The Saving-Investment Approach: Determination of Economic Growth of India

Journal of Development Economics and Management Research Studies (JDMS)
A Peer Reviewed Open Access International Journal
ISSN: 2582 5119 (Online)
Crossref Prefix No: 10.53422
10(15), 20-34, January-March, 2023
@Center for Development Economic Studies (CDES)
Reprints and permissions
https://www.cdes.org.in/
https://www.cdes.org.in/about-journal/

The Saving-Investment Approach: Determination of Economic Growth of India

Dr. M. Abdul Jamal[1] and **Dr.H. Yasmeen Sultana**[2]

Abstract

Savings and investment are key requirements for growth and development. Savings and investment have been considered as two critical macro-economic variables with microeconomic foundations for achieving price stability and promoting employment opportunities thereby contributing to sustainable economic growth. Since independence Indian economy has been moved from a moderate growth path of 1950-1980 to a higher growth trajectory since 1980s. Over the last four decades, Indian economy has emerged as one of the fastest growing economies of the world. This paper considers savings, investment and economic growth for India using annual time series data for the period 1991/92 to 2017/18. The study make use of the Autoregressive Distributed Lag (ARDL) approach to test for cointegration and Error correction based Granger causality analysis for investigate the causality between the variables. Data for Gross Domestic Savings (GDS) and Gross Domestic Investment (GDI) were taken from the National Accounts Statistics of India and Gross Domestic Product (GDP) was taken Reserve Bank of India. The study finds that saving explicitly determines investment in both the short and long runs and there is no evidence is found to support the usually accepted growth models in India, that investment is the engine of economic growth.

Keywords: Savings, Investment, Economic Growth, ARDL model.

[1] Assistant Professor, Department of Economics, The New College (University of Madras), Chennai, India.
[2] Assistant Professor, Department of Economics, Pondicherry University, Puducherry, India.

Introduction

The role of savings and investment in promoting economic growth of India has been given paramount importance since independence. Savings and investment have been considered as two critical macro-economic variables with microeconomic foundations for achieving price stability and promoting employment opportunities thereby contributing to sustainable economic growth. Since independence Indian economy has been moved from a moderate growth path of 1950-1980 to a higher growth trajectory since 1980s. Over the last four decades, Indian economy has emerged as one of the fastest growing economies of the world. Apart from registering impressive growth rate, India's growth process has been almost stable. Many empirical studies suggest the evidence that the year's variation in growth rate of Indian economy has been one of the lowest. In view of this fact, the role of savings and investment in proving the fundamental growth impulses in the economy cannot be over emphasized.

Savings & Investment

There are two views of the topic titled Savings and Investment. One is considered to apply to real physical macroeconomic activity, the "Keynesian", or National Accounts view. The other is considered to apply to money and banking, the "Monetarist" view. They primarily differ slightly in definitions of terms, which consequently lead to different discussions about very different subject matter. The two views actually are different subject areas, making it the historical debate difficult to collate, let alone reconcile. Keynesians start with accounting definitions, where Savings = Investment, by construction, and tend to emphasize the nonproductive (zero sum) nature of all vehicles by which savings eventually ends up as capital. Monetarists tend to focus on technical distinctions of how savings is transformed from money balances, eventually into capital, and emphasize the value of those vehicles in selecting which capital to invest in.

In a Keynesian sense, savings is whatever is left over after income is spent on consumption of goods and services, investment is what is spent on goods and services that are not 'consumed', but are durable. Since Income = Output, Savings = Investment for the total world's economy (or for a hypothetical 'closed' economy with zero foreign trade). In a Monetarist sense, savings is the total rate at which units of account exceed expenditures, and are accumulated as unit of account (e.g. dollar) balances with financial intermediaries. Or sometimes hoarded as currency. Investment is the rate at which financial intermediaries and others expend on items intended to end up as capital that directly creates value, i.e. physical capital, durable goods, human capital, etc. In general, savings does not equal investment, but differs slightly at all times, the differences constituting a behavioral relationship, rather than an accounting one, as in the Keynesian view.

Theory of Saving and Investment

The modern neoclassical view of saving is rooted in Marshall's microeconomic view of saving. Neoclassical economists argue that the level of saving determines the level of investment and equilibrium interest rate. Thus, from this perspective saving is a function of thriftiness; the demand for investment is a function of the marginal productivity of capital. Saving is therefore the way to increase investment spending, which subsequently increases capital accumulation and ultimately increases economic growth. However, there are several criticisms and limitations of the neoclassical view. The basis of Keynes' position on the neoclassical theory of saving and investment is that saving is not as simple as neoclassical thought, rather, it is a two-step process as opposed to a single process. Keynes tends to view saving as a process broken down into two parts; marginal propensity to consume and marginal propensity to save, thereby saving for Keynes, it is not only thrifty (neoclassical), but income is also considered. In this sense, the first part to saving is first acquiring the income before deciding how much to consume or save. Thus, to determine how much saving is ideal, one first needs income, and then the propensity to consume follows. Income is determined by the point of effective demand, effective demand determines employment, and income is determined by employment. However, employment is determined by investment, which depends on marginal efficiency of capital as an expectation in terms of money value. To sum up this perspective, saving never acts as a source of investment and never deviates from investment so S=I (Terzi,1986).

Economists like Marc Lavoie (Foundations of PK Economic Analysis, 1992), Karl Lutz(Economics for the Common Good, 1999), and Fuller (An Alternative to PK Household Consumption Theory, 1996) have argued that neoclassical economists emphasize saving and not consumption i.e. there could be no role for consumption in economic growth. Unlike the classical and neoclassical economists, Post Keynesians argue that, at the macro level, one cannot save something that does not exist. Thus, the income must exist to be saved; the income is derived from investment so ultimately investment determines how much can be saved. In heterodox economic schools of thought investment must necessarily come before saving can take place. Keynes, in his General Theory of Employment, Interest, and Money (1936) introduced us to the paradox of thrift. This idea basically states that saving reduces spending and thus is detrimental to economic growth. Unlike neoclassical and classical economists who assume that savings will be later spent on investment, Keynes did not make this assumption. Instead, Keynes believed that when we choose to save, the money is not being recycled back into the economy through investment or consumption of goods or services. This would result in a weakening of effective demand which would subsequently reduce aggregate national income, lower employment, and ultimately limit economic growth.

Instead, Keynes argued that for a nation to accumulate capital and, thus, achieve economic growth, there must be a level of effective demand consistent with the level of full employment. This means that, when the nation wants to increase growth, investment and consumption should be emphasized and promoted as much as possible. In Keynes' world, consumption plays an even more crucial role than saving in economic growth. Post Keynesians have taken after Keynes's assertion of the lack of relationship between saving and capital accumulation. Wray, in "Saving, Profits, and Speculation in Capitalist Economies" and in

Understanding Modern Money, has argued that economic growth requires deficit spending that generates a surplus elsewhere (Wray, 1991; 1998).Therefore, Wray argued the economy does not need saving to finance investment but rather, it needs credit creation i.e. endogenous money is necessary for growth. In a post-Keynesian world, investors must borrow to run their business including wages paid to workers. In the context, the investors must ensure that the workers spend as much of their income so the investors can eventually recuperate the expenditures borrowed to finance the wages. If workers decide to save a large portion of their income instead of spending, then the investors must find a way to get these savings circulated back into the economy by selling them non-producible goods like bonds, stocks, etc. In this way, the investors get back the wage bill expenditures. At the same time, whatever the investors spend on consumption of goods and investment finally returns to them as gross profits. As we can see, workers' failure to spend all of their income on consumption or non-producible goods or investors' failure to spend on consumption or investment goods will reduce the investors' gross profits. In short, one can see that in the Post Keynesian's world, saving cannot finance investments, but investment can however cause saving through the creation income.

ARDL Cointegration Approach

Several methods are available for conducting cointegration tests. Commonly used methods include the residual based Engle-Granger (1987) test, Johansen (1988), Johansen-Juselius (1990) and Gregory and Hansen (1996). The proposed autoregressive distributed lag (ARDL) approach, developed by Pesaran and Shin (1995 and 1998), Pesaran et al. (1996) and Pesaran et al. (2001) has become popular in recent years. The main advantage of the ARDL model given the power and testing of the long-run relationship is that it can be applied irrespective of the order of integration (and in small samples) while other cointegration techniques require all variables be of equal degree of integration (and large sample). Thus, the ARDL approach avoids the use of Augmented Dicky Fuller unit root tests and autocorrelation function tests for testing the order of integration. In fact, Hendry et. al., (1984) argue that the ARDL process of econometric modeling is an attempt to match the unknown data generating process with a validly specified econometric model, and thus economic theory restrictions on the analysis are essential. This paper, thus, examines the relationship between the savings, investment and growth using ARDL approach.

Methodology & Model Specification

Data used in this paper are annual figures covering the fiscal year 1991/92 to 2017/18 Gross Domestic Product (GDP) is the proxy for the real income. Gross Domestic Savings (GDS) is used as a proxy for savings, which is obtained by subtracting final consumption expenditure from gross domestic product. Investment is represented by the Gross Fixed Capital Formation (GFCF) in the national accounts. The data on these variables were taken from the National Accounts Statistics of India.

The issue of causality between the savings, investment and growth has taken attention in growth economics since the beginning. The controversy can be expressed in terms of two leading theoretical perspectives: the "Marx-Schumpeter-Keynes view" and "Mill-Marshall-Solow view"

(Chakravarty, 1993 and Gutierrez et al. 2007). The first view states that investment and innovation are the two variables that drive output growth. Under this, savings adjusts passively to meet the level of investment required to hold macroeconomic equilibrium and deliver a certain growth rate of output. In this view, growth leads savings. In the Mill-Marshall-Solow approach, that channel of causality is reversed since it assumed that all savings is automatically invested and translated into output growth under wage-price flexibility and full employment. As a result, savings leads growth. In order to explain the possible relationship between the savings, investment and growth based on data, this study has postulated the following three specifications.

$$GDP = f\ (GDS\ , GFCF) \ldots (1)$$
$$GDS = f\ (GDP\ , GFCF) \ldots (2)$$
$$GFCF = f\ (GDP\ , GDS) \ldots (3)$$

Where, GDP stands for gross domestic product, GDS for gross domestic savings and GFCF for gross fixed capital formation. The model (1) simply assumes that gross domestic product is positively associated with the GDS and GFCF, ceteris paribus. Similarly, GDS is assumed to be an increasing function of GDP and GFCF though it is also determined by other factors such as fiscal policy, macroeconomic uncertainty, demographics and income distribution. GFCF is taken as a function of GDP and GDS in model (3).

The autoregressive distributed lag (ARDL) cointegration procedure introduced by Pesaran and Shin (1999) and Pesaran, Shin, and Smith (1997, 2001) has been used to examine the long-run relationship between the savings, investment and growth. The short and long-run parameters with appropriate asymptotic inferences can be obtained by applying OLS to ARDL with an appropriate lag length. Following Pesaran et al. (1997, 2001), an ARDL framework for equation (1) can be written as:

$$\Delta lnGDP_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i}\Delta lnGDP_{t-i} + \sum_{i=1}^{n} \beta_{2i}\Delta lnGDS_{t-i} + \sum_{i=1}^{n} \beta_{3i}\Delta lnGDI_{t-i} + \alpha_1 lnGDS_{t-i} + \alpha_2 lnGDP_{t-i} + \alpha_3 ln\pi GDI_{t-i} + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots (4)$$

Where, Δ is the first difference operator, β_0 the drift component, and μ_t the usual white noise residuals. The coefficients (α_1-α_3) represent the long-run relationship whereas the remaining expressions with summation sign (β_1- β_3) represent the short-run dynamics of the underlying models. In order to investigate the existence of the long-run relationship among the variables in the system, the bound tests approach developed by Pesaran et al. (2001) has been employed. The bound test is based on the Wald or F-statistic and follows a non-standard distribution under the null hypothesis of no cointegration relationship between the examined variables, irrespective of whether the variables are purely I(0) or I(1), or mutually cointegrated. Under this, the null hypothesis of no cointegration $\alpha_1=\alpha_2=\alpha_3=0$ is tested against the alternative of cointegration $\alpha_1\neq\alpha_2\neq\alpha_3\neq0$. Pesaran et al. (2001) provide the two sets of critical values in which lower critical bound assumes that all the variables in the ARDL model are I(0), and the upper critical bound assumes I(1). If the calculated F-statistics is greater than the appropriate upper bound critical values, the null hypothesis is rejected implying cointegration. If such statistics is below the lower bound, the null cannot be rejected, indicating no cointegration. The unrestricted error correction model based on the assumption made by Pesaran et al. (2001) was also employed for the short-run dynamics of the model. Thus, the error correction version of the ARDL model pertaining to the equation (4) can be expressed as:

$$lnGDP_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i} \Delta lnGDP_{t-i} + \sum_{i=1}^{n} \beta_{2i} \Delta lnGDS_{t-i} + \sum_{i=1}^{n} \beta_{3i} \Delta lnGDI_{t-i} + \lambda EC_{t-i} + \mu_t \dots\dots\dots\dots\dots\dots . (5)$$

Where, is the speed of adjustment parameter and EC is the residuals that are obtained from the estimated cointegration model of equation (4). The error correction term (EC) is, thus, defined as: $EC_t = lnGDP_t - \gamma_1 lnGDS_t - \gamma_2 lnGDI_t.$ Where, $\gamma_1 = -\alpha_2 / \alpha_1$, and $\gamma_2 = -\alpha_3 / \alpha_1$ are the OLS estimators obtained from equation (4). The coefficients of the lagged variables provide the short run dynamics of the model covering the equilibrium path. The error correction coefficient ($\boldsymbol{\lambda}$) is expected to be less than zero and implies the cointegration relation. In order to check the performance of the model, the diagnostic tests associated with the model which examines the serial correlation, functional form and heteroscedasticity have been conducted.

Empirical Results

Cointegration analysis, at first, requires determining the order of integration of variables under study. This is because of the fact that ARDL technique cannot be used if the order of the integration of the variables is two or more. Thus, for this purpose, this study has employed the Augmented Dickey Fuller (ADF) test both at the level and difference of the variables. The lag length used for this test is determined using a model selection procedure based on the Schwarz Information Criterion. The statistical results of the ADF tests are presented in table 1. Table 1 show that all the variables are stationary in the first difference. Gross domestic savings is trend stationary at the level, but gross domestic product and gross fixed capital formation are non-stationary at the level for both cases with intercept and intercept with trend. The ARDL approach to cointegration, therefore, may be better to use since the variables are either I (0) or I (1).

Table-1: Results of ADF Tests

Variables	Level		First Difference	
	Intercept	Intercept and Trend	Intercept	Intercept and Trend
RGDP	-0.34(0.91)	-0.64(0.73)	-6.64(0.00)*	-5.84(0.00)*
RGDS	-0.53(0.75)	-2.43(0.08)**	-7.43(0.00)*	-7.20(0.00)*
RGFCF	-1.55(0.78)	-1.83(0.64)	-7.36(0.00)*	-7.23(0.00)*

Notes:
*1. * and ** denote the statistical significance at the 1% and 5% level respectively.*
2. The numbers within the parentheses for the ADF statistics are the p-values

In the first stage of ARDL procedure, we impose arbitrary and the same number of lags on each first differenced variables in equation (4) as well as the equations for the models of savings and investment and carry out F-test. The computed F-statistics in table 2 was compared with the critical values provided by Narayan (2004) for small samples. The results clearly indicate that, since computed F-statistic is greater than critical values, there is long-run relationship between real gross domestic product, real gross domestic savings and real gross fixed capital formation when real GDP is the dependent variable; that is the null hypothesis of no cointegration is rejected for GDP. It implies that gross domestic savings and gross capital formation both had an effect in the India's long run growth. But, taking real GDS as dependent variable, the result is inconclusive because the calculated F-statistics is between the upper and lower bound critical values, suggested by Narayan for small samples. Similar inconclusive outcome is obtained for the real GFCF. In such inconclusive case, following Kremers et al. (1992) and Bannerjee et al. (1998), we can use the error correction term to establish the evidence of cointegration.

Table-2: Bounds tests for Cointegration Analysis

Variables	Order of Lag	F - Statistics
RGDP	2	6.45*
RGDS	1	3.21
RGFCF	1	2.45

The long-run coefficients of the real gross domestic product, gross domestic savings and gross fixed capital formation are reported in table 3. Table 3 shows that when GDP is taken as dependent variable, the coefficients of real gross domestic savings and gross fixed capital formation both have the expected positive signs as suggested by economic theories, but only the coefficient of the GFCF is statistically significant. Since the coefficient of the GFCF is very low i.e. 0.78, it implies the low long-run investment multiplier implying that GDP increases by only 78 percent if investment increases by 100 percent. This implies the existence of many leakages in the Indian economy that are hindering the working of investment multiplier. The long run model of the corresponding ARDL (1, 0, 0) for real gross domestic product can be written as:

$$RGDP = 3.32 + 0.024\ RGDS + 0.78\ RGFCF \ldots\ldots\ldots\ldots (6)$$

Similarly, the long-run coefficients of gross domestic product and investment, when RGDS is dependent variable, both have positive signs, but statistically insignificant. The long run model of the corresponding ARDL (1, 0, 0) for real gross domestic savings (RGDS) can be written as:

$$RGDS = -0.47 + 0.32\ RGDP + 0.66\ RGFCF \ldots\ldots\ldots\ldots (7)$$

Table-3: Estimated Long-run Coefficients

Dependent Variable	Explanatory Variables		
	RGDP	RGDS	RGFCF
RGDP	-	0.24 (0.06)	0.78* (6.34)
RGDS	0.32 (0.68)	-	0.66 (0.21)
RGFCF	1.25* (6.24)	0.28 (0.06)	-

Notes:
*1. Figures in parenthesis are t-values. * represents significant at the 1 %.*

With GFCF being the dependent variable, the results reported in table 4 show that the coefficients of RGDP and RGDS have the positive sings. And, the coefficient of the RGFCF is statistically significant implying that growth of real GDP causes investment growth. A one percent increase in GDP leads to 1.42 percent increase in GFCF in the long-run. The coefficients of real gross domestic savings, although statistically insignificant, have the expected positive sign indicating the positive relationship between RGDS and RGFCF. This low impact of savings may be due to the fact that investment is influenced by foreign inflows such as foreign direct investment and positive net current transfer in balance of payments. The long-run model of the corresponding ARDL (1, 0, 1) for gross fixed capital formation is

$$RGFCF = -3.34 + 1.25RGDP + 0.28\ RGDS \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (8)$$

After the estimation of the long-run coefficients, the short-term dynamics of the model has been examined by estimating an error correction model. The ECM shows the speed of adjustment to restore equilibrium in the dynamic model after disturbance in any variables in the model. The diagnostic tests, which are used in this paper to examine the properties of the model, include the test of serial autocorrelation (χ^2Auto), normality (χ^2Norm), heteroskedasticity (χ^2BP) and omitted variables /functional form (χ^2RESET).

Table-4: Error Correction Representation of ARDL Model, ARDL (1, 0, 0)

Dependent Variable: Gross Domestic Product, RGDP			
Regressor	Coefficient	t-statistic	p-value
$\Delta RGDP_{-1}$	-0.3	-1.83	0.21
ΔRGDS	-0.006	-035	0.72
ΔRGFCF	0.32*	4.23	0.00
Ecm_{-1}	0.46*	96.32	0.00
Constant	1.83*	19.22	0.00
R^2= 0.97 R^2adj= 0.94	F = 3223.23 (0.00)	S.E. = 0.04 DW= 1.30	AIC=-6.12
Diagnostic test: Serial correlation - χ^2Auto (2) =7.23 (0.00) Functional Form - χ^2RESET(2) =3.32(0.23) Normality - χ^2Norm = 3.54(0.12) Heteroscedasticity - χ^2BP(2) =4.73(0.52)			

Notes:
*1. * indicates the significance at the 99% level.*
2. The values in parentheses are the probabilities.

Table 4 shows that the estimated lagged error correction term (ECM-1) is negative and statistically significant, which confirms the results of the bounds tests for cointegration. The statistical significance of the error correction term implies the long-run Granger causality i.e. both RGDS and RGFCF Granger cause real GDP. The absolute value of the coefficient of error correction term (i.e. 0.46) implies that about 46 percent of the disequilibrium in the real gross domestic product is adjusted toward equilibrium annually. For instance, if the real gross domestic product exceeds its long-run relationship with other variables in the model, then the RGDP adjust downwards at a rate of 46% per year. As presented in the table 5, there is no evidence of diagnostic problem with the model.

Table 5 shows the Granger causality tests. The results reported in Table 2 indicate that there is a statistical evidence of bidirectional short-run Granger causality between real GDP and real GFCF. Similarly, the bidirectional causality has been found between the real GDS and real GFCF in the short run also. But, there is no short-run Granger causality between real gross domestic savings and real GDP as shown in table 5.

Table-5: Results of Granger Causality Tests

Dependent Variable	Explanatory Variables		
	ΔRGDP	ΔRGDS	ΔRGFCF
ΔRGDP	-	0.12 (0.67)	10.28* (0.00)
ΔRGDS	0.34 (0.53)	-	5.16 (0.03)
ΔRGFCF	2.56*** (0.07)	3.28 (0.03)	-

Notes:

1. *Notes: Figures in parenthesis are t-values. *, ** and *** represent significant at the 1 %, 5% and 10 % respectively.*

Conclusion

This paper attempts to estimate the interdependence between gross domestic savings, investment and gross domestic product in India for the period of 1991/92 to 2017/18 based on annual data. The long-run cointegrating relationships and short-run adjustments are estimated in a multivariate setting using ARDL approach to cointegration. In addition, it examines the direction of relationship between the gross domestic savings, investment and gross domestic product using the Granger causality tests based on the VECM framework. Though unavailability of the quarterly data series on the variables and, thus, small sample size of only 27 is a limitation, this paper has provided the empirical basis for analyzing the causality between savings, investment and growth in India.

ARDL cointegration technique shows that there is evidence of cointegration between GDS, GFCF and GDP when GDP is taken as a dependent variable. Similarly, the long-run relationship between GDP, GDS and GFCF has also been found when GDS and GFCF are separately chosen as dependent variables. As the determinants of growth, the long-run coefficients of GDS and GFCF both are positive implying the positive association between GDS and GDP, and between GFCF and GDP. But, the long-run investment multiplier is very low implying the low impact of investment on growth. In addition, GDS is positively affected by GDP and GFCF, but the coefficients of both are statistically insignificant. GDP has significant positive impact on investment, but gross domestic savings do not have significant impact on investment in India. Moreover, the long-run causality between GDS, GFCF and GDP has been proved by statistically significant estimated error correction coefficients. The error correction models show that GFCF and GDS both Granger cause the GDP in the long-run. In the same way, GDS and GDP both Granger cause the GFCF in the long run. The long-run causality runs from GDS and GDP to GFCF also. These results are further validated by the diagnostic tests of the models. Regarding short-run causality, there is bidirectional causality between GFCF and GDP and between GDS and GFCF. But, no short-run causality exists between GDP and GDS.

References

1. Bannerjee, A., Dolado & Mestre, R. (1998): Error-correction mechanism tests for cointegration in single equation framework. Journal of Time Series Analysis, Vol. 19:267-283. Retrieved from http://e-archivo2.uc3m.es/jspui/bitstream/10016/3275/2/error-correctionJTSA-1998-ps.pdf.

2. Bassam, A. (2006): The relationship between savings and investment in MENA countries. International Journal.

3. Budha, B.B (2012): A multivariate analysis of savings, investment and growth in Nepal, MPRA Paper No. 43346, posted 20. December 2012 17:02 UTC.

4. Budha, B.B. (2006): An Analysis of Savings, Investment and Capital Formation in Nepal. Unpublished Master's Thesis, Central Department of Economics, Tribhuvan University, Kathmandu.

5. CAG Report (2017): Union Government, Ministry of Finance. Report of the Comptroller and Auditor General of India on Recapitalisation of Public Sector Banks, Report No. 28 opf 2017 (Performance Audit). Tech. rep. Ministry of Finance, 2017.

6. Caporale, G. M., Panopoulou, E., &Pittis, N. (2005): The Feldstein–Horioka puzzle revisited: a monte carlo study. Journal of International Money and Finance, 24(7), 1143-1149.

7. Carroll, C. & D. Weil (1994): Savings and Growth: A Reinterpretation. Carnegie-Rochester Conference Series on Public Policy 98:103-125.

8. Chakravarty, C. (1993): Alternative Approaches to a Theory of Economic Growth: Marx, Marshall and Schumpeter. Selected Economic Writings. Oxford: Oxford University Press.

9. Dagher, J. & Kovanen, A. (2011): On the Stability of Money Demand in Ghana: A Bounds Testing Approach. IMF Working Paper-WP/11/273. Retrieved from http://www.imf.org/external/pubs/ft/wp/2011/wp11273.pdf.

10. De Vita, G., & Abbott, A. (2002): Are saving and investment cointegrated? An ARDL bounds testing approach. Economics Letters, 77(2), 293-299.

11. Dickey, D. A., & Fuller, W. A. (1979): Distribution of the estimators for autoregressive time series with a unit root. Journal of the American statistical association, 74(366a), 427-431.

12. Dickey, D. A., & Fuller, W. A. (1981): Likelihood ratio statistics for autoregressive time series with a unit root. Econometrica: Journal of the Econometric Society, 1057-1072.

13. Domar, E. (1946): Capital Expansion, Rate of Growth, and Employment. Econometrica 14(2): 137-147. Retrieved from http://www.ie.ufrj.br/hpp/intranet/pdfs/domar1946.pdf.

14. Engle, R.F. & Granger, C.W.J. (1987): Co-Integration and Error Correction: Representation, Estimation, and Testing. Econometrica, Vol.55, No 2. Retrieved from http://www.uta.edu/faculty/crowder/papers/Engle_Granger_1987.pdf.

15. Feldstein & Horioka, Charles (1980): "Domestic Saving and International Capital Flows," Economic Journal, June 1980, 90, 314-29.

16. Feldstein, M. S., & Horioka, C. Y. (1979): Domestic savings and international capital flows, Economic Journal, June 1980.

17. Fuller, C. G. (1996): Elements of a Post Keynesian Alternative to “Household Production”. Journal of Post Keynesian Economics, 18(4), 595-607.

18. Gutierrez, M. & Solimano, A. (2007): Savings, Investment and Growth in the Global Age: Analytical and Policy Issues. American University of Paris's Working Paper No. 43. Retrieved from http://www.aup.edu/pdf/WPSeries/AUP_wp43-Gutierrez.pdf.

19. Harrod, R.F. (1939): An Essay in Dynamic Theory. The Economic Journal 49(193):14-33. Retrieved from http://www.fea.usp.br/feaecon/.../P2_Harrod_Essay_Dynamic_Theory.pdf.

20. India, Reserve Bank of. Guidelines for ‘on tap’ Licensing of Universal Banks in the Private Sector. 2016.

21. Ila Patnaik & Radhika Pandey (2019): Savings and capital formation in India, Working Paper 271, National Institute of Public Finance and Policy, New Delhi.

22. Johansen, S. & Juselius, K. (1990): Maximum Likelihood Estimation and Inference on Cointegration with Application to the Demand for Money. Oxford Bulletin of Economics and Statistics 52. Retrieved from http://nhjy.hzau.edu.cn/kech/hgjjx/Article/UploadFiles/tese/xuexiziyuan/jdwxxd/lwl/8.pdf.

23. Johansen, S. (1988): Statistical Analysis of Cointegrating Vectors. Journal of Economic Dynamics and Control, Vol. 12, No. 2/3.

24. Kaya, H. (2010): Saving Investment Association in Turkey. Topics in Middle Eastern and North African Economies, 12.

25. Keynes, J. M. (2016): General theory of employment, interest and money. Atlantic Publishers & Dist.

26. Kim, S. H. (2001): The saving–investment correlation puzzle is still a puzzle. Journal of International Money and Finance, 20(7), 1017-1034.

27. Kremers, J.J.M., N.R. Ericsson and Dolado, J.J. (1992): The Power of Cointegration tests. Oxford Bulletin of Economics and Statistics 54:325-543.

28. Lavoie, M. (1992): Foundations of post-Keynesian economic analysis. Books.

29. Llorca, M. (2008): Macro-financial developments of Slovakia: An empirical analysis based on the monetary circuit theory.

30. Lutkepohl, H. & Kratzig, M. (2004): Applied Time Series Econometrics. Cambridge: Cambridge University Press, UK.

31. Lutz, M. A. (2002): Economics for the Common Good: Two Centuries of Economic Thought in the Humanist Tradition. Routledge.

32. Miller, S. M. (1988): Are saving and investment co-integrated? Economics Letters, 27(1), 31-34.

33. Ministry of Finance, Government of India. Economic Survey 2017-18. 2018.

34. Narayan, P.K. & Smyth, R. (2008): Energy consumption and real GDP in G7 countries: new evidence from panel cointegration with structural breaks. Energy Economics 30:23312342.

35. Nasiru, I., & Usman, H. M. (2013): The relationship between domestic savings and investment: The Feldstein-Horioka test using Nigerian data. CBN Journal of Applied Statistics, 4(1), 75-88.

36. Odhiambo, N.M. (2007): Supply-leading versus demand-following hypotheses: empirical evidence from three SSA countries. African Development Review 19: 257-279.

37. P.K. 2004: Reformulating Critical Values for the Bounds F-statistics Approach to Cointegration: An Application to the Tourism Demand Model for Fiji. Discussion

Papers, ISSN 1441-5429. Retrieved from http://arrow.monash.edu.au/vital/access/%20/services/Download/.../DOC.

38. Pesaran, M. H. & Shin, Y. (2001): Bounds Testing Approaches to the Analysis of Level Relationships. Journal of Applied Econometrics 16. Retrieved from http://www.econ.cam.ac.uk/faculty/pesaran/pss1r1.pdf.

39. Pesaran, M. H. & Y. Shin (1997): Autoregressive Distributed Modeling Approach to Cointegration Analysis. Retrieved from http://www.eprg.org.uk/faculty/pesaran/ardl.pdf.

40. Pesaran, M.H., Shin, Y. & Smith, R.J. (1999): Bounds Testing Approaches to the Analysis of Long Run Relationships. Retrieved from http://www.econ.cam.ac.uk/ faculty/pesaran/pss1.pdf.

41. Poudyal, S.R. (1988): Foreign Trade, Aid and Development in Nepal. New Delhi: Commonwealth Publishers Pvt. Ltd.

42. Rao, K G K Subba (2009): "Critique of 2009 Committee on Savings and Investment". In: Economic and Political Weekly Vol. 44. Issue No. 39 (26 2009).

43. Reserve Bank of India. Disclosure in the "Notes to Accounts" to the Financial Statements- Divergence in the asset classification and provisioning. 18th Apr. 2017.

44. Reserve Bank of India. Resolution of Stressed Assets: Revised Framework. 12th Feb. 2018.

45. Tan-Hui B (2000): Savings, Investment and Capital Flow: An Empirical Study on the Asian Economics. Department of Economics Faculty of Economics and Management. University Putra Malaysia, Working Paper 3. 19

46. Tehranchian, A. M., &Behravesh, M. (2011): The relationship between savings and investment in Iran: Testing Feldstein's and Horioka's theory. African Journal of Business Management, 5(4), 1408.

47. Terzi, A. (1986): Finance, investment and saving: a comment on Asimakopulos. Cambridge Journal of Economics, 10(1), 77-80.

48. Verma, R. (2007): Savings, Investment and Growth in India: An Application of ARDL Bounds Testing Approach. Faculty of Commerce Papers, University of Wollongong, Australia.

49. Wagle, S. (2000): A study on Trends of Savings, Investment and Capital Formation in Nepal. Unpublished Master's Degree Thesis, Central Department of Economics, Tribhuvan University, Kathmandu.

50. Wray, L. R. (1991): Saving, profits, and speculation in capitalist economies. Journal of Economic Issues, 25(4), 951-975.

***