Effects of Trade and Financial Liberalization on Financial Development (Case Study: MENA Countries)

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Abstract

Financial sector is one of the most influential sectors in economic activities. Empirical and theoretical studies conducted in recent years have also confirmed the significant role of financial institutions in economic growth. Additionally, trade and financial liberalization policies have been particular concerned with strategic policies in developed and developing countries. According to dynamic panel data (DPD) and by means of generalized method of moments (GMM) during 1990 to 2008, this study has investigated effects of trade and financial liberalization on financial development of MENA member countries. Empirical results imply that trade liberalization and financial liberalization have influenced separately financial development, while due to inefficiency of financial institutions in providing appropriately financial resources, conducting both liberalization simultaneously has had an unexpected negative effect on the financial development in the region.

Keywords: Financial Development, Trade Liberalization, Financial Liberalization, Generalized Method of Moments (GMM)

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1. Introduction

In recent years, development of financial institutions has had a considerable effect on long-run economic growth in different countries worldwide. Financial development affects investment process and finally economic growth through creation and development of financial institutions, financial markets and efficient use of financial resources. On the other hands, in many economic texts and literature, trade liberalization is a basic factor of production and profits maximization; thus in 1970s, some developing countries made much effort to liberalize economies by increasing the role of market and decreasing existing barriers in international trade. In East Asia, these efforts were followed by a successful experience reducing the income gap towards reaching a convergence income with developed countries.

In 1990s, a wave of liberalization was accomplished in financial sector and its relevant services in developing countries which reducing financial repression and liberalization of capital flows were viewed as main dimensions of this phenomenon. Financial liberalization followed efficiency enhancement in trade by providing reforms in financial infrastructures and strengthening financial and economic systems.

The significance of this topic has been led, in recent years, to the crucial explanation of relationship between liberalization (financial and trade) and financial development as one of the important economic issues in developing countries (Do and Leckenko, 2004). By offering an original mathematical model and using Cobb-Douglas function, for instance, Do and Leckenko (2004) show that when lending rates and the quality of financial system are the outcomes of equilibrium conditions, financial system is influenced by trade.

Given the importance of such issue, this paper will explore the effect of trade and financial liberalization on financial development of the MENA[1]'s countries.

The remaining of the paper follows by offering a conceptual discussion on financial development, trade liberalization, and financial liberalization) in Section 2, and then the related literature in Section 3. Section 4 specifies an econometric regression model through which the hypothesis of the research will be examined.

Section 5 and Section 6 represent empirical results and concluding remarks, respectively.

2. A Conceptual Discussion

Financial markets and financial intermediaries have been created together with legal and tax system due to the existence of all types of information costs, implementation and exchange of contracts (Merton, 1992).

In fact, financial development is a process of establishing institutions which deepens information bases and the capacity of financial system analysis and increases the power of financial institutions in response to businesses, families, and other economic agents' needs through diversification of instruments, agreements, and contracts (Merton and Badie, 1995)

In 1970s, the concept of financial liberalization was considered after financial repression concept and three economists named Gold Smith (1969), McKinnon and Shaw (1973) strongly criticized financial repression theory and propounded the discussion of financial liberalization.

The discussion of financial liberalization was first focused on deregulation and determination of interest rate in free market. What happened in practice was the removal of government securities for savers, lenders, and loan recipients which finally led to sharp increase in interest rates and bankruptcy of many businesses and at last financial crisis 1982; it was followed by considering bed-making for financial institutions development.

In 1980s, by concentration on macroeconomic stability as a prerequisite for successful financial liberalization, this argument was focused on financial reforms; because the failure of financial liberalization experience in three South American countries (Argentina, Chile, and Uruguay) and financial crisis in 1982 weren't due to financial liberalization and many viewed inappropriate macroeconomic environment of these countries for financial liberalization as a reason for the failure of these policies.

In 1990s which is mentioned as the third stage of executing policies of financial development, the issue of market failure and the importance of financial institutions were emphasized as prerequisites for successful financial liberalization process (Gertrel and Rose, 1996). Along with this, it was recommended that countries at first revised their internal financial system and levy strong regulatory system and coherent rules and regulations to deal with moral hazards and

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[1] Middle East and North Africa countries include Iran, Saudi Arabia, Syria, Oman, Bahrain, United Arabic Emirates, Kuwait, Iraq, Qatar, Lebanon, Palestine, Egypt, Morocco, Libya, Jordan, Algeria, Tunisia, and Djibouti

asymmetric information and then they made attempts to integrate their financial system with international financial markets.

Additionally, Trade liberalization is considered as a requirement for liberalization of international capital flow (McKinnon, 1991) and in two recent decades, financial liberalization has occurred following trade liberalization (Martinez, 2004).

The most important effect of trade liberalization has been to increase competition in product markets. Direct relationship between increasing competition in product markets and productivity growth can improve the state of firms' governance and performance. When competition is not severe enough to reduce firm's interest rate, this increased competition will lead to a need for more funding that it will also cause internal financial development (particularly in banking system) and opening up the capital inflows.

Financial liberalization solely and without trade liberalization provides large industrial firms with an opportunity to use external financial resources more than their need, while small domestic firms with high potentials are not able to access their required financial resources. This threatens the interests of domestic financial sector because of industrial operators' access to international finance; therefore, in fact this domestic financial sector is under pressure for liberalization (Rajan and Zingales, 2003).

Several economists believe that international markets act more efficiently than closed domestic markets and consider financial liberalization as a factor for development of domestic financial markets (Stieglitz, 2000; Stultz, 1999). Free financial market provides required funds of borrowers who have fruitful and useful investing opportunities in developing markets. Theoretically, financial liberalization result in financial development possibly through following ways:

1. Financial liberalization leads to increase competition in banking system and introduce new financial instruments and techniques that it reduces financial repression, interest margin, and enhances the service quality of domestic financial sector (Shaw, 1973, McKinnon, 1973).

2. Removal of regulations on capital market is to compensate risk and brokerage fee with a reduction in expected return on investments costs and increases access to cash flows, this provides more diversity of financial baskets of foreign and domestic investors and increased investment (Fischer, 1998; Summers, 2000; Stultz, 1999).

3. Liberalization process often can provide the causes of financial system development by increasing the efficiency of financial systems and through eliminating inefficient financial institutions and putting pressure for reform of the financial infrastructure (Classens et al., 2001; Stiglitz, 2000; Stultz, 1999).

Structural reforms in financial sector are followed by reducing issues related to asymmetric information, adverse selection and moral hazard, while they lead to increase credits. However, the relationship between financial liberalization and financial development is ambiguous, but this point is noteworthy that for having useful financial dealings between countries, a financial system is required which is equipped with an acceptable legal and institutional infrastructure.

Meanwhile, the effect of trade liberalization on improvement of financial development in different countries depends on political economy and the expansion of domestic financial system of any country. The approach of supply and demand sides has been pointed out regarding the impact of trade liberalization on financial development.

By trade openness, the motivation of financial operators and domestic financial intermediaries (supply side) reduces rigidities of financial development because by emerging new financial institutions which increase competition and efficiency between financial activities, the combination of foreign competition and liberalization of capital flow induce financial institutions for a higher level of financial development (Rajan and Zingales, 2003).

The relationship between financial and trade sectors can be also considered from demand side. Trade liberalization is associated with the risk of external shocks and foreign competition; this leads to develop markets to diversify such risks and allows firms to cope with short term liquidity problems or reverse shocks (Svaleryd and Vlachos, 2002). It finally results in investment enhancement and financial development (Levine and Renelt, 1992). Trade liberalization is effective on the demand for foreign financing through specialization, innovation, and technology transfer and generally activities which increase the use of foreign financing.

In some countries, trade liberalization creates specialization to produce goods depending on foreign financing which leads to develop financial sector, to increase liquidity, and to reduce the risk of foreign financing used by entrepreneurs. However, when commerce moves towards importing goods based on internal

financing, after opening up, the financial system deteriorates (Do and Levchenko, 2004). Countries with relatively developed financial sector have comparative advantage in industrial sectors, which depend on external finance, in this case, both sectors' use foreign investments and credibility leading to enhancement of returns to scale (Kletzer and Bardhan, 1987).

3. Literature Review

Baltagi, et al. (2007) have explored the relationship between liberalization (trade and financial) and financial development using panel data on 42 countries among developing and industrial countries during 1980 to 2003. Having estimated a dynamic panel data (DPD), their results imply significant effects of trade, financial openness and economic institutions on different financial development levels among countries under consideration.

Ito (2005) investigated the effect of financial liberalization on the level of financial development in Asian countries. In this research, he used dynamic panel data technique and data for the period 1980–2000. He tried to determine the long term effect of the degree of capital account openness on financial development. The results obtained emphasize the priority of trade openness and financial openness and show that only when the financial openness has a positive effect on the financial development, countries achieve a higher degree of trade openness and legal and institutional infrastructures.

Huang and Temple (2005) have explored the relationship between foreign trade and financial development using DPD technique and data during 1990 to 2001. The results of applying cross-sectional method indicate significant and positive effect of increasing trade on bank-oriented financial development in countries with higher income rather than those of countries with lower income.

Do and Levchenko (2004) analyzed the effect of international trade flows on financial development for 77 member and non-member countries the OECD during the period 1965-1996. They finally found a positive effect of trade on promoting the growth of financial system in richer countries, but the poorer countries were affected inversely.

Hang (2008) examined the relationship between trade liberalization and financial development in Vietnam using data for the years 1992 to 2007 and the Angle-Grainger's causality test. The empirical results show that there is a positive relationship between trade liberalization and financial development. In addition, a reform on trade and financial policies has been associated with promoting financial sectors encouraging foreign trade in Vietnam. The study implies that such results, besides the theoretical studies, prove a strong relationship between trade liberalization and financial development.

Gries et al. (2009) have explored the relationship between financial deepening, economic development, and trade openness by means of data during 1961 to 2004 in 16 African countries using VAR and VECM approaches. In most countries of this sample, a long-term relationship between financial deepening and economic growth was not found significant. Political stability, stable macroeconomic conditions, and institutional quality should be effective factors in reducing discrepancies of financial sector in these countries and such measures could extremely benefit countries from trade liberalization.

Azvaji (2006) has evaluated the effect of financial liberalization policies and changes in bank interest rate on banking sector development in Iran during 1969-2003, using VECM econometric technique. There is a significant and negative relationship between legal reserves control through the country's central bank and financial sector development and a significant and inverse relationship between changes in banks' real interest rate and financial sector development so that an increase in real interest rate in the informal market can lead to a decrease in demand for loan in this sector while transferring loan applicants to the official markets (banking system) resulting in developing financial markets in the formal sector.

By emphasizing banking indices and two levels of public institutions, Komeijani et al. (2008) have considered the role of public and legal institutions on financial development in the selected less developed countries. Rasti (2009) has investigated the effect of business development on the process of financial development in Iran, employing a VAR model. By identifying significantly a positive effect of business development on Iran's financial development, this study concluded that trade liberalization did not lead to reduce financial development level. The recommendation has been towards trade liberalization, business and export development policies to improve the financial sector of the economy.

3. The Model

In this study, a panel data specification has been used for the MENA countries during 1990 - 2008 to evaluate the impact of trade and financial liberalization on financial market development (including banking sector and capital market). In

principle, applying dynamic panel data allows us to study the dynamics of changes. In this case, we obtain performance evaluation of variable relationships by using dynamic panel model estimation and generalized method of moments (GMM) with an order of difference and removing sectional effects.

Two de jure and de facto indices for financial liberalization plus other variables are used in estimation of two regressions (Baltagi and Demetriades, 2008), as follows:

KAOPEN denotes an index of financial openness (de jure) that is computed through moving average of control variables (0 and 1) indicating restriction on capital account for each country during 1990 to 2008[1].

FO includes an index of financial openness (de facto), index of foreign assets and liabilities to GDP[2] that is influenced by actions and policies which are brought about the influence of interest groups. The data of this index has been extracted from WDI database.

FD is a measure of financial development which has been calculated for each country during 1990 to 2008:

PRIVY is considered to credit grant to companies and private enterprises divided by *GDP*. This indicator yields information about allocation of credits that commercial banks give to private sector compared with the size of economy.

LIQLIA is the ratio of *M2* to *GDP*. Many scholars have considered this variable as financial deepening index[3].

MC denotes capital value of stock market from existing companies in the market divided by *GDP* which shows capital market size compared to economy's size[4].

Trade liberalization is measured by total exports and imports divided by *GDP*[5] (*TO*). *Y* and *INF* denote per capita income and inflation rate, respectively. Growth rate of per capita income is based on USD and fixed prices of 2000 and inflation rate is the implicit index of calculated price.

Overall, following Baltagi and Demetriades (2008)'s model, the effect of financial liberalization and trade openness (as trade liberalization) on financial development in MENA's countries has been explored empirically during 1990-2008. A dynamic econometric model is defined in Equation (2) and estimated by the *GMM* approach:

$$\ln FD_{it} = \beta_0 + \ln FD_{it-1} + \beta_1 \ln Y_{it-1} + \beta_2 \ln TO_{it-1} + \beta_3 \ln FO_{it-1} \quad (2)$$
$$+ \beta_4 (\ln TO_{it-1} \times \ln FO_{it-1}) + \beta_5 \ln X_{it-1} + u_{it}$$

where FD_{it} is the ratio of private sector credits to *GDP* in country i at time t. Y_{it-1} is the lagged *GDP* per capita in country i at time t. TO_{it-1} stands for the lagged trade liberalization measured by (exports + imports) to *GDP* in country i at time t. FO_{it-1} denotes the lagged variable of foreign assets and liabilities to *GDP*[6] in country i at time t. Finally, X_{it-1} is a vector which includes control variables such as inflation rate.

u_{it} is error term which includes country's specific (fixed and random) effects, time effects (e_t), and the equation errors (v_{it}) It is distributed independently and equally with zero mean and σ^2 variance:

$$u_{it} = e_{it} + v_t + v_{it} \quad (3)$$

4. Empirical Results

As mentioned earlier, generalized method of moments (*GMM*) has been used to estimate the model shown in (2). We first estimated this equation separately by using financial liberalization index (foreign assets and liabilities) and then three financial development indices (*RIVY*, *LIQLIA*, and *MC*) in which the estimation results of different equations have been reported in Tables 1 and 2.

According to the results, all variables used in this model are statistically significant at the 5% and 10% significance levels, and the coefficient signs are consistent with economic theories. Statistic of Sargan test rejects null hypothesis based on residues correlations with instrumental variables. In all cases, Sargan test (statistic J) is higher than 0.10 and 0.05, and then according to the results of this test, instrumental variables used in the estimation have necessary validity in 5% significance levels. Therefore, the validity of results is confirmed for interpretation. Regarding

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[1] This index has been computed by Chin and Ito (2002, 2005, and 2007). Major and further explanations are provided in appendix 2.

[2] This variable was introduced by Lane and Milesi-Ferreti, 2006.

[3] Kink and Levin (1993a) have calculated this variable which shows banking sector development.

[4] This index was introduced and applied by Beck et al (2003). The data of these indices have been extracted from WDI and IFS databases.

[5] This index is derived from experimental studies of Chin &Ito (2002, 2005, and 2007) Mah, J.S. (2003), Edwards, S. (1997).

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[6] *KAOPEN* and *FO* variables have been used without logarithm due to some negative data for these countries.

the order of serial correlation test can say that if p-value is higher than 0.1, null hypothesis is rejected based on lack of autocorrelation; it can be seen that H_0 is not rejected in second-order serial correlation test, and in case of model estimation with one of instrumental variables with an interruption, residues do not have autocorrelation. Hence, this test shows that instrumental variables are for regression of different significance levels of explanatory variables.

Given that coefficients have been estimated logarithmically, variables' coefficients indicate the variable traction towards financial development. In Equation (2), by the indexes of foreign assets and liabilities liberalization, financial development coefficients are statistically significant by values of 0.78, 0.85, and 0.59, respectively. They indicate that financial development in a particular year is extremely dependent on financial development in the previous year. The direct effect of financial and trade liberalizations are positive which imply the positive effect of liberalization on the financial development. The effect of trade liberalization of banking sector is lower than that of capital market development. This coefficient expresses that trade liberalization may increase financial development by about 24%.

Indeed, trade liberalization is associated with the movement of production resources towards advantageous activities in developing countries. In other words, by being outdated inefficient firms, advantageous businesses can increase their production capacity through free resources in the economy. It can be seen that trade liberalization in the considered countries does not have a significant effect on the banking sector growth but it will lead to severe growth of capital market; that is, trade liberalization will be resulted in moving resources from inefficient manufacturing activities towards efficient activities. Since companies that operate in the stock market have higher performance than other institutions, strong growth in capital market can be evaluated in this regard.

Financial liberalization has had a different impact on banking and capital sectors of MENA's countries. In these sampling countries, facilitating financial transactions has led to develop country's banking sector; because by financial liberalization, people who previously were deprived from financial resources for various reasons will also have the power of access to these resources. However, financial liberalization shows a negative impact on the capital market. Several factors can be effective in this area. First, in most developing countries,

capital market has low efficiency and by financial liberalization, capital will move from these countries towards more efficient markets. Furthermore, in oil-rich developing countries, capital market does not have the ability to attract resources because of structural problems of production and by increasing degree of financial freedom, capital will have high tendency to fly. In other words, due to the problems of manufacturing sector in these countries, financial liberalization will be led to the withdrawal of capital from manufacturing activities.

In this sample, interaction between financial liberalization and trade liberalization on banking sector is negative i.e. if these two processes take place simultaneously, they will have negative effect on the financial development; this issue has been also considered in previous studies (McKinnon, 1991; Tornell et al., 2004).

It can be observed that inflation has a negative effect on the financial development of MENA's countries. Inflation rate has been considered due to interfere in the decision making process and high inflation rate should restrict asset and encourage savings into real assets. Evidence shows that countries with high inflation rate have lower levels of financial development on average in comparison with countries that benefit from low inflation rate.

The effect of per capita income on financial development is positive which indicates that the higher per capita income, saving and investment increase; in this case, it shows required reforms in the banking system to provide various and extensive services by banking system and increase financial intermediation, so, it leads to increase financial sector development.

We have also estimated Equation (2) individually for MENA's countries including financial liberalization index (*KAOPEN*) and three financial development indices (*RIVY*, *LIQLIA*, and *MC*). The empirical results have been totally reported in Table 2, indicating all variables used in this model are statistically significant and consistent with economic theories.

It can be compared with the previous estimates; financial liberalization has a positive effect on the index of banking sector development and a negative effect on the capital market. In addition, in this sample, the interaction between financial liberalization and trade liberalization on banking sector is negative relatively, if these two processes take place simultaneously, they have negative effect on the financial development. In this estimation, per capita income also has a positive effect on the financial development.

Finally, the effect of increasing trade or financial liberalization can be calculated by analyzing a part of derivatives of financial development compared to each of liberalization variables.

If both derivatives are positive, the hypothesis, which expresses that increasing both liberalizations enhances financial development, is confirmed. Slight increase in each of trade and financial liberalizations leads to greater financial development. Certainly, in a case all β_4, β_3, β_2 cannot be positive. If one or more of this coefficient is negative while the other is positive, the measurement of derivatives inside sample will be required given that the degree of openness may vary.

By carried out calculations, we can talk about the MENA countries that the final effects of financial and trade liberalizations on financial development would be more pronounced while liberalization gets more deeper, financial markets will go to further development.

Overall, the marginal effect of trade liberalization on capital market is 1.27, and the marginal effect of financial liberalization is -0.13, while such results show that the final effect of trade liberalization on the capital market is positive and more pronounced than that of financial liberalization.

5. Conclusion

This study tried to examine the effect of trade and financial liberalizations on the financial development in MENA's countries using generalized method of moments (*GMM*) and dynamic panel data (*DPD*).

Generally, the results have indicated that trade liberalization and financial liberalization have positive effects on the financial development proxied by banking sector indicator; however, financial liberalization has had a negative on the financial development expressed by the stock market implying the weakness of financial institutions.

Trade and financial liberalizations have had a negative cross effect on financial development, revealing the fact that these two strategies should not take place simultaneously because financial institutions have not operated effectively due to low quality. Thus, without reforming domestic financial system and conducting strong regulatory system which set coherent rules and regulations to deal with moral hazard and asymmetric information, financial liberalization causes capital flight and destruction of financial sector of these countries.

The effect of inflation has been negative on the financial development; while high inflation rate leads to more restrict asset and encourages savings into real assets, then reduces saving and investment, implying that increasing inflation and macroeconomic situation of countries have deeply negative effects on the financial development of the MENA's countries.

The results have also indicated that per capita income has a positive and significant effect on the financial development so that an increase in this variable enhances financial sector development in the selected countries.

Overall, the implication of our empirical findings is that the conduction of economic liberalization in the MENA region needs long-run and strategic plans of development being implemented by all members, finally towards a unique and single financial market in the region.
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Appendix 1
Financial liberalization index
This index has been made and proposed by Chin and Ito which is prepared based on 0 and 1 variables using the IMF (*AREAER*[1]) reports. To compute the variable, they have considered four restrictions on foreign accounts.

k_1 : Multiple exchange rates

k_2 : Restrictions on current account transactions

k_3 : Restriction on capital account transactions

k_4 : Requirements of Surrender of Export Proceeds

An increase in this index represents more freedom of cross-border capital transactions. From 1996 onwards, due to the change in classification method in *AREAER*, for reflecting the complexity of capital account control, the consistency of these four groups was lost, so, Mushid and Mody method (2005) was used and in order to focus on the effect of financial liberalization (instead of controls) values 0 and 1 were defined in this way as in case of lack of restriction on the capital account 1 was considered and in case of the existence of restriction 0 was considered. In addition, for capital account control (k_3), five years share (including current year t and four years before it) was used:

$$SHAREK_{3,t} = (\frac{k_{3,t} + k_{3,t-1} + k_{3,t-2} + k_{3,t-3} + k_{3,t-4}}{5})$$

Then, capital account openness index (*KAOPEN*) was constructed by means of first standardized component (P.C.A), $k_{1t}, k_{2t}, SHAREK_{3t}, k_4$. An increase in this index represents more freedom of cross-border capital transactions. Regarding the manner of building an index, each series has zero mean. First Eigen vector of KAOPEN is ($SHAREK_3, k_1, k_2, k_4$) = (0.57, 0.27, 0.52, and 0.56) and indicates that changes in *KAOPEN* isn't resulted from $SHAREK_3$. Using variables k_{1t}, k_{2t}, k_{4t} in the definition of *KAOPEN* index rather than mere use of k_3 which indicated

restriction on the capital account is due to raise the accuracy of this index. For a country which has opened its capital account, this index (k_3) is more accurate. But each country may control capital flow by other means like restriction on capital account transactions or other techniques including multiple exchange rate and the requirements of surrender of export proceeds.

On the other hands, countries which have closed their capital account, may try to increase the intensity of these controls through imposing different restrictions, k_1, k_2, k_4, thus private sector cannot ignore the restrictions of capital account.

Because of characteristic and the manner of index definition, this index is formally, considered as a measure of financial openness since it attempts to measure the legal restrictions of capital account transfers. Therefore, it is an index different from financial openness measures based on price, for example, indices which are on the basis of interest rate parity approach (*UIP*, *RIP*) like Chung et al. (2003) and or indices which are based on the absence of optimized arbitrage profit such as De Gregori (1998). Scholars often consider measures based on price as real measures for integration. These two measures of financial openness have their own strengths and weaknesses.

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1 Annual Report Exchange Restriction Arrangement and Exchange Restriction

Table 1: The effect of openness on financial development in MENA countries
The index of financial liberalization: (Foreign assets and liabilities to GDP) index introduced by China &Ito

dependent variables / Independent variables	Private credit /GDP	M2/GDP	Capital market/GDP
FD(-1)	0.78 (0.00)	0.85 (0.00)	0.59 (0.00)
Y(-1)	0.30 (0.010)	0.16 (0. 002)	0.94 (0.020)
TO(-1)	0.24 (0.002)	0.03 (0.03)	1.35 (0.003)
FO(-1)	1.8 (0.00)	0. 46 (0.010)	-0.5 (0.158)
FO(-1)*TO(-1)	0.42 - (0.00)	-0.1103 (0.009)	0.9 (0.0170)
INF	-0.03 (0.00)	-0.03 (0.001)	0.05- (0.05)
First- order serial correlation test	-3.69 (0.0002)	-1.37 (0.170)	-2.83 (0.004)
Second-order serial correlation test	-1.57 (0.28)	-2.98 (0.002)	1.06 (0.13)
Sargan test (J-statistic)	0.2 9	0.39	0.29

. *Source:* **Authors**

Table 2: The effect of openness on financial development in MENA countries
The index of financial liberalization: KAOPEN index introduced by China &Ito

dependent variables / Independent variables	Private credit /GDP	M2/GDP	Capital market/GDP
FD(-1)	0.74 (0.00)	0.86 (0.00)	0.50 (0.00)
Y(-1)	0.34 (0.007)	0.74 (0.00)	0.96 (0.020)
TO(-1)	0.10 (0.04)	0.06 (0.03)	0.34 (0.00)
FO(-1)	0.39 (0.02)	0.14 (0.04)	-3.34 (0.00)
FO(-1)*TO(-1)	0.17 - (0.01)	-0.03 (0.03)	0.9 (0.00)
INF	-0.04 (0.00)	-0.03 (0.003)	0.06 (0.16)
First- order serial correlation test	-3.69 (0.002)	-1.94 (0.05)	2.87 (0.004)
Second-order serial correlation test	-1.37 (0.17)	-2.21 (0.02)	0.87 (0.38)
Sargan test (J-statistic)	0.49	0.26	0.29

Source: **Authors**.