What Drives Stock Market Development in Arab Countries?

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What drives stock market development in Arab countries?

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Abstract

Arab stock exchanges have witnessed tremendous growth in recent decades, and the number of listed companies and the size of stock market capitalization have increased. In the light of this remarkable growth, this study aims to find out what are the most important determinants and economic factors affecting this development during the period 2006– 2017. By employing panel data models, we find that trade openness, market liquidity, money supply and economic growth have positive impacts on stock market development, whereas the global financial crisis has negative impact. Based on these results, measures should be taken to improve market liquidity, control of money supply, and maintain a balanced economic growth rate to promote the development of Arab stock exchanges. Policy recommendations are provided based on these findings.

Key words: Macroeconomic variables, Stock markets development, Arab Countries, Panel data analysis.
Jel: C22, E44, C23.

1. Introduction

Almost all analysts, academics and decision-makers agree on the fact that financial development, especially the development of stock markets, is essential to promote economic growth. Attention to stock markets comes within the framework of modern guidance led by international and regional organizations on enhancing the role devoted to such markets in the financial system of any country because financial markets provide one of the most important channels for mobilizing savings towards the most efficient and profitable economic sectors. (Murinde, 2012; Al-Malkawi et al., 2013; Bernard & Austin 2011).

The stock markets which play a primordial role in the financial development received over the last decade a lot of attention as a source of economic growth. The theoretical approach to linking financial development to growth is a well-developed financial system that fulfils several functions. Indeed, it makes it possible to improve the efficiency of intermediation as a result of the reduction of the various transaction costs, of surveillance, and of information asymmetry.

The development of the stock market is essential for the continued development of the financial system. Indeed, according to Gazdar et al, 2010, the stock market increases flexibility in the financial intermediation process, as it provides investors with a clear exit strategy. Stock markets, through these functions, serve to bridge the gap between economic activity and financing.

Theoretically, works based on the idea of the existence of a positive effect of finance on economic growth refer to the role of the financial system in the allocation of resources, through the exercise of a certain number of functions. The effective exercise of its functions, namely: the production of ex-ante information on investments and the allocation of capital; controlling investments and exercising corporate governance after project financing; the ease of transferring resources over time and space;

diversification and risk management; mobilizing savings and pooling resources; the ease of trade in goods and services allows the financial system to stimulate activity and economic development.
Several studies have demonstrated the importance of stock markets in promoting economic growth in various ways, for instance by enhancing market liquidity, reducing the cost of mobilizing savings, improving corporate governance, and promoting international risk sharing.Jensen and Murphy,(1990), Levine (1991 & 2005), Obstfeld (1994), Bencivenga et al. (1996), and Greenwood and Smith (1997)).

Moreover, the development of the financial market is an important indicator for the sharing of information in a fair way among investors. It also provides a better assessment of companies, as well as the evolution of macroeconomic fundamentals. In addition, the banking sector is a major and dominant source of finance in many developing countries and even in developed ones. In this context, in an empirical study of a sample of more than 80 countries, King and Levine (1993) found that banking development affects economic growth. However, much previous and recent research focused on the links between stock markets and economic development such as Levine (1997) Levinse and Zervos (1998), Beck, Demirguc, and Levine (2000). Levine, Loayza and Beck (2000).
It is important to understand the relationship between macroeconomic factors and the stock market, because macroeconomic factors have a major impact on stock market performance and returns. Macroeconomic variables are part of the risk factors in stock markets (Chen et al.1986). The stock markets play a crucial role in any country's economic development. They are the intermediaries that ensure the flow of resources from surplus to deficit economic agents. They provide an institutional intermediation to mobilize money and efficiently channel it to profitable investments projects. Stock markets enable companies to raise funds for their investments and encourage savings by increasing the number of financial instruments and reducing risks with portfolio diversification. Thus increasing savings and investment and efficiently allocating capital among investment opportunities promotes economic growth.

On the other hand, the subject of factors influencing the development of financial markets has attracted the attention of many academics and researchers. Studies have shown that a well-developed stock market contributes to economic growth by increasing capital accumulation and enabling better distribution of resources. Furthermore, most of the empirical research results indicate that equity markets play a key role in the growth and development of the economy. Many scholars and scientists have drawn the attention to the necessity of developing stock markets.Thus, most academic results indicate that stock markets have a key role to play in economic growth and development.Levine and Zervos (1998), Misati, (2007), McKinnon (1973).
All that being said, there is no worldwide consensus on stock market development determinants. In other words, in the current empirical literature, there are no known specific variables or factors that may influence stock market development. For this reason, it is of paramount significance to search for key factors that determine the development of the stock market.

Over the past few decades, the increasing significance of stock markets in developing economies around the globe has changed the focus of many scientists, academics, policy makers and economists to study the determinants of stock market development. In the literature, many variables that may determine the evolution of the stock market have been cited, and many empirical researches have examined the macroeconomic factors of the growth of stock markets in developing countries.Quartey&Gaddah (2007); El-Nader &Alraimony (2013); Evrim-Mandaci et al., (2013); Phan &Vo (2013); Shahbaz et al (2015); Acquah-Sam (2016).
While research on stock markets in many emerging markets abounds, relatively little of the recent interest in financial markets has been directed at the Middle East and North Africa. This region comprises some of the richest countries in the world, endowed with huge resources of oil and gas. and

in contrast, there are other countries with much lower per capita income, and suffers from scarcity of natural resources.[1]
Stock exchanges are new to most Arab countries except Egypt and Lebanon, where the first stock market in the Arab region appeared in Egypt, with the establishment of the Alexandria Stock Exchange in 1883 and then the Cairo Stock Exchange in 1898, while the Beirut Stock Exchange did not appear until the 1920's.

After that, the Arab countries have established and developed stock exchanges in recognitionof their importance in collecting savings and directing them towards the various investment channels in light of the free economy system that most Arab countries have adopted since the mid-seventies. However, they have not yet acquired the characteristics of developed and mature markets.

The Arab stock markets are completely immature, their economies witness a dominance of the banking sector over financial activity andalimited trading volume due to the, relatively, low numberof listed companies, and these characteristics are widely shared in arab countries. But if the market size and economy are proportional, it is possible to overcome the constraints of scale by promoting regional integration. Immediate reforms can be initiated, starting with improving banking services and establishing stronger legal structures and regulations and providing incentives for private companies to go public via the stock exchange.
Previous research and financial theory alike have argued that countries with well-developed financial systems could experience faster economic growth. In addition, one wonders what determines the development of the stock market. This is the subject of many research and discussions. On the other hand, it is agreed that countries should adopt appropriate macroeconomic policies. This helps to foster competition in the financial sector, and to develop a strong and transparent institutional framework to better ensure operational efficiency of financial systems. Indeed, the development of the financial market is important for the further development of the financial system. It increases flexibility in the financial intermediation processas it provides investors with a clear exit strategy.
In this context, the aim of this paper is to determine the factors that influence the development of the Arab stock markets.The importance of this study is due to the crucial role of financial markets in economic development, as it brings many advantages and benefits to many entities such as: investors: to maintain and extend their investments, depositors: In order to reassure the recovery of their deposits and get profits. Market authorities: to identify indicators of success and failure and enable them to take the necessary measures and steps to prevent any market dysfunction, and regulatory authorities: to take precautionary measures to avoid financial crises affecting the national economy.
The topic of this study was motivated by the increasingly significant role of stock market development in promoting economic growth, on the one side, and conflicting study results on stock market growth determinants, on the other side; as well as the lack of studies and research on Arab stocks exchange growth.
Therefore, the aim of this article isto contribute to the literature review and to conduct a thorough empirical analysis of the Arab region stock markets. It serves to show the key determinants contributing to stock market development. It discusses the different factors and policies that lead to a better understanding of what drives the stock market growth in the Arab countries. In other terms, we try to answer the following question: what are the main macroeconomic determinants that affect the Arab stock market development?

We organized our paper as follow. Firstly, we presented some literature review related to our subject. Secondly, we described the data used and its sources , we then, exposed our model and its estimation.

[1] See Billmeier and Massa (2008) for a case study of the Egyptian stock market. Saadi-Sedik and Petri (2006) review developments in Jordan.

After that, we discussed the empirical results. Finally, wesummarized the main results in our conclusion.

2. literature review

The theoretical literature related to the causal relationship between financial development and economic growth has been conducted along four cases: (1) financial development stimulates economic growth; (2) economic growth promotes financial development; (3) Economic growth and financial development mutually affect each other ;(4) There is no relationship (neutral effect) (Levine, 2005). Accordingly, research on the topic of what determines the stock market development is considered very important especially in the Arab countries[2].In this literature, the determinants of stock market development can be classified into two main groups, the first deals with macroeconomic factors, and the second deals with institutional factors that affect financial markets development.[3](Edison, 2003) claims that there are three major institutional determinants. The legal protection of private property, the quality of governance, and the constraints on the executive and political leaders.

The empirical literature on the relationship between financial development and economic growth has grown considerably from the work of King and Levine (1993). However, it would be interesting to note that there is a radical divergence between the work devoted to the analysis of the link, finance and growth. Even though in their broad trend, most studies have concluded that there is a positive relationship between between the two, nonetheless,some studies have provided evidence against this assertion.

As far as the macroeconomic determinants of stock market development are concerned, most investigations ascribe the main determinants of stock market capitalization to macroeconomic factors such as economic growth, investment rate, savings rate, development of financial intermediaries and stock market liquidity. Garcia and Liu (1999) studied the macroeconomic variables affecting stock market growth using data gathered between 1980 and 1995 from 15 industrialized and developing countries. The research found that real income, savings rate, brokerage growth, and Market liquidity are the most important variables influencing the stock market capitalization. They found that real income, savings, financial intermediary development and liquidity on the stock market are important predictors of market capitalization, whereas macroeconomic stability is not statistically significant. The results illustrate the differences in market capitalization in East Asia and Latin America and that the stock market is more sophisticated in East Asia. The results also indicate that this is due to sustained economic growth, high savings rate, more liquid stock market, and more developed banking sector in East Asia.

In their study,Eichengreen and Leungnaruemitchai (2004) investigate the determinants of stock capitalization for a panel of 40 countries over the period 1990-2001. The authors conclude that the determinants of development of stock markets are multiple. Larger countries have better capitalized stock markets. In addition, these scale (or size) effects reflect the fixed costs of creating an appropriate stock market infrastructure such as settlement and clearing systems and a reliable legal framework for securities issues and transactions. Such infrastructure can also be important for the liquidity of secondary markets.

Yusoff (2005) studied Stock market development of Middle East and North Africa, the objective of the paper was to define, through the study of three nations: Egypt, Saudi Arabia and Tunisia, the determinants of capital market growth in the MENA region. Secondary data, for the period 1992 to

[2]The literature is quite extensive. For more details see:Shan et al. (2001), King and Levine (1993),McKinnon(1973), Goldsmith (1969) and Levine (2005).

[3]Sin Yu Ho Bernard Njindanlyke , (2017)," Determinants of Stock Market Development: A Review of the Literature ", Studies in Economics and Finance, Vol. 34 Iss 1.1-25.

2012, was used to achieve the objective of the study. The author found evidence that the most significant macroeconomic factors are: exchange rate, oil rent, per capita income, inflation, domestic savings, and interest rate. Differences in results have been justified by the financial and legal setting and political decisions of each country. The study also found that savings are a very strong boost to the stock market in Saudi Arabia and to a lesser extent as far as Egypt is concerned. This explains the booms in both countries' stock markets. In this direction, more research is needed, but it can be shown that savings have an impact on changing the risk aversion culture, especially towards the newly established stock markets.

In the same vein, ElWassal (2005) based on the fixed effects panel data analysis evaluated the determinants of emerging stock market development. The findings indicate that economic growth, financial liberalization policies, and foreign portfolio investment are drivers of stock market development in emerging market economies.

Ben Naceur, Ghazouani and Omran (2007) studied the role of stock markets in boosting economic growth and shed some light on the macroeconomic determinants of stock market development. By using unbalanced panel data from 12 countries in the MENA region,they discovered that the saving rate, financial intermediary, stock market liquidity were the main determinants of stock market development. Moreover, financial intermediaries and stock markets have been found to be complementary and not substitutes for growth. However, it was found that macroeconomic instability has a negative impact on stock market growth.

Yartey (2008) examined the institutional and macroeconomic determinants of stock market development using Panel data from 42 emerging economies. Dynamic Panels, were used to search for these determinants. The development of the stock market was measured by market capitalization as a percentage of GDP. The results show that the lagged market capitalization of one period as well as macroeconomic factors such as income level, gross domestic investment, banking sector development, private capital flows, and the liquidity of the stock market are important determinants of stock market development in emerging countries.

Boukhatem (2009) investigated the empirical determinants of stock market development in emerging Asia and Latin America. To achieve his objective, he used a dynamic Panel model in which the market capitalization as a percentage of GDP variable was used as a proxy for the development of stock markets. For the explanatory variables, the GDP per capita, the degree of trade openness, inflation, the investment environment and the exchange rate were chosen. Except for inflation, which has a negative effect, all the other variables have a positive effect on the development of stock markets.

Aduda et al. (2012) investigated the determinants of the development of the Nairobi Stock Exchange. Secondary data for the 2005-2009 period have been used to model factors affecting stock exchange growth. The results showed that macroeconomic factors such as liquidity on the stock market, institutional quality, per capita income, domestic savings and bank development were significant determinants of stock market development in Nairobi.However, the same results showed no significant relationship between stock market growth and macroeconomic stability, inflation and flows of private capital. The findings also show that the institutional quality of law, order and quality, democratic accountability and corruption index are important factors in stock market growth as it improves external financing possibilities.

Abdelbaki, H. H. (2013), examined the macroeconomic determinants of the Bahraini stock market development by using an ARDL model. Monthly data was used, and the proxy of stock market development was stock market capitalization as a percentage of GDP. The results the study yieldedshowthat income level, domestic investment, banking system development, private capital flows, and stock marketliquidity are the most important determinants of the *Bahrain Stock Market* development. The central bank policies and individual behavior influence banking development and financial system. For example, monetary policy relates to the stock market development by affecting money supply and investing activities in stocks.

Ho et al. (2017) provided a comprehensive literature review of the stock market growth determinants. Recent studies have been divided into quantitative and theoretical research.The studies, based on the empirical literature, found that stock market development determinants can be generally divided into two main groups: macroeconomic and institutional determinants.(Sin Yu Ho Bernard NjindanIyke ,2017).Theoretical as well as applied studies have shown in various ways how the stock market growth can be influenced by macroeconomic factors. Real income and its rate of growth promote stock market development, while the banking sector, interest rates and private net capital flows may reinforce or prevent it. Inflation and exchange rates have a negative impact on stock market development. The literature suggests in terms of institutional factors that different legal resources and incorporation of the stock market can have a positive or negative impact on the growth of the stock market. However, factors such as legal protection for investors, corporate governance, financial liberalization, and trade openness contribute positively to stock market growth.

The paper by (Sin-Yu et al, 2018) analyzes the macroeconomic determinants of the growth of the Philippines stock market during the period 2001 to 2016. Many macroeconomic factors were selected: inflation rate, exchange rate, development of the banking sector, economic growth, trade openness and stock market liquidity. An ARDL bound testing estimationwas used. The findings showed that, in the long run, trade openness had a negative impact on the growth of the Philippine stock market, while in the short run, the banking sector development and the exchange rate had positive effects on Philippine stock market development.

At the level of African countries, in his study (Ho, 2018) addressed the macroeconomic factors thatdrive the growth of South Africa's stock market during the 1975 to 2015 period.Using the ARDL approach, the study concluded that banking development and economic growth enhance thedevelopment of the stock market while inflation rate and real interest rate hinders stock market development.However, the paper notes that trade openness has a negative effect on the growth ofthe South African stock market, which is different from the results of many other studies.

Specifically, financial markets in the Arab countries have not attracted the attention of researchers and academics, with the exception of some studies on the MENA region. It is worth noting that Cherif and Gazdar (2010) studied the impact of the macroeconomic factors (Market liquidity, interest rate, level of savings, ...) and institutional quality on the stock market development in the MENA region. The findings revealed that whereas the levels of income, savings rate and interest rate have positive effect on stock market development, investment and inflation do not have. Moreover, they found that the institutional quality represented by a combination of policy risk index is not an important determinant of stock marketcapitalization in the MENA region. This has proven that in addition to qualitative institutions, other endogenous determinants of financial development are equally significant.

As shown earlier, the financial system of Arab countries is less developed compared to other developing countries. Therefore, there is the need to investigate what actually determines stock market development in the Arab world. However, no empirical study could be found that did this. This study attempts to fill this gap by empirically investigating macroeconomic determinants of stock market development in ten Arab countries over the period 2006 to 2017.

3. Data and methodology :

To achieve the objective of our study, a panel of 10 ArabStock markets was used. The period chosen is 2006-2017. The countries concerned are:United Arab Emirates (UAE), Bahrain, Egypt, Jordan, Kuwait, Morocco, Oman, Qatar, Saudi Arabia and Tunisia. From our literature review, we can say that the stock market development (SMD) modelcan be specified as follows:

$$SMD=f\,(TO, TR, BM, EG, FINCRIS)$$

Where:

SMD_{it}:It represents the dependent variable defined by market capitalization as a percentage of GDP. With i and t denoting the country and the time respectively.The other variables are the explanatory set of macroeconomic variables composed of trade openness, stock market liquidity, Broad money, economic growth and financial crisis.

3.1. Description of variables

The dependent variable: stock market capitalization

We measure stock market development (SMD)bytheratioof stock market capitalization to GDP, following (Yartey 2010;Ho & Odhiambo 2017). This proxy can be considered as a good indicator that reflects the development of stock market. Becauseit is less subjective than the composite financial index thatother authors used for the same objective (Billmeier,2009).

Furthermore, many studies (Demirgüç-Kunt and Levine, 1996) and (Levine and Zervos1996) used the market capitalization as a measure of stock market development. Meanwhile, they indicate that various metrics can be used to measure stock market development such as volatility, liquidity, size. Demirgüç-Kunt and Levine (1996)claim that all these variables are significantly correlated, which means that they are, to a large extent, interchangeable and any one of these proxies can be used as a measure of stock market development.

The explanatory variables

- Trade openness:

The total trade-to-GDP-ratio is often called the 'trade openness ratio', whichis the ratio of the sum of exports and imports to GDP. This indicator can be considered as a good measureofa country's 'openness' or 'integration' in the world economy.

- GDP Growth

GDP is one way to measure the size of an economy. It calculates the value of goods and services produced from resources that are locally located in an area over a given period of time. As economic performance improves and real GDP rises, optimism about financial market performance improves, and vice versa when the economic situation deteriorates.

We expect positive relationship between our dependent variable and economic growth. Economic growth (EG) is measured at the rate of GDP growth, the rate at which the economy grows on an annual basis. Such a proxy has been widely used in studies like this to measure the development of the economy; the estimator its coefficient is expected to be positive. (Carp, 2012; Nyasha and Odhiambo 2015), Levine and Zervos (1998), Deb and Mukherjee (2008).

- Broad money

It represents the broad concept of money, symbolized by M3, and includes, in addition to the components of the narrow concept, quasi-money and consists of total currency outside banks, demand deposits, futures deposits, short-term savings deposits with commercial banks and foreign currency deposits as well as post office savings deposits. Levine, Loayza, and Beck (2000),Beck, Demirgüç-Kunt, andLevine (2007).This variable is used in our applied workrelative to GDPand is referred to as BM. Here too, we expect a positive relationship between this proxy and our dependent variable.

- Stock market liquidity

Stock market liquidity (SML) is measured by stock turnover rate, which is a ratio that measures the liquidity of a stock market. Turnover Ratio is calculated by dividing the value of local shares traded on the local stock by the value of listed local shares. A number of studies have also used this measure, and its coefficient is expected to be positive. (Levine and Zervos, 1996; Cherif and Gazdar 2010; El-Nader and Alraimony, 2013;Garcia and Liu 1999, Yartey,2007;Billmeier and Massa,2009).

- Financial Crisis

It is well established that Financial crisis have a negative impact on financial markets, in general and emerging financial markets in particular, as far our study is concerned, we, therefore, expect a negative relationship between financial crisis and the stock market development. In our model this factor is represented by the dummy variable FINCRIS.

Table 1 displays our variables definitions, proxies, and expected signs.

Where:

SMD	Represents the ratio: Stock market capitalisation / GDP. As a proxy for the stock market development.	Garcia and Liu (1999), Yartey (2010),Yartey(2007), Boukhatem (2009)
TO	Represents the trade openness rate, measured by the ratio Σ(Exports+Imports)/GDP. Here we expect that trade openness would have a positive impact on the development of the stock market.	El-Wassal (2005), Niroomandet al. (2014)
BM	Represents the money supply M3 to GDP. As a macroeconomic variable, the money supply is supposed to impact positively the stock market development.	Levine, Loayza, and Beck (2000),Beck, Demirgüç-Kunt, andLevine (2007)
TR	Represents the share turnover ratio, measured by the ratio of the total value traded to the total market capitalization. This variable depicts how easy or difficult it is to buyorsell shares in a given stock market. It measures the stock liquidity and a higher TR implies a more liquid stock .Hence, here again we expect a positive relation between this variable and SMD.	Garcia and Liu (1999), Yartey(2007), Billmeier and Massa(2009)
EG	Represents the GDP growth. There is strong empirical evidence that a two-way positive causality relationship links Stock market development to economic growth. Hence why we expect a positive sign for this variable estimator.	Levine and Zervos (1998), Deband Mukherjee (2008), Carp(2012).
$FINCRIS$	Dummy variable which takes a value of "1" during the financial crises years and "0" otherwise. A negative relationship between this explicative variable and SMD, is expected, because of the damage that a financial crisis can	As far as we know, previous studies have notattempted to determine impact the financial crisis on the SMD.

	have on any economy.	

As we are going to study the determinants of the stock market development for 10 Arab countries and for a period of 12 years as stated above, we must opt for a panel data model.
Panel data models also called cross section time series–data models are a kind of econometric models that capture the behavior of the under-study unities across time. In general, we can express this kind of models as follows:

$$y_{it} = X'_{it}\beta_i + \alpha_i + \varepsilon_{it} (2)$$

Where:
X is the explanatory variables matrix, y the dependent variable vector, α the intercept and εtheerrorterm.
i refers to the ith unity under study, while t refers to the tthperiod.

We mainly distinguish 3 types of panel data models:

- The pooled models: This kind of models assumes that the unities have the same behavior over time and there is no heterogeneity between them. Which means that:

$$\alpha_i and\ \beta_i \text{in (2)are the same for all unities and are constant over time.}$$

- The fixed effects models: These models assume that there is some heterogeneity across unities which is due to some,time-invariant, characteristics that may lead to biased estimators if neglected. This type of models is also called Least Squares Dummy Variables models because they use dummy variables (one for each unit) to capture any specificities, which yields the following model:

$$y_{it} = X'_{it}\beta_i + \alpha_i D_i + \varepsilon_{it}$$

Where D_i is a dummy variable which takes the value 1 for the concerned unit and 0 for the others.

- The random effects models: Unlike the fixed effects models, these kind of models, also called Error Component Models (Baltagi, 2005), assume that the heterogeneity across unities is random and can vary over time.

$$y_{it} = X'_{it}\beta_i + (\alpha_i + u_{it}) + \varepsilon_{it}$$

Where
u_{it} is a white noise error term that reflects the heterogeneity across unities.
Panel data advantages:

- This kind of models helps to disentangle observable and unobservable individual heterogeneity of different units.
- Due to the presence of more observations (NxT) instead of T observations in a time series model and N observations only in a cross-section model, this kind of models yield more accurate estimators as the number of degrees of freedom gets larger.
- This kind of model allows the differences between different groups and inside the same group across time.

Hence, as a consequence of what was said above, our model takes the following form:

$$SMD_{it} = \beta_0 + \beta_1 TO_{it} + \beta_2 TR_{it} + \beta_3 BM_{it} + \beta_4 EG_{it} + \beta_5 FINCRIS_{it} + \varepsilon_{it}$$

In this paper, and after testing the stationarity of our time series, we proceed as follows:

- We first estimate the pooled model which assumes, as stated above, that our model is the same for all the countries in the sample and this is done by simply pooling all the (N*T) observations into one sample and using an OLS regression.
- We, then, estimate the fixed effects model, which supposes that there is some heterogeneity between the countries under study.
- The next step is to choose between the two previous models using an F test.
- If the fixed effects model is chosen, we, then, estimate the random effects model and use the Hausman test to see which of these two models to adopt.
- Finally, we discuss the obtained results.

3.2 Data Sources

The data on Arab stock market are gathered from Arab Monetary Fund (AMF). The data on macroeconomic variables are collected from the World Bank World Development Indicators (WDI). The sample size is constrained by the availability of the data. Due to the recent emergence of most Arab stock exchanges, therefore, only the markets for which enough data were available were selected. We obtained a balanced panel of 10 stock markets spanning the period 2006–2017. Table 2 presents the list of the stock markets included in our sample.

Summary statistics of the variables:

Table (2)

Variable	Mean	SD	Max	Min
SMD	64.392	37.305	238.670	10.000
TO	103.035	33.946	192.000	30.200
TR	36.722	50.748	429.200	0.8000
BM	77.792	25.940	139.230	31.713
EG	4.403	4.286	26.170	-7.076
FINCRIS	0.850	0.358	1.000	0.000

From the above table and with reference to our data, we can see that:

- The mean of the market capitalization as a percentage of the GDP (SMD) for the 10 countries is 64.4% and the maximum value for the same indicator is about 238.7% (for Jordan), whereas the minimum value is 10% (for Egypt) with a standard deviation of about 37.30 for the whole sample.

- The mean of the trade openness (TO) (i.e the sum of exports and imports as a percentage of the GDP) for the 10 countries is 103.03% whereas the maximum value for the same indicator is about 192% (for Bahrain) and the minimum value is 30.20% (for Egypt) with a standard deviation of about 33.95 for the whole sample.
- As far as the share turnover indicator (TR) (i.e. the volume traded as a percentage of market capitalization) is concerned, we can note that its mean value is 36.72% with a standard deviation of 50.75 and a maximum value of 429.20% (for Saudi Arabia market) and a minimum value of 0.80% (for the Bahrain market).
- For the money supply M3 to GDP (BM), the mean value is 77.79% with a standard deviation of 25.94, a maximum value of 139.23% (for Jordan) and aminimum of 31.71% (for Oman).
- The GDP growth rate (EG), displays the following figures: a mean value 4.40%, a standard deviation of 4.28 a maximum value of 26.17% (for Qatar) and a minimum value of about -7.07% (for Kuwait).

Correlation Matrix

The following table shows the degree of partial correlation between the explanatory variables:

Table 3

	TO	TR	BM	FINCRIS	EG
TO	1				
TR	-0.2426	1			
BM	-0.0214	-0.2042	1		
FINCRIS	0.0169	-0.3101	0.1640	1	
EG	-0.0151	-0.0143	-0.2274	-0.3436	1

The above table shows that the correlation levels between the study variables are not very strong, which allows us to confirm the absence of any multicollinearity problem.

Theseries stationarity test:

In order to avoid spurious regressions, it's common to study the series stationarity before estimating the model.

There are many tests that are used when dealing with panel data series. As far as we are concerned in this paper, we opt for the Levin, Lin & Chu test, also known as LLC test.

The hypotheses tested are:

H_0: Panels contain unit roots

H_1: Panels are stationary

Applying this test to our series we summarize the obtained results as follows:

Table (4)

Variable	Statistic	Prob
SMD	-23.327	0.000
TO	-4.083	0.000
TR	-2.197	0.014
BM	-1.729	0.041
EG	-4.029	0.000

From the results above, we can say that our series are stationary at level,i.e they are all I(0), which means that a short runrelationship may exist and that there is no need to differentiate our variables.

Estimation of the model:

As mentioned in (Moundigbaye, Rea, and Reed, 2018), there are many different estimators, one can choose from, when dealing with panel data models. Depending on the specificities of the estimators one is looking for. As far as our paper is concerned,andwith regard to the conclusions reached by Beckand Katz(1995) and Reed and Ye (2011), we opt for the Panel Corrected Standard Errors estimator (PCSE), because it guarantees obtaining estimators with an accurate confidence interval and a value for $\hat{\rho}< 0.30$ (which means no error autocorrelation).

- The pooled model (Model 1): As mentioned above, this type of model assumes that the 10 countries are homogeneous and a multivariate regression model estimated by Ordinary Least Squares (OLS), can encompass all of them.
- The Fixed Effects model (Model 2): This model assumes that the 10 countries representing our sample are heterogeneous in the sense that they have some specific characteristics that are constant over time.
- The Random Effects model (Model 3): which assumes that the 10 countries under study have some specific characteristics that are random and may vary over time.

Table(5)

variables	Model 1	Model 2	Model 3
TO	0.332*	0.458	0.398
TR	0.298	0.220	0.235
BM	0.744	0.837	0.813
EG	2.598	1.306	1.437
FINCRIS	-24.687	-36.157	-34.768
$\widehat{\beta_0}$	-29.168	-31.00	-25.342
R^2	0.495	0.789	0.541

TxN	120	120	120

(*) The values (.) represent the p-values of different estimators.

The next step, after the coefficient estimations, is to choose between the different models.

i- Choosing between model 1 and model 2, that is testing the hypothesis:

H_0: the model 1 is more suitable

Against

H_1: the model 2 is more suitable.

Table (6)

RedundantFixedEffects Tests
Pool: ARAB
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	16.310154	(9,105)	0.0000
Cross-section Chi-square	104.956867	9	0.0000

As the p-value of the F test is 0.00, we reject H_0, which means that the fixed effects model is more suitable.

ii- Choosing between model 2 and model 3, that is testing the hypothesis:

H_0: the model 3 is more suitable

Against

H_1: the model 2 is more suitable.

Table (7)

Correlated Random Effects - Hausman Test
Pool: ARAB
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	9.661235	5	0.0854

From the results of Hausman test, we have to accept the H_0 hypothesis, hence we conclude that the random effects model is more suitable for our study. i.e.

$$SMD_{it} = \underset{(0.125)^*}{-25.342} \underset{(0.00)}{+0.39TO_{it}} \underset{(0.00)}{+0.23TR_{it}} \underset{(0.00)}{+0.81BM_{it}} \underset{(0.00)}{+1.43EG_{it}} \underset{(0.00)}{-34.768FINCRIS_{it}} \quad (2)$$

$R^2 = 0.541$ TxN=120

(*) The values (.) refer to the p-value of each estimator.

The random effects for each country are represented by the value of the intercept, as follows:

Tab (8)

Country	Abud.	Jord.	Bah.	SAR	Kuw.	Mor.	Tun.	Oma.	Qat.	Egy.
$\widehat{\beta}_0$	**-28.89**	8.94	-2.74	9.95	26.69	-16.44	-25.59	10.53	**30.09**	-12.54

The above table shows that if we assign the same values to each of the explanatory variables for all the stock markets under study, the Qatari stock market (with the highest value of $\widehat{\beta}_0$) performs the best, while, in the same conditions the Abu Dhabi stock market has the worst performance.

Discussion of the results:

From the resultsabove, we can see that all the coefficients –except the intercept- have a statistical significance (i.e. p-value of less than 5%), which means that all the explanatory variables included in our model have a significant impact on the dependent variable, SMD. Furthermore, we can see that –except the dummy variable representing the financial crisis (FINCRIS)– all the other variables, as expected, have a significantpositive impact on the dependent variable. Even more, the value of the determination coefficient indicates that about 54% of variations in SMD can be explained by our explanatory variables. Taken altogether, we can assert that our 5 explanatory variables can be considered as determinants of the stock market development indicator and may be used as predictors of this dependent variable.

Turnover ratio which is the proxy of liquidity market is positively significant which is in line with: Greenwood and Jovanovic (1990), Greenwood and Smith (1997),Boyd and Smith (1998).

For the trade openness variable which isalso positivelyassociated with the stock market development; this result is similar to the findingsof: Braun and Raddatz (2004), VazakidisandAdamopoulos (2009), Niroomand et al. (2014).

Stiglitz 1984 also pointed out that trade openness promotes the development and growth of demand for financial services and products. (Newbery and Stiglitz 1984).

Our results are similar to Levine (1991), Bencivenga, Smith and Starr (1996) find that stock market liquidity is important for economic growth. Indeed, increased liquidity therefore facilitates investment in long-term projects with higher profitability and stimulates economic growth.

Conclusion

Our paper is aimed at emphasizing the role of some selectedmacro-economicvariables, represented by trade openness, stock market liquidity, Broad money, economic growth and financial crisis in explaining stock market development.

By using panel data estimation, we find that all variables havestatistically significant positive effects on market capitalization as a proxy for stock market development. Whereas financial crisis has, as expected, a negative impact on the same dependent variable.

Henceforth, it is an urgent need for Arab governments and financial supervision bodies to startimplementing appropriate policies that facilitate improving macroeconomic indicators which have a significant impact on stock market development, to ensure the development of stock markets in Arab economies.

And as Arab stock exchanges tend to be small and fragmented, regional integration is an important factor, especially in terms of economies of scale, and it can contribute to increasing these financial markets efficiency and improving their performance and growth. Inter-Arab trade operations and investment flows, especially in the financial market sector, facilitate the creation of a competitive environment. And governments should improve the financial infrastructure in some Arab countries that endure a severe lack of access to financial services, in addition, they should strengthen the regulatory and supervisory capabilities of the securities bodies.

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