Impact of Savings on Economic Growth in MENA Region

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Abstract

The present paper tests the relationship between saving and economic growth in the Middle East and North Africa region. The period studied from 1990 to 2016 this period was chosen to provide sufficient number of observations. The methodology uses a panel data which was unbalanced due to unavailability of data on some countries in some of the analyzed years. The data was balanced before applying the Granger causality test which found that savings and credit Granger causes economic growth. To further study the phenomena pooled ordinary least square (OLS), panel random and fixed effects methods are employed then Hausman test carried which found that the random effects model best fits the data. The model found positive high significance of saving, credit and foreign direct investment on economic growth.

Keyword: Savings, economic, growth, credit, FDI, MENA

First: Introduction

Early authors as Schumpeter (1911) stated the important role that financial system plays as an intermediary in technological innovation. Financial system facilitates efficient allocation of financial resources channeling savings to investment through the available financial tools which facilitate successful implementation of innovative products and production methods. Several economists thereafter have supported the impact of banks on economic growth through channeling available funds from savings to credit which stimulate more productive investment that raise economic growth. Literature argued that savings is necessary to reach higher economic growth through increasing the available funds ready for investment which raise domestic stability against sudden shifts in international markets. Foreign direct investment FDI included in number of empirical studies as an enhancer of economic growth as it strengthens the connection between growth and saving.

Empirical studies examining causality of saving and growth had different results some studies found that saving does affect growth while other stated the inverse which need further study to indicate the causality at MENA region.

Paper Importance: The paper will provide an empirical analysis trying to identify the relationship between savings and economic growth in MENA region

in line with the available theoretical and empirical literature. How savings affect economic growth as it facilitate enough resources available for credit to finance productive investment and further study of the role of FDI in economic growth as an additional source of funding.

Research Methodology: the study adopts two methods first; Granger causality test to identify the causality between savings and economic growth and the causality between credit and economic growth. Second, using panel model including 23 countries in MENA region in the period from 1990 to 2016, the panel model will be used to find the impact of saving, credit and FDI on economic growth.

The rest of paper structured as follows: Second section presents a review of theoretical literature to identify the relationship between savings and its impact on economic growth through credit and the role of FDI in stimulating economic growth. Third section presenting the empirical literature, fourth section is discussing the research methodologies used in the paper the Granger-causality test and panel model. Finally, the fifth section presents results and discussion of empirical analysis. The paper will end by presenting conclusion.

Second: Theoretical Literature Review

Schumpeter (1911) was the first to present the impact of financial sector development on economic growth through the role of financial institution of directing financial funds to productive investments which

stimulates technological innovation and economic growth. Bank credit plays an important role in facilitating financial resources and redirecting it to finance economic activities in the correct way (Ananzeh, 2016). Robinson (1952), Goldsmith (1969), Gurly and Shaw (1960, 1967), Shaw (1973), and Spellman (1982) stated that financial development enhance economic growth through increase of savings, and efficient allocation of financial resources which promote capital accumulation.

The classical Keynesian economic growth Harrod-Domar model developed by Roy F. Harrod (1939) and Evsey Domar (1946) explain economic growth as derived from saving and capital productivity. Harrod-Domar model states that the aim of savings is investment then economic growth rate depend on saving level and the economy capital –output ration. According to the model there are three growth kinds which are first; warranted growth at which the economy doesn't expand indefinitely, second; natural rate of growth at which the economy try to maintain full employment level, and third; actual growth which is the real rate of growth in the GDP per year. Harrod and Domar model was the precursor of the exogenous model. The model state that increasing savings and marginal production of capital or decreasing depreciation rate will increase output growth, also states that increasing in investment will lead to

capital accumulation which will increase growth (Gjergji, 2015).

Solow (1956) growth model is an exogenous model that explained economic growth by labor, capital accumulation, technological advancement and population growth. The model states that increase in saving rate will facilitate higher technological progress which will positively affects income per capita. McKinnon (1973) and Shaw (1973) followed Solow's hypothesis that saving role is very important in economic development due to its impact on increasing investment which will accelerate economic growth.

The Neoclassical model argued that saving rate impact on economic growth is not permanent; it has a short run positive effect which will disappear in the long term, but have long term impact on output (Adema, 2015). Mankiw, Romer and Weil (1992) examining neoclassical model found positive impact of saving rate on economic growth as the countries get richer when saving rate is higher.

Endogenous growth model considered savings, credit and liquid liabilities as explanatory variables of economic growth. Levin et al. (2000) using a dynamic panel model concluded that there is a correlation between economic growth and financial system. Khan (2001) stated that there is a casual relationship between financial instructions and economic growth. Aghion, Howitt, Comin and Tecu (2009) model states that poor

countries benefit from domestic saving as it raise investment in projects that could bring the country to a higher technological level. The model also stressed on the importance of foreign investment as the cooperation between foreign investors and local entrepreneur would help the country to reach higher technological frontier. While more developed countries already at the technological frontier don't benefit as much from domestic saving.

Empirical studies examining causality of saving and growth had different results some found that saving doesn't affect growth while other states the inverse as addresses below.

Third: Empirical Literature Review

Lewis, A. W. (1954) studying developing countries found that savings play important role in economic growth. Lewis argued that increase in savings will cause more investment which increases the production of the economy. Nurkse (1953) argued that "increase in the proportion of national savings devoted to capital accumulation is the primary aim of public finance in the context of economic development" (as mentioned in Gjønnes 2016). Bacha (1990) developed macroeconomic model and found a positive impact of saving on economic growth, and DeGregoro (1992) found same results using panel data of twelve countries in Latin America in the period from 1950 to 1985. Jappelli and Pagano (1994) using a sample of 22 OECD countries

from 1960 to 1987 found a positive significance of domestic saving rate on economic growth. Carrol and Weil (1994) analyzing data of 64 countries found that growth Granger causes saving and not the inverse. Attanasio et al. (2000) studying 123 countries from 1960 to 1994 using Granger causality, the study found positive relationships between lagged saving rates and investment rates. Regarding the causality, the growth found to be weakly positively causing saving. Bisat et al. (1997) studying economic growth, saving and investment in Arab countries found significant importance of savings and investments on long run economic growth.

Krieckhaus (2002) studying 32 countries from 1960 to 1980 including Brazil, the study found that there is a positive significance of public saving on economic growth as increase in public saving increases national saving and investment which leads to higher economic growth. Mason (1988) found similar conclusion that savings is important for developing countries as it leads to higher investment which leads to higher economic growth rate. A.P. Thirlwall (2002) studied financial liberalization to stimulate investment and savings in order to enhance economic growth. The study found that savings is important to achieve higher economic growth and investment rates in Egypt. Romm (2003) examined savings and it's inter-relation with investment and growth, the results stated that private savings has a direct and indirect impact on growth and that growth is

positively related with private saving, concluding that growth enhances saving which enhances further growth. Baharumshah et al. (2003) studying saving behavior in 5 Asian countries in the period from 1960 to 1997 found that saving rate causes economic growth. Alguicil et. Al (2004) found evidence going in line with Solow's model that higher saving rate will cause higher economic growth as a result of the reverse causal relationship between national savings and GDP; the model included FDI confirming its importance of enhancing economic growth and strengthens the connection between growth and saving. Katircioglu and Nartaliyeva (2006) studying Kazakhstan in the period from 1993 to 2002 found that domestic saving causes economic growth. M. Shahbaz (2008) studied the relationship between domestic saving and economic growth and the results shows the existence of long run relationship between the studied variables with a strong bond for very long time period. Lasky (2004) based on Mankiw, Romer and Weil (1992) adding human capital to Solow model increases the effect of saving rate substantially for physical capital, as output increase will create higher human capital investment. Odhiambo (2009) studying South Africa found tri-variate causality between savings, economic growth and foreign capital inflows. Olapido (2010) studying Nigeria found unidirectional causality between saving rate and economic growth, as well as FDI complementary role in growth. Misztal (2010)

affirmed unidirectional causality between domestic savings and GDP.

Ananzeh (2016) studying the relationship between bank credit and economic growth in Jordan found that bank credit efficiency has an important impact on economic growth in Jordan. Leitao (2012) studied link between bank credit and economic growth in European Union in the period from 1990 to 2010 and the results stated that savings promotes growth.

There are other studies prove the inverse relationship from growth to savings as Sinha (1998, 1999, 2000) empirical studies in developing countries including Pakistan, and Philippines found that economic growth Granger causes saving growth. Sinha and Sinha found same results in India (2007) and Mexico (1998). While Sinha (1999) studying Sri Lanka found opposite direction saving causing economic growth. Andersson (1999) states that causal relationships between output and saving differs according to the country also causality in long run can go in different direction in short run. Sajid and Sarfraz (1999) study state that there is a mutual relationship between output and savings in Pakistan while in long run the causality goes only from savings to GDP which goes with Keynesian model. Mavrotas and Kelly (2001) studied India and Sri Lanka found bidirectional causality in Sri Lanka but no causality between growth and private saving in India. Anorou and Ahmad (2001) investigating seven African countries the

study found economic growth causes saving in four countries and the opposite relation in Congo, and bidirectional in Cote d'Ivoire and South Africa. Mohan (2006) in favor of hypothesis of causality direction from economic growth to savings and the main finding that income category of the country specify the causality direction. Yenturk et al. (2009) found that GNP growth rate in Turkey increase saving. Samantraya and Patra (2014) studying saving n India from 1971 to 2012 found that GDP positively affect saving and there is a spiral interlinkages between saving and economic growth. Hundie (2014) studying savings, economic growth and investment in Ethiopia in the period from 1969 to 2011 found bidirectional causality between growth and investment and between investment and savings and very week causality from economic growth to savings.

Gjergji (2015) investigated the impact of saving on economic growth in the period from 1992 to 2012 the study found positive relationship between saving and economic growth with a complementary role played by FDI. Ananzeh (2016) studying the relationship between bank credit and economic growth in Jordan found that bank credit efficiency has an important impact on economic growth in Jordan. Leitao (2012) studied link between bank credit and economic growth in European Union in the period from 1990 to 2010 and the results stated that savings promotes growth.

As shown from the above empirical studies results the direction of the relationship between saving and economic growth differs due to countries heterogeneity which require further empirical study of MENA region to identify the direction of the causality and impact of saving on economic growth.

Fourth: Methodology Description

4.1 Definitions of the Variables

- **Real Gross Domestic Product (RGDP)**

Real GDP is the dependent variable in the model used as indicator of growth and development in the studied countries. The Explanatory variables as follow:

- **Gross domestic savings as percentage of GDP (Sav)**

Gross domestic savings has a significant role in economic growth through financing productive investment it is used to estimate the effect of domestic saving on economic growth. Saving considered as economic growth determinate through literature since Schumpeter (1911) through the role of financial institution of facilitating the financial funds to productive investments which stimulates technological innovation and economic growth.

- **Domestic credit provided by financial sector as percentage of GDP (credit)**

Domestic credit provided by financial sector as percentage of GDP used to estimate the effect of credit on economic growth. Bank credit plays an important role

to facilitate financial resources and redirecting it to the finance economic activities.

- **Foreign direct investment net inflows (FDI)**

Foreign direct investment net inflows used to estimate the effect of investment on economic growth. FDI included in number of empirical studies as an enhancer of economic growth.

4.2 Granger Causality Test

Granger (1969) created a methodology to study the causal relationship between time series. If x (t) and y (t) are stationary series, then the following model can be used to test if x causes y.

$$y_t = \alpha + \sum_{k=1}^{K} \gamma_k y_{t-k} + \sum_{k=1}^{K} \beta_k x_{t-k} + \varepsilon_t \qquad \text{with } t = 1, \ldots, T \qquad (1)$$

If past values of x are significant predictors of current y value then x have a causal impact on y. based on (1) causality can be investigated based on F-test with the following null hypothesis.

$$H_0 : \beta_1 = \ldots = \beta_K = 0 \qquad (2)$$

If H0 is rejected it means that there is causality from x to y. To test the causality in other direction the variables can be interchanged.

Dumitrescu and Hurlin (2012) developed Dumitrescu and Hurlin test (DH) to test Granger causality in panel data sets using (3). One concern in carrying the test is

choosing the number of lags to be used in the estimations. Based on Akaike, Bayesian and Hannan-Quinn an extension of

DH test has been added to facilitate this task (Lopez, Weber, 2017) which will be used in the current paper using Stata 14.

$$y_{i,t} = \alpha_i + \sum_{k=1}^{K} \gamma_{ik} y_{i,t-k} + \sum_{k=1}^{K} \beta_{ik} x_{i,t-k} + \varepsilon_{i,t} \quad \text{with } i = 1,\ldots,N \text{ and } t = 1,\ldots,T \tag{3}$$

Where $x_{i,t}$ and $y_{i,t}$ are the observations for individual i in period t. coefficients can differ across individuals, the lag k assumed to be identical for all individuals and the panel must be balanced.

To determine causality test for significant effects of past vales of x on the present value of y tested as in Granger (1969) using the following null hypothesis.

$$H_0: \beta_{i1} = \ldots = \beta_{iK} = 0 \quad \forall i = 1,\ldots,N \tag{4}$$

4.3 Panel Model Specification

This section investigates the impact of savings on economic growth in MENA region through regressing saving, credit and FDI on Real GDP to identify the significance and direction of relationship between savings in addition to credit and FDI as facilitators on real GDP used as proxy of economic growth. The model specified as follows:

$$RGDP_{it} = a_0 + a_1 sav_{it} + a_2 credit_{it} + a_3 FDI_{it} + \varepsilon_{it} \tag{5}$$

- RGDP: real GDP

- Sav: Gross domestic savings as percentage of GDP
- Credit: Domestic credit provided by financial sector as percentage of GDP
- FDI: net inflows of Foreign direct investment
- a_0 intercept parameter
- $a_1, \ldots, a_n$: are the coefficients of the independent variables
- ε stochastic error term

The pooled ordinary least square (OLS), panel random and fixed effect methods are employed then Hausman test carried which found that the random effects model best fits the data.

Data retrieved from World Bank - World Development Indicators database last updated October 2018.

Fifth: Empirical Results and Discussions

5.1 Results of Granger Causality Test

Dumitrescu and Hurlin test (DH) used to test Granger causality in panel datasets covering the period from 1990 to 2016 the test carried twice as follows:

5.1.1 Causality between Savings and GDP

Causality test between saving and GDP carried according to the following steps

- First the data was balanced as the test require that all data must be balanced
- Second generating one year lagged GDP variable
- Third running the test to check the following hypothesis

H0: Saving doesn't granger-cause GDP

H1: Saving does granger -cause GDP for at least one panel var (id)

- Fourth: lag of one year results rejected null hypothesis and accepted H1 which show that Saving does granger -cause GDP with very high significance
- Fifth: carrying DH lag test for choosing the optimal number of lags to be used in the estimation which found to be 6 years lag with very high significance.

  That shows that causality impact are very high significant starting from one year lag which goes with literature that saving cause economic growth.

Table (1): Dumitrescu and Hurlin Granger-Causality test results Saving and GDP

F- stat	P-value	Number of lags
16.7868	0.0000	6 lags (optimal lags)
5.7173	0.0000	1 lags

Source: Author's computation using Stata 14

5.1.2 Causality between Credit and GDP

Causality test between credit and GDP carried according to the following steps

- First the data was balanced as the test require that all data must be balanced
- Second generating one year lagged GDP variable
- Third running the test to check the following hypothesis

H0: Credit doesn't granger-cause GDP
H1: Credit does granger -cause GDP for at least one panel var (id)

- Fourth: lag of one year results accepted null hypothesis which show that credit does not granger -cause GDP
- Fifth: carrying DH lag test for choosing the optimal number of lags to be used in the estimation which found to be 2 years lag. At 2 years lag null hypothesis rejected accepted the hypothesis that credit Granger- cause GDP with high significance.

  That shows that Credit impact on GDP doesn't happen after at least 2 years which goes with literature that credit is an intermediary between saving and economic growth which needs time to take effect in causing the economic growth.

Table (2): Dumitrescu and Hurlin Granger-Causality test results Credit and GDP

F- stat	P-value	Number of lags
3.2746	0.0011	2 lags (optimal lags)
0.9188	0.3582	1 lags

Source: Author's computation using Stata 14

5.2 Panel Model Results

From the below table it can be deduced that using the random effect model, the R_2 (coefficient of determination shows that about 30 percent of the total

variations in GDP are explained by all the independent variables in the model.

Table (3): Panel Model Regression Results

Variables	Coefficient	p> ItI
saving	1.04	0.000
FDI	9.79	0.000
credit	1.71	0.000
Constant	5.73	0.254
R. Squared	0.305	

Source: Author's computation using Stata 14

As show from the results in table (3) all explanatory variables used are very highly positively significant to GDP which goes with literature. From the above table one percent increase in domestic saving will lead on average to 1.04 percent increase in real GDP. One percent increase in FDI will lead to on average to 9.79 percent increase in real GDP. One percent increase in domestic credit will lead on average to 5.73 percent increase in real GDP.

Conclusion

The present paper analyses the relationship between economic growth and savings. Explanatory variables were introduced as domestic savings, domestic credit and foreign direct investment. The results found that the endogenous models have a great potential to explain economic growth in the MENA region. The link between economic growth and saving was presented with OLS

model and Granger causality test. The study found that saving enhances economic growth in the MENA region with further positive significant assistance of credit and FDI.

The granger causality test results found that savings Grange cause economic growth with optimal 6 years lag. The causality impact is very highly significant starting from one year lag which goes with literature that saving cause economic growth.

Credit doesn't Granger cause economic growth with one year lag but with optimal lag period of two years credit found to Granger cause economic growth which goes with literature that credit is an intermediary between saving and economic growth which needs time to take effect in causing the economic growth.

Random effects model found to best fits the data using 23 MENA countries for the period from 1990 to 2016 all explanatory variables are highly positively significant to economic growth which goes with Schumpeter (1911), Harrod-Domar model, Solow (1956) growth model exogenous model that states that increase in saving rate will facilitate higher technological progress. McKinnon (1973) and Shaw (1973) followed Solow's hypothesis that saving role is very important in economic development due to its impact on increasing investment which will accelerate economic growth. Mankiw, Romer and Weil (1992) neoclassical model that found positive impact of saving rate on economic growth, and finaly Endogenous growth model which

considered savings, credit and liquid liabilities as explanatory variables of economic growth.

Macroeconomic policies in MENA countries should focus on increase domestic saving through raising awareness of the importance of savings and adding new financial tools that attract depositors to save their money on the banking system. New credit policies and tools should be introduced to attract more secured credit services. Foreign direct investment should be raised through attractive investment environment to enhance economic growth to help in financing entrepreneurial activities beside the domestic savings.

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Annex

Countries used in the regression analysis

Algeria
Bahrain
Djibouti
Egypt, Arab Rep.
Iran, Islamic Rep.
Iraq
Israel
Jordan
Kuwait
Lebanon
Libya
Mauritania
Morocco
Oman
Qatar
Saudi Arabia
Somalia
Sudan
Syrian Arab
Republic
Tunisia
Turkey
United Arab
Emirates
West Bank and
Gaza
Yemen, Rep.