The Casual Relationship between Household Savings and Economic Growth in Bahrain

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Abstract: This study aims to examine if neoclassical theory of growth is hold for Bahrain as an open economy employing Cointegration, Vector Error Correction and Granger Causality over the period of 1999-2014. Even though Cointegration test indicates the existence of a stable long-run equilibrium relationship between household saving and economic growth, Granger causality reveals that significant unidirectional causality runs from economic growth to household saving. This is contrary to the neoclassical theory of growth that causality runs from savings to economic growth. This is evidence that the theory does not hold in Bahrain during the period studied. Therefore, it might be suggested that household saving does not seem to play a major role in contributing to Bahrain's economic growth. This may be due to the fact that some other reasons bringing about savings unproductive.

Keywords: Household savings, Economic growth, Macroeconomic, Cointgration , Bahrain.

1. INTRODUCTION

Economists and policy makers have long recognized the critical importance of saving for the maintenance of strong and sustainable economic growth for developed and developing countries. The recent literature on economic growth has found that countries with higher savings have tended to have higher growth rates. This finding has been interpreted as being consistent the neoclassical theory or Solow model(1956)[1] that argues that higher saving leads to higher investment, which in turn leads to higher economic growth. The presupposition is that higher saving contributes positively to economic growth; therefore, this has led to strong macroeconomic policy recommendations for development in many countries. Although saving is found to have positive impact on economic growth as postulated in the traditional view of economic growth, it is not known whether the variable has impact on economic growth of Bahrain.

Kingdom of Bahrain is one of the Gulf Cooperation Council countries (GCC), it is a small open economy; relatively low populated country and high of financial surplus, in addition to foreign sector inflows have been a key power for the investment process because of more openness and liberalization of financial sector, trade and technologies.

Household saving in Bahrain represents an integral part of national saving, and it is the most important source of funds to finance capital investment in the real sector, because foreign capital is mostly invested in production of natural resources like oil and gas. Currently the ratio of household saving to GDP equals to 25%, which is considered one of the highest saving/GDP ratios in emerging economies, compared with 12% in year 1999. There are many reasons led to raise household saving in Bahrain during the study period such as: the growth of real GDP per Capita by 9% per annum ,financial incentives that offered by Bahrain commercial initiations that give high returns for different savings options, with no/or low risk, this led to raise household deposits by 70.5% per annum. Applying tax incentives for different forms of savings (Deposits, Bonds, stocks…etc.). In addition to confidence in Bahrain›s economy and development plans that carried out by the government of the Kingdom.[2]

There have been extensive theoretical and empirical researches examine the relationship between saving and/or household saving and economic growth both in the context of developed and developing countries. Although the relationship between household saving and economic growth is an important one, the direction of causality between the two variables has continued to generate series debate among scholars. Most theories and empirical studies point to saving led growth (Harrod, 1939; Solow, 1956; McKinnon1973, Romer1986,Page1994, Sinha and Sinha1998, Jappelli & Pagano, 1994; Romm 2005, Aghion at el.,2009, Oladipo, 2010, Turan and Gjergji 2014), while others show evidence for growth driven saving such (Keyns1936,Modigliani1970, Sinha & Sinha1998; Dekle1993, Saltz1999, Agarwal2001, Nurudeen2010, Abu, 2010, Pinchawe 2011), and some suggest there is bi-directional causality between the two variables such as: (Edwards 1996, Jappelli and Padula2007,Sajid and Sarfraz2008, Bassam2010). Few studies found ambiguous or no relationship between the two variables such as: (Sinha1996, Andersson1999, Mohan2006, Seng 2014). The empirical findings seem to be inconclusive. Aside from this, it is not known whether saving plays a major role in explaining economic growth in Bahrain as postulated in the neoclassical theory.

Therefore, the present study attempts to examine the causal relationship between household saving and economic growth, using Granger causality test. More specifically, the study is going to investigate whether increases in household saving Granger-causes GDP growth rate or vice versa

The examination of the causal relationship between household saving and economic growth in Bahrain is very important because it provides useful information on which economic variable that the Bahrain government and relevant authorities need to control in order to attain the desired level of the targeted variable. For example, if the results of causality test indicate that household saving precedes and causes economic growth, then Bahrain government and policy makers can design or employ policies that would promote the mobilization of saving in order to achieve higher economic growth in Bahrain.

Rest of the paper is organized as follows: Section two reviews the relevant literature. Section three presents the study methodology. Section four shows the data and empirical results. Section five concludes this paper with an agenda for policy makers.

2. THEORETICAL AND EMPIRICAL LITERATURE REVIEW

The relationship between household saving and economic growth remains a controversial one in both theory and empirical findings. This section presents a brief review.

2.1 REVIEW OF ECONOMIC THOUGHT

Different theories of economic growth focus on the question of what circumstances lead to sustained economic development within an economy. Among the different theories of economic growth are the mercantilists, classical, Keynesian, neoclassical and Endogenous Growth theories.

Early economic theories developed as Europe moved away from feudalism and toward capitalism. Two early and opposing schools of thought were the physiocratic and mercantilist theories of economic growth. French theory, believed that economic growth came only from land ownership and agriculture. The latter, on the other hand, believed that trade was the sole producer of economic growth.

Adam Smith (1776) in his work "*Inquiry into the Nature and Causes of the Wealth of Nations*" developed the classical theories of economic growth as a critique of both the physiocrats and the mercantilists. According to Smith, division of labor comes from two sources, first the saving and capital

accumulation, and seconds the extent of the market. The saving in capitalists system, savings creates investment and hence economic growth. It is useless for division of labor if the market is very small. The economy tries to use cost saving technology and division of labor in the case where the market is large. Division of labor is limited by the size of market, and trade limits the size of market. Free trade can be both domestically and internationally.[3]

Keynes (1936) believed that during a recession, wealth creators or wealth holders will hold onto their money and not invest it in the free market. As a result, Keynes' theory on economic growth state that the government must invest in the labor market to boost economic growth that stimulates increased savings, where increases in output leads to increase incomes, thus raising the level of saving in the economy at least in the short run.[4]

The earliest attempt to extend the Keynesian theory to the long run was made by Harrod (1939) and Domar (1946) growth model which is a conventional empirical that helps people to understand the economic growth rate derive from the productivity of capital and the savings level. This model states that aggregate savings are arranged from any funds with the purposes of investment. According to the Harrod - Domar growth model, the GDP growth rate of an economy depends on two important factors the savings level and capital-output ratio of the economy. This means that GDP growth rate has a positive correlation to the average propensity to save (s). Therefore, the more saving or investment in an economy, the greater will be of the rate of national income (GDP). [5]

Robert Solow (1956) helped to develop the classical theory by insisting that savings creates growth and consumption should be postponed to allow savings to be built up. The Solow growth model predicts that a rise in the saving rate (the saving supply from full employment income) positively affects the level of per capita income. If the rate of saving increase, the steady state (which is k* in his model) will also rises. The income/output per capita is higher; however, the growth rate of output will not grow in the same level as increasing of saving. Solow supposed that the size of economy does not matter for the economic growth, but the main factors depend on capital, labor and technology. [1]

Modigliani (1970) showed that a very simple version of the life-cycle model can predict that high growth causes high saving and he found empirical support for the theoretical prediction using cross-country data. He argued that higher growth raised the life-time wealth of young (working) savers relative to retired (non-working) dissevers, thus raising the total savings of the economy. The increase in national savings in turn leads to higher investment and expansion of output.[6]

During mid-1980s a new beginning of growth theory launched by Romer (1986), called New or Endogenous Growth Theory, where he tried to explain the growth process in a different manner. Thus the dissatisfaction out of neoclassical model motivated to construct new growth theories where the key determination of growth theories are endogenous in the model as in these new theories, the long run growth is not determined by exogenous factors setting up endogenous growth theories. The simplest version of endogenous model is AK model which assumes constant exogenous saving rate and fixed level of technology. The stickiest assumption of this model is that production function does not include diminishing returns to capital. This means that with this strong assumption the model can lead to endogenous growth. One of his conclusions is that higher saving leads to a permanently higher rate of economic growth. [7]

Mankiw et. al (1992) in catching up effect theory argued that if government policies stimulate the national saving rate, people will tend to save more and consume less, and this will create more resources available to make capital goods. Therefore, the capital stock will rise, causing growth in productivity and GDP. [8]

2.2 REVIEW OF EMPIRICAL STUDIES

A review of literature on the relationship between saving and economic growth indicates a positive relationship between household savings and economic growth. This relationship can be explained with several approaches. Some empirical studies analyze the relationship between the two variables using the correlation coefficient and dynamic econometric models. While other studies used the Cointegration techniques in addition to the Granger causality test. Moreover, some empirical studies point to saving led growth , and others show evidence for growth driven saving, while few studies found ambiguous or no relationship between the two variables.

2.2.1 HOUSEHOLD SAVING CAUSES ECONOMIC GROWTH

Bacha (1990)[9], Otani and Villanueva (1990)[10], DeGregorio (1992)[11], Jappelli and Pagano (1994)[12] analyze the relationship between economic growth and savings using the ordinary least squares method (OLS). Their researches prove that the higher saving rate (share of domestic savings in GDP), the higher the economic growth rate. While Sinha and Sinha(1998)[13] performed multivariate causality tests between the growth rate of private saving, public saving and economic growth for Mexico. The results show that the growth rates of private and public saving Granger cause economic growth. In year 1999 Sinha found some evidence that causality flows from both gross domestic saving and from gross domestic private saving to economic growth for Sri Lanka. So, the conventional wisdom does hold for Sri Lanka.[14].

Alguacil et al (2004) investigate the saving-growth nexus by taking into account the impact of foreign capital in complementing saving and the beneficial effects of FDI on domestic investment and income. The Granger non-causality test revealed that higher saving precedes economic growth.[15] Also researches carried out by Krieckhaus (2002) in 32 countries indicates that higher level of savings led to higher investment levels and thus contributed to higher rate of economic growth in analyzed countries.[16]

In Kazakhstan Katircioglu and Naraliyeva (2006) analyzed the relationships between private savings, direct foreign investment and economic growth during the period (1993-2002) using the Granger causality test and co-integration methods. The results of their research pointed at the existence of one-way, positive relation between private savings and economic growth in Kazakhstan in a long period of time.[17] Also Mohan (2008) found that household savings in India has contributed significantly to its economic growth which recorded a steady rise over the last decades.[18]

In Nigeria, Olajido (2009) employed the Toda and Yamamoto (1995) and Dolado and Lutkepohl(1996) TYDL methodology to examine the direction of causal relationship between savings and economic growth in Nigeria between 1970 and 2006. The empirical results proposed that savings and economic growth are positively Cointegrated indicating a steady long run equilibrium relationship. Further, the findings revealed a unidirectional causality between savings and economic growth and the corresponding role of FDI in growth.[19]

Piotr(2010) analyzed the cause and effect relationship between economic growth and savings in advanced economies and in emerging and developing countries. In this work he used Cointegration models and Granger's causality test. The results confirmed the existence of one-way causal relationship from gross domestic savings to gross domestic product in the case of developed countries as well as in developing and transition countries.[20]

Ramesh (2011) investigated the relationship between saving, investment and economic growth for India over the period 1950-51 to 2007-08. He found that the Cointegration analysis suggested that there

is a long-run equilibrium relationship. The results of Granger causality test show that higher saving and investment lead to higher economic growth, but the reciprocal causality is not observed. Further, it is empirically evident that saving and investment led growth is coming from the household sector.[21] Aswini and Mohit(2012) found the same results when they study the pattern between savings, investment and economic growth and the policies which led to such changes and estimating and forecasting the policy implications which would affect these variables in India for the period(1950-2011). They found that the direction of causality is from saving and investment to economic growth collectively as well as individually and there is no causality from economic growth to saving and/or investment.[22]

2.2.2 ECONOMIC GROWTH DRIVEN HOUSEHOLD SAVING

Dekle (1993) presented comparable Granger causality regressions for a group of fast growing countries and he found that growth positively Granger-causes saving in every country in his sample. [23] Caroll and Weil (1994), basing on the data of five-year average rates of economic growth in OECD member states and using Granger causality test came to the conclusion that the rate of economic growth was the cause of savings in Granger sense.[24]

Edwards (1995) looked at data from a panel of 36 countries over the period (1970-1992) Using lagged population growth, openness, political instability, and other lagged variables as instruments, he concluded that the rate of output growth has an important, positive effect on saving.[25] In Mexico, Sinha and Sinha (1998) employed econometric techniques to validate or invalidate the claim that higher household saving rate leads to high growth rate. The empirical results did not support the view that higher saving rate causes higher economic growth. The authors concluded that causality runs from economic growth to saving.[26] Agarwal (2001) found the same results for a sample consisting Asian economies, where he discovered that, in most economies causality runs from GDP to saving.[27]

Using cross section data between 1960 and 1997 and Granger causality methodology, Anoruo and Ahmadi (2001) observed the causal relationships between the growth rate of domestic savings and economic growth for seven African countries (Congo, Cote d'Ivoire, Ghana, Kenya, Nigeria, South Africa and Zambia). Their studies established that savings are Cointegrated in all of the countries except for Nigeria and that economic growth Granger-causes the growth rate of domestic savings for all the countries considered except Congo where reverse causality was obtained.[28],while Bhaharumshah et al (2003) found that saving does not Granger cause economic growth rate for five Asian countries (Singapore, South Korea, Malaysia, Philippines and Thailand).Also, dealing with the relationship between savings and economic growth for various economies with different income levels.[29]

In the work done by Verma (2007), the regression results support the Carroll-Weil hypothesis (1994) that it is not savings that causes economic growth, but instead, it is growth that causes savings in India.[30], while Attanasio et al.(2000) questioned the reliability of the results obtained by Caroll and Weil, implying that the use of annual data instead of average data from five years improves the precision and statistical importance of estimates and changes the structure of the causal relationship between variables.[31]

Waithima (2008) used the Hendry Model with a two-step method to model a saving function for Kenya. He observed that a 1% increase in GDP growth rate causes a 0.5% increase in private saving. Moreover, the causality tests revealed a unidirectional causality that runs from per capita GDP to private saving.[32], while in Pakistan Sajid and Sarfraz (2008) employed both Cointegration and the vector error correction techniques and discovered that unidirectional short and long runs causality from output (GNP and GDP) to household savings. They concluded that overall short run results favor Keynesian point of view that savings depend upon level of output.[33]

Nurudeen (2010) employed the Granger-causality and Johansen co-integration test to analyze the relationship between saving and economic growth in Nigeria during the period 1970- 2007. He found out causality runs from economic growth to saving, implying that economic growth proceeds and granger causes saving. He recommends that government and policy makers should employ policies that would accelerate economic growth so as to increase saving.[34] Piotr (2011) analyzed the cause and effect relationship between economic growth and savings in advanced economies and in emerging and developing countries. He applied Cointegration models and Granger's causality test. The results confirmed the existence of one-way causal relationship between gross domestic savings and gross domestic product in the case of developed countries as well as in developing and transition countries. At the same time it was revealed the absence of causal relationship between gross domestic product and gross domestic savings both in developed economies and developing and transition countries.[35] The same results found by Pinchawee (2011) when he investigated the causality relationship between the domestic saving and economic growth of Thailand during the period(1960-2010), the empirical result suggested that the direct of causality goes from economic growth to saving only.[36]

Some studies found that no relationship between the two variables such as : Sinha (1996) when he looked at the causality between the growth rates of gross domestic saving and gross domestic private saving and economic growth. The bivariate causality results showed that there is no causality running in either direction between the growth rate of private saving and economic growth or between the growth rate of saving and economic growth.[37] Also in the study of Sinha and Sinha (2007), when they examined the relationship between per capita saving and per capita GDP for India during the 1950-2004 period. They employed the Toda and Yamamoto tests of Granger causality and discovered that there is no causal relationship between per capita GDP and per capita household saving.[38] The same conclusion shown in the study of Seng(2014) when he examined the relation between saving and economic growth for Cambodia[39]

Other studies found the results differ across the countries such as: Andersson (1999), when he used the bivariate vector autoregressive (VAR) or vector error correction (VEC) models to analyze the relationship between saving and GDP for a group of countries that include Sweden, UK, and USA. The results of the Granger non-causality test indicated that the direction of causal relationship between saving and output differ across the countries.[40] Also, Saltz (1999) using the model of vector error correction (VEC) and the model of vector auto regression (VAR) analyzed the relation between savings and economic growth in seventeen countries from all over the world. The results of the analysis indicated that in nine of the analyzed countries economic growth was the cause of increased domestic savings. In two countries the opposite relation was noticed, while in three other countries no causal relation between economic growth and domestic savings was identified. Finally, in two countries, the existence of a two-way causal relation between analyzed variables was confirmed.[41] Mohan (2006) studied the relationship between domestic saving and economic growth for many countries with different income levels. He addressed whether the causality of domestic saving and economic growth is different among low income, low middle income, upper middle income, and high income countries. He used test of stationary (the ADF test), test for Cointegration by Johansen method, and the granger causality test. The result of the relationship between domestic saving and economic growth for with different income levels is indicate that for high income countries (HIC) the direction of causality run from economic growth rate to growth rate of saving, In upper-middle income countries (UMC), the result indicates that there is bi- direction causality. The direction of causality runs from growth rate of saving to economic growth rate in the same time it runs from economic growth rate to growth rate of saving. This can imply that these countries are in the transit time to reach the steady state as high income countries (HIC).The empirical study for lower-middle income countries (LMC) also had the result similar to high income countries (HIC) which is the direction of causality run from economic growth rate to growth

rate of saving. However, there is no causality between growth rate of saving and economic growth rate in Ecuador. The empirical result in Low-income countries (LIC) suggested that some countries are bi- direction causality, in some countries the direction of causality run from growth rate of saving to economic growth rate, and some countries is run from economic growth rate to growth rate of saving. And India is no causality between two variables. In conclusion, this paper based the result favor the causality relationship in term of causality run from economic growth rate to growth rate of saving. Moreover, he believed that the income class does play an important role for the causality direction.[42]

Ibrahim (2013) tries to examine the relationship between domestic saving and economic growth in GCC countries, the main finding shows that the causality direction is differ from country to another country , where economic growth rate Granger causes growth rate of saving in 4 countries, while the results prevailed in one country, and the bi-directional causality was found in one country.[43]

Bassam AbuAl-Foul (2010) employed an econometric technique to investigate the long run relationship between real gross domestic product and real gross domestic saving for Morocco and Tunisia during the period 1965-2007 and 1961-2007, respectively. The regression exercise reveals interesting results. For instance, it was shown that whereas a long-run relationship exists between gross domestic product and gross domestic saving in Morocco, there was no such evidence for Tunisia. Secondly, the Granger causality test indicates the existence of a two-way causal relationship between gross domestic product growth and gross domestic saving growth in Morocco. Lastly, he observed a unidirectional Granger causality between real gross domestic product and real gross domestic saving as causality runs from gross domestic saving growth to gross domestic product growth in Tunisia.[44]

Finally the study of Adebiyi (2005) was a surprise, when he employed quarterly data spanning between 1970 and 1998 to examine savings and growth relationships in Nigeria using Granger causality tests and impulse response analysis and concluded that growth, using per capital income, is sensitive to, and has an inverse effect on household savings.[45]

3. METHODOLOGY

To examine the extent to which economic growth is related to household saving and vice versa, the theory of Cointegration and Error Correction Models (ECM) is applied. The Engle-Granger two-steps Cointegration procedure is employed to test the presence of Cointegration between the two variables. [46] If both time series are integrated of the same order then it is possible to proceed with the estimation of the following Cointegration regression:

$$\text{Log Hs}_t = \sum_{i=1}^{n} a_i \text{ Log Hs}_{t-i} + \sum_{j=1}^{n} b_j \text{ Log Y}_{t-j} + \varepsilon_t \tag{1}$$

$$\text{Log Y}_t = \sum_{i=1}^{n} c_i \text{ Log Y}_{t-i} + \sum_{j=1}^{n} d_j \text{ Log Hs}_{t-j} + \mu_t \tag{2}$$

Where Log Y_t : Economic growth rate, Log HS_t: household saving rate at time t, ε_t and μ_t are random error terms

In principle, there can be a long-run or equilibrium relationship between two series in a bivariate relationship only if they are stationary or if each series is at least integrated of the same order (Campbell and Perron, 1991).[47] That is, if two series are integrated of the same order, I (d) for d = 0, 1, 2… then

the two series are said to be Cointegrated and the regression on the same levels of the two variables is meaningful (not spurious). Therefore, the first task is to check for the existence of stationary property in the series for economic growth rate and household savings. We employ (ADF) unit root test (Dickey and Fuller, 1981),[48] in order to test each of the series in the levels (Log Y_t and Log HS_t) and the first difference. ADF allows for higher autocorrelation in residuals. That is, we consider an equation of the form:

$$\Delta X_t = \beta_1 + \alpha_1 X_{t-1} + \sum_{i=1}^{n} \rho \, \Delta X_{t-i} + e_{1t} \tag{3}$$

In the above equation, X is the variable under consideration, Δ is the first difference operator, t is a time trend and e_{1t} is a covariance stationary random error term. The optimal lag length n is determined in the ADF regression and is selected using Akaike's Information Criteria (AIC) (Akaike, 1973) to ensure serially uncorrelated residuals [49]. The null hypothesis of non-stationary is tested using the t-statistic with critical values calculated by MacKinnon (1991).[50]. The null hypothesis that $LogY_t$ and Log HS_t are non-stationary time series is rejected if $\alpha_1 < 0$ and statistically significant.

ADF test is carried out for both variables by replacing Xt with $LogY_t$ and Log HS_t in equation (3) ADF unit root test is also applied for residuals ε_t and μ_t {from equations (1) and (2)} by rewriting equation (3) in terms of ε_t and μ_t instead of X_t. When ε_t and μ_t are found to be integrated of order zero then it can be concluded that these two series are Cointegrated. If the hypothesis of no integration is rejected, a stable long-run relationship exists between economic growth and household saving rates. According to Engle and Granger (1987), when Log Yt and Log HSt are found to be Cointegrated then there must be an error correction mechanism (ECM) that may take the following form:

$$\Delta \, LogHS_t = \alpha_0 + \sum_{i=1}^{m} \alpha_1 \, \Delta \, LogHS_{t-1} + \sum_{j=0}^{n} \alpha 2 \, \Delta \, Log \, Y_t + g_1 \, E_{t-1} + V_1 \tag{4}$$

$$\Delta \, Log \, Y_t = \beta_0 + \sum_{i=1}^{m} \beta 1 \, \Delta \, LogY_{t-1} + \sum_{j=0}^{n} \beta 2 \, \Delta \, LogHS_t + g_2 E_{t-1} + V_2 \tag{5}$$

In the above equations E_{t-1} is an error correction terms, *n* and *m* are the number of lag lengths (determined by AIC) and V_1 and V_2 are random disturbance terms. The error correction term measures the deviations of the series from the long-run equilibrium relationships. For the series to converge to the long-run equilibrium relation, $g_1 \geq 0$, $g_2 \leq 1$ should hold, however Cointegration implies that all g_1, g_2 should not be equal to zero.

In order to conduct the causality direction between the two variables, Granger (1969) developed Granger causality test. The Granger causality test regresses a variable Y on a lagged value of itself and another variable X. If X is significant, this means that it explains some of the variance of Y that is not explained by lagged value of Y itself. This shows that X is causally prior to Y and said to Granger causes Y. [51]

4. DATA AND EMPIRICAL RESULTS

4.1 DATA

The data employed in this study is time series data, which is limited to the period (1999-2015). The collected data are macro data for GDP growth rate, and household saving rate. Annual data is taken

from the Central Bank of Bahrain statistical Bulletin (various issues).The variables used in this study are *Log HS* (log of household saving) and *LogY* (log of Real GDP)**.** All the data are in BD millions and are measured in real terms (2001=100). Figure (1) shows the changes of the variables that used in the model. As seen Bahrain's household saving and economic growth rates having stayed consistently at an average of 5% and 16.7% a year respectively.

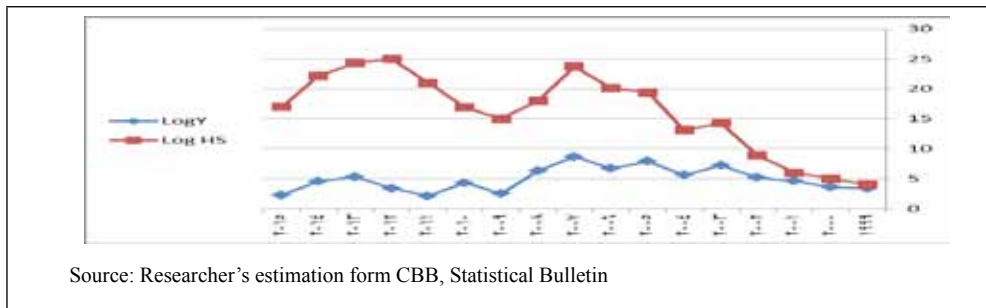Source: Researcher's estimation form CBB, Statistical Bulletin

Figure 1. Household saving rate and Economic growth rates in Bahrain during (1999-2015)

A significant positive and robust relationship between growth rate and household saving rate is being observed during the study period, as shown from figure (2). The correlation coefficient between the economic growth and household savings rate calculated on the basis of the above data was 0.56 in the 1999-2015 period, which proves the existence of essential and positive linear relation between these variables.
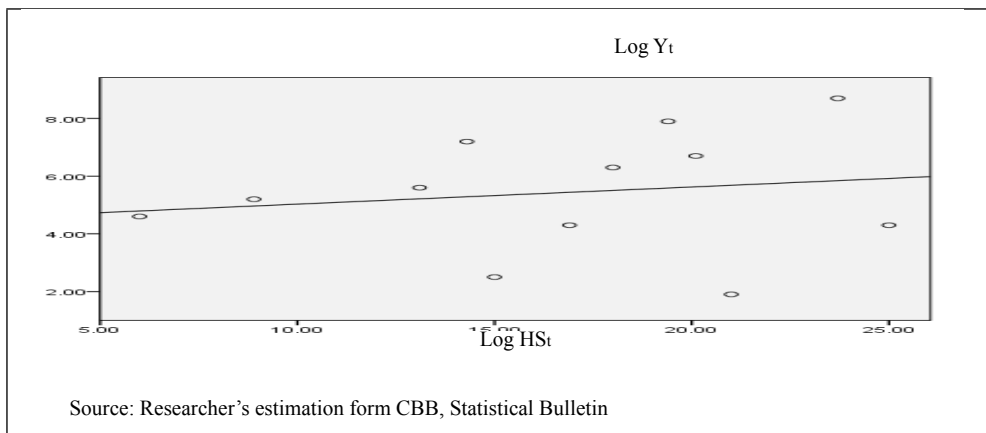

Source: Researcher's estimation form CBB, Statistical Bulletin

Figure 2. Relationship between household savings rate and economic growth rate in Bahrain during (1999-2015)

4.2 EMPIRICAL RESULTS

Before determining the causal relationship between household saving and economic growth and vice versa in Bahrain during the study period, it is essential to determine the stationeries of the analyzed time series. To do so, we use the ADF test (Augmented Dickey-Filler). Table (1) shows the results of the ADF unit root test for the variables in their level and first differences. The data series of both variables are not found to be non- stationary at level. If the non-stationary data series is used to perform the

granger causality test; the results of the test could be spurious. In order to make it stationary; the same test performed on first differences for both variables. After taking the first differences; the coefficients compared with the critical values reveals that household saving is found to be stationary as well as economic growth. Based on the ADF test results; the two variables are integrated of order one I (1)

TABLE 1. ADF UNIT ROOT TEST FOR LEVEL AND FIRST DIFFERENCES

H0: there is a single unit root H1: there is no single unit root		
Variables	**Level**	**First difference**
	Intercept& trend	Intercept& trend
Log Y_t	-2.47(1)	-3.07(2)
Log HS_t	-1.84(2)	-2.14(3)

Source: Researcher's estimation using SPSS

* ADF critical values at level are: -4.071 at 1%, -3.464 at 5% and -3.158 at 10%. While ADF critical values at first differences are: -2.727 at 1%, -1.964 at 5% and -1.627 at 10%

**The numbers in parentheses are the lags used for the tests, which are augmented up to a maximum of 4 lags. The choice of optimum n lag was decided on the basis of minimizing the Schwarz information criterion

The next step is to carry out the Engle-Granger two steps Cointegration test that confirms the existence of correlation relationship between the two variables. Table (2) illustrates the regression outcome of equations (1) and (2) as well as the ADF test for residuals that obtained from regression. The results indicate that the residuals are free of unit roots and Cointegrated of degree zero I(0); this means household saving and economic growth are Cointegrated and there is a long run relationship between both of them.

TABLE 2. ENGLE AND GRANGER TWO-STEP COINTEGRATION TEST

Regression equation Variables	**Coefficient of Log HS_t**	**Coefficient of Log Y_t**	**ADF statistics for residuals**
Log Y_t	0.039		--3.56* (1)
Log HS_t		0.450	-2.89**(1)

Figures within parentheses indicate lag lengths

*, ** indicate significant at 1% and 5% levels respectively comparing
with critical t-statistic as computed by MacKinnon (1991).

The estimated coefficients of the error correction term (long-run effects) and the lagged values of the two series (short-run effects) is shown in table (3) The results show that there is unidirectional relationship between of economic growth and household saving from growth rate to household saving rate and not vice versa with appropriate signs (negative), where the estimated coefficient of the error correction term (Et-1) is significant at the 1% level.

TABLE 3. ERROR CORRECTION MODEL RESULTS

Variables equation	LogHS$_t$	Log Y$_t$
Const.	-0.18 (-0.36)	0.064 (1.38)
E$_{t-1}$	-0.34 (1.26)	-0.62 (3.78)*
Log Y$_t$	0.98 (2.43)*	---------
Log Y$_{t-1}$	0.67 (2.16)*	0.47 (3.27)*
Log Y$_{t-2}$	1.23 (1.25)	0.38(2.77)**
Log HS$_t$	---------	0.07 (1.56)***
Log HS$_{t-1}$	0.25 (3.12)*	0.25 (1.26)
Log HS$_{t-2}$	0.17 (0.61)	0.08 (0.14)
Adjusted R^2	0.659	0.374
DW	1.906	2.08
FF	0.716	1.12
Normality	1.505	2.408
Het.	0.3519	0.3789

Figures in parentheses are t-statistics

*, ** and *** indicate significant at 1%, 5% and 10% levels respectively comparing with critical t-statistics from standard t-table. DW: D.W

Statistic for testing residual serial correlation. FF: Ramsey's (1970) RESET test functional form. Normality: Jarque – Bera test (1981) for skewness and excess kurtosis of the residuals He: Heteroscedasticity (Koenker, 1981).

In order to confirm the previous results, the Granger Causality test employed to examine the pair wise relationship between variables. The results are provided in Table (4), where, the first null hypothesis is rejected which means that economic growth Granger causes household saving, while, the second null hypothesis is accepted implying that household savings does not Granger cause economic growth. The results reveal that a unidirectional causal relationship that runs from economic growth to household saving, On the other hand, there is no reverse causality runs from household saving to economic growth. The result consistent to the Keynesian theory (economic growth leads to higher saving), while it is contrary to neoclassical theory of growth that causality runs from savings to economic growth; and therefore this theory is not likely to hold in Bahrain economy during the study period.

TABLE 4. RESULTS OF THE GRANGER CAUSALITY TEST

Pairwise Granger Causality Test Sample:1999-2015 Lags:2			
Null Hypothesis	**Obs.**	**F-Statistic**	**Probability**
Log Y_t does not Granger cause Log HS_t	17	2.91	0.147
Log HS_t does not Granger cause Log Y_t		0.012	0.185

5. CONCLUSION

The study aims at investigating whether or not the traditional view of growth is hold for Bahrain economy during the period of 1999-2015, which states that, a high level of household saving helps the economy to progress on a continuous growth path since investment is mainly financed out of savings. In order to achieve the study goal, Cointegration method employed to conduct the nature of the relationship between the two variables. The main finding is that there is a long run relationship between the two variables that leads to investigate the causality direction between both of them. The findings suggest that the economic growth rate Granger causes household saving rate. Accordingly the traditional view of growth is not valid for Bahrain economy, where the causality runs from economic growth to household saving. Accordingly, we can say that Bahrain economy tends to have higher level of income (GDP) first in order to generate higher rate of household saving, which means that income source of Bahrain economy does play an important role in determining the direction of causality, where most income comes from natural resources. Therefore, we recommend that government and policy makers should employ policies that would accelerate economic growth so as to increase GDP per capita and household saving. These policies should be consistent to Bahrain Economic Vision 2030, where the ultimate aim is to ensure that every Bahraini household has at least twice as much disposable income · in real terms · by 2030. This could be happened if Bahrain government improves population, participation and/or productivity (3Ps), by adopting the following strategy: first, diversification of economic activities strategy because of oil sector is likely diminishing ability to continue to drive the real growth and government revenue in the following years, especially when the oil prices getting down recently ; therefore other activities are needed to drive growth and generate sufficient employment opportunities for the growing population. Moreover, government revenue sources will have to be diversified to ensure the sustainability of public sector expenditure. Second, apply proactive promotion strategy of specific industries and sectors through sustained high levels of investment; this is a growth model was successfully implemented in East Asian countries such as Singapore and South Korea, and it proved instrumental for propelling these countries from developing into advanced economies. Third, develop the export-oriented sectors to finance investments. Fourth, upgrade the efficiency of government funding and availability of private funding. Fifth, support the transition of small and medium size businesses to larger corporations. Finally the expansion of output at faster rates than Bahrain population growth rate will give the opportunity to Bahraini people to enjoy higher standards of living.

REFERENCES

Robert M. Solow, "A Contribution to the Theory of Economic Growth", The Quarterly Journal of Economics,Vol.70, No.1, pp.65-94, Feb.1956.

Central Bank of Bahrain, Statistical Bulletin: Various Issues.

Adam smith, "An Inquiry into the Nature and Causes of the Wealth of Nations", An electronic classic series publication, Edited by Jim Mants, English department, The Pennsylvania State University, USA. 1776.

Keynes , "The General Theory of Employment, Interest and Money", Palgrave Macmillan, UK, 1939.

Harrod, R.F.,"An Essay in Dynamic Theory", Economic Journal, March, 1939

Angus, D. and Christin, P., "Growth and Saving among Individuals and Households", The Review of Economics and Statistics Journal, Vol.82, No.2, May.2000

Romer, Paul M.,"Increasing Returns and Long-Run Growth," Journal of Political Economy, Vol. 94, No.5,pp. 1002−1037, October 1986.

N. Gregory Mankiw & David Romer & David N. Weil , "A Contribution To The Empirics Of Economic Growth", The Quarterly Journal Of Economics, May 1992

Bacha, E. L., A, "Three-Gap Model of Foreign Transfers and the GDP Growth Rate in Developing Countries", Journal of Development Economics, Vol.32.1990.

Otani, I., Villannueva,D., "Long Term Growth in Developing Countries and its Determinants: An Empirical Analysis", World Development, Vol.18.1990.

DeGregorio, J.," Economic Growth in Latin America", Journal of Development Economics, Vol.39.1992.

Japelli, T., Pagano, M., "Savings, Growth and Liquidity Constraints", Quarterly Journal of Economics, Vol.109.1994.

Sinha, D. and Sinha, T., "Cart Before the Horse? The Saving-Growth Nexus in Mexico", Economics Letters, Vol.61, 1998

Sinha, D., "Export Instability, Investment and Economic Growth in Asian Countries: A Time Series Analysis", Yale Economic Growth Center, Vol. 52, No.3,1999.

Alguacil, M., Cuadros, A., Orts, V., "Does Saving Really Matter for Growth? Mexico(1970-2000)", Journal of International Development, Vol.16,No. 2, 2004.

Krieckhaus,J., "Reconceptualizing the Developmental State: Public Savings and Economic Growth", World Development, Vol.30, No.10, pp.1697-1712, 2002.

Katircioglu, S. T., Naraliyeva, A., "Foreign Direct Investment, Domestic Savings and Economic Growth Kazakhstan: Evidence from Co-Integration and Causality Tests", Investment Management and Financial Innovations, Vol. 3, No.2, 2006

Mohan R., "The Growth Record of the Indian Economy, 1950-2008: a Story of Sustained Savings and Investment", Deputy Governor of the Reserve Bank of India Conference, Growth and Macroeconomic Issues and Challenges in India.2008

Olajide S. Oladipo, "Does Saving Really Matter for Growth in Developing Countries? The Case of a Small Open Economy", 2009, Available at: http://economics.ca/2009/papers/0619.pdf.

Piotr M., "The relationship between Savings and Economic Growth in Countries with Different Level of Economic Development", University of information technology and management, Financial Internet Quarterly finance,Vol.7, No.2, 2010.

Ramesh, J., "Causal Relationship between Saving, Investment and Economic Growth for India: What Does the Relation Imply?", MPRA paper, No.40002, 2001.

Aswini K, and Mohit,J., "Investigating the Causal Relationship between Saving, Investment and Economic Growth for India", International Journal of Financial Management,Vol.1, No.2, 2012.

Dekle,R.," Raising Saving Rates: Evidence from the Japanese Economy", Manuscript, World Bank, 1993.

Caroll, C. D., Weil, D. N., "Saving and Growth: A Reinterpretation", Carnegie-Rochester Conference Series on Public Policy, Vol.40, 1994.

Edwards, S., "Why are Saving Rates so Different across Countries?", An International Comparative Analysis, NBER Working Papers, No. 5097, 1995

Sinha, D. and Sinha, T., "Relationships among Household saving, Public saving, Corporate saving and Economic growth", Journal of International Development, Vol. 20, No.2, 2008.

Agrawal, P., "The Relation between Savings and Growth: Cointegration and Causality Evidence from Asia", Applied Economics, Vol.33, 2001.

Anoruo, E., Ahmad, Y., "Causal Relationship between Domestic Savings and Economic Growth: Evidence from Seven African Countries", African Development Bank, Vol. 13, No.2, 2001.

Baharumshah et al., "Savings Dynamic in Asian Countries", Journal of Asian Economics, Vol.13,pp. 827-845, 2003.

Verma, R., "Savings, Investment and Growth in India: An Application of the ARDL bounds testing approach", South Asia Economic Journal, Vol. 8, No.1, 2007

Attanasio, O. P., Picci, L., Scorcu, A. E., Saving, "Growth, and Investment: A Macroeconomic Analysis Using a Panel of Countries", The Review of Economics and Statistics, Vol. 82, No.2, 2000.

Waithima, A. K., "the Egg or the Chick First; Saving or GDP Growth: Case for Kenya", KCA Journal of Business Management, Vol.1, No.1, 2008.

Sajid, G. M. and M. Sarfraz, "Savings and Economic Growth in Pakistan: An Issue of Causality", Pakistan Economic and Social Review, Vol. 46, No.1, 2008

Nurudeen, Abu, "Saving-Economic Growth Nexus in Nigeria, 1970-2007: Granger Causality and Co-Integration Analyses", Review of Economic and Business Studies, Vol. 3, No.1, 2012

Piotr M., "The relationship between Savings and Economic Growth in Countries with Different Level of Economic Development", University of information technology and management, Financial Internet Quarterly finance,Vol.7, No.2 , 2010.

Pinchawee, R., "The Relationship Between Domestic Saving and Economic Growth and Convergence Hypothesis: Case Study of Thailand", Master thesis, Sodertorns University, Netherlands, spring.2011.

Sinha, D.,"Saving and economic growth in India", EconomiaInternazionale, Vol.49, No. 4,1996.

Sinha, D. and Sinha, T., "Relationships among Household Saving, Public Saving, Corporate Saving and Economic Growth" , Minich Personal RePEc Archive, MRPA paper, No.2597, April 2007.

Seng Sothan,"Causal Relationship between Domestic Saving and Economic Growth: Evidence from Cambodia", International Journal of Economics and Finance; Vol. 6, No. 9; 2014

Anderson, B., "On the Causality between Saving and Growth: Long and Short Run Dynamics and Country Heterogeneity" , Department of Economics, Uppsala University, Sweden, 1999.

Saltz, I. S., "an Examination of the Causal Relationship between Savings and Growth in the Third World", Journal of Economics and Finance, No.23, 1999.

Mohan, R., "Causal relationship between savings and economic growth in countries with different income levels", Economics Bulletin, Vol.5, No.3, pp. 1–12, 2006.

Ibrahim Alomar, "Economic Growth and Savings in GCC:A Cointegration and Causal Relationship Analysis", International Journal of Humanities and Social Science, Vol. 3 No. 9, May 2013

Bassam, AbuAl-Foul, "the Causal Relation between Savings and Economic Growth: Some Evidence from MENA Countries", Being a Paper Presented at the 30th MEEA Meeting in Atlanta, January 2010.

Adebiyi, "Saving-Growth Relationship in Nigeria: An Empirical Evidence", African Review of Money, Finance and Banking, 2005.

Engle, R.F. and C.W.J. Granger, "Cointegration and Error Correction: Representation, Estimation and Testing", Econometrica, Vol.55, 1987.

Campbell and Perron, "A critique of the application of unit roots tests", Journal of Economic Dynamics and Control, Vol.15, pp.275-284, April 1991.

Dickey, D.A. and W.A. Fuller, "Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root", Econometrica, Vol. 49, 1981

Shuhua Hu, "Akaike Information Criterion", Center for Research in Scientific Computation North Carolina State University, Raleigh, NC, March 15, 2007

MacKinnon, J. G., "Critical values for Cointegration tests", Chapter 13 in Long-Run Economic Relationships: Readings in Cointegration, ed. R. F. Engle and C. W. J. Granger. Oxford, Oxford University Press, 1991.

Granger, C., "Investigating Causal Relations by Economic Models and Cross-Spectral Methods", Econometrica, Vol.37, No. 3, 1969.