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The Nexus between Savings Gap, Foreign Exchange Gap, and Foreign Direct Investment Inflows into Asia: Two Gap Model Analysis with Panel Data Approach

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Abstract— *The study analyses the nexus between Savings (Savings- Investment), Foreign Exchange (Import-Export) Gap and net Foreign Direct Investment (FDI) inflow into Asian Countries. Economies for this analysis are taken from Newly Industrialised Countries (NICs) based on the valuation of GDP of the respective countries. Six countries, such as, China, India, Indonesia, Thailand, Malaysia and Philippines are considered for this study over a period 1982-2016. Using Panel Data Approach, the analysis has been able to find out a long run cointegration between Savings Gap and FDI as well as Foreign Exchange Gap and FDI. As proposed by Two Gap Model, the influence of FDI has been found on both the variables. Whereas the effect of savings gap on net FDI inflow is positive and significant for the said period with a negative Error Correction Term which proves the movement from short run disequilibrium to long run stable equilibrium. After proving the direction of causality, the short run joint influence of savings gap with its lagged values has been checked. Through Wald Test, the result is proved to be significant. On the other hand, the effect of Foreign Exchange Gap on FDI is not significant in nature. Finally, from the study, it is suggested that if domestic savings for all the six countries together are given importance from the level of respective Governments, the Savings Gap may be reduced which will indicate less dependence on foreign investments into these countries. Being NICs, self-funding of future investments is always preferred which is only possible if countries are contended with adequate capital accumulation on their own in previous periods.*

Keywords — *Two Gap Model, Foreign Exchange Gap, FDI, Asia, Panel Data*

I. INTRODUCTION

Newly Industrialised Countries (NICs) are characterised by rapid export driven economic growth and secular migration of workers from rural sector to urban area. Heading to the direction of high Human Development Index, economic freedom and job switching from agricultural to manufacturing industries, NICs are mixed breeds of developed and developing countries. While moving towards such development, they need a high amount of capital accumulation for their future investments in their own economies. Looking at this aspect, data in NICs show a very low rate of capital accumulation to gear their future requirements for investment. Data on NICs in Asia, specifically, display a very poor rate of savings from 1990s. Countries with future potential characters of such development, in this case, certainly need help of Foreign Aids to foster future investment in their economies (Moosa, I,2002). From this facet, the importance of analysis regarding Savings- Investment Gap and its relationship with Foreign Aid, i.e, Foreign Direct Investment (FDI) come into picture for these countries. On the other hand, as these economies need to become export driven to enter and maintain global competition, the question of analysis of the difference between valuation of export and import (Foreign Exchange Gap) also take place for discussion. In this respect, the gap between Imports and Exports of these countries are examined. Many of the cases, it is seen that imports in these countries are exceeding export valuation and there remains a Foreign Exchange Gap for these economies. This gap is also filled by FDI from abroad to ease the economic crisis (Moosa, I,2002).

Considering these Savings- Investment Gap and Foreign Exchange Gap together, the developing economies are specified with a model, termed as, Two Gap Model. The analysis of this model is important in this study because NICs always face the problem such differences and were specified by closed economies in general. The

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Two Gap Model of development is confined in the post-Keynesian growth models for closed economies explained by Harrod (1939) and Domar (1946). The two gaps are explained as:

A. Savings Gap: When Savings are in shortage of future productive investment in economies.

B. Foreign Exchange Gap: When foreign currency earnings fall short of foreign currency payments for buying necessary foreign commodities.

The derivation of Two Gap model is clarified as follows:

As per Expenditure Method of measurement of National Income,

$Y = C + I + (X - M)$

Where Y= Output

C= Consumption Expenditure

I= Investment Expenditure

X= Exports of country

M= Imports of country

From $Y = C + I + (X - M)$,

We can express,

$Y - C + M = I + X$

Or, $S + M = I + X$ (as Y-C=Savings, S)

Or $M-X = I-S$

The above expression (M-X) is called Foreign Exchange Gap and (I-S) is called as Savings Gap.

For ideal scenario, the Foreign Exchange Gap and Savings Gap should be same to maintain the National income equilibrium. Any disequilibrium from this level generates excess supply or excess demand in the economy.

Studies (Akande, E., & Oluyomi, O. D, 2010) suggest that in many of the cases, Foreign Exchange Gap exceeds Savings Gap. Also, to fill the respective gaps, foreign aids have become one of the most crucial factors. In this context, we shall discuss the theoretical Two Gap Model empirically in our study for the Newly Industrialised Countries (NICs) in Asia.

In this study, we chose six NICs in Asia based on their valuation of Gross Domestic Product. The countries selected here for further analysis are respectively China, India, Indonesia, Thailand, Malaysia, and Philippines. As Asian countries were closed economies previously and their openness started since 1990s, we took data from 1982 till 2016. Using Panel Data analysis, we first checked the order of integration of the underlying variables, Savings Gap, Foreign Exchange Gap and FDI by using Levin, Lin and Chu (LLC) and Im–Pesaran–Shin (IPS) Test. As we are satisfied with their same order of integration, I (1), we moved on to establish a long run cointegration between Savings Gap and FDI as well as Foreign Exchange Gap and FDI. After this, we employed Vector Error Correction Model (VECM) to determine the direction of causality for long run as well as short run. Finally, by using Wald Test, we tried to find out the joint causality of the short run independent variables and their lagged values on the dependent variable.

The study is structured as follows: Section two will focus on the available survey of literatures. Section three will concentrate on the trends of Investment- Savings and Import- Export data taken for respective countries. Section four will describe the data sources and description of the variables. Section five will cover the analysis of the results based on econometric methodology used in this study. Section six concludes the paper.

II. REVIEW OF LITERATURE

Harrod (1939) and Domar 1946) explained in their model that economic growth is dependent on labour and capital, and, more investment leads to capital accumulation. The model was designed for developing countries where labour is abundant, and capital is scarce. The Solow–Swan model (1956) described long run economic growth in the framework of neoclassical economics. They analysed economic growth with the help of capital accumulation, growth rate of labour and technological progress. Levy, V. (1984) proved in case of Egyptian economies, the importance of foreign aid is very crucial. The study was developed in the context of Two Gap Model, and it was found that the benefit of foreign aid is more effective than its high costs. The foreign loans help to finance domestic consumption. The study also outlined the fact that Egyptian Government should take initiative to use these foreign loans to channelize future investments. Van Wijnbergen, S. (1986) discussed the effective of foreign aid in the framework of macroeconomic variables, giving specific focus on real exchange rate misalignment. The study was based on two gap model and domestic goods market disequilibrium. Dean, A.,

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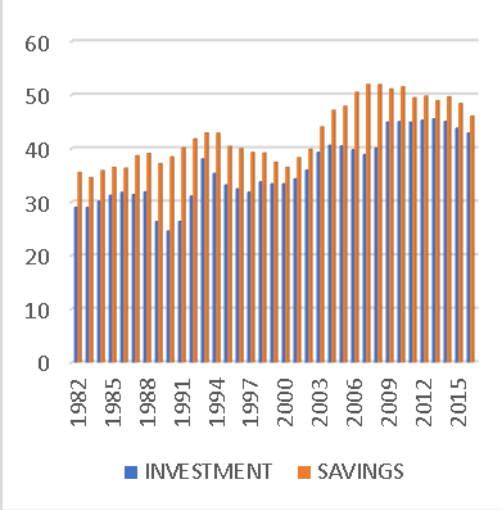
et al. (1989) analysed the level of savings and investment to be quite low because of less population in the post war period. Bacha, E. L. (1990) compared financially constrained developing economies with developed economies that are characterised by abundant savings and foreign exchange in his Three Gap Model. His suggestion in this case was to arrange debt relief measures for developing countries for solving this savings or foreign exchange gap issues. Baxter, M., & Crucini, M. J. (1993) observed in their study that national savings and investments are positively correlated with perfect mobility of financial and physical capital in all the developed and developing countries in the world. Attanasio, O. P., et al. (2000) found out for 123 countries that lagged savings rate are positively correlated with investment rates and both investment and savings granger cause each other over a period 1961-1994. Ito, T. (2001) analysed the effect of financial crisis in 1997-1998 in case of Asian economies. Also, the study examined the conditions necessary for the revival of economic growth in Asia. Beck, T., & Levine, R. (2004) examined a positive impact of stock markets and banks on economic growth. Freund, C., & Warnock, F. (2007) analysed current account imbalances in G7 industrial countries. The study was focussed on finding the outcome that larger current account deficits take longer time to resolve and are related with slower income growth during the recovery period. Brouwer, J., Paap, R., & Viaene, J. M. (2008) found out a strong relationship between wages and productivity growth in the context of Balance of Payment - constrained Growth Model. It was suggested in the study that institutional setting in the countries favours international diffusion of technology. Goh, S. K., & Tham, S. Y. (2013) studied the relationship between export and import with inward and outward FDI in Malaysia. Adom, A. D., & Elbahnasawy, N. G. (2015) analysed the influences of savings-investment gaps on economic growth using a sample of five developing countries such as Africa - Egypt, Côte d'Ivoire, Ghana, Kenya and Nigeria. Gocer, I., et al. (2016) examined a positive impact of saving on economic growth in sixty-five developing countries where savings exceed investments, and a negative impact where investments exceed saving. Evans, M. D. (2017) focussed on finding the relation between country's external position to future trade flows and financial conditions in the absence of arbitrage opportunities for US market over past sixty years. Kayalvizhi, P. N., & Thenmozhi, M. (2017) explained technology, culture and corporate governance as several factors influencing inward FDI in emerging markets. It was found that technology plays a crucial factor in influencing inward FDI in these economies. Mihalache-O'Keef, A. S. (2018) analysed the effect of foreign direct investments on the probability of civil Conflict taking globalisation in this context. Sayari, N., Sari, R., & Hammoudeh, S. (2018) investigates a long run cointegration between Economic Freedom Index (EFI), Foreign Direct Investment (FDI) and value-added components of GDP in thirty Eastern, Central and Western European countries considering the impact of sector specific components of GDP on economic freedom.

III. TRENDS IN THE VARIABLES

Historical Trends of Investment- Savings and Import- Export data for China, India, Indonesia, Thailand, Malaysia and Philippines:

a. Investment- Savings Data for Six countries:

Figure 1 shows the above trends of Savings- Investment volumes.



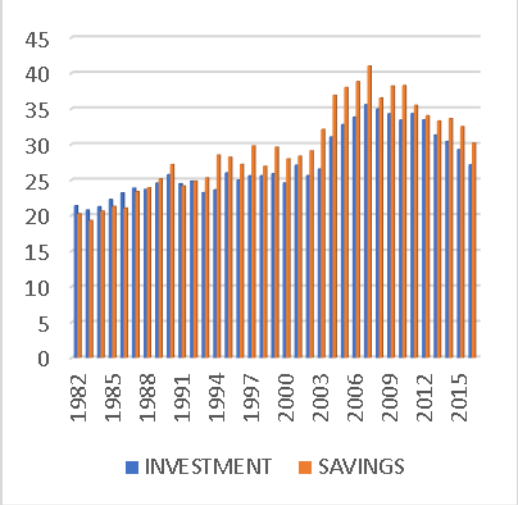


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Figure1(a)- China

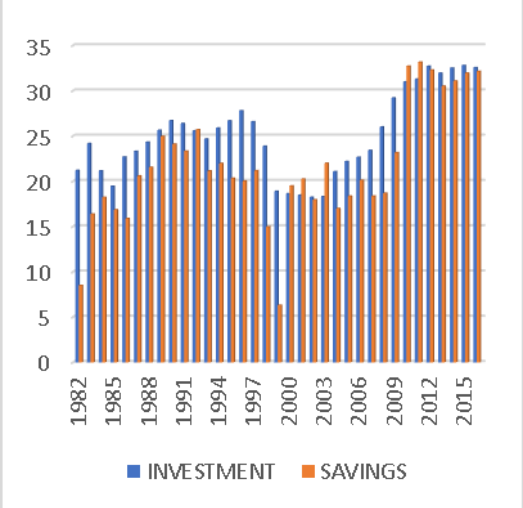

Figure1(b)- India

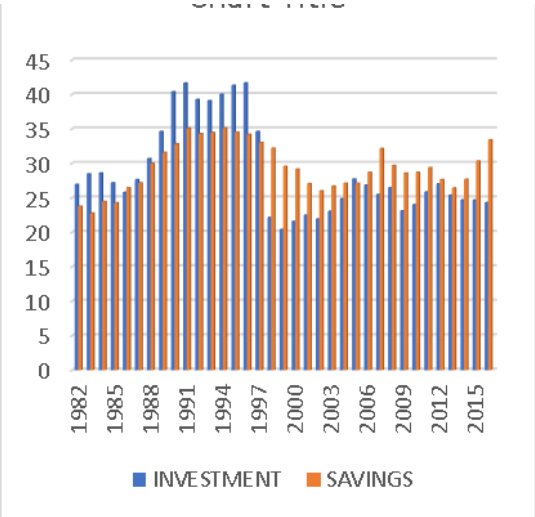

Figure1(c)- Indonesia

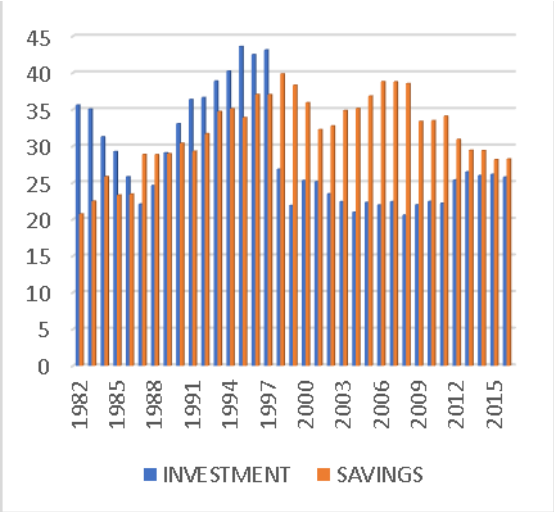

Figure1(d)- Thailand

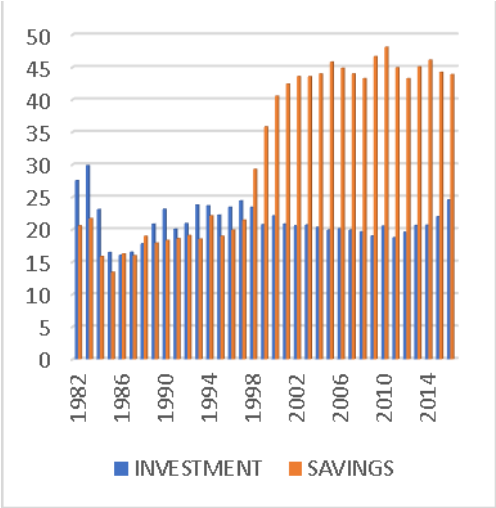

Figure1(e)- Malaysia

Figure1(f)- Philippines

From Figure 1, it is observed that approximately except China, all the five countries are either having equivalent amount of investment and savings, or, falling short of savings to help future investment to happen in their respective economies. For case of Malaysia and Philippines, the observation is changed year 2000 onwards. As our data ranges from 1982-2016, we have calculated the overall period and analysed for the complete dataset which show a gap between these two variables.

b. Import- Export Data for Six countries:

Figure 2 shows the above trends of Import- Export volumes.

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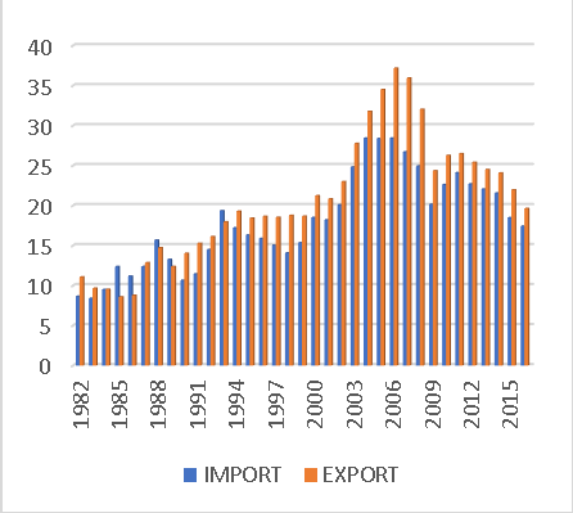

Figure 2(a)- China

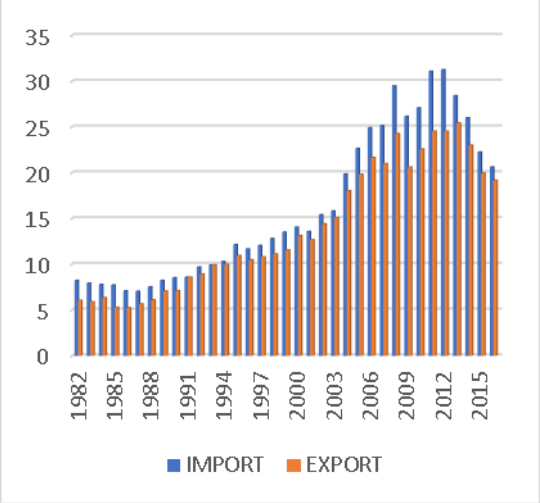

Figure 2(b)- India

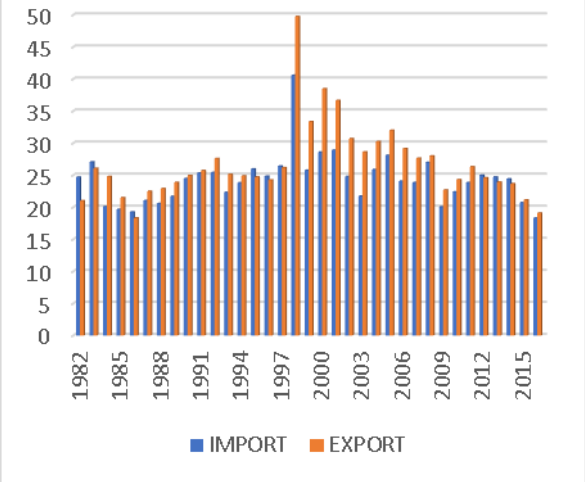

Figure 2(c)- Indonesia

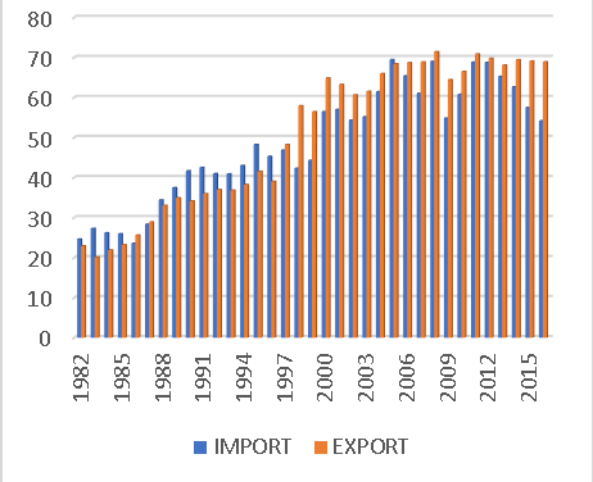

Figure 2(d)- Thailand

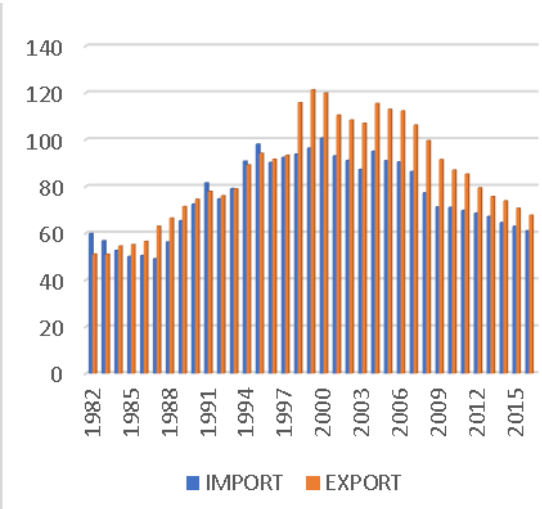

Figure 2(e)- Malaysia

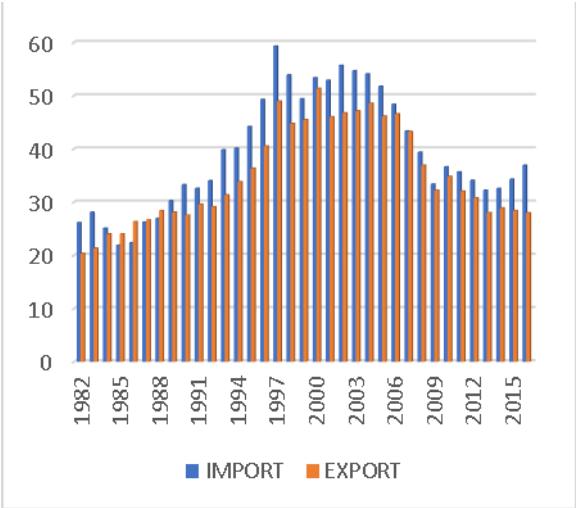

Figure 2(f)- Philippines

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Figure 2 shows gap of Import and Export. Except India and Philippines, the rest of the countries are capable of maintaining the exports more than their imports.

IV. DATA DESCRIPTION AND RESEARCH METHODOLOGY

All the variables, Savings, Investment, Export, Import and FDI have been taken from World Bank database. The complete set of data is ranging from 1982-2016 with full availability of all the values. Hence, our analysis holds a balanced panel for the said period. All the variables are in terms of percentage of GDP of their respective countries. After sourcing of the data, it was taken as Logarithmic form and the full analysis was done on that.

A. Panel Unit Root Test

The popular panel unit root test is Levin and Lin (1992, 1993, called LL after) panel unit root test. In 2003, Levin, Lin and Chu (LLC) suggest a more powerful panel unit root test than performing individual unit root tests for each cross-section. The null hypothesis is that each individual time series holds a unit root against the alternative that each time series is stationary. On the other hand, Im–Pesaran–Shin (1997, called IPS after) developed LL's framework by following for heterogeneity of the coefficient on the lagged dependent variable.

B. Panel Cointegration Test

For Panel cointegration analysis, there are three popular tests.

i. Pedroni Residual Based Panel Cointegration:

Pedroni (1999) derives seven panel cointegration test statistics. Of these seven statistics, the first four are based on within - dimension, and the rest three are based on between - dimension. Pedroni (1999) describe the seven test statistics, "The first of the simple panel cointegration statistics is a type of non - parametric variance ratio statistics. The second is a panel version of a non - parametric statistics that is analogous to the familiar Phillips Perron rhostatistics. The third statistics is also non - parametric and is analogous to the Phillips and Perron rho- Statistics. The fourth statistics is the simple panel cointegration statistics which is corresponding to augmented Dickey - Fuller t - statistics." (Pedroni, 1999, p 658) "The rest of the statistics are based on a group mean approach. The first of these is analogous to the Phillips and Perron rho - statistics, and the last two analogous to the Phillips and Perron t - statistics and the augmented Dickey - Fuller t - statistics respectively" (Pedroni, 1999, p 658).

ii. Kao (1999) Cointegration Tests

Kao describes two tests under the null hypothesis of no cointegration for panel data. One is a Dickey - Fuller type test, and another is an Augmented Dickey - Fuller type test. For the Dickey - Fuller type test Kao presents two sets of specification.

In the bivariate case Kao consider the following model:

$Yit=\alpha i+\beta Xit+eit$

$Yit= Yit-1+uit$ Where $i=1,\ldots N$, $t=1,\ldots T$

$Xit=Xit-1+\epsilon it$

iii. Combined Individual Tests (Fisher/Johansen)

Fisher (1932) derives a combined test that uses the results of the individual independent tests. Using Johansens (1988) test for cointegration, Maddala and Wu (1999) used Fisher's result to propose an alternative approach to testing for cointegration in panel data by combining tests from individual cross-sections to obtain at test statistic for the full panel. If $л_i$ is the p-value from an individual cointegration test for cross-section, then under the null hypothesis for the panel,

$$-2\sum_{I=1}^{N} \log_e (л_i) \text{ is distributed as } \chi 2 \quad 2N.$$

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EViews reports χ2 value based on MacKinnon‐Haug‐Michelis (1999) p‐values for Johansen's cointegration trace test and maximum eigenvalue test.

It proposes two different approaches, one of them is the likelihood ratio trace statistics and the other one is maximum eigenvalue statistics, to determine the presence of cointegration vectors in non-stationary time series.

In our study, we used Combined Individual Tests (Fisher/Johansen) to check for panel cointegration.

C. Causality Analysis

Once the cointegration process is completed, the next issue is to be addressed as direction of causality. In this study, after proving cointegration, a Panel Vector Error Correction Model (VECM) is to be estimated. Also, the direction of causality must be detected at the same time. After this, using Wald Test, the short run significance of joint causality of the independent variables and its lagged values must be considered.

V. RESULTS

Table 1 explains Panel Unit Root Test results of Levin, Lin and Chu (LLC).

Table 1: Levin, Lin and Chu(LLC) Panel Unit Root Test

			Test Statistics		Probability	
Variables	Period	Number of Countries	Level	First Difference	Level	First Difference
Ln(FDI)	1982-2016	6	-1.27274	-6.36443**	0.1016	0.0000
Ln(I-S)	1982-2016	6	-1.32804	-8.42136**	0.0921	0.0000
Ln(M-X)	1982-2016	6	-1.42030	-7.69338**	0.0778	0.0000

Source: Calculated by author.

Notes: 1. Both at Level and First Difference, individual trend and intercept have been considered.
2. ** indicates 1% level of significance.

Table 2 explains Panel Unit Root Test results of Im–Pesaran–Shin(IPS).

Table 2: Im–Pesaran–Shin(IPS) Panel Unit Root Test

			Test Statistics		Probability	
Variables	Period	Number of Countries	Level	First Difference	Level	First Difference
Ln(FDI)	1982-2016	6	-1.04658	-9.18094**	0.1476	0.0000
Ln(I-S)	1982-2016	6	-2.23386	-9.48946**	0.0127	0.0000
Ln(M-X)	1982-2016	6	-1.30492	-7.25282**	0.0960	0.0000

Source: Calculated by author through 9.5

Notes: 1. Both at Level and First Difference, individual trend and intercept have been considered.
2. ** indicates 1% level of significance.

Both Table 1 and Table 2 prove that all three variables are integrated of same order I (1). The next step is to check for long run cointegration between them. To check that, Fisher Johansen cointegration process is implemented. For proving the Two- Gap Model empirically, we first considered long run cointegration between Ln(FDI) and Ln(I-S). After that, the long run cointegration between Ln(FDI) and Ln(M-X) have been analysed. Table 3 and Table 4 show the number of cointegrated equation for the said variables. Trace Statistic and Max-Eigen value Statistic are considered for finding the number of cointegrated equation.

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Table 3: Johansen Fisher Panel Cointegration Test for variables Ln(FDI) and Ln(I-S)
Cointegration Rank Test (Trace and Maximum Eigenvalue)

Hypothesized No. of Cointegrating Equation(s)	Fisher Stat. (from Trace Test)	Probability	Fisher Stat. (from Max-Eigen Test)	Probability
None	33.18	0.0009	29.28	0.0036
At most 1	13.46	0.3363	13.46	0.3363

Source: Calculated by author through Eviews 9.5

In Table 3, both Trace and Max Eigen value statistic are first tested against Null(H0) Hypothesis of no cointegration and then check for at most one cointegrating equation. The first probabilistic value of Trace statistic (0.0009) explains rejection of Null hypothesis of no cointegration. Whereas, the second probability value (0.3363) exerts acceptance of Null Hypothesis of at most one cointegrating equation. These results are similar to that of Max- Eigen value statistic shown in Table 3. Hence, from this table, it shows that there is long run cointegration between Ln(FDI) and Ln(I-S).

In Table 4, similarly, the cointegration between Ln(FDI) and Ln(M-X) have been tested based on above two test statistics.

Table 4: Johansen Fisher Panel Cointegration Test for variables Ln(FDI) and Ln(M-X)
Cointegration Rank Test (Trace and Maximum Eigenvalue)

Hypothesized No. of Cointegrating Equation(s)	Fisher Stat. (from Trace Test)	Probability	Fisher Stat. (from Max-Eigen Test)	Probability
None	36.11	0.0003	35.14	0.0004
At most 1	11.53	0.4841	11.53	0.4841

Source: Calculated by author through Eviews 9.5

In Table 4, the first probabilistic value of Trace statistic (0.0003) describes rejection of Null hypothesis of no cointegration. Whereas, the second probability value (0.4841) proves acceptance of Null Hypothesis of at most one cointegrating equation. The same inference can be taken out of Max- Eigen value statistic by finding the respective two Null hypotheses of no cointegration and at most one cointegrating equation. Hence, from this table also, it shows that there is long run cointegration between Ln(FDI) and Ln(M-X).

After proving the cointegration, the next step is to find out Panel Error Correction Term by employing Panel Vector Error Correction Model. The first VECM is based on Ln(FDI) and Ln(I-S). The corresponding ECMs are explained in equation 1 and equation 2 respectively.

$$\Delta lnFDI_{it} = \theta_{1j} + \sum_{k=1}^{m} \theta_{11ik} \Delta lnFDI_{it-k} + \sum_{k=1}^{m} \theta_{12ik} \Delta \ln (I-S)_{it-k} + \lambda_{1i} \varepsilon_{it-1} + u_{1it}$$

---------- Equation 1

$$\Delta \ln (I-S)_{it} = \theta_{2j} + \sum_{k=1}^{m} \theta_{21ik} \Delta \ln (I-S)_{it-k} + \sum_{k=1}^{m} \theta_{22ik} \Delta \ln FDI_{it-k} + \lambda_{2i} \varepsilon_{it-1} + u_{2it}$$

---------- Equation 2

where Δ is the first-difference operator; m is the lag length; $\theta_{11}, \theta_{12}, \theta_{21}$, and θ_{22} are the coefficients of significance of independent variables in short run and their lagged terms ; residuals u_{1it} and u_{2it} are independently and normally distributed with zero mean and constant variance and ε_{it-1} is the Error Correction Term resulting from the long-run equilibrium relationship. Finally, λ is a parameter indicating the speed of adjustment to the equilibrium level after a shock from short run disequilibrium to long run stable equilibrium.

The respective coefficients with their probabilities in equation 1 and 2 are listed below in Table 5 and Table 6.

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Table 5: Results of Panel Vector Error Correction Model from Equation 1

Variables	Coefficient	Std. Error	t-Statistic	Probability
ε_{it-1}	λ_{1i}(0.212922)*	0.035467	(6.003396)	0.0000
$\Delta^{lnFDI_{it-1}}$	Θ_{11i1}(0.204390)*	0.065258	(3.132014)	0.0019
$\Delta^{lnFDI_{it-2}}$	Θ_{11i2}(0.154972)*	0.059052	(2.624331)	0.0090
$\Delta ln\ (I-S)_{it-1}$	Θ_{12i1}0.188931*	0.052359	3.608392	0.0004
$\Delta ln\ (I-S)_{it-2}$	Θ_{12i2}(0.021135)	0.054113	(0.390567)	0.6963
Constant	Θ_{1i}0.037384	0.018867	1.981481	0.0483

Source: Calculated by author through Eviews 9.5

Notes: * indicates 5% level of significance.

Table 6: Results of Panel Vector Error Correction Model from Equation 2

Variables	Coefficient	Std. Error	t-Statistic	Probability
ε_{it-1}	λ_{2i}(0.022636)	0.013938	(1.624017)	0.1052
$\Delta ln\ (I-S)_{it-1}$	Θ_{21i1}(0.207583)*	0.072115	(2.878504)	0.0042
$\Delta ln\ (I-S)_{it-2}$	Θ_{21i2}(0.224019)*	0.074531	(3.005710)	0.0028
$\Delta^{lnFDI_{it-1}}$	Θ_{22i1}0.012047	0.089882	0.134031	0.8935
$\Delta^{lnFDI_{it-2}}$	Θ_{22i2}(0.014509)	0.081334	(0.178382)	0.8585
Constant	Θ_{2i}(0.016488)	0.025986	(0.634497)	0.5261

Source: Calculated by author through Eviews 9.5

Notes: * indicates 5% level of significance.

The second VECM is based on ln (FDI) and ln(M-X). The corresponding ECMs are explained in equation 3 and equation 4 respectively as:

$$\Delta lnFDI_{it} = \beta_{1j} + \sum_{k=1}^{m} \beta_{11ik} \Delta lnFDI_{it-k} + \sum_{k=1}^{m} \beta_{12ik} \Delta \ln\ (M-X)_{it-k} + ¥_{1i} \Psi_{it-1} + v_{1it}$$

---------- Equation 3

$$\Delta \ln\ (M-X)_{it} = \beta_{2j} + \sum_{k=1}^{m} \beta_{21ik} \Delta \ln\ (M-X)_{it-k} + \sum_{k=1}^{m} \beta_{22ik} \Delta \ln\ FDI_{it-k} + ¥_{2i} \Psi_{it-1} + v_{2it}$$

---------- Equation 4

where Δ is the first-difference operator; m is the lag length; $\beta_{11}, \beta_{12}, \beta_{21}$, and β_{22} are the coefficients of significance of independent variables in short run and their lagged terms ; residuals v_{1it} and v_{2it} are independently and normally distributed with zero mean and constant variance and Ψ_{it-1} is the Error Correction Term resulting from the long-run equilibrium relationship. Finally, ¥ is a parameter indicating the speed of adjustment to the equilibrium level after a shock from short run disequilibrium to long run stable equilibrium.

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The respective coefficients with their probabilities in equation 3 and 4 are listed below in Table 7 and Table 8.

Table 7: Results of Panel Vector Error Correction Model from Equation 3

Variables	Coefficient	Std. Error	t-Statistic	Probability
Ψ_{it-1}	$¥_{1i}$(0.214388)*	0.04230	(5.067859)	0.0000
$\Delta^{lnFDI_{it-1}}$	β_{11i1}(0.217158)*	0.068634	(3.163977)	0.0017
$\Delta^{lnFDI_{it-2}}$	β_{11i2}(0.147176)*	0.063755	(2.308465)	0.0215
$\Delta ln\ (M-X)_{it-1}$	β_{12i1}(0.069799)	0.066526	(1.049196)	0.2948
$\Delta ln\ (M-X)_{it-2}$	β_{12i2}(0.040977)	0.065268	(0.627829)	0.5305
Constant	β_{1i}(0.034927)	0.020143	1.733975	0.0838

Source: Calculated by author through Eviews 9.5

Notes: * indicates 5% level of significance.

Table 8: Results of Panel Vector Error Correction Model from Equation 4

Variables	Coefficient	Std. Error	t-Statistic	Probability
Ψ_{it-1}	$¥_{2i}$(0.108708)*	0.036163	(3.006009)	0.0028
$\Delta ln\ (M-X)_{it-1}$	β_{21i1}(0.268142)*	0.073110	(3.667645)	0.0003
$\Delta ln\ (M-X)_{it-2}$	β_{21i2}(0.044302)	0.071727	(0.617647)	0.5372
$\Delta^{lnFDI_{it-1}}$	β_{22i1}0.049581	0.075427	0.657339	0.5114
$\Delta^{lnFDI_{it-2}}$	β_{22i2}0.103589	0.070065	1.478473	0.1401
Constant	β_{2i}(0.009645)	0.022136	(0.435723)	0.6633

Source: Calculated by author through Eviews 9.5

Notes: * indicates 5% level of significance.

From Table 5, it is observed that the coefficient of the Error Correction Term is negative (0.212922) and significant at 5 percent level of significance (p value- 0.000). This implies that there is a long run cointegration between ln(FDI) and ln(I-S) and also there exists chances of 21 percent of these two variables to move together from short run disturbances to long run stable equilibrium. The direction of causality is from the savings gap (I-S) to net FDI inflow in all the countries taken into consideration. The short run coefficient of (I-S) explains that as the savings gap increases by 1-unit, net FDI inflow increases by 0.188931 unit. The result is significant at 5 percent level. Hence, the theoretical concept of Two Gap Model is not empirically getting proved in case of these Newly Industrialized Countries in Asia. Where the model specifies that FDI bridges the gap between Investment and Savings by contributing to developing economies, the result of this study is contradictory. The analysis considers the endogeneity of the variables taken into consideration and explains the unidirectional causality from (I-S) to FDI.

Table 6 also explains the coefficient of the Error Correction Term which is negative (0.022636) but insignificant at 5 percent level of significance (p value- 0.1052). the result implies the absence of long run cointegration as well as short run causality in the other way around.

Table 7 and Table 8 show that in both cases, there exists a long run cointegration between ln(FDI) and ln(M-X). the chances of movement from short run disequilibrium to long run equilibrium is respectively 21 percent and 11 percent. The results are also statistically significant at 5 percent level. The main concern was finding direction of causality. As the empirical study shows, in spite of having long run cointegration, the direction of short run causality is not clear which again contradicts the theoretical the second gap (Foreign Exchange Gap) of

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Two Gap Model. As no coefficients in the short run has significant values, the analysis is unable to find any prominent outcome from VECM in case of FDI and (M-X).

As we found a long run cointegration and direction of causality in case of ln(FDI) and ln(I-S), the next step is to find out the short run significance of joint causality of the independent variable, ln(I-S), and its lagged value by employing Wald Test. The result of the test is shown in Table 9.

Table 9: Results of Wald Test of joint causality of ln(I-S)

Test Statistic	Value	Probability
Chi-square	13.97521	0.0009

In Table 9, the coefficients of ln(I-S) are tested against Null Hypothesis (H0) of no joint causality against an Alternative Hypothesis (H1) of the presence of joint causality. As the system allows lag of two periods into concern, the respective coefficients of ln(I-S) were tested as:

H0: $\Theta 12i1 = {}^{\Theta}{}_{12i2} = 0$ against H1: $\Theta 12i1 \neq {}^{\Theta}{}_{12i2} \neq 0$

The result shows a Chi- Square value which is significant at 1 percent level. This explains to reject Null hypothesis of absence of joint causality of ln(I-S) to ln(FDI) and accept the Alternative hypothesis. This again proves prominently that (I-S) plays a crucial role in attracting net FDI inflow into specifically the Newly Industrialised Asian economies taken into consideration for the study.

VI. CONCLUSION

The Two- Gap Model explains the effectiveness of FDI in developing countries in three different ways. Besides making the other MNCs from abroad to take part in investment opportunities in host countries and encouraging the flow as well as growth of host country investment, it mobilises domestic savings of host country economies. Apart from these results, the main idea of the model is to reduce the two gaps generated by developing economies by inflow of FDI.

In our analysis, not only the unidirectional effect of FDI, but also the endogeneity issue between the variables is considered. It is proved that the effect of FDI inflow on the savings gap and foreign exchange gap is insignificant. Rather, the impact of savings gap plays a crucial role in determining the level of net FDI inflow in the Newly Industrialized Countries in Asia. In case of savings gap, the effect on net FDI inflow is positive and significant. Firms in home countries are taking the advantages of the increased gap and making their entries into Asian markets. The impact of the other variable, the foreign exchange gap, on the other hand, on net FDI inflow is insignificant in our analysis.

Mathematically, the Savings gap may increase either because of higher investment associated with constant or less savings or less savings associated with the constant level of domestic investment. Any of the cases, the main concern is the amount of savings being generated in the developing economies. As savings is one of the crucial factors deciding the level of future investment and economic growth, economy should be concerned of the policy issue framework to mobilize the level of domestic savings. This will support a stable savings gap which may help to restrain the economy from any short run external shock disturbances affecting the steady flow of economic development of NICs in Asia.

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REFERENCES

[1] Adom, A. D., & Elbahnasawy, N. G. (2015). Saving-investment Gap and economic growth in developing countries: Simulated evidence from selected countries in Africa. Science and Education Studies, 9.

[2] Akande, E., & Oluyomi, O. D. (2010). The Two-Gap Model of Economic Growth in Nigeria: Vector Auto regression (VAR) Approach.

[3] Attanasio, O. P., Picci, L., & Scorcu, A. E. (2000). Saving, growth, and investment: a macroeconomic analysis using a panel of countries. Review of Economics and Statistics, 82(2), 182-211.

[4] Bacha, E. L. (1990). A three-gap model of foreign transfers and the GDP growth rate in developing countries. Journal of Development economics, 32(2), 279-296.

DOI: 10.51386/25815946/ijsms-v6i3p115

Volume: 6 Issue: 3 May to June 2023 https://www.ijsmsjournal.org

[5] Baxter, M., & Crucini, M. J. (1993). Explaining saving--investment correlations. The American Economic Review, 416-436.

[6] Beck, T., & Levine, R. (2004). Stock markets, banks, and growth: Panel evidence. Journal of Banking & Finance, 28(3), 423-442.

[7] Brouwer, J., Paap, R., & Viaene, J. M. (2008). The trade and FDI effects of EMU enlargement. Journal of International Money and Finance, 27(2), 188-208.

[8] Dean, A., Durand, M., Fallon, J., & Hoeller, P. (1989). Saving trends and behaviour in OECD countries.

[9] Domar, E. D. (1946). Capital expansion, rate of growth, and employment. Econometrica, Journal of the Econometric Society, 137-147.

[10] Evans, M. D. (2017). External balances, trade and financial conditions. Journal of International Economics, 107, 165-184.

[11] Freund, C., & Warnock, F. (2007). Current account deficits in industrial countries: the bigger they are, the harder they fall? In G7 current account imbalances: sustainability and adjustment (pp. 133-168). University of Chicago Press.

[12] Gocer, I., Akin, T., & Alatas, S. (2016). The effects of saving-investment gap on economic growth in developing countries: A clustering and panel data analysis. Theoretical & Applied Economics, 23(2).

[13] Goh, S. K., & Tham, S. Y. (2013). Trade linkages of inward and outward FDI: Evidence from Malaysia. Economic Modelling, 35, 224-230.

[14] Harrod, R. F. (1939). An essay in dynamic theory. The economic journal, 49(193), 14-33.

[15] Im, K. S., Pesaran, M. and Shin, Y. (2003), “Testing for Unit Roots in Heterogeneous Panels”, Journal of Econometrics 115, 53‐74.

[16] Ito, T. (2001). Growth, crisis, and the future of economic recovery in East Asia. Rethinking the East Asian Miracle, 55-94.

[17] Johansen, S. (1988), “Statistical Analysis of Cointegration Vectors”, Journal of Economic and Control 12, 231‐254.

[18] Kao, C. (1999), “Spurious regression and residual‐based tests for cointegration in panel data”, Journal of Econometrics 90, 1‐44.

[19] Kayalvizhi, P. N., & Thenmozhi, M. (2017). Does Quality of Innovation, Culture and Governance Drive FDI?: Evidence from Emerging Markets. Emerging Markets Review.

[20] Levin, A., Lin, F. and Chu, CJ. (2002), “Unit Root Tests in Panel Data: Asymptotic and Finite‐Sample Properties”, Journal of Econometrics 108, 1‐24.

[21] Levy, V. (1984). The savings gap and the productivity of foreign aid to a developing economy: Egypt. The Journal of Developing Areas, 19(1), 21-34.

[22] MacKinnon, J. G., Haug, A. A. and Michelis, L. (1999), “Numerical Distribution Functions of Likelihood Ratio Tests for Co‐integration”, Journal of Applied Econometrics 14, 563‐577.

[23] Maddala, G. S. and Wu, S. (1999), “A Comparative Study of Unit Root Tests with Panel Data and A New Simple Test”, Oxford Bulletin of Economics and Statistics 61, 631–652.

[24] Mihalache-O'Keef, A. S. (2018). Whose greed, whose grievance, and whose opportunity? Effects of foreign direct investments (FDI) on internal conflict. World Development, 106, 187-206.

[25] Moosa, I. (2002). Foreign direct investment: theory, evidence and practice. Springer.

[26] Pedroni, P. (1999), “Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors”, Oxford Bulletin of Economics and Statistics 61, 653‐670.

[27] Sayari, N., Sari, R., & Hammoudeh, S. (2018). The impact of value added components of GDP and FDI on economic freedom in Europe. Economic Systems.

[28] Van Wijnbergen, S. (1986). Macroeconomic aspects of the effectiveness of foreign aid: On the two-gap model, home goods disequilibrium and real exchange rate misalignment. Journal of International Economics, 21(1-2), 123-136.