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Impact of the real economy on stock market performance: evidence from Arab countries

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Impact of the Real Economy on Stock Market Performance:

Evidence from Arab countries

A Thesis Submitted to

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by Mariam Khaled Hasseeb

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ABSTRACT

In this paper, the macroeconomic determinant of stock market performance represented in stock market capitalization in 15 markets in the Arab world are assessed. The analysis is based on panel data techniques from 1995 to 2014. Furthermore, differentiation between Arab countries according to their affiliation to the Gulf Cooperation Council (GCC) and according to their classification as oil vs. non-oil economies is explored, In addition to traditional variables, an institutional variable and remittances are included among the regressors. The results were that domestic credit, GDP, economic freedom and net remittances have negative effect on stock market capitalization. On the other hand, investment, stocks traded and inflation have a positive effect. Upon classifying the sample to oil vs. non-oil economies, domestic credit lost significance, GDP, economic freedom and net remittances have a negative effect in oil economies and a positive effect in non-oil economies. Inflation has a positive effect in oil economies and a negative effect in non-oil ones. Furthermore, classifying the sample to GCC vs. non-GCC countries, GDP has a negative effect on both. Stocks traded and investment have a positive effect on both. Domestic credit, net remittances and inflation have a negative effect in GCC countries and a positive one in non-GCC countries.

Keywords: Arab countries, Stock market capitalization, macroeconomics, Panel data regression

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I. Introduction

Numerous studies modeled the relationship between stock prices and real economic activities in terms of production rates, productivity, unemployment, inflation, interest rates, and so forth. However, the economic role of stock markets in relatively less developed countries is less clear. Specifically, how do less developed markets respond to changes in their fundamental economic variables, compared with the well-developed and more efficient markets? The answer to this question is still in need to a great deal of researching and studying to help bring such economies and the economies of the Middle Eastern countries particularly within the attention of the community of researchers. They have to be presented as a block and the findings of such studies can thus be compared with the first-category economies in a way that may facilitate transmission of information across the categories of economies.

The Arab region witnessed, and still, wars, political turmoil, revolutions and economic instability. As a result, these countries have not yet emerged as economic powers, which could explain the lack of academic research on this regions' capital markets. Moreover, it is unclear whether emerging markets in this region react, similarly, to economic and political shocks like other emerging markets and/or developed markets. Thus, the purpose of this paper is to make an in-depth analysis of 15 Arab capital markets in order to assess how they can improve their capital market.

The short span of time over which data extracted from the sources relevant to the subject are displayed represents one of the main difficulties standing on the way of the quantitative ascertaining of the soundness and significance of the links that tie the variables, dependent and independent and at whatever level they may be represented, selected to be tested. Furthermore, the relative scarcity of the prior studies on the subject in some cases and the apparent absence of them in many others add to the difficulties.

The rest of the paper is as follows: Section II reviews existing literature on the topic; Section III describes the methodology applied as well as sources of data; section IV deals with the empirical analysis and section V concludes the study.

II. Literature review

Previous studies concerning the effects of macroeconomic news announcements on financial markets is extensively studied. However, researchers have mostly concentrated on the relationships among developed economies.

From various research, it was found that three main points define the argument for the relation between financial development and economic growth. The financial development provides a good opportunity for economic growth, at the same time, economic growth encourages financial development, and that they both affect each other. For that, a lot of research was made to find out what affects the stock market development. This paper focuses on institutional and macroeconomics factors.

Many sources document that institutions are important for stock market development. Transparency, property protection and contract enforcement are three of the main characteristics of legal systems to develop capital markets. From these examples are Laporta, R., & F (1997) who argue that legal traditions affect the level of protection of creditors and shareholders, and the efficiency of contract enforcement, so it has a role in financial systems. Pagano (1993) believes that the existence of transparency and regulations surges investor confidence and affects financial market development significantly. Moreover, (Pistor & Raiser, 2000) investigated a sample of transition economies and reached the conclusion that the effectiveness of the legal institutions is as important as the quality of them in affecting the financial development. Jayasuriya (2005) argues that good institutions decrease return volatility in developing markets. Buchanan (2007) studied the role of legal foundations: the French and the English one for stock market development together with other financial variables. Finally, Creane (2004) found a significant effect for the institutional quality, as the degree of property rights protection and the degree of government participation in banking and finance measured by the

Heritage Foundation's index of Economic Freedom, for the stock market development in the Middle East and North Africa region.

Garcia (1999) studied the effect of macroeconomic factors such as income, saving rate, financial intermediary development, and stock market liquidity on financial growth and shows their importance. Huybens (1999) theoretically, and Boyd (2001) empirically, finds that high inflation results in small, less active, and less efficient stock markets. Aggarwal (2006) believes that remittances promote financial development in a sample of 99 developing countries. Gupta (2007) reached the same results for Sub-Saharan Africa.

In the framework of the examination of the impact of real interest rates on stock market and liquidity, Omran (2003) found a significant long-run and short-run relationships between real interest rates and the stock market performance variables in terms of market activity and liquidity, which reveal an expected behavior for the stock market response to the increase in real interest rates.

Omran (2006) examined the structural behavior of the Egyptian stock market following the introduction of the economic reform program in 1991. The study analyzes the stock market indicators to determine whether they experience significant changes after 1991 compared to the previous period (1980-1990). The overall results clearly reveal that all stock market indicators: market activity, market size, market liquidity, and market concentration, experienced significant improvements after the introduction of the economic reform program in 1991.

Billmeier and Massa (2009) assessed the macroeconomic determinants of stock market capitalization in a panel of 17 countries in the Middle East and Central Asia including hydrocarbon-rich countries and economies without sizeable natural resource wealth. They included an institutional variable and remittances among the regressors and through the application of a fixed-effect panel regression on pooled data from 17 countries across the Middle East and Central Asia region from 1995 to 2005. They tested the impact of institutions and remittances on the evolution of market capitalization for the whole sample. Both, as they indicated, turn out to have a positive and significant impact on the dependent variable. They found that the coefficients for lagged income and lagged investment were positive and significant as well, while domestic credit had a weaker

impact than found in the literature. Similarly, lagged total value traded was significant and had a positive impact on market capitalization. They concluded that both of their regressors of choice, institutions and remittances, mattered in the overall regional sample and in the sub-sample of countries without resource endowment, but had no significant impact on stock market capitalization in resource-rich economies. Moreover, the data indirectly confirmed that the size of remittances was driven by migration to the Gulf countries as they lost significance once the oil price was included. They interpreted this as evidence that high oil prices had been a major contributor to the recent market boom all around, either directly in resource-rich economies, or indirectly through remittance effects in countries without such endowments.

Rault and Arouri (2009) investigated the long-term relationship between oil price shocks and stock markets in the Gulf Cooperation Council countries. The results show the existence of strong significant long-run relationships between oil prices and stock markets and that oil price increases have a positive impact on stock prices in most GCC countries.

Parham and Lean (2011) investigated the relationship between stock returns and exchange rates for six Middle Eastern countries, namely: Egypt, Jordan, Kuwait, Oman, and Saudi Arabia before and during the 2007 global financial crisis. Their empirical results show bi-directional causality among stock prices and exchange rates in both the short- run and long- run for Egypt, Iran, and Oman before the crisis. They also found no interaction among the markets in Jordan and Saudi Arabia in the short-run, while a causal relationship from the exchange rates to stock prices exists in Kuwait.

A study by Gentzoglanis (2007) examined the link between stock markets and economic growth in advanced and emerging economies in the Middle East and North Africa (MENA) region. It was found that the link exists only in the group of high-income countries but this relationship is rather weak for the low-income MENA economies. As far as the link between financial variables and growth is concerned, there is a positive relationship between the ratio of market capitalization/ GDP and future economic growth. The link between turnover velocity and future economic growth is present for high-

income countries but not for low-middle income countries. Thus, a higher turnover velocity Granger-causes growth but the location of the effect is not the same for low- and high- income economies.

Naceur, Ghazouani and Omran (2007) tried to identify the main macroeconomic determinants of stock market development. This study examined the impact of financial intermediary development on stock market capitalization. The authors found that saving rate, financial intermediary (especially credit to private sector), stock market liquidity (especially the ratio of value traded to GDP) and the stabilization variable (inflation change) are the important determinants of stock market development, while income as well as investment does not prove to be significant. In addition, they found that financial intermediaries and stock markets are complements rather than substitutes in the growth process.

Maghayereh (2003) examined the long-run relationships between the Jordanian stock market prices and selected macroeconomic variables. The findings of the paper suggest that the stock price index is co-integrated with a set of macroeconomic variables, that is: exports, foreign reserves, interest rate, inflation, and industrial production, which exhibit a direct long-run equilibrium relation with the stock price index. In addition, the paper concludes that macroeconomic variables are significant in predicting changes in stock prices. Thus, it can be claimed that stock price variability is fundamentally linked to economic variables, through the change in stock price lags behind those economic activities. Finally, the results of the study show that investors' perceptions of stock price movements in the ASE (Amman Stock Exchange) are highly sensitive to the international environment, especially to the economic and political environments in the neighboring Arab countries.

Naceur and Ghazouani (2007) assessed the impact of the rate of inflation on the financial sector performance in the MENA region using dynamic panel data with the Hansen's methodology in order to estimate threshold levels. Globally, they found that inflation has a negative and significant incidence on financial sector development, but with no evidence of threshold levels even after controlling for simultaneity and omitted variables

biases. In other words, a marginal increase of inflation is harmless to stock market performance and banking sector development whatever the rate of inflation. However, all these results should be taken with some care. First, the sample includes several countries that witnessed very high and volatile level of inflation during the observation period. Further, this rather weak relationship could be attributed to the use of annual data instead of data over five years that would have helped the authors as they indicated to abstract from business cycle relationship.

Abdelaziz, Chortareas, and Cipollini (2008) considered the linkage between stock prices and exchange rates in four Middle East emerging markets. The paper analyzes the long-run interaction among stock prices and the real exchange rate in four oil-exporting Middle East countries using co-integration analysis. They start from applying the reduced rank regression technique (equivalent to FIML) to estimate a VECM for the whole sample period. Both the reduced rank regression technique and the Quasi Maximum Likelihood approach (robust to non-normality and heteroscedasticity in the residuals of the VECM) suggest the existence, in the second sub-period, of a long-run equilibrium relationship among the stock prices, the real exchange rates and oil prices for three countries: Egypt, Oman and Saudi Arabia. As for Kuwait, both econometric techniques (employed to estimate VECM coefficients) suggest the existence of a long-run equilibrium relationship between stock and oil prices. The authors found that, in each country, oil prices have a long-run positive effect on stock prices and that in Egypt and Oman real exchange rates are positively related to stock prices, while in Saudi Arabia it is negatively related. The persistence profiles show that the convergence to the long-run equilibrium takes 17 and 18 months in Egypt and Saudi Arabia respectively, while it takes 22 and 24 months in Oman and Kuwait.

Al-Abedallat and Al Shabib (2012) studied the effect of the change in investment and gross domestic product (GDP) on the Amman Stock Exchange Index through examining the relationship between the change in investment and the rate of growth in gross domestic product (GDP) and the movement of Amman Stock Exchange Index for the period 1990- 2009. To test the hypotheses they used statistical analysis and multiple regressions to analyze the relationship between the dependent variable (Amman Stock

Exchange Index) and the independent variables (investment and GDP). The authors reached the following results through their study: there is a relationship between two macroeconomic indicators (investment and GDP) and the dependent variable, which means that the movement of prices in the Amman Stock Exchange is affected by the movement of these two variables and thus there is an effect of these two variables collectively on Amman Stock Exchange Index's movement. In addition, each of the two variables separately has impact on the dependent variable with less impact from GDP than investment.

III. Data and Methodology

In this analysis, a panel regression on data from economies across the Arab region was used from 1995 to 2014. The Arab World consists of 22 countries in the Middle East and North Africa: Algeria, Bahrain, the Comoros Islands, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Mauritania, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, the United Arab Emirates, and Yemen. Some countries have not yet established stock markets (for example, Yemen, the Comoros islands, Djibouti, Mauritania and Somalia) and other countries recently established stock markets (Iraq, Syria, and Libya). The sample countries includes only 15 countries. These countries are Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia and United Arab Emirates. The following regression is run:

$$\text{Marketcap}_{it} = \alpha_i + \beta_1 \text{ Institutions }_{it} + \beta_2 \text{ Remittances }_{it} + \beta_3 \text{ ecofreedom} + \beta_4 \text{ GDP} + \beta_5 \text{ investment} + \beta_6 \text{ inflation} + \beta_7 \text{ docredit} + \beta_8 \text{ stocks traded value} + e_{it}$$

The dependent variable is the market capitalization of listed companies as a percent of GDP. Market capitalization is the share price times the number of shares outstanding. It is used as a proxy for financial market growth. The source of this data is Standard & Poor's, Global Stock Markets Factbook and supplemental S&P data. Author's calculations from some listed stock exchanges were also used.

A matrix of independent variables used in previous studies were included. An explanation for the rationale behind the choice of the regressors follows:

Economic Freedom As a proxy for the quality of institutions, the Heritage Foundation's Index of Economic Freedom is used (Heritage Foundation,2015). Economic freedom is the right of people to control their own labor and property. The principles of economic freedom are measured in the index of economic freedom which is an annual guide published by the Wall Street Journal and the Heritage Foundation. The index helps track over two decades the advancement in economic freedom, prosperity and opportunity. The index is measured based on 10 quantitative and qualitative factors, grouped into four wide classes of economic freedom which are: The rule of law (property rights, freedom from corruption), government size (fiscal freedom, government spending), regulatory efficiency (business freedom, labor freedom, monetary freedom) and market openness (trade freedom, investment freedom and financial freedom). These classes are graded on a scale from 0 to 100. These ten economic freedoms are averaged with equal weights to get the country's overall score. All components in the index are equally significant in arriving at the benefits of economic freedom. Countries that are concerned with economic reforms could improve the factors with lowest scores and find opportunities to increase their economic performance. These factors might specify some binding constraints on economic growth and prosperity.

Net Remittances It plays a significant role in the Arab countries. In some countries, they have become a larger source of external financing than foreign direct investment flows. Remittances are so important in some countries where many workers have been migrating to Gulf countries that dispose huge oil and natural gas reserves. These workers tend to send money to their home countries in order to be attached to homeland, for solidarity, to diversify their portfolio and movements of exchange rate. Remittances contribute to the economic development of the country where they reduce poverty, enhance entrepreneurship; improve education and other positive effects. They add to the disposable income and the aggregate level of deposits and credit intermediated by the local banking sector. The source of this data is IMF balance of payments data, and World

Bank and OECD GDP estimates. Net remittances as percent of GDP was used instead of just remittances received as some Gulf countries only have remittances paid and zero remittances received while other recipient countries only have remittances received.

GDP has a positive and significant impact on stock market capitalization. The more prosperous companies that are quoted on the stock market, the higher the propensity to invest in the stock market by consumers. Data are in constant 2005 U.S. dollars. The source is the World Bank national accounts data, and OECD National Accounts data files.

Investment determines stock market capitalization as stock markets are one way of intermediating saving to investment projects. Investment is measured as the ratio of gross fixed capital formation to GDP. Gross capital formation consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Data is from the World Bank national accounts data, and OECD National Accounts data files.

Inflation change is a determinant of macroeconomic stability in most literature. If high price volatility in the price level occurs, there will be uncertainty in the stock market and people will have less incentive to trade in stock markets. Inflation is measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly.. The source of the data is the International Monetary Fund, International Financial Statistics and data files and authors' calculations.

Domestic credit in the panel, domestic credit to private sector as a percent of GDP is used.
Domestic credit to private sector refers to financial resources provided to the private sector by financial corporations, such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment. This variable measures the role of banks in providing long-term financing to

the private sector and it is used as an indicator of financial intermediary development. Data for this variable is from the International Monetary Fund, International Financial Statistics and data files, and World Bank and OECD GDP estimates.

Stocks traded value is a measure of stock market liquidity. This variable is measured as the total stocks traded as a percent of GDP. This indicator complements the market capitalization ratio by showing whether market size is matched by trading. When the stock market is liquid, the amount traded and the saving invested increase.

IV.   Empirical Analysis

In order to contrast the effects of domestic credit, economic freedom, net remittances, stocks traded and GDP on stock market capitalization at different developmental levels. This paper analyzes Arab countries where the countries are further subdivided according to their affiliation to the Gulf Cooperation Council (GCC). A list of countries included in each group is included in Appendix A.1. Moreover, there is a classification of oil economies versus non-oil ones where the countries included are the ones with very high exports of oil to GDP. A list of the countries included in each group is included in Appendix A.2. There is also a division according to income groups. It should be noted that the GCC countries are all high-income countries. The World Bank's definitions of the income groups are applied to classify the Arab countries. Low income countries are those with GNI per capita of $1,005 or less in 2010. Lower-middle income countries are those with a GNI per capita between $1,006 and $3,975, upper-middle income countries are those with a GNI per capita between $3,976 and $12,275, and the high income countries are those in which 2010 GNI per capita was $12,276 or more (World Bank, 2012). A list of all countries in each income group is included in Appendix A.3.

Table 1 shows variables' specification

variable	variable label
docredit	Domestic credit to private sector (% of GDP)
invest	Gross capital formation (% of GDP)

gdp	GDP (constant 2005 US$)
inflation	Inflation, consumer prices (annual %)
netre	Net remittances (%GDP)
marketcap	Market capitalization of listed companies (% of GDP)
stockstraded	Stocks traded, total value (% of GDP)
ecofreedom	Index of Economic Freedom

Table 2: Summary statistics for whole sample of selected Arab economies for regression model's variables from year 1995 until year 2014

Variable	Mean	Std. Dev.	Min	Max
Market Capitalization	49.68	44.91	0.00	298.99
Domestic Credit	41.38	24.48	0.98	100.00
Investment	23.67	7.54	0.71	46.88
GDP (millions)	76100	88200	7890	531000
Inflation	5.73	23.43	-16.12	387.31
Net Remittances	3.96	6.60	-3.66	26.48
Stocks Traded	21.23	43.71	0.00	372.25
Economic Freedom	57.05	15.04	14.00	77.70

Table 2 reports some descriptive statistics for the variables over the sample period, taking all sample without any divisions. Stock market capitalization as a percentage of the GDP is, on average 49.68 percent of GDP with SD equals to 44.91. The minimum value of zero is contributed by Lebanon in 1996 as the stock market closed due to a war between the israeli forces and Hizbollah. Domestic credit to private sector as a percent of GDP has a minimum value of 0.98 percent and a maximum value of 100 percent. GDP in constant U.S dollars has an average of 76100 million U.S dollars. The inflation has vast variability across countries where some countries are experiencing deflation with a minimum value of -16.12 and a maximum value of 387.31. As mentioned before, net remittances as a percent of GDP are used to highlight the difference between countries who pay and receive remittances. The average net remittances amounted 3.96 percent of GDP. The stocks traded has an average of 21.23 percent of GDP. This measure is not very accurate as some countries did not have an active market except in recent years, some do not even

have a stock market while others have very active ones since the beginning of the observations. The institutional quality in the whole sample is borderline good.

Table 3: Summary statistics for oil Arab economies for regression model's variables from year 1995 until year 2014

Variable	Mean	Std. Dev.	Min	Max
Market Capitalization	49.74	40.59	0.01	196.71
Domestic Credit	31.80	19.87	0.98	85.17
Investment	22.65	8.16	0.71	46.88
GDP (millions)	92100	97600	10100	531000
Inflation	6.56	27.28	-16.12	387.31
Net Remittances	0.74	1.61	-3.66	7.32
Stocks Traded	24.96	48.26	0.00	372.25
Economic Freedom	55.55	17.16	14.00	77.70

Stock market capitalization as a percentage of the GDP for oil economies is, on average 49.74 percent of GDP which is not different than the whole sample. Domestic credit to private sector as a percent of GDP also is not far than the average of the whole sample equals to 31.80 percent. GDP in constant U.S dollars has an average of 92100 million U.S dollars which is higher than the whole sample. This is the result that most of oil countries are the high-income countries. The inflation has nearly the same results as the whole sample. Net remittances as a percent of GDP are used to highlight the difference between countries which pay and receive remittances. The average net remittances amounted 0.74. This is due to the fact that oil economies tend to pay remittances rather than receive it. The stocks traded has an average of 24.96 percent of GDP which is also higher than the whole sample. The institutional quality in the oil economies is still borderline good.

Table 4: Summary statistics for non-oil Arab economies for regression model's variables from year 1995 until year 2014

Variable	Mean	Std. Dev.	Min	Max
Market Capitalization	49.56	53.44	0.00	298.99
Domestic Credit	67.74	14.60	27.62	100.00
Investment	26.45	4.47	18.75	38.12
GDP (millions)	32200	20200	7890	86800
Inflation	3.46	2.72	-0.72	14.93
Net Remittances	11.69	7.57	3.29	26.48
Stocks Traded	13.57	31.37	0.32	189.11
Economic Freedom	61.19	4.01	51.50	70.40

Stock market capitalization is on average a little bit higher in oil economies than in non-oil economies. The latter account for some of the more recent stock markets in the sample due to the fact that the corresponding countries emerged barely few years ago. At the same time, however, the non-oil countries are responsible for the lowest and highest market capitalization. In this subsample, the means for investment and domestic credit are around the values of 26.45 and 67.74 percent of GDP, respectively. The substantial role remittance flows play appears in both oil and non-oil countries, where on average they account for 11.69 % of GDP which is far higher than oil economies showing that the remittances received are higher. Splitting the sample reveals that, on average, institutions in oil and non-oil countries display a comparable level of institutional quality, but that the standard deviation in oil countries is larger than in nonoil countries. The value of stocks traded in oil countries is almost twice the value in non-oil countries, consistent with a higher market capitalization in the former.

Table 5: Summary statistics for panel of whole sample of selected Arab economies for regression model's variables from year 1995 until year 2014

Variable		Std. Dev.
Market Capitalization	between	35.27
	within	30.27
Domestic Credit	between	23.44
	within	9.19
Investment	between	5.30
	within	5.53
GDP (millions)	between	84800
	within	32500
Inflation	between	7.75
	within	22.20
Net Remittances	between	6.85
	within	1.83
Stocks Traded	between	24.28
	within	36.10
Economic Freedom	between	15.23
	within	3.03

The table above explains the source of the variability in each variable where there is within variation which is the variation coming from within the country and the between variation which is the variation between the countries. As can be seen from the table, stock market capitalization, domestic credit, income and net remittances document a

sizeable within variation in many countries. On the other hand, investment, inflation and stocks traded have between variation. Following is a representation of each variable across all the countries.

Figure 1: Domestic credit to private sector (% of GDP) of whole sample of Arab economies from year 1995 until year 2014

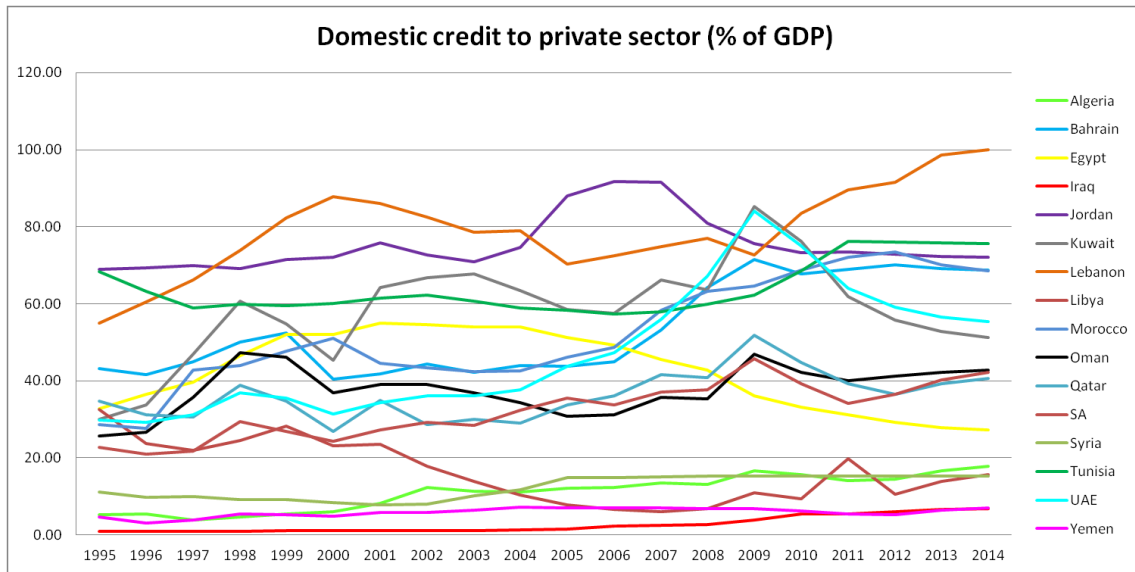**Domestic credit to private sector (% of GDP)**

Figure 1 shows that Iraq had always had the lowest figures followed by Yemen. The highest domestic credit to private sector as a percent of GDP was for Lebanon that experienced increasing rates starting 2009. Most of the Arab countries have fluctuating trends.

Figure 2: Gross Capital Formation (% of GDP) of whole sample of Arab economies from year 1995 until year 2014

Gross capital formation (% of GDP)
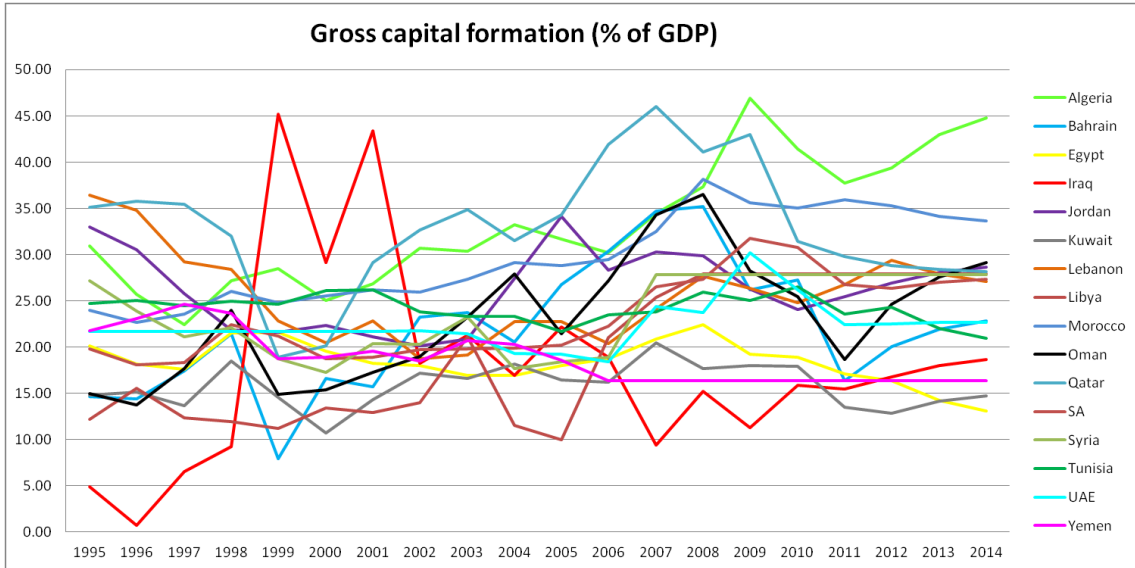
Figure 2 shows that Egypt are one of the countries experiencing a sharp downfall in its gross capital formation as a percent of GDP since 2007 and it got even worse after the 2011 revolution. On the contrary, it is noticeable that Algeria is the highest country and has an upward trend since 2009. Moreover, Gulf countries as Bahrain, Qatar and UAE report the highest figures.

Figure 3: GDP (Constant 2005 US$) of whole sample of Arab economies from year 1995 until year 2014

GDP (constant 2005 US$)
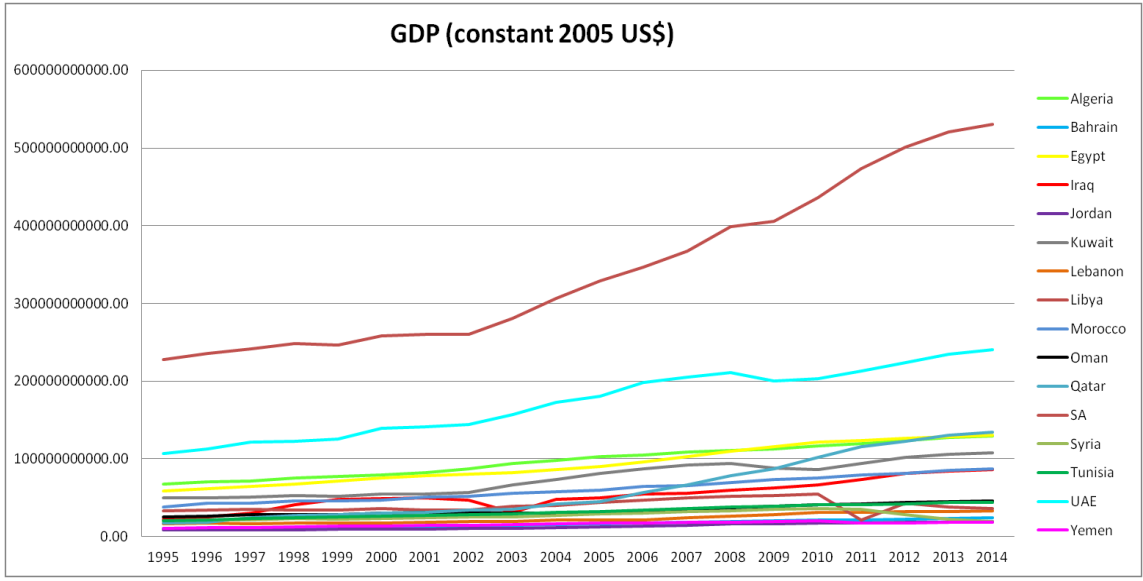
Figure 3 reports the GDP with constant 2005 US dollars of whole sample of selected Arab economies from year 1995 until year 2014. The discrepancy between Arab countries is not very high except for Saudi Arabia and United Arab countries that have a very high real GDP compared to other countries.

Figure 4: Net Remittances (% GDP) of whole sample of Arab economies from year 1995 until year 2014

Net remittances (%GDP)

Legend: Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, SA, Syria, Tunisia, UAE, Yemen
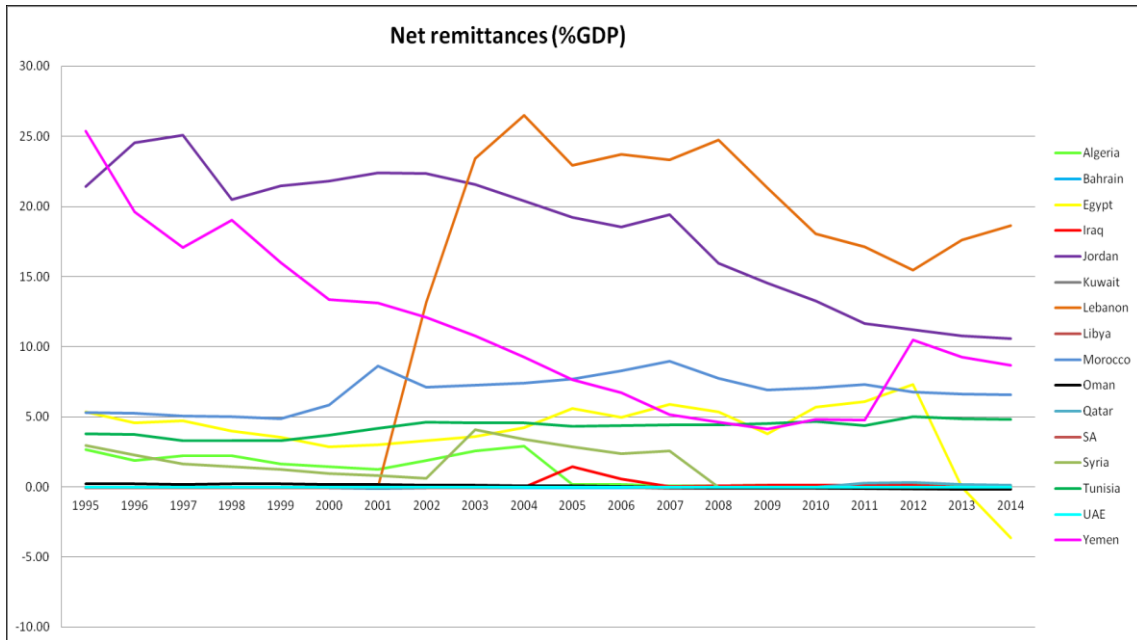
Figure 4 shows the large differences in the net remittances. Lebanon has the highest reported figures followed by Jordan, Qatar and Yemen. On the other hand, Iraq has very low net remittances all over the years. It should be noted that some of the Arab countries do not report neither remittances paid nor received where UAE is one of these countries.

Figure 5: Stocks traded, total value (%GDP) of whole sample of Arab economies from year 1995 until year 2014
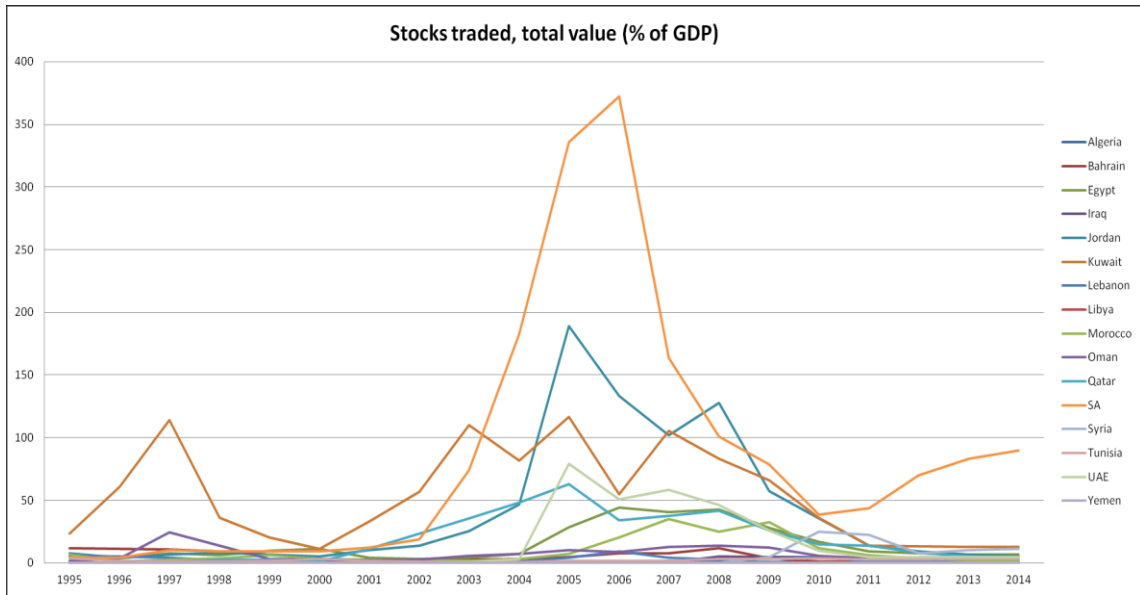
Figure 5 reports the total value of stocks traded as a percent of GDP. It is clear from the above figure that Saudi Arabia has a very active stock market compared to other Arab countries followed by Jordan. It should be noted that Yemen does not have a stock market till today and that Iraq, Libya and Syria started their stock markets in the late 2000s.

Figure 6: Index of Economic Freedom of whole sample of Arab economies from year 1995 until year 2014
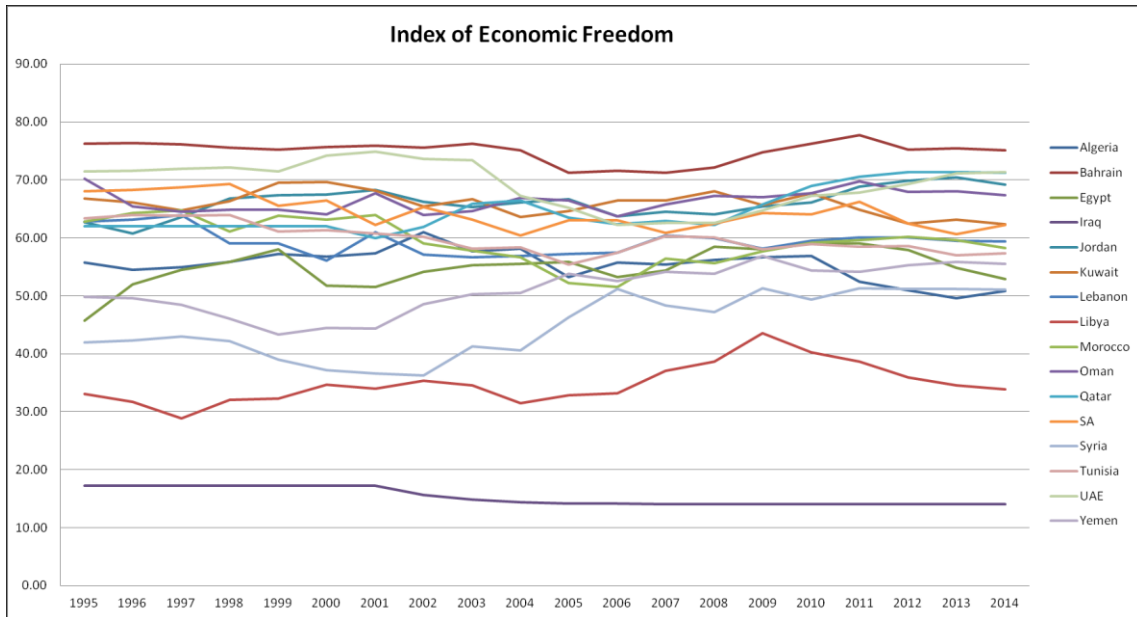
Figure 6 reports the index of economic freedom representing institutional quality ccording to the Heritage foundation. It can be seen than all selected Arab countries are borderline good. The highest scores are contributed by Kuwait where it had always sustained a score in the 70s. It is also interesting to notice the very low scores of Iaq and and Libya. All other countries are between very low and border line good scores.

Figure 7: Inflation, consumer prices (Annual %) of whole sample of Arab economies from year 1995 until year 2014

Inflation, consumer prices (Annual %)

Legend: Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, SA, Syria, Tunisia, UAE, Yemen
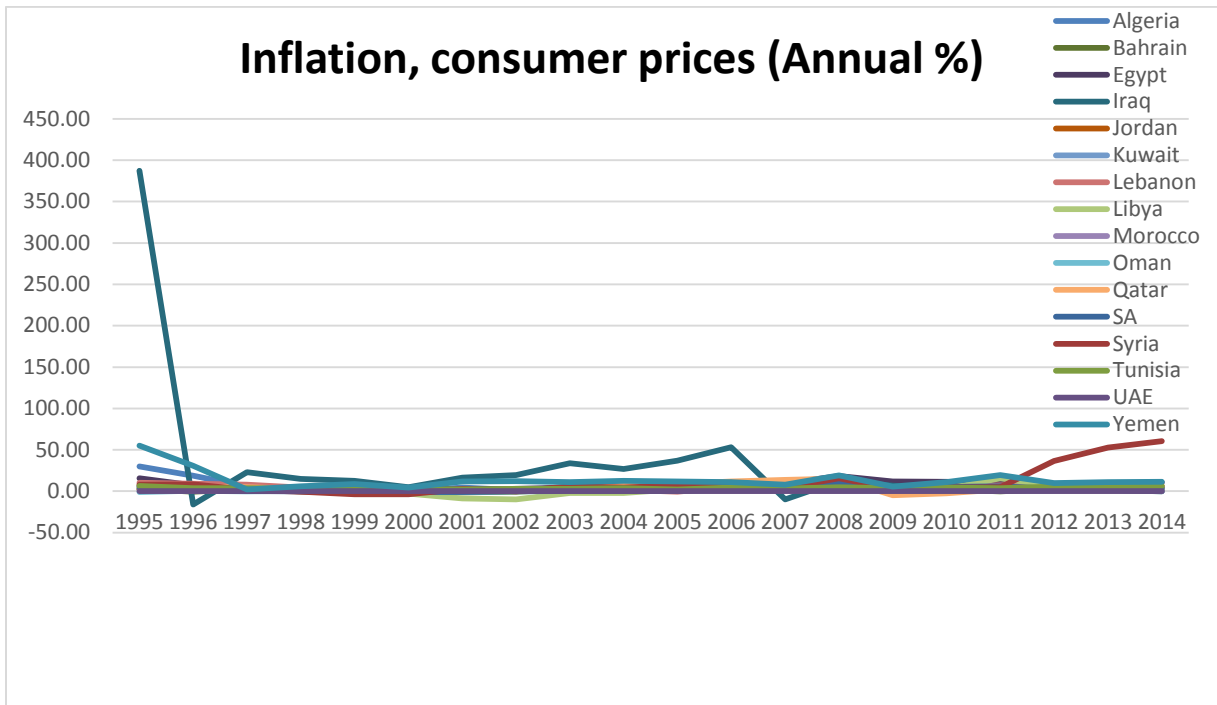
Figure 7 reports inflation as the change in the consumer price index of whole sample of selected Arab economies from year 1995 until year 2014. The figure shows that Iraq biased the whole graph. The reason for that is the Iraqi Kurdish civil war which took place in 1995 and caused inflation to reach 387 % followed by -16% as reported to the world bank. Other countries are experiencing fluctuation with Syria having a significant upward trend following its revolution.

Figure 8: Histogram of logarithmic transformation of market capitalization in the Arab countries
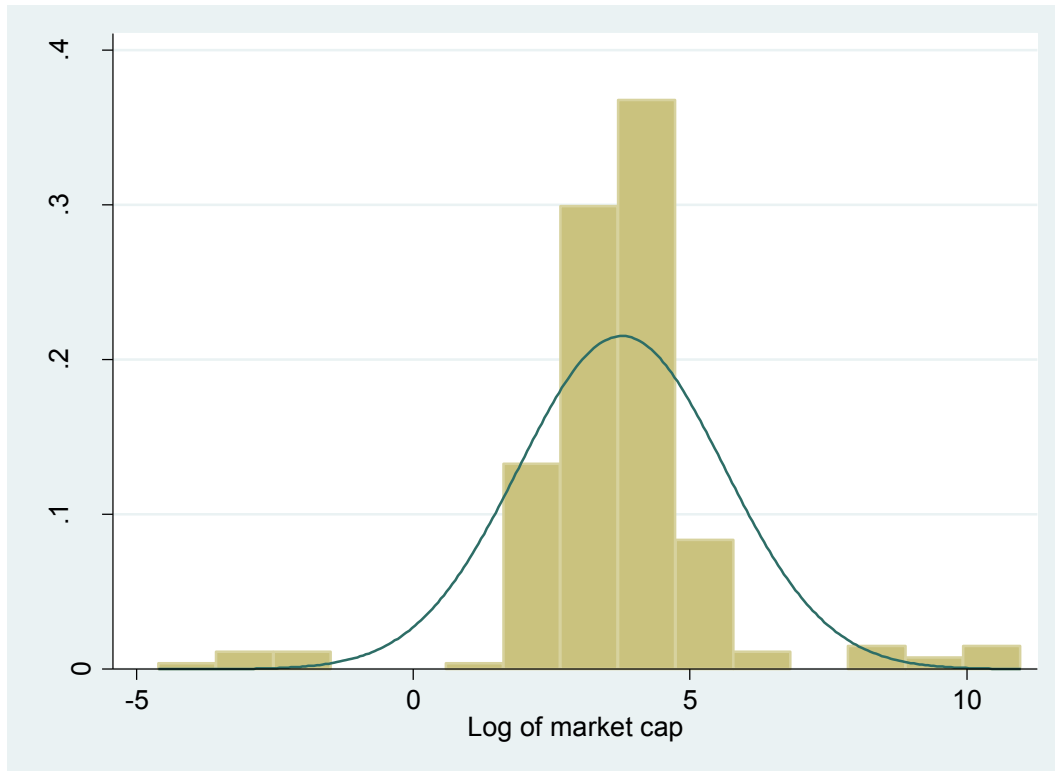
The dependent variable which is the stock market capitalization as a percent of GDP was normalized by taking the natural logarithmic transformation of the observations. As can be noticed from figure 8, the log of market capitalization has a normal distribution.

Figure 9: Bar chart of average market capitalization in oil economies vs. nonoil economies
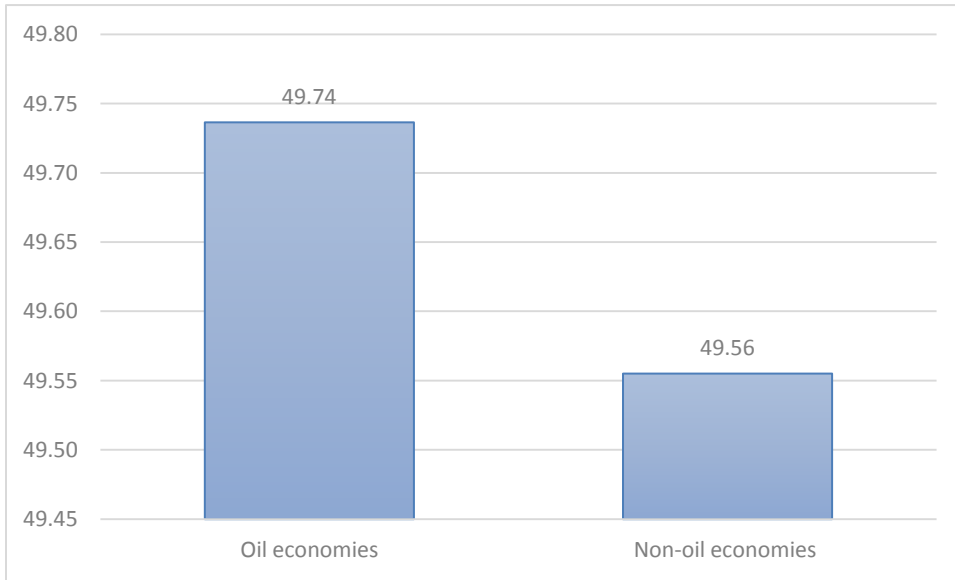
Figure 9 shows the difference in the stock market capitalization between the two subdivisions where as expected oil economies have higher stock market capitalization owing to the active and relatively older stock market that they have.

Figure 10: Box plot of natural logarithmic transformation of market capitalization in nonoil economies vs. oil economies
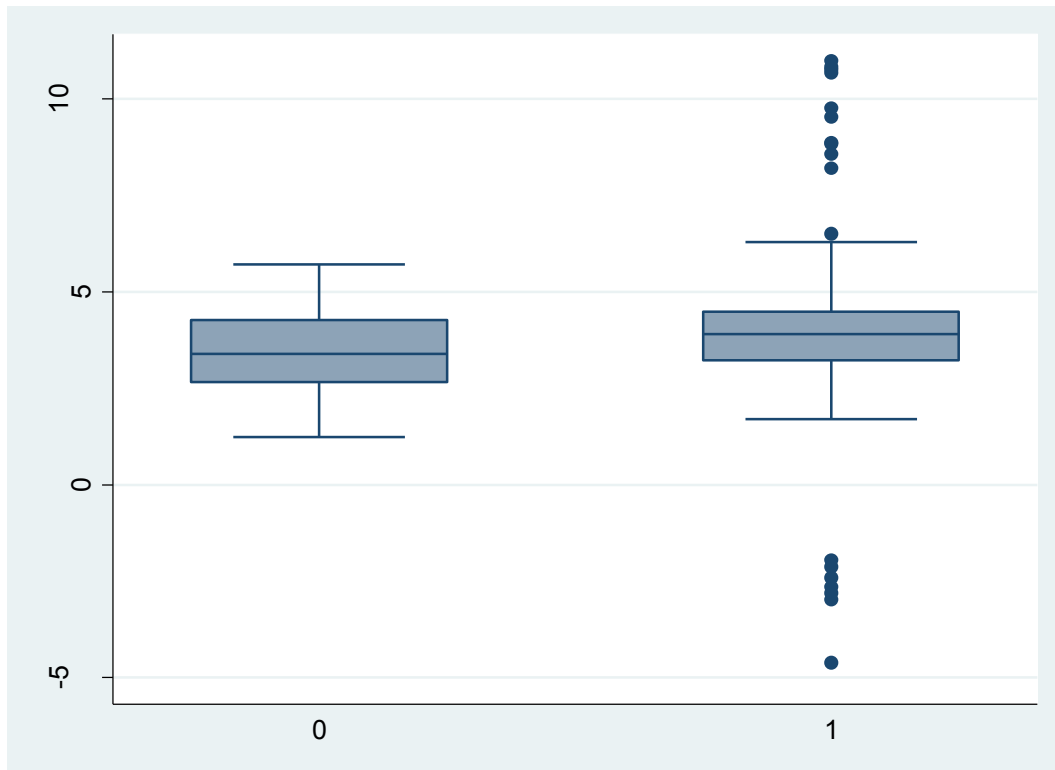
Figure 10 shows that the mean is not a representative measure for the stock market capitalization variable as the oil economies subsample has a lot of outliers as could be seen in the graph.

Figure 11: Fixed effect (within) regression of whole sample of Arab economies from year 1995 until year 2014

```
Fixed-effects (within) regression              Number of obs      =         205
Group variable: Country                        Number of groups   =          13

R-sq:  within  = 0.2590                         Obs per group: min =           4
       between = 0.1839                                         avg =        15.8
       overall = 0.0008                                         max =          20

                                                F(7,185)           =        9.24
corr(u_i, Xb)  = -0.4312                        Prob > F           =      0.0000
```

| lmarketcap	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
ldocredit	-.0706443	.2280348	-0.31	0.757	-.5205273	.3792386
lgdp	.1425843	.2003792	0.71	0.478	-.2527378	.5379065
lstockstraded	.2875473	.0415136	6.93	0.000	.2056464	.3694481
lecofreedom	.9659778	.9877946	0.98	0.329	-.9828124	2.914768
lnetrem	.3340531	.1649254	2.03	0.044	.0086767	.6594296
linvest	.1863468	.2466018	0.76	0.451	-.3001664	.6728601
linfm	.3917117	.4850107	0.81	0.420	-.5651514	1.348575
_cons	-6.488508	6.333133	-1.02	0.307	-18.98296	6.00594

sigma_u	1.8913386					
sigma_e	.56075754					
rho	.91919824	(fraction of variance due to u_i)				

```
F test that all u_i=0:      F(12, 185) =     15.91              Prob > F = 0.0000
```

First, fixed-effects (within) regression was estimated for the log of market capitalization as dependent variable and log of domestic credit, log of GDP, log of stocks traded, log of investment, log of economic freedom, log of net remittances as independent variables. Fixed effects model is a model that characterizes the observed quantities in terms of independent variables that are treated as if the quantities were non-random. The fixed effects estimator that is also known as within estimator refers to an estimator for the coefficients in the regression model. If fixed effects model is assumed, time independent effects is imposed for each entity that are probably correlated with the regressors. The results are shown in figure 11.

Figure 12: Modified Wald test for groupwise heteroskedasticity test of whole sample of Arab economies from year 1995 until year 2014

```
H0: sigma(i)^2 = sigma^2 for all i

chi2 (13)  =    46343.64
Prob>chi2 =      0.0000
```

Due to the great variability across countries shown in the graphical representation of the different variables adopted in this study, groupwise heteroskedasticity need to be checked. Using modified Wald test for groupwise heteroskedasticity (Baum, 2001). The null hypothesis for the test is that there is homoscedasticity and the decision is to reject the null hypothesis where p-value is equal to 0.000 which is less than alpha which is equal to 0.05.

Figure 13: Pasaran CD (cross-sectional dependence) test of whole sample of Arab economies from year 1995 until year 2014

Correlation matrix of residuals:

	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13
r1	1.0000												
r2	-0.6666	1.0000											
r3	0.6829	-0.8385	1.0000										
r4	0.8809	-0.9052	0.9274	1.0000									
r5	0.7061	-0.9279	0.9812	0.9562	1.0000								

r6 -0.7219 0.9961 -0.8697 -0.9391 -0.9481 1.0000

r7 0.6638 -0.9998 0.8270 0.8994 0.9200 -0.9948 1.0000

r8 0.7079 -0.9624 0.9549 0.9569 0.9943 -0.9762 0.9566 1.0000

r9 -0.6267 0.9967 -0.7941 -0.8702 -0.8963 0.9862 -0.9980 -0.9383 1.0000

r10 0.7962 -0.8956 0.9799 0.9831 0.9882 -0.9276 0.8872 0.9770 -0.8564 1.0000

r11 -0.4860 0.9695 -0.8383 -0.8217 -0.9161 0.9539 -0.9676 -0.9441 0.9696 -0.8528 1.0000

r12 0.7697 -0.9863 0.8870 0.9626 0.9567 -0.9970 0.9842 0.9799 -0.9711 0.9475 -0.9318 1.0000

r13 -0.3533 0.9219 -0.6291 -0.6702 -0.7560 0.8843 -0.9264 -0.8137 0.9471 -0.6734 0.9497 -0.8455 1.0000

 Frees' test of cross sectional independence = 7.387

|---|

 Critical values from Frees' Q distribution

                alpha = 0.10 : 0.5822

                alpha = 0.05 : 0.8391

                alpha = 0.01 : 1.4211

Average absolute value of the off-diagonal elements = 0.880

Cross-sectional dependence should be checked as well. Pasaran CD test of cross-sectional independence in fixed effect regression is used (Frees, 1995). This is used to test whether the residuals are correlated across entities. Cross-sectional dependence can lead to bias in tests results (also called contemporaneous correlation). The null hypothesis is that residuals are not correlated. It frees tests for cross-sectional dependence

by using Frees' Q distribution (T-asymptotically distributed). The decision is not to reject the null hypothesis. Since the null hypothesis of no heteroskedasticity was rejected while the other hypothesis of the cross-sectional independence is not rejected. This implies that both fixed effects and random effects estimators are consistent.

Figure 14: Random effect regression of whole sample of Arab economies from year 1995 until year 2014

```
H0: sigma(i)^2 = sigma^2 for all i

chi2 (13)   =    46343.64
Prob>chi2 =       0.0000


. xtreg lmarketcap ldocredit lgdp  lstockstraded lecofreedom lnetrem linvest linfm

Random-effects GLS regression                   Number of obs      =        205
Group variable: Country                         Number of groups   =         13

R-sq:  within  = 0.2163                          Obs per group: min =          4
       between = 0.7994                                          avg =       15.8
       overall = 0.5311                                          max =         20

                                                 Wald chi2(7)       =      94.20
corr(u_i, X)   = 0 (assumed)                     Prob > chi2        =     0.0000
```

lmarketcap	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
ldocredit	-.2997302	.1829163	-1.64	0.101	-.6582395	.0587791
lgdp	-.015114	.1515792	-0.10	0.921	-.3122037	.2819758
lstockstraded	.2933326	.0410626	7.14	0.000	.2128513	.3738139
lecofreedom	-2.074454	.4666857	-4.45	0.000	-2.989141	-1.159767
lnetrem	.1918041	.1567866	1.22	0.221	-.1154919	.4991002
linvest	.2047383	.2365177	0.87	0.387	-.258828	.6683045
linfm	.5234079	.488047	1.07	0.284	-.4331466	1.479963
_cons	10.46768	4.619289	2.27	0.023	1.414042	19.52132
sigma_u	.63107929					
sigma_e	.56075754					
rho	.55879814	(fraction of variance due to u_i)				

Then random effect model was also estimated. Random effects models are used in the analysis of hierarchical or panel data when one assumes no fixed effects (it allows for individual effects). The random effects model is a special case of the fixed effects model. Figure 14 reports the results of the random effect model.

Figure 15: Hausman test of whole sample of Arab economies from year 1995 until year 2014

```
                    —— Coefficients ——
                    (b)          (B)           (b-B)        sqrt(diag(V_b-V_B))
                   within       random        Difference          S.E.

    ldocredit    -.0706443    -.2997302       .2290859          .1455444
        lgdp      .1425843    -.015114        .1576983          .1378029
lstockstra~d      .2875473     .2933326      -.0057853          .0130523
  lecofreedom     .9659778    -2.074454       3.040432          .8804195
      lnetrem     .3340531     .1918041       .142249           .067522
      linvest     .1863468     .2047383      -.0183914          .096377
        linfm     .3917117     .5234079      -.1316962          .1259029

                          b = consistent under Ho and Ha; obtained from xtreg
               B = inconsistent under Ha, efficient under Ho; obtained from xtreg

       Test:  Ho:  difference in coefficients not systematic

               chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                       =        23.90
             Prob>chi2 =       0.0012
```

Further step was undertaken, which is using Hausman test to check the efficiency of the random-effects model. The test evaluates the consistency of an estimator when compared to an alternative, less efficient, estimator that is already known to be consistent. It helps one evaluate if a statistical model corresponds to the data. The null hypothesis is rejected and results shows that random effect is not efficient. Nevertheless, the fixed effect cannot be used because of the heteroscedasticity problem. The Cross-sectional time-series Feasible Generalized Least Squares regression (GLS) is adopted. GLS is a technique used for estimating the unknown parameters in a linear regression model. The GLS is applied when the variances of the observations are unequal (heteroscedasticity) which is the case, or when there is a certain degree of correlation between the observations. In these cases ordinary least squares can be statistically inefficient, or even give misleading inferences. Further models use this regression technique.

Table 6: Regression results of Arab countries for the whole sample, 1995-2014

	GLS Model
	Coefficient
Domestic Credit	-0.380***
	(-3.455)
GDP (millions)	-0.438***
	(-9.325)
Stocks Traded	0.449***
	(17.629)
Economic Freedom	-0.898**
	(-2.407)
Net Remittances	-0.157*
	(-1.899)
Investment	0.379**
	(2.494)
Inflation	0.631*
	(1.697)
_cons	15.640***
	(5.265)
Number of observations	205
R2	
note: *** p<0.01, ** p<0.05, * p<0.1	

Table 6 shows the results of the panel regressions. The impact of all regressors on the evolution of market capitalization for the whole sample was estimated. All variables have a significant impact. Investment, stocks traded and inflation traded turn out to have a positive and significant impact on the dependent variable while domestic credit has a negative impact than found in the literature. Similarly, economic freedom and net remittances have a negative effect on market capitalization.

Table 7: Regression results of Arab countries for the oil vs. non-oil economies division, 1995-2014

	Oil Economies	Non-oil Economies
	coefficient	Coefficient
Domestic Credit	-0.197	-0.095
	(-1.440)	(-0.563)
GDP (millions)	-0.442***	0.235***
	(-7.742)	(2.819)
Stocks Traded	0.368***	0.412***
	(9.347)	(17.024)
Economic Freedom	-1.598***	4.445***
	(-3.612)	(7.606)
Net Remittances	-0.393**	0.658***
	(-2.210)	(7.181)
Investment	0.231	1.299***
	(1.301)	(5.930)
Inflation	0.860**	-0.495
	(2.105)	(-0.950)
_cons	18.188***	-24.665***
	(5.564)	(-5.540)
Number of observations	132	73
R2		

note: *** p<0.01, ** p<0.05, * p<0.1

Table 7 shows the results of the panel regressions by classifying the sample into oil vs. non oil economies. Oil economies reported the same results as the whole sample except that domestic credit and investment variables lost significance. On the other hand, non-oil economies show different results where the domestic credit variable also lost significance

together with the inflation one. GDP, net remittances and economic freedom have a positive and significant impact.

Table 8: Regression results of selected Arab countries for the GCC vs. Non GCC affiliation, 1995-2014

	GCC	Non GCC
	Coefficient	Coefficient
Domestic Credit	0.419***	-0.711***
	(3.359)	(-5.002)
GDP (millions)	-0.048	-0.413***
	(-1.025)	(-5.007)
Stocks Traded	0.402***	0.518***
	(12.229)	(14.958)
Economic Freedom	5.783***	-2.096***
	(7.252)	(-4.238)
Net Remittances	-3.760**	0.237**
	(-2.462)	(2.146)
Investment	0.223*	1.079***
	(1.807)	(4.492)
Inflation	-1.769**	1.320***
	(-2.438)	(3.152)
_cons	-10.532*	15.115***
	(-1.822)	(3.809)
Number of observations	84	121
R2		

note: *** p<0.01, ** p<0.05, * p<0.1

Table 8 shows the results of the panel regressions by dividing the sample into GCC vs. non-GCC economies In the GCC subdivision, the domestic credit and the economic freedom variables now have a positive and significant effect. It is worth noting also that the coefficient of GDP lost significance and inflation now have negative coefficients. On the other hand, in the non-GCC subdivision, the results of the regression analysis is the same as the whole sample except that net remittances has a positive value.

V.   Conclusion

Stock market development is an integral part of financial development, which is, in turn, associated with economic growth. In this paper, the role of selected variables in explaining stock market development was highlighted. A panel of 15 Arab countries were analyzed for which data were available. As the sample comprises both oil economies and non-oil economies, the effect of these variables on stock market development is investigated and whether it is different in oil versus non-oil economies. The sample also is classified into GCC vs. Non-GCC economies and the effect is explored.

In the average country contained in our panel of Arab economies, good institutions and remittances do not contribute significantly to stock market development. Notably, the positive effect holds true in countries without a sizeable natural resource endowment.

 Previous results for other regressors commonly encountered in the literature are broadly confirmed.

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Appendix A

Table A.1: Arab countries classification according to GCC affiliation

GCC	Non-GCC
Bahrain	Algeria
Kuwait	Egypt
Oman	Iraq
Qatar	Jordan
Saudi Arabia	Lebanon
United Arab Emirates (UAE)	Libya
	Morocco
	Syria
	Tunisia

Table A.2: Arab countries classification according to oil vs. non-oil economies division

Oil economies	Non-oil economies
Algeria	Jordan
Egypt	Lebanon
Iraq	Morocco
Libya	Tunisia
Syria	
Bahrain	
Kuwait	
Oman	
Qatar	
Saudi Arabia	
United Arab Emirates (UAE)	

Table A.3: Arab countries classification according to income group

High income	High-middle income	Low-middle income
Bahrain	Algeria	Egypt
Kuwait	Jordan	Iraq
Oman	Lebanon	Morocco
Qatar	Libya	Syria
Saudi Arabia (SA)	Tunisia	Yemen
United Arab Emirates (UAE)		

VITA

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