Analysis of the relationship between the development of the activity of the Iraqi Stock Exchange and the economic development in Iraq for the period (2005-2020) using the (NARDL) model

Dr. Yousif Abdullah Abed Al- Ani[1], Adil Basheer Dhahir Dukhkhai[2]

[1]*Mustansiriyah University / College of Administration & Economics/ Department of Banking and Finance Email: yousif_alani2000@uomustansiriyah.edu.iq*
[2]*Wasit University /College of Administration &Economics/ Department of Banking and Finance Email:* adelbasheer@uoawsit.edu.iq

Abstract:

The research aims to measure and analyze the relationship between economic development in Iraq and the development of the Iraqi stock market for the period (2005-2020) using the NARDL model, as well as knowing the extent of the impact of a shock on economic development in the Iraqi stock market. The research concluded that there is a direct, non-linear, long-term relationship between economic development and the development of the Iraqi stock market, in addition to the fact that an increase in economic development by (1%) will lead to an increase in the development of the Iraqi stock market by (4.474%), while a decrease Economic development by (1%) will lead to a decrease in the development of the Iraqi stock market by (3.929%). Also, the occurrence of a shock in economic development (high rates of economic development) will lead to an increase in the development of the Iraqi stock market, which reaches its peak after about one season (three months) from the occurrence of the shock and then begins to decline to reach the peak after about two quarters of the shock occurrence (half a year) , then it increases and reaches its peak in the third quarter of the shock to remain at this level (an increase in the development of the stock market by about 0.5%) and it remains at this level without returning to the state of equilibrium even after twenty chapters (five years) from the occurrence of the shock.

Keywords: economic development, stock market development, Iraq stock exchange, NARDL, Iraq.

1. Introduction:

The process of economic development requires the accumulation of capital, and given that commercial banks alone cannot finance medium and long-term investments due to the limited balances available to them, as well as facing the problem of providing the financial resources necessary to finance economic development. Hence the relationship between economic development and stock market activity in financing economic development as a contemporary financing model, in addition to the prominent role of economic development in revitalizing the stock market, which leads to achieving financial integration and increasing cash flows.

1.1. Research problem:
The research problem revolves around the following question:
Does economic development affect the development of stock market activity in Iraq?

1.2. Research hypothesis:
The research starts from the hypothesis that:

- The existence of a direct non-linear long-term relationship between economic development and the development of the Iraqi market for securities.

1.3. research aims:
1- Measuring and analyzing the relationship between economic development in Iraq and the development of the Iraqi stock market for the period (2005-2020).
2- Knowing the extent of the impact of a shock on economic development in Iraq on the development of the Iraqi market for securities.

2. Previous studies:

Countries with relatively well-developed stock markets achieve faster growth rates in per capita GDP than other countries that are less developed

in the stock market, and this will be reflected again in the stock market activity. Several financial and banking studies have dealt with this topic, including:

2.1. Ajit Singh, 1991 study dealt with the problem of the relationship between the stock market and economic development in developing countries. Western and Japan to rely on the banking system instead of the financial markets to finance the process of industrial development.

2.2. The study (Ross Levine, 1997) focused on the role of the stock market in the economic development of a number of countries for the period (1976-1993) in providing the necessary liquidity for investments through savers and this matter will enhance the investments in the long term and thus achieve economic development, and the results of the study concluded that countries in which the stock market is relatively developed have achieved faster growth rates in per capita GDP than other countries that are less developed in the stock market during the period (1976-1993), in addition to alleviating obstacles to foreign indirect investment that will increase market liquidity and that this openness to foreign investment will reduce the severe fluctuations in the stock market, which will contribute to the process of economic development in the long term.

2.3. The study (Surya Bahadur GC & Suman Neupane, 2006) explored the existence of a causal relationship between the stock market and economic development in Nepal for the period (1988 - 2005) using the Kranger causality tests and the Engel-Kranger co-integration tests, and the study concluded that there is a two-way causal relationship between the stock market and the economic development in Nepal for the period (1988 - 2005) Securities and economic development, as well as a long-term equilibrium relationship (joint integration) between the stock market and economic development.

2.4. The study (Samy Ben Naceur et al, 2008) focuses on the countries of the Middle East and North Africa using annual data for eleven countries for the period (1997 - 2005) in order to verify the impact of stock market liberalization on the economic development of countries in the Middle East and North Africa using the GMM methodology The results of the study indicate that there is no effect of stock market liberalization on economic development, while there is an adverse effect in the short term between stock market development and economic development and it turns into a direct effect in the long term.

2.5. Research (Manjurul Alam Mazumder, 2015) on the importance and role of the stock market in the economic development in Bangladesh for the period (2003 - 2013), and the results revealed that the stock market has a significant contribution to the economic development in Bangladesh.

The nature of economic development:
Economic development is the creation of wealth that benefits society. It is an investment in the development of the economy in order to provide prosperity and a better quality of life for all residents. There is no specific definition of economic development, but in general it is defined as the allocation of specific resources such as: land, labor, and entrepreneurship in order to increase the level of commercial activity, increase employment, income distribution and financial solvency. To shift from a backward economy to an advanced one, and this transformation process is accompanied by a rise in income levels, in addition to an improvement in the welfare aspects of health, education and housing. Developing countries are usually classified according to the standard of per capita income, which refers to their share of GDP (calculated by dividing the output by the total population), and is by far the best available measure of the value of goods and services produced for each person in society annually. (Manjurul Alam Mazumder, 2015: P12)
As for the requirements of economic development, in addition to economic and non-economic factors, capital formation plays a prominent role in improving the level of production in the economy, as the shortage of capital will stand in the way of economic development. While investment is the most prominent economic development strategy, investment is based on three principles: exports, productivity and sustainability, which constitute the main support for economic development, as economic development needs to follow the appropriate strategy in order to achieve economic development.
Economic development aims to improve the level of economic well-being represented by increasing the per capita GDP and providing a wide range of social services. Emphasizes the achievement of economic development. (Shin, Y., Yu, B., & Greenwood-Nimmo, M. 2014: P15)
Therefore, economic development is of great importance in developing the economic sectors in

countries, improving the lives of their citizens and increasing national income, and this works to reduce the social and economic difference between the classes of society, which will lead to achieving security and stability in these countries.

- Stock market:

Stock markets play a pivotal role of growing importance in supporting and achieving economic development by assuming the task of mobilizing domestic and foreign savings and directing them towards the most profitable uses. This pivotal role has grown with the passage of time to the extent that the market has become known as the mirror reflecting the extent of the development of the real sector in the economy and supporting the supply side of the economy at a time when contemporary economies have become more than ever before characterized by the intensity of financing and the complexity of their financial operations.

The issue of increasing economic welfare by adopting the option of financing through the financial markets has become dependent on market efficiency and its role in the development and allocation of investments. In practice, the stock market cannot play the role assigned to it unless it has the elements of efficiency that contribute to the real evaluation of the listed companies and their traded securities, that evaluation based on which the investment decision is made as a result of analyzing the information and data available to investors. (Ross Levine, 1997: P19)

On the other hand, the process of economic development in any country requires large capital. It is not possible to achieve the desired rates of development without the presence of capital accumulation. Here, the importance of stock markets in the process of economic development emerges as one of the mechanisms for accumulating private and public savings and directing them towards various investment channels, in addition to that they represent the link between sectors that save and have excess financing capacity, and sectors that lack liquidity to finance investments, which in turn serve development goals. in any country.

In general, it can be said that capital markets drive the process of economic development by performing several functions, most notably:

1- Mobilizing savings and financing investment activity.

2- Increasing the volume of investments and raising the rate of investment productivity.

3- Increasing the efficiency of resource allocation (investments).

3. Research Methodology:

3.1. Model Description:

The research is based on the NARDL model (autoregressive nonlinear decelerated distributions) in describing the phenomenon of economic development in Iraq and the development of the Iraqi stock market for securities. Where the variables are stationary at the first difference I (1), or a mixture between the first difference and the level I (1) &I (0), and not one of the variables is stationary at the second difference I (2), in addition to that, they are not residuals of the model It contains problems of serial correlation, variance, and non-normal distribution (Pesaran et al, 2001). But the NARDL model requires segmentation of the independent variable (ED) into positive and negative as follows (Shin et al, 2014):

$$ED_t = ED_0 + ED^+ + ED^-$$

Where: $ED^+ = \sum_{j=1}^{t} \Delta ED^+ = \sum_{j=1}^{t} \max(\Delta ED_j , 0)$

$$ED^- = \sum_{j=1}^{t} \Delta ED^- = \sum_{j=1}^{t} \min(\Delta ED_j , 0)$$

Based on this assumption, we have a NARDL(p,q) model as follows:

$$= \sum_{j=1}^{p} \phi_j SM_t$$
$$SM_{t-j} + \sum_{j=0}^{q} (\theta_{j=0}^{+} ED_{t-j}^{+} + \theta_j^{-} ED_{t-j}^{-}) + \varepsilon_t$$
$$.......(1)$$

whereas:

SM_t The development of the Iraqi stock market. ED_t^+: high economic development. ED_t^-: low economic development.

The above equation represents the short-run formula of the NARDL model, the residuals of which should be free from problems of serial correlation, instability of variance, and non-normal distribution.

$$\Delta SM_t = \rho \xi_{t-1} + \sum_{j=1}^{p-1} y_j \Delta SM_{t-j} + \sum_{j=0}^{q-1} (\varphi_j^{+} \Delta ED_{t-j}^{+} + \varphi_j^{-} \Delta ED_{t-j}^{-})$$
$$............... (2)$$

whereas:

ξ_{t-1} Error correction limit. $??$: error correction speed.

The error correction velocity coefficient is between (1-) and (0). Also, it must be spiritual.

$$\Delta SM_t = \rho SM_{t-1} + \theta^{+} ED_{t-1}^{+} + \theta^{-} ED_{t-1}^{-} + \sum_{i=1}^{p-1} \gamma_i \Delta SM_{t-i} + \sum_{i=0}^{q-1} \pi_i \Delta ED_{t-i}$$
$$.................. (3)$$

The above equation is the long-run form of the NARDL model.

3.2. data:

The per capita GDP data was used as an indicator of economic development in Iraq (ED) in US dollars and at current prices as an indicator of

economic growth in Iraq based on the data of the International Bank for Reconstruction and Development, as well as the market value in the Iraq Stock Exchange (SM) in million US dollars and at prices As an indicator of the development of the Iraqi stock market, based on the data of the Iraqi Stock Exchange, for the period (2005Q1 - Q42020) and the logarithmic formula (the natural logarithm) was taken for the two variables, and thus the number of views is (64), these data appear according to the following figure (1) :
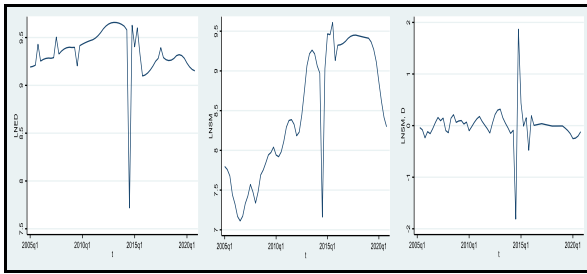
Figure 1: Iraq's economic development (LNED) and the development of the Iraq Stock Exchange (LNSM) for the period **(2020Q4 - 2005Q1)**

3.3. Unit root tests:
The main purpose of using unit root tests is to avoid the phenomenon of spurious regression. The Dickie-Extended Fuller (ADF) and Phillips-Perron (PP) tests are the most famous. The time series is static if its mean, variance and variance are constant over time. (1) As follows:

Table (1): (ADF, PP) test of economic development in Iraq and the development of the Iraqi stock market

Unit root tests:

		Level				1st difference		
Tests		ADF		PP		ADF		PP
Variables	T-Statistic	Prob	T-Statistic	Prob	T-Statistic	Prob	T-Statistic	Prob
LnED	-4.541	0.001	-7.129	0.000	/	/	/	/
LnSM	-2.012	0.595	-2.764	0.211	-6.652	0.000	-10.179	0.000

Source: From the researcher's work based on the statistical program (STATA 16).

The results of Table (1) in the above indicate that the time series of economic development (Ln ED) is stationarity at the level I(0)]], as the statistical value (T) and for both tests (ADF and PP) is greater than the tabular value, as well as the value of (Prob) is less than (5%), which means rejecting the null hypothesis that the time series is not static and accepting the alternative hypothesis that the time series is static; While the time series for the development of the Iraq Stock Exchange (Ln SM) is stationary at the first difference (I(1)]], as the statistical value of (T) and for both tests (ADF,PP) is greater than the tabular value, in addition to the fact that the value of (Prob) Less

than (5%) and thus rejecting the null hypothesis and accepting the alternative hypothesis.

4. Applied results:

Annex 1 shows the results of the NARDL model estimation; The F-Bounds Test confirms that its value is (13.56), which is greater than the value of (F_PSS), which is (2.0683), and that the value of (Prob) for it is (0.001), which is less than (5%), which means rejecting the null hypothesis that there is no Joint integration between economic development and the development of the Iraqi market for securities and the acceptance of the alternative hypothesis of its existence. An increase in economic development by (1%) will lead to an increase in the development of the Iraqi market for securities by (4.474%), while a decrease in economic development by (1%) will lead to a decrease in the development of The Iraqi Stock Exchange increased by (3.929%), and when there is any short-term imbalance from the long-term balance, the error correction model quickly restores balance (-0.1088%) quarterly, which means that (10.88%) of the imbalance in the shock of the last quarter will be corrected in the current chapter.

Appendix (1) shows that the model is considered statistically acceptable through a statistical test (F) with a value of (48.99) and a value of (Prob) for it (0.000), which is less than (5%), which means that the alternative hypothesis is accepted in the significance of the estimated model as a whole and the hypothesis is rejected. In addition, the remainder of the estimated model does not suffer from the problem of serial correlation as shown by the (Portmanteau) test, as its Prob value is (0.3686), which is greater than (5%), which means that the null hypothesis is accepted and the alternative hypothesis is rejected. The stability of the variance does not exist in the residuals of the estimated model as confirmed by the (Breusch-Pagan-Godfrey) test, where the value of Prob is (0.8875), it is greater than (5%), which means that the null hypothesis is accepted and the alternative hypothesis is rejected, and that the residuals of the model are distributed in a normal distribution It is also proven by the (Jarque - Bera) test, as its Prob value is (0.9616), which means accepting the null hypothesis and rejecting the alternative hypothesis. (Ramsey RESET) (Ramsey Regression Equation Specification Error Test) where the statistical value of the F-test is (1.822) and its (Prob) value is (0.1582) which is greater than (5%), which means rejecting the null hypothesis and accepting the alternative hypothesis that the estimated NARDL model does

not suffer from the problem of characterization error.
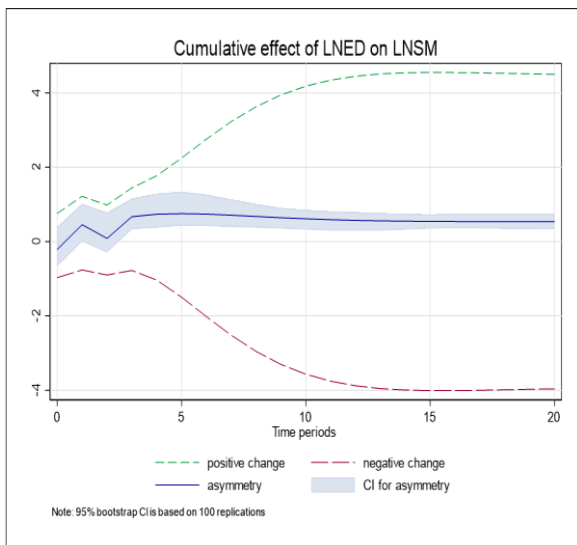
Figure (2): The dynamic multipliers of the impact of economic development on the development of the Iraqi stock market

Figure (2) in the above shows that a shock in economic development (high rates of economic development) will lead to an increase in the development of the Iraqi stock market, which reaches its peak after about one season (three months) from the occurrence of the shock and then begins to decline to reach the peak after about two quarters from the occurrence of the shock. The shock (half a year), then increases and reaches its peak in the third quarter of the shock to remain at this level (an increase in the development of the stock market by about 0.5%) and remains at this level without returning to the state of equilibrium even after twenty chapters (five years) from get shock.

5. Conclusions:

The existence of a long-term, direct, non-linear equilibrium relationship between economic development in Iraq and the development of the Iraqi stock market. In addition, an increase in economic development in Iraq by a certain percentage will lead to an increase in the development of the Iraqi stock market by about four and a half times of that percentage in the long term, while its decrease by a certain percentage will lead to a decrease in the development of the Iraqi stock market by about four times that percentage in The long-term, and the cumulative impact of development shocks is positive on the development of the Iraqi stock market in the short and long terms.

References

[1] GC, S. B. (2006). Stock market and economic development: a causality test. The Journal of Nepalese Business Studies, 3(1).

[2] Levine, R. (1997). Stock markets, economic development, and capital control liberalization. Perspective, 3(5), 1-8.

[3] Mazumder, M. A. (2015). Stock Market and Economic Development in Bangladesh: A Case Study of Chittagong Stock Exchange.

[4] Naceur, S. B., Ghazouani, S., & Omran, M. (2008). Does stock market liberalization spur financial and economic development in the MENA region? Journal of Comparative Economics, 36(4), 673-693.

[5] Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of applied econometrics, 16(3), 289-326.

[6] Shin, Y., Yu, B., & Greenwood-Nimmo, M. (2014). Modelling asymmetric cointegration and dynamic multipliers in a nonlinear ARDL framework. In Festschrift in honor of Peter Schmidt (pp. 281-314). Springer, New York, NY.

[7] Singh, A. (1991). The stock market and economic development: should developing countries encourage stock markets?