Abstract
This paper has addressed the nature of the casual relationship between national savings and foreign capital in Pakistan over the period 1960-2010 using the Granger no-causality test based on Toda and Yamamoto (1995) procedure. The results show that no causality is found from foreign capital to savings but savings causes foreign capital when we consider the whole period (1960-2010). But for 1973-90 periods, both caused each other. No causality is found between foreign capital and savings but savings Granger-cause foreign capital in 1990-2010 periods. Income and savings Granger cause each other for all periods. The investment-savings relationship is mixed. Foreign capital is not a permanently dependable source. Pakistan has to rely on its own savings though the need for foreign capital will continue to haunt. An adequate reduction in non-development expenditure would release resources for productive investment that would raise production and employment and would result in the virtuous circle of saving-investment-growth-savings.

Keywords: Savings, Foreign capital, Granger no-causality, Pakistan

Jel classification: F21, F30, F35

1. Introduction
Saving is important not only for the stability of the domestic economy but has also implications for foreign debt and fiscal balance (Afzal and Shah 2010). After gaining independence from the colonial powers, it was the scarcity of savings in the developing countries that constrained them to accept foreign loans disguised as aid for rapid economic development and growth. These countries were poor and underdeveloped from western standard. It was concluded from the economic development of the developed countries that the major cause of the underdevelopment was the lack of industrialization. Rapid industrial development required high rates of savings and investment in order to achieve the ‘take-off’ stage. Because of low per capita income and erratic export earnings, domestic savings and foreign exchange earnings were too low to finance the desired level of investment. Foreign aid was conceived to fill the two gaps. Chenery and Strout (1966) advocated that net capital inflow (including aid) would supplement the domestic saving that would lead to a rise in domestic investment, which in turn will accelerate the economic growth.

Tiruneh (2004) noted that the economic propensity to borrow abroad is linked with the rising gap between national savings and domestic investment. According to Root (1990) the vicious circle of the saving-investment gap appears to be the main barrier to the growth and development in developing countries. The constraint on savings demonstrates the powerlessness of the developing countries to save sufficient amount of resources to carry out the desired level of investment that could lead to self-sustained growth. Aizenman and Radziwill (2004) observed that on the average 90% of the capital stock in

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developing countries is self-financed and this fraction was stable throughout the 1990s. If this had been stable throughout the whole post-war period, foreign savings in the form of foreign debt may not have contributed to investment in developing countries. Nevertheless, foreign resources constraint may be regarded one of the factors accounting for foreign indebtedness of developing countries. According to Easterly (1999) domestic savings is a necessary but not a sufficient condition for raising investment in developing countries to an intended level.

The role of foreign economic assistance in economic development and growth remains contentious in economic literature. Chenery and Strout (1966) concluded, on the basis of empirical evidence from LDCs (less developed countries) that foreign capital has a positive effect on the economic growth. Rahman (1968), Griffin and Enos (1970), and Weiskopf (1972) stressed the negative effects of foreign aid on the domestic savings of the recipient countries. They argued that the foreign capital could adversely affect the economic growth by substituting the domestic savings. Other studies argued that the effect of foreign aid on savings may not be necessarily negative (Papanek 1972, 1973, Over 1975). Later studies introduced changes in the early studies and re-estimated the relationship between foreign aid and domestic savings. These studies also reported negative effects of foreign aid (Gupta 1975, Mosely 1980, Synder 1990, Reinhart and Talvi 1998). Razzaque and Ahmed (2000) found a negative long-run relationship between domestic savings and foreign aid. Waheed (2003) reported a significant positive long-run relationship between domestic savings and foreign aid in Pakistan. This shows that the literature on effectiveness of foreign aid shows positive as well as negative effects on the economic development. Many economists hold the view that increase in capital inflow since the early 1990s has created extraordinary opportunities for developing countries to realize rapid economic growth. International financial institutions counsel developing countries to adopt policy regimes that support capital inflows. A large number of developing countries have significantly reduced restrictions on capital inflows, and some have offered considerable incentives in the form of tax concessions or subsidies to international investors (Hanson 2001 and UNTAD 1999).

Standard economic theory prediction that capital inflows decidedly increase investment rates in developing countries (Obstfeld and Rogoff (1996) are based on the argument that in developed and developing countries, savings and return to investment move differently. Savings in developed countries are plentiful and return to investment is low. While in developing countries diametrically opposite scenario prevails because of divergence in capital per worker. The movement of capital from developed to developing countries would change the said scenario and this would help the developing countries to achieve faster growth. However, the ground realities of the developing countries may differ significantly. It has to be seen empirically whether FDI (foreign direct investment) enhances investment in developing countries more than is supported by the domestic savings? Studies addressing empirically the effect of FDI inflows on economic growth in developing countries have also failed to produce definite results (Borensztein et al., 1998). It has been argued that foreign direct investment not only provides an initial capital inflow to support the balance of payments (BoPs) of the host country but also fills the saving-investment gap, enhances productivity and employment, transfers advanced technology and management skills that promotes economic growth These
alleged benefits convinced the policy makers in developing countries to liberalize domestic economies to attract foreign capital (Ram and Zhang, 2002, GOP 1991-92).

2. Pakistan Scenario

The first technical assistance agreement was signed with the US in February 1951. The trend of foreign aid shows that in the initial period bulk of the aid had been in the form of grants and grant-like assistance and when Pakistan got used to foreign aid its content was changed gradually from grants to loans. The share of grants and grant-like assistance declined from 80% during the first plan (1955-60) to 10% during the fourth plan (1970-75). Its share increased to 22% and 23% during 5th and 6th plans most probably because Pakistan was sharing perceptions with US on Afghan problem (Afzal 1990).

The role of foreign aid varies from country to country. Pakistan has been relying on the foreign aid to support its development programs since independence. And the aid still has a larger proportion in the foreign capital inflows to Pakistan. In Pakistan, several studies have been done to find out the role of foreign aid in economic development. Shabbir and Azher (1992) and Khan and Rahim (1993) concluded that the aid has accelerated the rate of growth of GDP. Aslam (1987) examined that the public foreign capital inflow (FCI) did not affect the domestic investment significantly, while the private FCI covered the domestic saving-investment gap. Some other studies were carried to analyze the impact of FCI on savings in Pakistan. Khan, Hasan and Malik (1992) estimated that the FCI caused decline in national saving in Pakistan during the period 1959-88. Pakistan has received generous external financial assistance from 1950s to 1980s. However, since 1990s foreign investment has almost replaced foreign aid. Studies (Khan and Rahim 1993, Kemal 1992, Khan et al., 1992, Mahmood and Qasim 1992, Afzal 2004) have reported a negative relationship between savings and foreign capital inflows and thus support the “displacement hypothesis. Shabbir and Azher (1992) found negative coefficients for both foreign private investment (FPI) and foreign aid, thus supporting the displacement hypothesis which posits that foreign financial flows discourage saving and resource mobilization efforts. Studies on the FDI in Pakistan (Majeed and Ahmad 2008, Le and Attaullah 2000, Akhtar 2000, Buckley 2000, Aqeel and Nishat 2005) have analysed different aspects of foreign investment in Pakistan but did not examine the impact of foreign investment on savings.

Pakistan lags behind in both saving and investment relative to other countries in the region except Bangladesh. Pakistan has not only under- saved but also under-invested unlike its neighbours which had experienced sustained high growth (Hook 1997). A number of studies have investigated the various factors and diverse aspects of saving behaviour affecting savings in Pakistan using both time-series and cross-section data (Afzal 2004).

The present study extends the relationship between savings and foreign capital in three aspects. All the fore-mentioned studies have used traditional econometrics techniques that assume that the data is stationary implying that the time series properties have not been addressed that can result in spurious regression. Secondly, other studies have examined the impact of foreign aid on domestic saving. This study uses both forms of capital that is foreign aid and foreign investment. Thirdly, this paper uses modern techniques of time series econometrics using more recent methodology suggested by Toda and Yamamato (1995) and thus overcoming the shortcomings of the previous studies. Therefore, the
purpose of the paper is to explore the relationship between national savings, foreign capital, domestic investment and income (GDP) in Pakistan using the aforementioned technique that has far reaching implications for macroeconomic stability which is the dire need of Pakistan’s economy in the wake of current precarious economic situation mainly resulting from security threats, energy crisis and global recession.

3. Methodology

Time series techniques involve the examination of data for unit roots and for this purpose we use KPSS. The KPSS Lagrange Multiplier tests the null of stationarity (H₀: ρ< 1) against the alternative of a unit root (H₁: ρ =1). We determine the optimal lag length of the VAR (vectorautoregression) using the AIC (Aikke information criterion), FPE (final prediction error) and SBC (Schwartz Bayesian Criterion). The standard Granger or Sims tests are likely to provide invalid causal inferences if the series are cointegrated. An error-correction model (ECM) is the alternative test for Granger causality that incorporates information from the cointegrated properties of the variables involved. Toda and Phillips (1993) argue that the Granger causality tests in ECM still contain the possibility of incorrect inference because it suffers from nuisance parameters and therefore, their results are not reliable. They have suggested an alternative procedure of estimating an unrestricted VAR that consists of transforming an estimated ECM to its levels VAR form and then applying the Wald type test for linear restrictions to the resulting VAR model.

Lütkepohl and Reimers (1992) have provided the distribution of the Wald statistic for the bivariate case. However, these procedures are not easy to apply. Therefore, we use the Granger no-causality methodology developed by Toda and Yamamato (1995). They have provided a simple procedure requiring the estimation of an ‘augmented’ VAR even when there is cointegration which guarantees the asymptotic distribution of the MWALD statistic. They have proposed a modified Wald test (MWALD) for restrictions on the parameters of a VAR (k). MWALD statistic has an asymptotic χ² distribution when a VAR (k +dₘₐₓ) is estimated where dₘₐₓ is the maximal order of integration suspected to occur in the process. MWALD statistic can be used even when a series is stationary, integrated of order 1 or 2, non-cointegrated or cointegrated of an arbitrary order. However, this procedure does not replace the conventional hypothesis testing of unit roots and cointegration ranks. Zapata and Rambaldi (1997) further developed and interpreted this methodology. They have concluded that given the performance of the tests in larger samples, the MWALD approach has much practical appeal because of its simplicity. They also conclude that the results at samples of size 50, nonetheless, appear quite accurate. For our analysis, we assume that savings depend on income (y), foreign capital (fc), and investment (inv) ceteris paribus which is formulated as the following VAR system:

$$
\begin{align*}
\begin{bmatrix}
\text{savings} \\
y \\
f_\text{c} \\
\text{inv}
\end{bmatrix}
= \begin{bmatrix}
b_{10} \\
b_{11} \\
b_{12} \\
b_{14}
\end{bmatrix}
+ \begin{bmatrix}
b_{21} & b_{22} & b_{24} \\
b_{31} & b_{32} & b_{34} \\
b_{41} & b_{42} & b_{44}
\end{bmatrix}
\begin{bmatrix}
\text{savings} \\
y_{t-1} \\
f_{\text{c},t-1} \\
\text{inv}_{t-1}
\end{bmatrix}
+ \cdots + 
\begin{bmatrix}
b_{51} & b_{52} & b_{54} \\
b_{61} & b_{62} & b_{64} \\
b_{71} & b_{72} & b_{74} \\
b_{81} & b_{82} & b_{84}
\end{bmatrix}
\begin{bmatrix}
\text{savings}_{t-5} \\
y_{t-5} \\
f_{\text{c},t-5} \\
\text{inv}_{t-5}
\end{bmatrix}
+ \begin{bmatrix}
u_{t} \\
u_{t} \\
u_{t} \\
u_{t}
\end{bmatrix}
\end{align*}
$$

(1)
To test the hypothesis that “no Granger causality runs from \( x_j \) to \( y_j \)”, we test \( H_0: b_{11}^{(1)} = b_{11}^{(2)} = b_{21}^{(1)} = b_{21}^{(2)} = 0 \ldots b_{11}^{(p)} = b_{21}^{(p)} \) where \( b_{ij}^{(j)} \), \( j = 1, 2, \ldots, p \), are the coefficients of the income, foreign capital and investment in the equations of system \((1)\) where the system is being estimated as a VAR \((k)\). Causality from \( x_j \) to \( y_j \) can be established by rejecting the above null hypotheses which requires finding the significance of the MWALD statistic for the group of lagged independent variables documented above. A similar procedure can be applied to test the hypothesis that no Granger causality runs from \( y_j \) to \( x_j \). The system of equations is jointly estimated as a Seemingly Unrelated Regression (SUR) model by maximum likelihood and computes the MWALD test statistic.

4. Data sources
Data on savings, income (GDP), gross investment and foreign aid, foreign investment (foreign capital) was collected from State Bank of Pakistan (SBP) Annual Reports (various issues) and Government of Pakistan (GOP), Economic survey (various issues). The period of the study is from 1960-2010. Since quarterly data were not available for all the variables under consideration, we have used annual data from 1960-2010 obtained from the aforementioned sources.

5. Empirical results
On the basis of KPSS test the null hypothesis of stationarity is rejected at 1% for all variables without trend. However, the null of first difference stationary is accepted for all variables with and without trend and therefore all variables are nonstationary and possess unit roots (Table 1). After having examined the data for unit roots, we now determine the lag order of unrestricted VAR by the three information criteria (FPE, AIC and SC). We proceed now to use Granger no-causality test. The results have been presented in Table 2 and Table 3.

<table>
<thead>
<tr>
<th>Variable</th>
<th>KPSS Level</th>
<th>KPSS First Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Without trend</td>
<td>With trend</td>
</tr>
<tr>
<td>savings</td>
<td>0.95</td>
<td>0.05</td>
</tr>
<tr>
<td>fc</td>
<td>0.95</td>
<td>0.08</td>
</tr>
<tr>
<td>y</td>
<td>0.95</td>
<td>0.07</td>
</tr>
<tr>
<td>inv</td>
<td>0.95</td>
<td>0.07</td>
</tr>
</tbody>
</table>

Note: 1%, 5% and 10% critical values for KPSS are 0.73, 0.46 and 0.35 for without trend. 1%, 5% and 10% critical values for with trend are 0.216, 0.146 and 0.1199. These critical values are from Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1, p.166)

We used FPE, AIC and SC to determine the lag length.\(^1\) We also estimated the model using a number of different lag structures to make certain that the results are not sensitive to the choice of lag length. Pindyck and Rubinfeld (1991) noted that different lag structures are used to ensure that the results are not sensitive to the choice of lag length.

\(^1\) AIC and FPE error supported 2 while SC indicated 1 as the optimal lag length
Tables 2 shows the results of MWALD test. Income does not cause saving and saving does not cause income is rejected for different lag structures (VAR order). fc does not cause saving is not rejected for all lag structures while saving does not cause fc is rejected except one lag structure 3(4). Except the last lag structure, investment does not cause savings is accepted while except the first lag structure, savings does not cause investment is rejected. These results clearly show that there is bi-directional causality between savings and income. Growth of GDP and real per capita income are the major determinant of savings in Pakistan. Foreign capital that comprises foreign aid and foreign investment does not cause savings and this result is supported by early studies (Afzal 2004).

<table>
<thead>
<tr>
<th>Lag structure (VAR Order)</th>
<th>MWALD Statistic($\chi^2_n$) n df</th>
<th>y does not cause savings</th>
<th>savings does not cause y</th>
<th>fc does not cause savings</th>
<th>savings does not cause fc</th>
<th>inv does not cause savings</th>
<th>savings does not cause inv</th>
</tr>
</thead>
<tbody>
<tr>
<td>savings 1(2)</td>
<td>MWALD Statistic($\chi^2_n$)</td>
<td>7.93 (0.01)</td>
<td>7.87 (0.01)</td>
<td>1.17 (0.55)</td>
<td>5.067 (0.07)</td>
<td>3.97 (0.13)</td>
<td>0.94 (0.62)</td>
</tr>
<tr>
<td>savings 2(3)</td>
<td>MWALD Statistic($\chi^2_n$)</td>
<td>11.59 (0.008)</td>
<td>163.37 (0.000)</td>
<td>1.15 (0.76)</td>
<td>8.04 (0.03)</td>
<td>3.17 (0.36)</td>
<td>17.16 (0.0007)</td>
</tr>
<tr>
<td>savings 3(4)</td>
<td>MWALD Statistic($\chi^2_n$)</td>
<td>15.11 (0.005)</td>
<td>24.19 (0.001)</td>
<td>1.07 (0.89)</td>
<td>6.34 (0.17)</td>
<td>6.78 (0.15)</td>
<td>8.55 (0.07)</td>
</tr>
<tr>
<td>savings 4(5)</td>
<td>MWALD Statistic($\chi^2_n$)</td>
<td>18.92 (0.002)</td>
<td>29.34 (0.000)</td>
<td>4.47 (0.48)</td>
<td>14.72 (0.01)</td>
<td>19.51 (0.002)</td>
<td>9.95 (0.07)</td>
</tr>
</tbody>
</table>

Note: figures within parentheses are p-values

The argument that foreign investment will help fill the saving-investment gap is not supported. Savings causes investment but the relationship is not the other way round. During the four decades (1973-2010) a number of significant structural changes have occurred in Pakistan resulting from domestic and international factors. Disintegration of Pakistan in 1971, massive devaluation in May 1972, demise of the Bretton Woods system, oil-price hike beginning from October 1973 and its impact on the world economy notably developing countries were prominent changes that certainly affected Pakistan’s economy, besides structural changes that occurred when Pakistan adopted a comprehensive programme of macroeconomic reforms towards the end of 1980s and the economy was liberalized at the beginning of 1990s. Post 9/11 scenario and the so-called war-on-terror brought countless miseries to Pakistan’s economy and its population. Bomb explosions, suicidal attacks and target killings became rampant that affected severely every section of the population. Oil-price hike, energy crisis, rising inflation and unemployment, depreciation of rupee, rising debt-burden, deteriorating law and order situation and security issues have made the common man life unsustainable culminating in a very low economic growth and thus completing the vicious circle. Therefore, it is imperative to see the impact of the aforementioned factors on savings. This suggests that the MWALD test results derived in Table 2 may be unstable and may have changed overtime. We therefore, examine the impact of these structural changes for the periods 1973-1990, and 1990-2010 The results of the MWALD test have been shown in Table 3.
Table 3: Results of MWALD Test: 1973-90 and 1990-2010

<table>
<thead>
<tr>
<th>Lag structure (VAR Order)</th>
<th>Period</th>
<th>y does not cause savings</th>
<th>savings does not cause y</th>
<th>fc does not cause savings</th>
<th>savings does not cause fc</th>
<th>inv does not cause savings</th>
<th>savings does not cause inv</th>
</tr>
</thead>
<tbody>
<tr>
<td>savings 1(2)</td>
<td>1973-90</td>
<td>32.94 (0.000)</td>
<td>19.15 (0.001)</td>
<td>17.05 (0.0001)</td>
<td>4.53 (0.06)</td>
<td>60.25 (0.000)</td>
<td>1.54 (0.46)</td>
</tr>
<tr>
<td>savings 1(2)</td>
<td>1990-2010</td>
<td>6.31 (0.04)</td>
<td>7.52 (0.02)</td>
<td>0.11 (0.94)</td>
<td>7.08 (0.02)</td>
<td>3.38 (0.18)</td>
<td>5.30 (0.07)</td>
</tr>
</tbody>
</table>

Note: figures within parentheses are p-values

We observe different results for the two periods. The results of Table 3 for savings and income are the same (Table 2). This substantiates the fact that macroeconomic performance represented primarily by GDP is the principal determinant of savings. During 1973-90, foreign capital and savings caused each other. On the other hand, investment caused savings but savings did not cause investment.

During 1980s, share of national savings declined while that of foreign savings increased.

The redeeming feature of the increase in oil prices was the increasing workers’ remittances that emerged as an important source of foreign exchange earnings. It was because of remittances that the current account deficit vacillated around one billion dollars as remittances by Pakistani workers abroad increased from $136 million (18% of the total merchandise exports) in 1972-73 to $1156 million in 1977-78 and financed 80% of the trade deficit. Within a decade, they reached as high as $2886 million, surpassing the merchandise export earnings by 10% in 1982-83. Furthermore during this period the flow of Western official capital such as long-term loans and grants amounted to an annual average of more than one billion US dollars that enabled the government to finance its way out of the difficult situation (Afzal and Ali 2008).

For 1990-2010, we see a different scenario for both foreign capital and investment. Both did not cause savings but savings did in 1990-2010. This is supported by Pakistan experience. As a percentage of total investment, national savings increased from 74.97% in 1989-90 to almost 87% in 1997-98 while foreign savings declined from 25.03% in 1989-90 to 13.3% in 1997-98. The share of foreign savings declined from 7.08% of GNP in 1992-93 to 2.31% in 1997-98. While the share of national savings increased from 13.61 in 1989-90 to 15.05% in 1997-98. During 2000s, national savings as percentage of GDP were 16.9%, while foreign savings were only 2.1%. During 2000-2004, foreign savings were even negative (GOP 2010-11).

6. Conclusion

This paper has addressed the nature of the casual relationship between national savings and foreign capital in Pakistan over the period 1973-2010 using the Granger no-causality test based on Toda and Yamamoto (1995) procedure. The results show that no causality is found from foreign capital to savings but savings caused foreign capital when we consider the whole period (1973-2010). But for 1973-90 periods, both caused each other. For 1990-2010 periods, no causality is found between foreign capital and savings. However, savings Granger-caused foreign capital in 1990-2010 period. For all periods, income and savings Granger-caused each other. The investment-savings relationship is

The results clearly demonstrate that the viable and dependable relationship has been found between income and savings. Foreign capital is not a permanently dependable source because both are motivated by political and economic interests of the donors and MNCs (multinational corporations). Pakistan’s economic development and notably foreign aid history supports the said observation. Pakistan has to rely on its own savings though the need for foreign capital will continue to haunt. The need to raise savings and thus attract investment in order to accelerate economic growth is universally acknowledged. High rates of saving are important because savings provide most of the funds for investment.

An adequate reduction in non-development expenditure would release resources for productive investment that would raise production and employment and would result in the virtuous circle of saving-investment-growth-saving. Creation of a favorable investment climate, political stability, peaceful law and order situation, adequate supply of energy and good industrial relations are also important factors for raising the rate of investment.

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