drivers of wealth in these countries. That fact contradicts Piketty's theory on the accumulation of wealth as a factor increasing inequality. It also opposes the literature on the paradox of plenty and the natural resources abundance curse.

<u>Chapter Four: Methodology and Empirical Model</u>

1. <u>Methodology</u>

According to Galbraith and Kum, "the use of the Theil index as a measure of inequality avoids many of the difficulties inherent in the use of the income distribution measures by Deininger and Squire data-Gini coefficient. The Theil Statistics are more consistent across time and countries" (Galbraith & Kum, 2004). While Galbraith and Pedro explained that "Theil's T statistic is part of the family of generalized entropy of inequality measures; benefits of its use include its useful ability to be decomposed exactly into within-group and between-group components" (Galbraith & Pedro, 2001).

Panel or longitudinal data was used in this study, where N was observed over T time periods. We studied 20 countries of the MENA region over a 49-year period from 1963 to 2012. However, the data used is unbalanced as it is not continuously completed for all countries.

2. <u>Empirical Model</u>

In our study, we used both the "fixed effect" and "Random effect" regression model having constant the average effects of each country. By including fixed effects, we are controlling for the average differences between the countries and hence greatly reducing the threat of omitted variable bias.

The model estimates the relation between economic inequality and capital rate of return:

Model THEIL $_{it}=$ $\beta_0 + \beta_1 GDS_{it} + \beta_2 GFCAPC_{it} + \beta_3 REALINT_{it} + \beta_4 DPSTINT_{it} +$
$\beta_5 DEPINTRIN_{it} + \beta_6 GDPG_{it} + \beta_7 OILRNT_{it} + \beta_8 OILGROWTH_{it} +$
$\beta_9 GDPC_{it} + \beta_{10} GDPPG_{it} + \beta_{11} TRADEG_{it} + \beta_{12} MNFG_{it} + \beta_{13} CHOSCF_{it}$
$+ v_i + \emptyset_t + \varepsilon_{it}$

Where: country (i), time (t), Theil Index (THEIL$_{it}$), Gross domestic savings (% of GDP) (GDS$_{it}$), Gross fixed capital formation (constant 2005 US$) (GFCAPC$_{it}$), Real interest rate (%) (REALINT$_{it}$), Deposit interest rate (%) (DPSTINT$_{it}$), Interaction Variable between Real Interest and Deposit Interest (DEPINTRIN$_{it}$), GDP growth (annual %) (GDPG$_{it}$), oil rents as percent of GDP (OILRNT$_{it}$), Interaction Variable between Oil rent and GDP growth (annual %) (OILGROWTH$_{it}$), GDP per capita (constant 2005 US$) (GDPC$_{it}$), Interaction Variable between GDP growth (annual %) and GDP per Capita (GDPPG$_{it}$), Trade (% of GDP)

(TRADEG$_{it}$), Manufacturing, value added (% of GDP) (MNFG$_{it}$), Out-of-school children of primary school age, female (number) (CHOSCF$_{it}$), the country effect (v), the time effect (Ø), and the error term (ε).

Below is Table 2 summarizing all the independent variables used in this study's empirical model.

Table 2: Description of Independent Variables and Data unit	
Independent Variables	**Description**
Capital Formation:	
GDS	Gross domestic savings (% of GDP)
GFCAPC	Gross fixed capital formation (constant 2005 US$)
Capital Rate of Return:	
REALINT	Real interest rate (%)
DPSTINT	Deposit interest rate (%)
DEPINTRIN	Interaction Variable between Real Interest and Deposit Interest
Economic Growth:	
GDPG	GDP growth (annual %)
OILRNT	Oil rents (% of GDP)
OILGROWTH	Interaction Variable between Oil rent and GDP growth (annual %)
GDPC	GDP per capita (constant 2005 US$)
GDPPG	Interaction Variable between GDP growth (annual %) and GDP per Capita
TRADEG	Trade (% of GDP)
MNFG	Manufacturing, value added (% of GDP)
Socio-economic:	
CHOSCF	Out-of-school children of primary school age, female (number)

Source: Author's Calculations based on analysis of data from World Bank Indicators database and UTIP-UNIDO, 2016

Chapter Five: Model Results and Discussions

This thesis aimed to investigate the effect of the capital formation and the capital rate of return on economic inequality in MENA region using panel data from 1963-2012 while controlling other factors of economic growth and socio-economic conditions. We will explain, in this chapter, the findings reached in this study using STATA 11 Software, making use of the data downloaded from the World Bank indicators database and University of Texas Inequality Project – United Nations Industrial Development Organization (UTIP-UNIDO) industrial data statistics (Galbraith J. , 2016).

Table 3 summarizes the statistics of the variables. As mentioned in chapter 3, Theil index is the dependent variable of the model and it measures the economic inequality. It has 598 observations with an average of 0.090 and a standard deviation of 0.095 with the highest value of 0.58934 in Bahrain in 1994. Gross domestic savings has 724 observations with an average of 23.8% of Gross Domestic Product. As for the deposit interest rate, it has an average of 10.6% in a range between 0.69% and 438%, with the lowest value depicted for Djibouti in 2006.

Table 3: Summary Statistics					
Variables	Obs	Mean	Std. Dev.	Min	Max
THEIL	598	0.090	0.095	0	0.589
1) Capital Formation:					
GDS	724	23.79983	19.48053	-66.95316	80.66445
GFCAPC (millions)	419	17,900	22,700	39.6	139,000
2) Capital Rate of Return:					
REALINT	343	4.072	12.628	-36.267	88.100
DPSTINT	477	10.593	25.067	0.688	438.358
DEPINTRIN	336	200.958	2238.017	-619.621	38619.370
3) Economic Growth:					
GDPG	795	5.181	9.553	-64.047	104.487
OILRNT	767	19.669	19.381	0.000	86.982
OILGROWTH	709	107.156	374.714	-2840.098	5914.889
GDPC	783	8,692.244	13,502.520	401.944	81,788.950
GDPPG	769	53,258.820	176,672.900	(689,592.400)	1,952,693.000
TRADEG	784	73.374	36.050	0.021	251.139
MNFG	545	12.066	5.583	0.100	25.741
3) Socio-economic:					
CHOSCF	389	208,583.700	300,816.500	37.000	1,537,855.000

Source: Author's Calculations based on analysis of data from World Bank Indicators database and UTIP-UNIDO, 2016 using Stata 11

The results found from the fixed effect models are almost consistent with the results found from the random effect models. In both models, there is a positive relationship between inequality and each of the following variables: Gross domestic savings, Value added of manufacturing, the interaction variable between Oil rent and GDP growth and the interaction variable between real and deposit interest. Similarly, both models have shown a negative relationship between inequality and each of the following variables: Real interest, Oil rents, Out-of-school female primary children, value added of trade and the interaction variable between GDP growth and GDP per capita.

As opposed to the above consistency, few exceptions in results exist in some variables. The Gross fixed capital formation variable is positively related to inequality using the fixed effects across all models. However, the same variable is only positively related to inequality using the random effects on models 4 and 5, while being negatively related to inequality using the random effects on the reamining models 1, 2 and 3. Similarly, the GDP per Capita variable is negatively related to inequality using the fixed effects in models 4 and 5. However, the same variable is positively related to inequality using the random effects for the same models 4 and 5. Moreover, another exception could be spotted for the deposit interest rate variable. It is negatively related to inequality using either the fixed effects or the random effects across all models except in model 5. At this specific model, using the random effects, the deposit interest rate changes to be positively related to inequality. Also, GDP growth is positively related to inequality across all models except in Models 3 & 5 under the Fixed Effects where it is negatively related to inequality.

Independent Variable	Dependent Variable	Expected Sign (Hypothesis)	Model Results
Capital Formation: GDS GFCAPC	Inequality	Positive Positive	True True Except RE M 1,2,3
Capital Rate of Return: DPSTINT REALINT DEPINTRIN	Inequality	Positive Positive Positive	False Except RE Model 5 False True
Economic Growth: GDPG OILRNT OILGROWTH GDPC GDPPG	Inequality	Positive Positive Positive Positive Positive	True except FE M 3 & 5 False True (M4 &5) M4 &5: RE True FE False M4 &5: False
MNFG TRADEG	Inequality	Positive Positive	True (M3 &5) False
Socio-economic: CHOSCHF	Inequality	Positive	False

Source: Author's compilation from for Stata 11 results

Table 4: Fixed-effects Model Dependent Variable THEIL Index					
Variables	Model 1	Model 2	Model 3	Model 4	Model 5
1) Capital Formation:					
GDS	0.003131 (2.04)**	0.003150 (2.03)**	0.005262 (2.28)**	0.003362 (2.17)**	0.007316 (3.19)**
GFCAPC	0.000004 (1.43)	0.000004 (1.45)	0.000006 (1.89)*	0.000006 (1.62)	0.000009 (2.16)**
2) Capital Rate of Return:					
REALINT	-0.002847 (-1.96)**	-0.002929 (-1.96)**	-0.003777 (-2.24)**	-0.003061 (-1.84)*	-0.004369 (-2.39)**
DPSTINT	-0.003483 (-1.83)*	-0.003300 (-1.65)*	-0.001372 (-0.52)	-0.002208 (-1.07)	-0.001348 (-0.52)
DEPINTRIN	0.000395 (1.93)**	0.000405 (1.93)**	0.000449 (1.90)*	0.000383 (1.76)*	0.000511 (2.14)**
3) Economic Growth:					
GDPG	0.000010 (0.56)	0.000008 (0.41)	-0.000007 (-0.30)	0.000005 (0.26)	-0.000020 (-0.87)
OILRNT	-0.006562 (-3.45)***	-0.006526 (-3.39)***	-0.006353 (-2.58)***	-0.011858 (-3.74)***	-0.013279 (-3.61)***
TRADEG	-	-0.000042 (-0.32)	-0.000073 (-0.52)	-0.000044 (-0.34)	-0.000046 (-0.34)
MNFG	-	-	0.003377 (0.78)	-	0.007015 (1.57)
OILGROWTH	-	-	-	0.000792 (2.32)**	0.001183 (2.76)***
GDPC	-	-	-	-0.000009 (-0.26)	-0.000019 (-0.53)
GDPPG	-	-	-	-0.000002 (-2.05)**	-0.000003 (-2.56)***
4) Socio-economic:					
CHOSCF	-0.000005 (-1.88)*	-0.000005 (-1.83)*	-0.000004 (-1.25)	-0.000005 (-1.75)*	-0.000004 (-1.34)
Constant	0.063964 (1.06)	0.078977 (1.03)	-0.026519 (-0.23)	0.119632 (1.18)	-0.040073 (-0.34)
F	9.75	8.51	5.60	7.22	5.56
R^2	0.69	0.73	0.60	0.72	0.67
N	65	65	57	65	57
Notes:					
*** Statistically Significant at 1% Significance level					
** Statistically Significant at 5% Significance level					
* Statistically Significant at 10% Significance level					

Source: Author's Calculations based on analysis of data from World Bank Indicators database and UTIP-UNIDO, 2016 using Stata 11

In Table 4, using the fixed-effects model on the panel regression data with dependent variable Theil index, the test results show that the variables of gross domestic savings, gross fixed capital formation and the interaction variable between deposit interest and real interest are positively related to the level of inequality across all models. For example, in model 1, a one percent increase in the gross domestic savings will increase the level of inequality by 0.3 percent. The positive relationship between the level of inequality and the gross domestic savings is statistically significant across all models at 5%. As for the positive relationship between the level of inequality and the interaction variable between deposit interest and real interest, it is statistically significant across all models but at different significance levels: at 5% for models 1, 2 and 5 and at 10% for models 3 and 4. This is as opposed to the positive relationship between the level of inequality and the gross fixed capital formation which is only statistically significant in model 5 at 5% and in model 3 at 10%. This supports the literature on Piketty's model when he claimed that the accumulation of wealth increases inequality.

The results on GDP growth in MENA showed no significant impact on economic inequality by itself and the direction of the relationship was contradicting across the different tested models. They are positively related in models 1, 2 and 4 supporting Kuznets' theory of a necessary tradeoff between growth and inequality and that growth slowers the development and hence increases poverty and inequality. However, being negatively related in models 3 and 5 supports the ongoing debate in literature by Stiglitz. Adding these results to the fact that oil is known to be a mirror image of growth , we created the interaction variable between oil rent and GDP growth. The coefficient of this interaction variable is positively related to the level of inequality in model 4 at 5% statistical significance and in model 5 at 1% statistical significance.

Figure 10: Oil Rents and GDP Growth in MENA
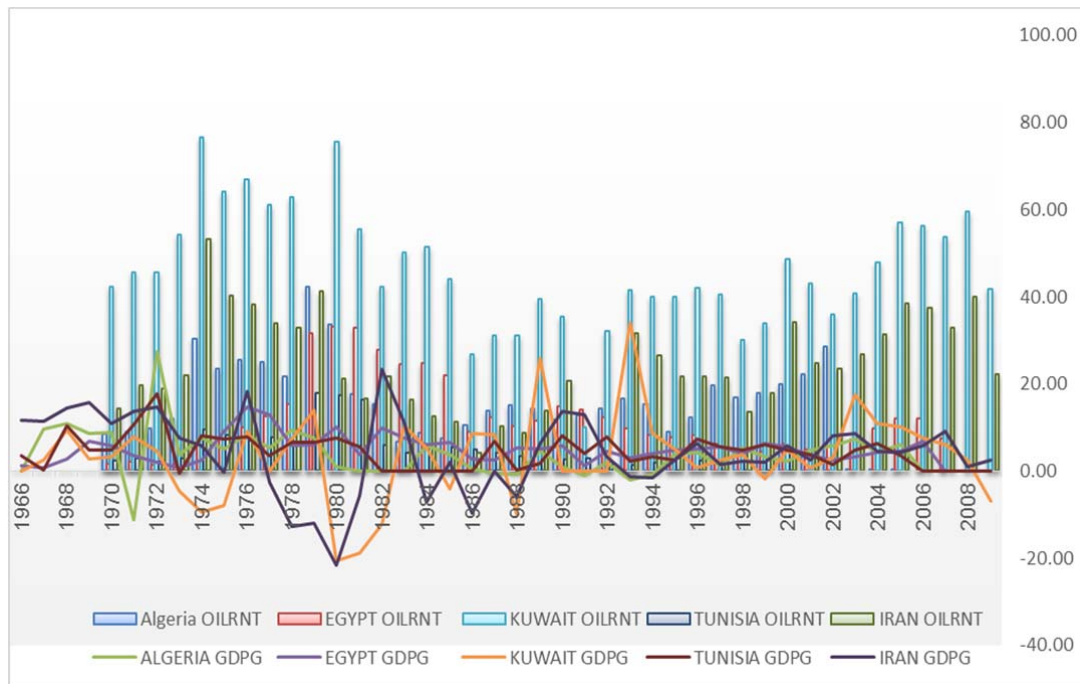
Source: Author's Calculations based on analysis of data from World Bank Indicators database

Same positive relationship exists between the level of inequality and the added value of the manufacturing in models 3 and 5 where the manufacturing variable was included in the model of study, but it is not statistically significant.

On the other hand, the test results on the panel regression data of inequality show that the variables of the real interest, deposit interest, oil rent and the number of out-of-school female children of primary school age are negatively related to the level of inequality across all models. For example, in model 1, a one percent increase in the deposit interest will decrease the level of inequality by 0.3 percent and a one percent increase in oil rent in model 4 will decrease the level of inequality by 1.1%. This contradicts Piketty's theory and the literature claiming that when we have a higher rate of return on capital and wealth, the economic inequality increases. The test shows that the negative relationship between the level of inequality and the real interest is statistically significant at 5% across all models, with the exception of model 4 where it is statistically significant at 10%. This is opposed to the negative relationship between the level of inequality and the deposit interest which is only statistically significant in models 1 and 2 at 10%. As for the negative relationship between the level of inequality and the oil rent, it is statistically significant across all models at 1%. This

defeats the literature debate on the curse of having abundant natural resources, especially oil in MENA countries. The debate accuses the huge revenues coming from the oil sector of slowering the economic growth since the other economic sectors will not be as competitive as the oil sector within the region's context of resources mismanagement and high corruption. Whereas the negative relationship between the level of inequality and the number of out-of-school female children of primary school age is only statistically significant in models 1, 2 and 4 at 10%.

Moreover, the coefficient of the interaction variable between GDP growth and GDP per capita is negatively related to the level of inequality in model 4 at 5% statistical significance and in model 5 at 1% statistical significance. A negative realtionship also exists between the level of inequality and GDP per capita in models 4 and 5, but it is not statistically significant. The same negative relationship, with no statistical significance, exists between the level of inequality and trade in models 2, 3, 4 and 5.

Although GDP growth added statistical significance to GDP per capita by creating the interaction variable but it is not statistically significant by itself as a variable, as I mentioned above. The GDP growth coefficient is negatively related to the level of inequality in models 3 and 5. However, the coefficient is positively related to inequality in models 1, 2 and 4.

Table 5: Random-effects Model Dependent Variable THEIL Index					
Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
1) Capital Formation:					
GDS	0.002540 (2.07)**	0.000547 (0.66)	0.001026 (0.91)	0.000981 (1.33)	0.000244 (0.23)
GFCAPC	-0.000006 (-0.59)	-0.000004 (-0.65)	-0.000006 (-0.92)	0.000001 (1.94)**	0.000009 (1.11)
2) Capital Rate of Return:					
REALINT	-0.001145 (-0.92)	-0.001223 (-0.85)	-0.000180 (-0.11)	-0.003110 (-2.30)**	-0.001625 (-0.87)
DPSTINT	-0.003482 (-1.99)**	-0.003061 (-1.55)	-0.001621 (-0.72)	-0.000693 (-0.35)	0.000148 (0.07)
DEPINTRIN	0.000297 (1.53)	0.000542 (2.39)***	0.000383 (1.48)	0.000678 (3.36)***	0.000476 (1.88)**
3) Economic Growth:					
GDPG	0.000005 (0.10)	0.000013 (0.86)	0.000007 (0.43)	0.000013 (1.00)	0.000011 (0.76)
OILRNT	-0.002239 (-1.77)*	-0.000092 (-0.11)	-0.000369 (-0.33)	-0.006743 (-2.75)*	-0.004963 (-1.51)
TRADEG	-	-0.000102 (-0.95)	-0.000079 (-0.70)	-0.000141 (-1.50)	-0.000128 (-1.25)
MNFG	-	-	0.002963 (1.18)	-	0.001995 (0.76)
OILGROWTH	-	-	-	0.000568 (1.56)	0.000395 (0.83)
GDPC	-	-	-	0.000019 (3.09)**	0.000018 (2.31)**
GDPPG	-	-	-	-0.000002 (-2.01)**	-0.000002 (-1.35)
4) Socio-economic:					
CHOSCF	-0.000010 (-4.53)***	-0.000006 (-3.10)***	-0.000008 (-3.28)***	-0.000007 (-3.70)***	-0.000007 (-2.96)**
Constant	0.130039 (4.38)***	0.139114 (5.98)***	0.078860 (1.41)	0.102760 (4.61)***	0.073670 (1.34)
F					
R^2	0.56	0.49	0.59	0.81	0.80
N	65	65	57	65	57
Notes:					
*** Statistically Significant at 1% Significance level					
** Statistically Significant at 5% Significance level					
* Statistically Significant at 10% Significance level					

Source: Author's Calculations based on analysis of data from World Bank Indicators database and UTIP-UNIDO, 2016 using Stata 11

In Table 5, using the random-effects on the panel regression data of inequality, the test results show that the variables of gross domestic savings, the GDP growth and the interaction variable between deposit interest and real interest are positively related to the level of inequality across all models. For example, in model 1, a one percent increase in the gross domestic savings will increase the level of inequality by 0.2 percent. The positive relationship between the level of inequality and the gross domestic savings is only statistically significant in model 1 at 5%. As for the positive relationship between the level of inequality and the interaction variable between deposit interest and real interest, it is statistically significant at 1% for models 2 and 4 and at 5% for model 5. As for models 1 and 3, the interaction variable has no statistical significance. The coefficient of GDP growth shows no statistical significance across all models.

Additionally, the data results show that the coefficient of GDP per capita and the interaction variable between oil rent and GDP growth are positively related to the level of inequality in models 4 and 5, but with different statistical significance. The GDP per Capita is statistically significant to the level of inequality in both models at 5%. However, the oil growth interaction variable has no statistical significance over inequality in both models. This statistical insignificance is also valid for the positive relationship that exists between the coefficient of the value added for manufacturing and the level of economic inequality in models 3 and 5.

On the other hand, the panel regression data of inequality show that the variables of the real interest, oil rent and the number of out-of-school female children of primary school age are negatively related to the level of inequality across all models. For example, in model 4, a one percent increase in the real interest will decrease the level of inequality by 0.3 percent and a one percent increase in oil rent will decrease the level of inequality by 0.7%. The negative relationship between the level of inequality and the number of out-of-school female children of primary school age is statistically significant across all models at 1%, except for model 5 where it is statistically significant at 5%. In opposition to that is the negative relationship between the level of inequality and the real interest. The latter is statistically insignificant across all models, with the exception of model 4 in which it is statistically significant at 5%. As for the negative relationship between the level of inequality and the oil rent, it is only statistically significant in models 1 and 4 at 10%.

Additionally, the coefficient of the interaction variable between GDP growth and GDP per capita is negatively related to the level of inequality in model 4 at 10% statistical significance and at no statistical significance in model 5. A negative realtionship also exists between the level of inequality and trade in models 2, 3, 4 and 5, but it is not statistically significant at any model.

The remaining two variables tested (i.e. the gross fixed capital formation and the deposit interest) are positively related to the level of inequality in some models and negatively related to it in other models. The coefficient of the gross fixed capital formation is positive in model 4 at 5% statistical significance whereas it is positive and insignificant in model 5. This same variable's coefficient is negative across all the remaining models (model 1 through 3) at no statistical significance. As for the coefficient of the deposit interest, it is negatively related to the level of inequality in models 1 through 4 with no statistical significance except for model 1 in which the coefficient is statistically significant at 5%. The deposit interest coefficient is insignificant statistically and positively related to the inequality level in model 5.

Also, the R Square for all the models ranges from 49 to 81 percent which indicates that the chosen variables in our research provide a reasonably good fit to explain the dependent variable of inequality.

Chapter Six: Conclusion and Recommendations

This thesis aimed to investigate the effect of the capital formation and the capital rate of returns on the economic inequality in MENA region while controlling other factors of economic growth and socio-economic conditions.

The research results have shown that factors of capital formation such as GDS and GFCAPC are positively related to economic inequality. So, the increases in GDS and GFCAPC will cause a h of wealth and inheritance increases inequality.

On the other hand, the results showed that the capital rate of returns such as the real interest, the deposit interest, Oil rents and out-of-school female primary children are negatively related to economic inequality. When the deposit interest rate or the oil rents increase, the economic inequality decreases.This contradicts Piketty's theory and the literature claiming that the higher rate of return on capital and wealth increases the economic inequality. It also defeats the literature debate on the curse of having abundant natural resources, especially oil in MENA countries. The debate accuses the huge revenues coming from the oil sector of slowering the economic growth since the other economic sectors will not be as competitive as the oil sector within the region's context of resources mismanagement and high corruption.

The empirical results presented above should have important implications on formulating and conducting macro-economic policies and development strategies in this region. This is to control capital formation and wealth accumulation to curtail inequality and treat it as a priority to eradicate poverty.

This research is an addition to the limited research on economic inequality in the MENA region. However, the missing and un-reliable data available for the MENA countries was considered a challenge to the study by reducing the number of observations in the regression models. Hence, this represents a good area to be explored by researchers and data collectors and it is suggested for extensive data collection and research in the near future to be used as a further analysis for the measures and effects of the different variables on economic inequality. Thus, it will allow policy makers and government officials design and

implement programs to decrease the effect of capital accumulation on increasing the economic inequality while maintaining sustainable growth in the region.

When the data collection's shortcoming is covered, it will be up to policy makers to develop comprehensive strategies for inclusive development and better wealth distribution to tackle inequality. Revised fiscal and monetary policies to reform tax and benefits are needed to increase fair and redistributive effects and avoid the effect of wealth and power accumulation.

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