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Analyzing the Impact of Foreign Capital Inflows on Domestic Savings in Pakistan: A Comprehensive Time Series Investigation

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Abstract

This research delves into the ramifications of foreign capital inflows on domestic savings within the context of Pakistan. Utilizing annual time series data spanning from 1972 to 2022, this study employs the Auto Regressive Distributed Lag (ARDL) methodology alongside causality analysis. The findings underscore that factors such as labor force participation rate, gross fixed capital formation, deposit interest rate, foreign direct investment, trade, GDP growth, and foreign remittances exert a favorable influence on gross domestic savings over the long term. Conversely, variables encompassing age dependency, external debt stock, and net official development assistance exhibit a detrimental impact on gross domestic savings. Furthermore, the outcomes derived from the Granger causality test reveal the absence of causal relationships between foreign direct investment, remittances, trade, external debt, and gross domestic savings. Notably, unilateral causality is identified solely between net official development assistance and gross domestic savings.

Keywords: *Foreign Aid, FDI, Foreign Debt, Foreign Remittances, Savings, ARDL, Causality Analysis*

JEL Classification: *E21, F35, F24*

1. Introduction

Nature has endowed Pakistan with a lot of human and natural resources including mountains, deserts, irrigated lands, and four seasons so Pakistan can be a suitable country for domestic and foreign investors. The government of Pakistan knows the requirements of foreign investors therefore comprehensive and investment-friendly policies are being devised. Savings are vital for capital formation, productivity, and sustainable development. Foreign capital inflows have a significant role in the growth process of the capital-deficient productive capacity of the economy. Foreign capital inflows are the main resources that enhance domestic savings as well as the economic growth of a nation from the developing world. These have also been considered the key elements in the process of economic globalization and integration. Foreign capital inflows boost the economic development of a country and increase the production and job opportunities in an economy (Ahmad et al., 2002).

Foreign capital inflows play a very important role in low-income countries because there is a lack of modern technology, capital, and skilled labor (Ahmad, 1986). The major components of foreign capital inflows are foreign direct investment, foreign aid, foreign remittances, and foreign debt. Domestic savings play an essential role in the economic growth progress of an economy. It can help the economy to become financially strong (Chaudhry et al., 2009). Domestic savings are important in emergency cases. It can also be used in many ways, for example to build a factory, to start a new business, to invest

in an existing business, to enhance a business, etc. There are a lot of studies that have been done to explain the link between foreign capital inflows (FCI) and domestic savings. This study shows the link between foreign capital inflows and domestic savings in Pakistan.

The plan of the paper is as follows: Section 2 presents the review of the literature. Model specification is given in section 3. Section 4 describes data and ARDL model specification. Section 5 explains the results and discussions. Section 6 consists of the conclusion and policy recommendations.

2. Foreign Capital Inflows and Savings: An Empirical Review

In this section, we are reviewing the studies that are based on foreign capital inflows and savings.

As a flow of foreign capital, remittances can play a vital role in household savings. Privara and Trnovsky (2021) identified how remittances have contributed to raising household savings along with other macroeconomic factors in Baltic countries after piercing financial stress in 2009. OLS and fixed effect methods were adopted to estimate the results. Results indicated that in the long run remittances are the fundamental drivers of household savings. Additionally, savings were not affected by economic fluctuations in the short run but were reliant on demographic determinants as well as foreign capital, which may convey instability in financial flows and economic development of Baltic countries.

Idrees et al. (2020) investigated the influence of foreign capital flows on domestic savings in Pakistan over the period 1981 to 2010. To analyze the effect of foreign aid, remittances as well as foreign direct investment on household savings authors used the multiple regression analysis. Findings revealed that remittances and FDI have a significant and positive influence while foreign aid exhibited negative effect on savings. So it has been suggested that if Pakistan wants to raise the level of household savings, it should emphasize the significance of FDI along with remittances.

Hamdar and Nouayhid (2017) examined the role of foreign capital inflows on savings and investment in a less developed country. The authors used the time series data from the period 1989 to 2010 by applying OLS. The researchers used savings as a dependent variable while the variables of investment and foreign capital inflows were used as independent variables. The study found a negative association between capital inflows, domestic savings, and investment because the amount of profit that is earned through foreign capital inflows is used to build and maintain infrastructure like schools, roads, etc. in less developed countries like Lebanon.

Hossain (2014) analyzed the impact of foreign capital inflows on domestic savings in developing countries. The researcher used the panel data from the period 1971 to 2010 and applied the common correlated effects mean group (CCEMG) technique. The study found a negative relationship between foreign capital inflows and domestic savings because FCI was used to enhance foreign reserves and to decrease the deficits that exist in the balance of payment in developing nations.

In their study, Ali and Nishat (2009) examined the repercussions of foreign capital inflows on domestic savings within developing nations. The scholars employed time series data spanning the interval from 1975 to 2008. The study used the OLS and ARDL methodology. The researchers used foreign capital inflows as explanatory variables while domestic savings as a dependent variable. The authors found a negative relationship between foreign capital inflows and domestic savings in developing countries because the link between the employment rate and foreign capital inflows is positive which is why foreign capital inflows become the cause of to rise in the employment rate. As we know Pakistan is a

consumption-oriented country so the main part of the income of the people is used for consumption purposes which becomes the cause of the low savings rate.

Verma and Wilson (2005) highlighted the association between FCI, economic growth, investment, and domestic savings in a developing country. The study used time-series data from the period 1950 to 2001 and utilized the full information maximum likelihood method and cointegration technique. The authors used foreign capital inflows and economic growth as independent variables and domestic savings and investment as dependent variables. The researchers found a negative relationship between foreign capital inflows and domestic savings.

Ahmad et al. (2002) examined the impact of foreign capital inflows on domestic savings in Pakistan from the period 1972 to 2000. The results were estimated by applying the error correction model and cointegration techniques. The authors found a negative relationship between foreign capital inflows and domestic savings because the foreign capital inflows are used to make the resources that are not so beneficial for the people in developing countries and the revenues which were generated by using these resources increased the consumption and became an obstacle to enhance domestic savings in Pakistan.

Khan et al. (1992) conducted an estimation concerning the influence of foreign capital inflows on domestic savings within a low-income nation. The research employed time series data spanning from 1959 to 1988 and adopted the Ordinary Least Squares (OLS) methodology. The authors found the negative linkage of foreign capital inflows with domestic savings because the maximum amount of foreign capital inflows were used for consumption purposes which were considered as the main hurdle to accelerate domestic savings in Pakistan.

Mapalad (1998) investigated the link between foreign capital inflows and domestic savings in the Philippines. The study was based on time-series data from the period 1952 to 1993. The researcher found no direct link between foreign capital inflows and domestic savings by applying two-stage least squares technique and inferred that the national savings rate was mainly determined by these variables: its lagged value, augmentation of per capita real income, and balance of payment crises as inducted by a model in the less developed country.

Aslam (1987) pointed out the connection between foreign capital inflows and domestic savings and investment in Pakistan from the period 1963 to 1985. The results of the study were estimated through the multiple regression analysis technique. The study found a negative association of inflows of capital with domestic savings because dependency on foreign capital inflows forced the country to have low growth which decreased the real wage rate and became the cause of low savings in Pakistan.

Ahmad (1986) highlighted the impact of foreign capital inflows on domestic savings in Bangladesh from the period 1960 to 1980. The estimation technique which was used in this study was the two stages least square method. The author found a non-negative association between domestic savings and foreign capital inflows because foreign capital inflows did not replace domestic savings in Bangladesh.

Chen (1977) asserted the effect of foreign capital inflows on domestic savings in developing countries from the period 1956 to 1971. The methods that were used for the estimation were the OLS method and two-stage least squares technique. The study found a negative relationship between foreign capital inflows and domestic savings due to official inflows. The relationship between these variables (foreign capital inflows and domestic savings) varied from nation to nation. In certain nations, it was positive and in others it was negative.

Grinols and Bhagwati (1976) probed the link between foreign capital inflows and domestic savings in less developed countries from the period 1960 to 1970. The study found a negative association between foreign capital inflows and domestic savings because developing countries depended on foreign loans and the number of foreign capital inflows was used for the repayment of the loan and its interest. Due to this, the number of foreign capital inflows might not be used for the investment which indicated low domestic saving in developing nations.

From the above-mentioned studies, we have concluded that all the studies have the same view about the negative relationship between foreign capital inflows and savings. The studies were mostly on developing countries and the authors have used two stages least squares (2SLS) method, ordinary least square (OLS) method, generalized method of moment (GMM) technique, autoregressive distributed lag (ARDL) model, error correction model (ECM) and cointegration techniques. The studies give various reasons for the negative link between foreign capital inflows and saving: foreign capital inflows do not replace domestic savings.

3. Model Specification

To examine the linkage between foreign capital inflows and gross domestic savings in Pakistan, the following model is displayed in equation (1).

$$GDS = f(LFPR, GFCF, GDPG, DR, DEPR, FDI, REM, TRADE, ED, ODA) \quad \textbf{(1)}$$

The econometric form is shown in equation (2):

$$GDS = \beta_0 + \beta_1 LFPR + \beta_2 GFCF + \beta_3 GDPG + \beta_4 DR + \beta_5 DEPR + \beta_6 FDI + \beta_7 REM + \beta_8 TRADE + \beta_9 ED + \beta_{10} ODA + \mu \quad \textbf{(2)}$$

Where:
GDS = Gross Domestic Savings (% of GDP)
LFPR = Labor force participation rate (% of total population ages 15+)
GFCF = Gross fixed capital formation (% of GDP)
GDPG = GDP growth (annual %)
DR = Deposit interest rate (%)
DEPR = Age dependency ratio (% of working-age population)
FDI = Foreign direct investment, net inflows (% of GDP)
REM = Personal remittances received (% of GDP)
TRADE = Trade (% of GDP)
ED = External debt stocks (% of GDP)
ODA = Official development assistance (% of GNI)

4. Data and Methods

The data used is annual time series data of Pakistan ranging from 1972 to 2022. Data used in the analysis are taken from World Development Indicators. We have applied the ARDL technique to estimate the results. The general form of ECM (error correction model) is given in equation (3) which explains the impact of foreign capital inflows (foreign aid, foreign direct investment, foreign debt, foreign remittances, trade, gross domestic product growth, gross fixed capital formation, age dependency ratio, deposit interest rate, and labor force participation rate) on gross domestic savings.

$$\Delta(GDS)_t = \alpha + \beta_1(GDS)_{t-1} + \beta_2(LFPR)_{t-1} + \beta_3(GFCF)_{t-1} + \beta_4(GDPG)_{t-1} + \beta_5(DR)_{t-1} + \beta_6(DEPR)_{t-1} + \beta_7(FDI)_{t-1} + \beta_8(REM)_{t-1} + \beta_9(TRADE)_{t-1} + \beta_{10}(ED)_{t-1} + \beta_{11}(ODA)_{t-1} + \sum_{i=1}^{a_1}\delta_1\Delta(GDS)_{t-i} + \sum_{i=0}^{a_2}\delta_2\Delta(LFPR)_{t-i} + \sum_{i=0}^{a_3}\delta_3\Delta(GFCF)_{t-i} + \sum_{i=0}^{a_4}\delta_4\Delta(GDPG)_{t-i} + \sum_{i=0}^{a_5}\delta_5\Delta(DR)_{t-i} + \sum_{i=0}^{a_6}\delta_6\Delta(DEPR)_{t-i} + \sum_{i=0}^{a_7}\delta_7\Delta(FDI)_{t-i} + \sum_{i=0}^{a_8}\delta_8\Delta(REM)_{t-i} + \sum_{i=0}^{a_9}\delta_9\Delta(TRADE)_{t-i} + \sum_{i=0}^{a_{10}}\delta_{10}\Delta(ED)_{t-i} + \sum_{i=0}^{a_{11}}\delta_{11}\Delta(ODA)_{t-i} + \varepsilon_t \quad \textbf{(3)}$$

The coefficients of long-run parameters are βi and in the autoregressive distributed lag model (ARDL) the short-run dynamic coefficients are δi. The error term is ε_t while Δ is the operator of the first difference. If a long-run relationship exists, long-run coefficients are estimated through the following equation (4).

$$\Delta(GDS)_t = \alpha + \sum_{i=1}^{a_1}\eta_1(GDS)_{t-i} + \sum_{i=0}^{a_2}\eta_2(LFPR)_{t-i} + \sum_{i=0}^{a_3}\eta_3(GFCF)_{t-i} + \sum_{i=0}^{a_4}\eta_4(GDPG)_{t-i} + \sum_{i=0}^{a_5}\eta_5(DR)_{t-i} + \sum_{i=0}^{a_6}\eta_6(DEPR)_{t-i} + \sum_{i=0}^{a_7}\eta_7(FDI)_{t-i} + \sum_{i=0}^{a_8}\eta_8(REM)_{t-i} + \sum_{i=0}^{a_9}\eta_9(TRADE)_{t-i} + \sum_{i=0}^{a_{10}}\eta_{10}(ED)_{t-i} + \sum_{i=0}^{a_{11}}\eta_{11}(ODA)_{t-i} + \varepsilon_t \quad \textbf{(4)}$$

The short-run domestic savings equation in the ARDL model can be estimated with equation (5).

$$\Delta(GDS)_t = \alpha + \sum_{i=1}^{a_1}\lambda_1\Delta(GDS)_{t-i} + \sum_{i=0}^{a_2}\lambda_2\Delta(LFPR)_{t-i} + \sum_{i=0}^{a_3}\lambda_3\Delta(GFCF)_{t-i} + \sum_{i=0}^{a_4}\lambda_4\Delta(GDPG)_{t-i} + \sum_{i=0}^{a_5}\lambda_5\Delta(DR)_{t-i} + \sum_{i=0}^{a_6}\lambda_6\Delta(DEPR)_{t-i} + \sum_{i=0}^{a_7}\lambda_7\Delta(FDI)_{t-i} + \sum_{i=0}^{a_8}\lambda_8\Delta(REM)_{t-i} + \sum_{i=0}^{a_9}\lambda_9\Delta(TRADE)_{t-i} + \sum_{i=0}^{a_{10}}\lambda_{10}\Delta(ED)_{t-i} + \sum_{i=0}^{a_{11}}\lambda_{11}\Delta(ODA)_{t-i} + \omega ECM_{t-1} + \varepsilon_t \quad \textbf{(5)}$$

The parameters with summation signs denote the short-run coefficients and parameters of the error correction model (ECM). ω represents the speed of adjustment.

5. Results and Discussions

5.1 Descriptive Statistics and Correlation Analysis

Table 1 shows the results of descriptive statistics of the main variables.

Table 1: Descriptive Statistics of Key Variables

	Mean	Median	Max	Min	SD	Skewness	Kurtosis	JB	Prob.	Obs.
GDS	10.67	10.06	17.61	1.45	4.35	0.04	2.03	1.81	0.40	46
LFPR	30.19	29.82	32.98	27.46	1.68	0.32	1.96	2.83	0.24	46
GFCF	15.81	16.49	19.24	11.44	2.10	-0.67	2.32	4.33	0.11	46
GDPG	4.82	4.84	10.22	0.81	2.10	0.20	2.67	0.52	0.77	46
DR	6.39	7.19	10.17	-1.63	2.23	-1.60	5.90	35.89	0.00	46

DEPR	81.44	86.98	88.91	65.08	8.53	-0.77	1.87	6.94	0.03	46
FDI	0.68	0.50	3.67	-1.18	0.91	1.44	6.03	33.42	0.00	46
REM	5.13	4.96	10.25	1.45	2.17	0.23	2.22	1.55	0.46	46
TRADE	33.53	33.35	38.91	27.72	2.75	-0.18	2.69	0.43	0.81	46
ED	0.26	0.26	0.35	0.19	0.04	0.24	1.97	2.48	0.29	46
ODA	2.43	2.11	7.48	0.71	1.46	1.51	5.49	29.29	0.00	46

DEPR has the highest mean value which is 81.44 % of the working-age population and ED has the lowest mean value which is 0.26 % of GDP in the set of data. DEPR has the highest median value in the arranged set of data which is 86.98 % of the working-age population and ED has the lowest mid-value which is 0.26 % of GDP. Max represents the maximum values in the series. Min shows the minimum values in the whole set of data. DEPR has the maximum value in the whole set of data which is 88.91 % of the working-age population. DR has the minimum value in the series which is -1.63 %. DEPR has the highest value of standard deviation in the whole set of data and that is 8.53 % of the working-age population which shows the greater spread in the series and ED has the lowest value of standard deviation in the whole series which shows the distance of individual value from the average or mean value that is round about 0.04 % of GDP. The variables GDS, LFPR, GDPG, FDI, REM, ED, and ODA are positively skewed. While the other variables GFCF, DR, DEPR, and TRADE are negatively skewed. The variables DR, FDI, and ODA are leptokurtic. All the other variables GDS, GFCF, GDPG, LFPR, DEPR, ED, REM, and TRADE are platykurtic. The probability value of JB stats of GDS, LFPR, GFCF, GDPG, REM, TRADE, and ED of these variables are in a symmetrical distribution. The other variables DR, DEPR, FDI, and ODA are in non-symmetrical distribution.
Table 2 shows the results of the correlation matrix of the main variables.

Table 2: Correlation Matrix of Key Variables

Correlation	GDS	LFPR	GFCF	GDPG	DR	DEPR	FDI	REM	TRADE	ED	ODA
GDS	1.00										
LFPR	-0.55	1.00									
GFCF	0.40	-0.45	1.00								
GDPG	-0.13	-0.09	0.23	1.00							
DR	-0.33	-0.03	0.26	-0.05	1.00						
DEPR	0.20	-0.82	0.50	0.23	0.23	1.00					
FDI	0.46	0.11	0.42	-0.15	-0.16	-0.23	1.00				
REM	-0.74	0.37	-0.14	0.44	0.18	-0.05	-0.44	1.00			
TRADE	0.14	-0.31	0.40	0.08	0.37	0.16	0.26	-0.07	1.00		
ED	0.04	0.43	-0.30	-0.13	-0.20	-0.78	0.13	-0.08	0.12	1.00	
ODA	-0.21	-0.27	0.12	0.18	0.10	0.60	-0.31	0.10	-0.16	-0.75	1.00

There is a negative moderate correlation between GDS and LFPR because its value is -0.55. GDS has a positive moderate correlation with GFCF and FDI. GDS has a negative weak correlation with GDPG and ODA. There is a positive weak correlation between the variables GDS and TRADE, GDS and ED, and GDS and DEPR. GDS has a negative strong correlation with REM. LFPR has a negative moderate correlation with GFCF and TRADE. LFPR has a negative weak correlation with GDPG, DR, and ODA. LFPR has a negative strong correlation with DEPR because its value is -0.82. LFPR has a positive moderate correlation with ED and REM. LFPR has a positive weak correlation with FDI. GFCF has a positive weak correlation with GDPG, DR, and ODA. GFCF has a positive moderate correlation with DEPR, FDI, and TRADE. GFCF has a negative weak correlation with REM. GFCF has a negative moderate correlation with ED. There is a negative weak correlation between GDPG and DR, GDPG and FDI, and GDPG and ED. GDPG has a positive weak correlation with DEPR, TRADE, and ODA. DR

has a positive weak correlation with DEPR, REM, and ODA. DR has a positive moderate correlation with TRADE because the coefficient value of TRADE is 0.37. DEPR has a negative weak correlation with FDI and REM. DEPR has a positive weak correlation with TRADE. DEPR has a negative strong correlation with ED. DEPR has a positive moderate correlation with ODA. FDI has a negative moderate correlation with REM and ODA. FDI has a positive weak correlation with TRADE and ED because the coefficient values of these variables are 0.26 and 0.13 which represent the weak correlation and the signs of the coefficient are positive that's why it shows a positive weak correlation between these variables. There is a negative weak correlation between REM and TRADE and REM and ED because the coefficient values of these variables are -0.07 and -0.08. There is a positive weak correlation between REM and ODA. There is a positive weak correlation between TRADE and ED. TRADE and ODA have a negative weak correlation because the sign of the coefficient is negative which is why there is a negative weak correlation between TRADE and ODA. ED and ODA have a negative strong correlation.

5.2 Results of ADF Unit Root

Table 3 shows the results of the ADF unit root analysis. The results of the ADF test show that there is a mixed order of integration among the variables. So, the optimum methodology suggested by the econometricians is ARDL so, we would apply ARDL for the estimation of the model.

Table 3: ADF Unit Root Test Results

Unit Root Test on Level							
Variables	**Intercept**	**Lags**	**Intercept and Trend**	**Lags**	**None**	**Lags**	**Conclusion**
GDS	-2.06 (0.25)	0	-2.04 (0.56)	0	-0.60 (0.44)	0	NS
LFPR	-0.84 (0.79)	0	-1.31 (0.87)	0	0.50 (0.82)	0	NS
GFCF	-2.23 (0.19)	0	-2.71 (0.23)	0	-0.01 (0.67)	0	NS
GDPG	-5.13 (0.00)	0	-5.78 (0.00)	0	-1.49 (0.12)	0	S
DR	-2.01 (0.27)	0	-2.19 (0.48)	0	-0.63 (0.43)	0	NS
DEPR	-2.60 (0.09)	3	-2.69 (0.24)	3	-2.52 (0.01)	0	S
FDI	-2.80 (0.06)	1	-2.87 (0.17)	1	-1.52 (0.11)	0	S
REM	-1.93 (0.31)	0	-2.57 (0.54)	0	-0.64 (0.42)	0	NS
TRADE	-3.56 (0.01)	0	-3.49 (0.05)	0	-0.09 (0.70)	0	S
ED	-1.74 (0.40)	0	-4.62 (0.00)	0	-0.51 (0.82)	0	NS
ODA	-2.09 (0.24)	0	-4.04 (0.01)	0	-1.70 (0.08)	0	S

5.3 Results of Bounds Test

Table 4 shows the results of the bounds test analysis. It shows that the value of the F-statistic is greater than the upper bound I (1) at a 5% and 10% level of significance. That is why the long-run relationship exists and when a long-run relationship exists it means cointegration also exists.

Table 4: Bounds Test based on F-Test

		5% Critical Value Bounds		10% Critical value Bounds	
Model	**F-Statistic**	I(0)	I(1)	I(0)	I(1)
GDS/ LFPR GFCF GDPG DR DEPR FDI REM TRADE ED ODA	3.898275	2.06	3.24	1.83	2.94

5.4 Long Run Results

We now elucidate the long-term findings, as presented in Table 5.

Table 5: Long Run Estimates of Foreign Capital Inflows and Domestic Savings

Dependent Variable: GDS				
Selected Model: ARDL(1, 1, 2, 2, 0, 0, 1, 0, 1, 2, 0)				
Variable	**Coefficient**	**Std. Error**	**t-Stat**	**Prob.**
LFPR	1.331079	0.601742	2.212043	0.0372
GFCF	1.577382	0.396808	3.975176	0.0006
GDPG	0.696735	0.419356	1.661441	0.1102
DR	0.717473	0.219922	3.262401	0.0034
DEPR	-0.471273	0.170875	-2.757992	0.0112
FDI	1.593886	0.758833	2.100445	0.0469
REM	0.886175	0.304680	2.908544	0.0079
TRADE	0.346237	0.209057	1.656187	0.1113
ED	-0.798129	0.251496	-3.173530	0.0042
ODA	-1.036126	0.424761	-2.439315	0.0228
C	89.394122	35.363465	2.527867	0.0188

In the extended timeframe, a notable and statistically significant correlation is observed between Gross Domestic Savings (GDS) and Labor Force Participation Rate (LFPR). As labor force participation increases, it will enhance the production of industrial units. It will enable the industry to do efficient production. Efficient and more production in industrial units will attract people for more investment in different industries. For more investment, people will borrow from the banking sector. More demand for loans can be fulfilled by urging people to enhance their savings. Secondly, more investment will lead to more production. More productivity means more GDP growth which will cause an increase in gross domestic savings (Graham, 1987; Oropesa, Yamada et al., 1990 Joubert and Todd, 2011).

In an economy for efficiency and more production, there is a need to replace the old capital goods with new capital assets. This is also essential to increase the capital goods like machinery, labor, tools, and transportation assets to increase the productivity of different sectors in the economy. This process is called capital formulation. It would be beneficial only when there is the best and efficient utilization of these resources. The capital goods can be attained domestically as well as through foreign investments. If there is more capital formulation in different sectors, there will be more production units that will have efficient production of goods and services. This will positively influence the gross domestic product and become the cause of high GDP growth. More growth in the gross domestic product will uplift the domestic savings of the country. So, the coefficient value of GFCF is 1.57. The coefficient is positive which represents the positive and significant relationship between GDS and GFCF in the long run. Our results are compatible with the studies (Kanu et al., 2014; Jagadeesh, 2015; Shuaib et al, 2015; Gibescu, 2010; and Armstrong et al, 1996).

It is obvious that if there is high GDP growth in the economy, it will lead to more gross domestic savings. Different methods can help to increase the GDP growth i.e. if the banks charge a low policy rate, people will get more loans that will prove beneficial to increase the economic activity as well as GDP growth. In this modern era, the best way to uplift GDP growth is to do innovation in all sectors. This will decrease the cost of doing business as well as enhance productivity which ultimately increases the GDP growth and domestic savings. The sign of the coefficient of GDPG is positive which shows the long-run positive and insignificant relationship between GDPG and GDS. The studies by Waithima, 2008; Odhiambo, 2009; Oladipo, 2010 and Misztal, 2011 have found the positive impact of GDS on GDP growth.

If the central bank of the country increases the deposit rate, it will attract the people for more savings in banks. Through more savings, the supply of loanable funds will increase in banks. When the supply of loanable funds increases, it will push down the policy rate at which banks advance the loans to the people. The investor will demand more loans from banks to put these in economic activities at a low-interest rate. The investors borrow the loan from banks and invest it into economic activity and that will enhance the production of different sectors. It will also increase the profitability ratio of investors which attracts the other investors from their home country or abroad to put their investment in these sectors. Through more profit, the investors can reallocate their savings to different economic units. These steps positively influence the gross domestic product as well as gross domestic savings. The coefficient value of DR is 0.71, which shows the positive and significant relationship between DR and GDS in the long run. So, our results are in line with the studies (Mushtaq and Siddiqui 2017; Oshikoya, 1992 and Molho, 1986).

In an economy, when the burden of older people increases, domestic savings will go down. The reason behind this negative relation is that people who are retired from their jobs use their saved part of the money. They are not participating in economic activity but they are using their saved resources to meet their basic needs. These people are considered a burden on the economy because they are using the saved part of their money without earnings. When in an economy people of this category increase, there will be less domestic savings. Hence, the negative coefficient of DEPR signifies a substantial and adverse long-term association between DEPR and GDS. Our results are consistent with the studies (Apergis and Christou, 2012; Keho, 2012 and Gupta, 1975).

The economic reason for the positive relationship between foreign direct investment and domestic savings is that more foreign direct investment will generate more economic activity. Gross domestic product will increase due to foreign direct investment and it will enhance domestic savings. FDI is also used in productive ways that will lead to high economic growth and an increase in domestic savings. FDI enhances the investment in a country creating more economic growth and domestic savings. The estimated parameter of FDI is positive and statistically significant. So, our results are supported by different studies which are Bano and Tabbada, 2015; Hassen and Anis, 2012; Chani et al, 2010 and Dhar and Roy, 1996.

If the residents of the country send more remittances back to their country, this money may be used for consumption and savings purposes. More consumption leads to an increase in aggregate demand of an economy and that will increase the economic activity as well as GDP and domestic savings. Another use of remittances is to save money. The majority of people save their money in banks and this amount can be used as loanable funds. This activity generates the investment in economy which will improve economic growth and increase domestic savings because foreign remittances contribute to encouraging financial development and help to eliminate poverty conditions. In this way, remittance inflows play a vital role in promoting

economic activity and lead to a decrease in poverty alleviation in developing countries. The coefficient represents the long-run positive and significant relationship between REM and GDS. Our results are compatible with the studies (Inoue, 2018; Azam et al, 2016; Imai et al, 2014; Lartey, 2013; Javid et al, 2012; Baldé, 2011and Morton et al, 2010).

A good relationship between countries has a positive impact on trade. If more trade-in economy, it means that there is a high GDP growth rate that will lead to more domestic savings. The coefficient of TRADE is 0.34 which shows the positive and insignificant relationship between TRADE and GDS in the long run. So, our results are consistent with the studies (Inoue, 2018; Lartey, 2013; Gruben and Mcleod, 1998; Sheikh et al. 2018; Sheikh et al. 2019).

If a country is facing an external debt burden, then the major part of the gross domestic product of the economy is used for debt services that will negatively impact gross domestic savings. Debt burdens hangover economies and scares off investors due to high anticipated future tax-reducing public savings. The inverse linkage between debt burden and domestic savings is that foreign funds appear to substitute domestic savings and the resources generated through foreign debt have been used partially for spending purposes. Hence, the computed ED value further confirms the presence of an adverse and statistically noteworthy association between ED and GDS. This observation aligns with the outcomes reported in prior research conducted by Sheikh et al. (2015), Oageng and Boitumelo (2017), Jappelli et al. (2014), Aliyu and Usman (2013), Chaudhry et al. (2009), as well as Okafor and Tyrowicz (2009), all of which substantiate the detrimental influence of ED on GDS. Net official development assistance has a negative impact on economic growth because the countries are dependent and the miscellaneous course of actions and self-governing expansion for the reason that democracies are the major problems to imperfections. Foreign aid is used for development projects in low-income countries because the poor countries magnetize the largest part of aid infraction to their earnings and the poor countries hoard least not the actual in the less developed countries and developing countries are dependent on developed countries. Corruption and political instability are also the main reasons for this correlation. So, the coefficient shows the negative and insignificant relationship between ODA and GDS in the long run. Our results are compatible with the studies (Afawubo and Mathey, 2017; Mohey-ud-din, 2005; Bowles, 1987 and Mosley, 1980).

5.6 Error Correction Results

The results of error correction estimates are discussed in Table 6.

Table 6: Error Correction Estimates of Foreign Capital Inflows and Domestic Savings

Dependent Variable: GDS
Selected Model: ARDL(1, 1, 2, 2, 0, 0, 1, 0, 1, 2, 0)

Variable	Coefficient	Std. Error	t-Stat	Prob.
D(LFPR)	0.112061	0.718251	0.156019	0.8774
D(GFCF)	1.017616	0.389417	2.613176	0.0155
D(GFCF(-1))	-0.765257	0.358479	-2.134730	0.0437
D(GDPG)	0.050045	0.167854	0.298146	0.7683
D(GDPG(-1))	0.269141	0.205715	1.308323	0.2037
D(DR)	-0.692286	0.204963	-3.377611	0.0026
D(DEPR)	-0.454729	0.185964	-2.445250	0.0225
D(FDI)	0.231846	0.714896	0.324308	0.7486
D(REM)	-0.855065	0.362697	-2.357522	0.0273
D(TRADE)	0.040320	0.166487	0.242178	0.8108
D(ED)	-0.568675	0.179807	-3.162696	0.0043
D(ED(-1))	0.440809	0.170434	2.586386	0.0165

D(ODA)	-0.999752	0.471164	-2.121879	0.0448
CointEq(-1)	-0.964894	0.176519	-5.466246	0.0000

5.7 Granger Causality Analysis

Granger causality test is used to check the causality between two variables mostly in time series analysis. The first step in the analysis of Granger causality is to choose the optimum lag. Table 7 shows the lag selection criteria. According to the results, the optimum lag is 2 because at lag 2 the value of AIC and SC has the minimum values.

Table 7: VAR Lag Order Selection Criteria

Endogenous variables: GDS LFPR GFCF GDPG DR DEPR FDI REM TRADE ED ODA

Lag	Log L	LR	FPE	AIC	SC	HQ
0	-717.6621	NA	6.715680	33.12101	33.56705	33.28642
1	-396.1230	467.6934	0.000863	24.00559	29.35816*	25.99058
2	-216.4936	171.4644*	0.000182*	21.34062*	31.59971	25.14518*

Table 8 shows the result of the Granger causality test.

Table 8: Pairwise Granger Causality Test

Null Hypothesis:	Lags	F-Statistic	Lags	F-Statistic	Lags	F-Statistic
LFPR ⇏ GDS	2	2.86139 (0.0690)	3	2.44343 (0.0794)	4	2.3445 (0.0743)
GDS ⇏ LFPR		2.33951 (0.1094)		1.13061 (0.3493)		1.35930 (0.2685)
GFCF ⇏ GDS	2	0.47612 (0.6247)	3	0.23903 (0.8686)	4	0.67942 (0.6110)
GDS ⇏ GFCF		0.31080 (0.7346)		0.51663 (0.6734)		0.43110 (0.7851)
GDPG ⇏ GDS	2	1.41558 (0.2547)	3	1.00672 (0.4007)	4	0.68084 (0.6100)
GDS ⇏ GDPG		0.50200 (0.6091)		0.57827 (0.6330)		0.45211 (0.7701)
DR ⇏ GDS	2	0.02257 (0.9777)	3	0.43683 (0.7280)	4	0.50738 (0.7306)
GDS ⇏ DR		0.59302 (0.5574)		0.38636 (0.7635)		1.51265 (0.2204)
DEPR ⇏ GDS	2	5.82903 (0.0060)	3	5.70166 (0.0026)	4	5.55007 (0.0015)
GDS ⇏ DEPR		7.77538 (0.0014)		4.02412 (0.0142)		1.55213 (0.2094)
FDI ⇏ GDS	2	0.31063 (0.7347)	3	0.74549 (0.5319)	4	0.93550 (0.4551)
GDS ⇏ FDI		1.69843 (0.1959)		1.70201 (0.1834)		1.31759 (0.2832)
REM ⇏ GDS	2	1.15472 (0.3254)	3	0.78485 (0.5266)	4	0.67452 (0.6143)
GDS ⇏ REM		0.76167 (0.4735)		0.44943 (0.7192)		0.79776 (0.5550)
TRADE ⇏ GDS	2	1.75898 (0.1853)	3	0.72982 (0.5408)	4	0.73101 (0.5771)
GDS ⇏ TRADE		0.87822 (0.4234)		0.44568 (0.7218)		2.00670 (0.1157)
ED ⇏ GDS	2	1.31877	3	0.95249	4	0.70407

		(0.2788)		(0.4253)	(0.5947)
GDS ⇏ ED		0.20015 (0.8194)		0.21691 (0.8840)	0.46365 (0.7619)
ODA ⇏ GDS	2	0.03050 (0.9700)	3	0.28296 (0.8373)	0.85992 (0.4981)
GDS ⇏ ODA		3.68220 (0.0343)		0.68599 (0.0610)	1.45625 (0.2378)
GFCF ⇏ LFPR	2	1.62660 (0.2093)	3	1.40096 (0.2579)	1.06361 (0.3895)
LFPR ⇏ GFCF		2.49004 (0.0957)		1.74673 (0.1743)	1.96100 (0.4228)
GDPG ⇏ LFPR	2	0.18018 (0.8358)	3	0.47326 (0.7028)	1.47645 (0.2310)
LFPR ⇏ GDPG		0.22081 (0.8028)		0.30578 (0.8210)	0.24350 (0.9116)
DR ⇏ LFPR	2	3.92003 (0.0279)	3	2.56459 (0.0693)	4.53410 (0.0048)
LFPR ⇏ DR		0.65401 (0.5254)		0.45585 (0.7148)	0.20618 (0.9332)
DEPR ⇏ LFPR	2	4.80575 (0.0135)	3	2.67285 (0.0615)	2.83529 (0.0394)
LFPR ⇏ DEPR		1.54432 (0.2259)		0.96635 (0.4189)	0.26347 (0.8993)
FDI ⇏ LFPR	2	3.09538 (0.0562)	3	1.22837 (0.3131)	1.47315 (0.2320)
LFPR ⇏ FDI		0.50008 (0.6102)		0.75535 (0.5263)	0.51287 (0.7267)
REM ⇏ LFPR	2	2.69528 (0.0798)	3	1.23061 (0.3123)	2.30907 (0.0779)
LFPR ⇏ REM		1.76214 (0.1847)		1.48748 (0.2338)	0.78865 (0.5407)
TRADE ⇏ LFPR	2	1.19630 (0.3129)	3	1.25068 (0.3054)	1.03822 (0.4019)
LFPR ⇏ TRADE		1.34358 (0.2724)		0.79487 (0.5046)	0.64268 (0.6358)
ED ⇏ LFPR	2	2.60354 (0.0865)	3	1.10280 (0.3603)	0.94561 (0.4497)
LFPR ⇏ ED		1.62811 (0.2090)		2.01367 (0.1288)	1.78725 (0.1542)
ODA ⇏ LFPR	2	0.17206 (0.8426)	3	0.48050 (0.6979)	0.26902 (0.8958)
LFPR ⇏ ODA		1.40241 (0.2581)		0.76898 (0.5190)	0.47451 (0.7541)
GDPG ⇏ GFCF	2	2.84997 (0.0296)	3	2.55682 (0.0699)	1.84434 (0.1431)
GFCF ⇏ GDPG		0.04595 (0.9551)		0.06817 (0.9765)	0.24869 (0.9085)
DR ⇏ GFCF	2	0.46774 (0.6298)	3	0.43299 (0.7306)	0.47595 (0.7531)
GFCF ⇏ DR		0.45932 (0.6350)		1.43387 (0.2485)	1.91131 (0.1311)
DEPR ⇏ GFCF	2	7.64113 (0.0015)	3	6.68984 (0.0010)	5.82501 (0.001)
GFCF ⇏ DEPR		0.34937 (0.7073)		0.25167 (0.8596)	0.05604 (0.9939)
FDI ⇏ GFCF	2	1.72511 (0.1911)	3	2.83308 (0.0514)	1.83896 (0.1441)

		0.06938		0.44280		0.37457
GFCF ⇏ FDI		(0.9331)		(0.7238)		(0.8251)
		1.26073		1.00052		2.71854
REM ⇏ GFCF	2	(0.2945)	3	(0.4034)	4	(0.0458)
		0.27925		0.76663		1.03597
GFCF ⇏ REM		(0.7578)		(0.5201)		(0.4030)
		0.03967		0.21725		0.44285
TRADE ⇏ GFCF	2	(0.9611)	3	(0.8838)	4	(0.7768)
		1.31305		3.45537		3.83103
GFCF ⇏ TRADE		(0.2803)		(0.0260)		(0.0113)
		2.40021		2.02049		1.50207
ED ⇏ GFCF	2	(0.1036)	3	(0.1279)	4	(0.2235)
		1.00103		1.46574		1.53631
GFCF ⇏ ED		(0.3765)		(0.2397)		(0.2138)
		2.37221		2.29087		1.25572
ODA ⇏ GFCF	2	(0.1066)	3	(0.0947)	4	(0.3070)
		0.80373		0.91196		1.12242
GFCF ⇏ ODA		(0.4549)		(0.4449)		(0.3627)
		0.72388		0.49020		1.08209
DR ⇏ GDPG	2	(0.4911)	3	(0.6912)	4	(0.3808)
		1.5939		1.17707		1.14436
GDPG ⇏ DR		(0.2149)		(0.3816)		(0.3524)
		0.40433		0.32525		0.35346
DEPR ⇏ GDPG	2	(0.6701)	3	(0.8071)	4	(0.8398)
		0.82068		0.63830		1.88476
GDPG ⇏ DEPR		(0.4474)		(0.6952)		(0.1357)
		2.52264		1.81462		1.47537
FDI ⇏ GDPG	2	(0.0929)	3	(0.1614)	4	(0.2313)
		1.24990		0.64441		0.57520
GDPG ⇏ FDI		(0.2975)		(0.5914)		(0.6825)
		3.42571		2.33370		2.43611
REM ⇏ GDPG	2	(0.0423)	3	(0.0898)	4	(0.0660)
		0.47990		0.84393		2.00286
GDPG ⇏ REM		(0.6224)		(0.4786)		(0.1163)
		0.80528		2.10542		2.17750
TRADE ⇏ GDPG	2	(0.4541)		(0.1161)	4	(0.0925)
		3.09895		1.94980		1.70928
GDPG ⇏ TRADE		(0.0561)		(0.1385)		(0.1707)
		1.41232		1.26550		1.80273
ED ⇏ GDPG	2	(0.2555)	3	(0.3003)	4	(0.1411)
		2.05718		2.27245		1.78641
GDPG ⇏ ED		(0.1411)		(0.0962)		(0.1543)
		1.67177		1.09711		1.51174
ODA ⇏ GDPG	2	(0.2011)	3	(0.3629)	4	(0.2214)
		1.57423		3.20152		1.82670
GDPG ⇏ ODA		(0.2200)		(0.0347)		(0.1472)
		0.77923		0.78078		1.11159
DEPR ⇏ DR	2	(0.4656)	3	(0.5123)	4	(0.3671)
		2.79955		1.55511		0.34892
DR ⇏ DEPR		(0.0728)		(0.2166)		(0.8429)
		1.11786		1.06906		0.63174
FDI ⇏ DR	2	(0.3370)	3	(0.3740)	4	(0.6433)
		4.50715		3.47391		2.69413
DR ⇏ FDI		(0.0712)		(0.0255)		(0.0472)
		0.99599		0.88443		0.73288
REM ⇏ DR	2	(0.3783)	3	(0.4581)	4	(0.5759)
DR ⇏ REM		0.24994		0.43493		0.37309

		(0.7801)		(0.7293)	(0.8262)
TRADE ⇏ DR	2	1.13435 (0.3318)	3	1.27334 (0.2977)	1.26892 (0.3013)
DR ⇏ TRADE		0.58612 (0.5612)		1.38594 (0.2623)	1.76747 (0.1582)
ED ⇏ DR	2	3.90817 (0.0282)	3	3.96160 (0.0152)	2.43260 (0.0663)
DR ⇏ ED		2.51058 (0.0939)		1.13108 (0.3491)	0.88204 (0.4850)
ODA ⇏ DR	2	1.39760 (0.2593)	3	1.00316 (0.4026)	0.72558 (0.5808)
DR ⇏ ODA		1.99527 (0.1496)		1.57465 (0.2124)	1.40567 (0.2537)
FDI ⇏ DEPR	2	2.51353 (0.0937)	3	1.93165 (0.1414)	0.90467 (0.4722)
DEPR ⇏ FDI		3.54943 (0.0381)		7.49106 (0.0005)	7.82965 (0.0001)
REM ⇏ DEPR	2	3.63222 (0.0355)	3	2.33428 (0.0897)	2.05288 (0.1089)
DEPR ⇏ REM		2.68797 (0.0803)		2.88295 (0.0487)	2.33545 (0.0752)
TRADE ⇏ DEPR	2	0.17940 (0.8364)	3	0.11923 (0.9842)	0.30100 (0.8752)
DEPR ⇏ TRADE		0.63604 (0.5347)		0.25963 (0.8540)	0.31164 (0.8682)
ED ⇏ DEPR	2	0.25211 (0.7784)	3	0.34894 (0.7901)	0.29619 (0.8784)
DEPR ⇏ ED		3.21783 (0.0506)		1.64615 (0.1954)	1.42932 (0.2454)
ODA ⇏ DEPR	2	1.02004 (0.3700)	3	0.03869 (0.9897)	0.04086 (0.9967)
DEPR ⇏ ODA		0.97952 (0.3845)		0.93193 (0.4353)	0.54516 (0.7037)
REM ⇏ FDI	2	0.29841 (0.7436)	3	0.27884 (0.8403)	0.22036 (0.9252)
FDI ⇏ REM		0.07956 (0.9237)		0.21486 (0.8855)	0.06862 (0.9910)
TRADE ⇏ FDI	2	0.01724 (0.9829)	3	0.08462 (0.9680)	0.06456 (0.9920)
FDI ⇏ TRADE		0.49480 (0.6134)		0.40299 (0.7517)	0.32203 (0.8612)
ED ⇏ FDI	2	1.19063 (0.3146)	3	1.98931 (0.1324)	1.43430 (0.2439)
FDI ⇏ ED		0.07798 (0.9251)		1.94940 (0.1386)	1.81619 (0.1485)
ODA ⇏ FDI	2	1.03509 (0.3647)	3	0.86159 (0.4698)	0.73158 (0.5769)
FDI ⇏ ODA		0.18003 (0.8359)		0.06958 (0.9758)	0.04342 (0.9963)
TRADE ⇏ REM	2	4.09354 (0.0241)	3	3.05816 (0.0401)	1.80437 (0.1508)
REM ⇏ TRADE		0.58181 (0.5635)		0.59846 (0.6201)	0.73319 (0.5757)
ED ⇏ REM	2	0.71839 (0.4937)	3	0.35966 (0.7825)	0.71107 (0.5901)
REM ⇏ ED		0.18642 (0.8306)		0.20690 (0.8910)	2.13153 (0.0982)

ODA ⇏ REM	2	0.49876 (0.6111)	3	1.15250 (0.3412)	4	0.91535 (0.4666)
REM ⇏ ODA		0.43288 (0.6517)		1.78647 (0.1672)		1.96830 (0.1224)
ED ⇏ TRADE	2	1.27340 (0.2910)	3	0.82485 (0.4886)	4	1.45517 (0.2374)
TRADE ⇏ ED		0.51670 (0.6004)		0.61308 (0.6108)		1.25184 (0.3079)
ODA ⇏ TRADE	2	0.84091 (0.4390)	3	1.99623 (0.1319)	4	2.69754 (0.0476)
TRADE ⇏ ODA		2.62799 (0.0850)		1.76266 (0.1717)		0.48055 (0.7498)
ODA ⇏ ED	2	1.09406 (0.3449)	3	1.25348 (0.3049)	4	0.98601 (0.4287)
ED ⇏ ODA		3.87397 (0.0292)		1.90165 (0.1468)		1.00663 (0.4181)

At first, we take GDS (gross domestic savings) dependent. variable and independent variables are LFPR, GFCF, GDPG (GDP growth), DR (deposit interest rate), DEPR (age dependency ratio), FDI (foreign direct investment), REM (personal remittances), ED (external debt stock) and ODA (net ODA received). There is unilateral causality between the variables LFPR and GDS because LFPR Granger causes GDS but GDS does not Granger causes LFPR. There is no causality between GFCF and GDS because both variables do not Granger cause. There is also no causality exists between GDPG and GDS because GDPG does not Granger cause GDS at lag 2, 3, and 4 and GDS does not Granger cause GDPG at lag 2, 3, and 4. At lag 2, 3 and 4 DR does not Granger cause GDS and GDS does not Granger cause DR so, there is no causality exist between DR and GDS. Bilateral causality exists between DEPR and GDS because DEPR Granger causes GDS at lag 2, 3, and 4, and GDS Granger causes DEPR at lag 2 and 3 but does not cause at lag 4. So, we consider that GDS Granger causes DEPR because it causes two lags but does not cause one lag.

FDI does not Granger cause GDS and GDS do not Granger cause FDI at lag 2, 3, and 4 so, there exists no causality between FDI and GDS. REM and GDS do not Granger cause at any of the given lags which is why there exists no causality between these variables. There is no causality between the variables TRADE and GDS because these variables do not Granger cause anymore at the given lags 2, 3, and 4. There exists no causality between ED and GDS because ED and GDS do not Granger cause at lag 2, 3, and 4. There is unilateral causality between ODA and GDS because ODA does not Granger cause GDS at lag 2, 3, and 4 but GDS Granger cause ODA at lag 2 and 3 so, there is one-way causality. LFPR has no causality with GFCF and GDPG. LFPR has unilateral causality with DR and DEPR there exists a one-way causality between the variables. There exists no causality between FDI and LFPR because both variables do not Granger cause. REM and LFPR have unilateral causality because REM Granger causes LFPR at 2 and 4 lags but LFPR does not Granger cause REM in all the three lags. LFPR has no causality with TRADE, ED, and ODA.

GDPG has unilateral causality with GFCF because GDPG Granger cause but GFCF does not. No causality exists between DR and GFCF the reason behind this is that both variables DR and GDPG do not Granger cause each other. There is a one-way causality between DEPR and GFCF. GFCF has no causality with the variables FDI, REM, ODA, and ED but unilateral causality with TRADE. GDPG has no causality with DR, DEPR, FDI, TRADE, ED, and ODA

because these variables do not Granger cause but GDPG has unilateral causality with REM the reason behind unilateral causality between GDPG and REM is that REM Granger cause GDPG at 2,3 and 4 lag and GDPG does not Granger cause REM at 2, 3 and 4 lags. DR has no causality with DEPR, REM, TRADE, and ODA but unidirectional causality with FDI. There is unilateral causality between FDI and DEPR and bilateral or two-way causality between DEPR and REM. DEPR has no causality with TRADE, ED, and ODA. FDI has no causality with REM, TRADE, ED, and ODA. REM has one-way causality with TRADE and no causality with ED and ODA. TRADE has no causality with ED and ODA. And ED has no causality with ODA the reason behind this is that ODA does not Granger cause ED at any of the given lags and ED $\nRightarrow$ ODA at 2, 3, and 4 lags. The sign $\nRightarrow$ represents that does not Granger Cause.

6. Conclusion

This study delves into the implications of foreign capital inflows on domestic savings in Pakistan within the temporal scope of 1972 to 2022. The empirical outcomes obtained through the Auto Regressive Distributed Lag (ARDL) analysis unveil noteworthy patterns. Specifically, gross domestic savings demonstrate a substantial and positive correlation with factors such as labor force participation rate, gross fixed capital formation, deposit interest rate, foreign direct investment, and foreign remittances. However, the relationships with trade and GDP growth manifest as positive yet statistically insignificant. Conversely, the age dependency ratio and external debt stock exhibit significant and negative impacts on gross domestic savings. Meanwhile, net official development assistance displays a negative influence that lacks statistical significance. The coefficient derived from the error correction term underscores the model's robust significance and its tendency to gravitate toward equilibrium. Consequently, the findings affirm a positive nexus between foreign capital inflows and domestic savings in Pakistan.

The results of the Granger causality test, in contrast, reveal the absence of causal connections between foreign direct investment, remittances, trade, external debt, and gross domestic savings. Notably, unilateral causality is observed solely between net official development assistance and gross domestic savings.

Drawing from the study's outcomes, several policy implications can be formulated:

- The government may focus on technical education. To enhance the industrial units this will enhance the LFPR.
- There is a need to focus on the government to provide opportunities for capital formation by creating ease of doing business.
- The central bank may increase the deposit interest rate so that more deposits would be possible in the savings account and gross domestic savings would increase.
- Policymakers may design policies that attract foreign direct investment from other countries which will have a positive impact on gross domestic product as well as gross domestic savings.

The overseas may transfer their remittances to the country through a proper channel which can participate in the growth of GDP and have a positive impact on domestic savings.

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The data that support the findings of this study are available from the corresponding author upon reasonable request.

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References

Afawubo, K., & Mathey, S. (2017). The effectiveness of aid on savings and investment in Sub-Saharan Africa: do volatility and institutional quality matter? *Applied Economics*, 49(51), 5212-5230.

Ahmad, M. H., Ahmed, Q. M., & Qayyum, A. (2002). Foreign capital inflows and domestic savings in Pakistan: Cointegration techniques and error correction modelling [with Comments]. *The Pakistan Development Review*, 825-836.

Ahmad, S. (1986). Domestic Saving and Foreign capital inflow: The case of Bangladesh. *The Bangladesh Development Studies*, 75-91.

Ali, M., & Nishat, M. (2009). Do foreign inflows benefit Pakistani poor? *The Pakistan Development Review*, 48(4-II), 715-738.

Aliyu, R. M., & Usman, U. A. (2013). An econometric study of the impact of external debt, public debt, and debt servicing on national savings in Nigeria: a cointegration approach. *International Journal of Management and Social Sciences Research* (IJMSSR), 2(2), 73-83.

Apergis, N., & Christou, C. (2012). Dependency rate and savings: The African evidence with panel data. *International Journal of Business and Management*, 7(4), 84.

Armstrong, H. W., Balasubramanyam, V. N., & Salisu, M. A. (1996). Domestic savings, intra-national and intra-European Union capital flows, 1971–1991. *European Economic Review*, 40(6), 1229-1235.

Aslam, N. (1987). The impact of foreign capital inflow on savings and investment: The case of Pakistan. *The Pakistan Development Review*, 26(4), 787-789.

Azam, M., Haseeb, M., & Samsudin, S. (2016). The impact of foreign remittances on poverty alleviation: Global evidence. *Economics & Sociology*, 9(1), 264.

Baldé, Y. (2011). The impact of remittances and foreign aid on savings/investment in Sub- Saharan Africa. *African Development Review*, *23*(2), 247-262

Bano, S., & Tabbada, J. (2015). Foreign direct investment outflows: Asian developing countries. *Journal of Economic Integration*, 359-398.

Bowles, P. (1987). Foreign aid and domestic savings in less developed countries: some tests for causality. *World Development*, 15(6), 789-796.

Chani, D., Irfan, M., Salahuddin, M., & Shahbaz, M. Q. (2010). A note on the causal relationship between FDI and savings in Bangladesh. *Theoretical and applied economics*, 17(11), 53-62.

Chaudhry, I. S., Malik, S., & Ramzan, M. (2009). Impact of foreign debt on savings and investment in Pakistan. *Journal of Quality and Technology Management*, 5(2), 101-115.

Chen, E. K. (1977). Domestic saving and capital inflow in some Asian countries: A time-series study. *Asian Survey*, 17(7), 679-687.

Dhar, B., & Roy, S. S. (1996). Foreign direct investment and domestic savings-investment behaviour: Developing countries' experience. *Economic and Political Weekly*, 2547-2551.

Gibescu, O. (2010). Does the gross fixed capital formation represent a factor for supporting economic growth? Online at https://mpra.ub.uni-muenchen.de/50135/ MPRA Paper No. 50135, posted 24 Sep 2013 12:38 UTC

Graham, J. W. (1987). International differences in saving rates and the life cycle hypothesis. *European Economic Review*, 31(8), 1509-1529.

Grinols, E., & Bhagwati, J. (1976). Foreign capital, savings and dependence. *The Review of Economics and Statistics*, 416-424.

Gruben, W. C., & McLeod, D. (1998). Capital flows, savings, and growth in the 1990s. *Quarterly Review of Economics and Finance*, 38(3), 287-302.

Gupta, K. L. (1975). Foreign capital inflows, dependency burden, and saving rates in developing countries: A simultaneous equation model. *Kyklos*, 28(2), 358-374.

Hamdar, B., & Nouayhid, S. (2017). Remittances and foreign aid as sources of external development finance: impacts on savings and investment in post-war Lebanon. *Economia Internazionale /International Economics*, 70(1), 47-72.

Hassen, S., & Anis, O. (2012). Foreign direct investment (FDI) and economic growth: an approach in terms of cointegration for the case of Tunisia. Journal of Applied Finance and Banking, 2(4), 193.

Hossain, D. (2014). Differential impacts of foreign capital and remittance inflows on domestic savings in developing countries: a dynamic heterogeneous panel analysis. *Economic Record*, 90, 102-126.

Idrees, M. A., Khan, A., Khan, M. A., Raees, M. B., & Syed, M. (2020). Impact of foreign capital inflows on household savings in Pakistan. *European Journal of Business and Management Research*, *5*(4).

Imai, K. S., Gaiha, R., Ali, A., & Kaicker, N. (2014). Remittances, growth and poverty: New evidence from Asian countries. *Journal of Policy Modeling*, 36(3), 524-538.

Inoue, T. (2018). Financial development, remittances, and poverty reduction: Empirical evidence from a macroeconomic viewpoint. *Journal of Economics and Business*, 96, 59-68.

Jagadeesh, D. (2015). The impact of savings in economic growth: an empirical study based on Botswana. *International Journal of Research in Business Studies and Management*, *2*(9), 10-21.

Jappelli, T., Marino, I., & Padula, M. (2014). Households' saving and debt in Italy. *Politica Economica*, 30(2-3), 175-202.

Javid, M., Arif, U., & Qayyum, A. (2012). Impact of remittances on economic growth and poverty. *Academic Research International*, 2(1), 433.

Kanu, S. I., Ozurumba, B. A., & Anyanwu, F. A. (2014). Capital expenditures and gross fixed capital formation in Nigeria. *Journal of Economics and Sustainable development, the International Institute for Science, Technology and Education (IISTE)*.

Keho, Y. (2012). Does dependency rate really impede savings? Some Sub-Saharan African evidence. *Journal of African Studies and Development*, 4(3), 69.

Khan, A. H., Hasan, L., Malik, A., & Knerr, B. (1992). The dependency ratio, foreign capital inflows and the rate of savings in Pakistan [with comments]. The Pakistan Development Review, 31(4), 843-856.

Lartey, E. K. (2013). Remittances, investment and growth in sub-Saharan Africa. *The Journal of International Trade & Economic Development*, 22(7), 1038-1058.

Mapalad, M. C. M. (1998). Foreign Capital Inflows and Domestic Savings in the Philippines /L'afflux De Capitaux Étrangers Et L'épargne Intérieure Aux Philippines. *Savings and Development*, 5-25.

Misztal, P. (2011). The Relationship between Savings and Economic Growth in Countries with Different Level of Economic Development (Wspólzaleznosci miedzy oszczednosciami i wzrostem gospodarczym w krajach o róznym poziomie rozwoju gospodarczego). *Finansowy Kwartalnik Internetowy e-Finanse*, 7(2), 17-29.

Mohey-ud-din, G. (2005). Impact of foreign aid on economic development in Pakistan [1960-2002]. Online at https://mpra.ub.uni-muenchen.de/1211/ MPRA Paper No. 1211, posted 19 Dec 2006 UTC

Molho, L. E. (1986). Interest rates, saving, and investment in developing countries: A re-examination of the McKinnon-Shaw hypotheses. Staff Papers, 33(1), 90-116.

Morton, J., Panday, P., & Kula, M. (2010). Remittances, poverty and economic growth. *International Journal of Arts and Sciences*, 3(7), 390-99.

Mosley, P. (1980). Aid, savings and growth revisited. *Oxford Bulletin of Economics and Statistics*, 42(2), 79-95.

Mushtaq, S., & Siddiqui, D. A. (2017). Effect of interest rate on bank deposits: Evidences from Islamic and non-Islamic economies. *Future Business Journal*, 3(1), 1-8.

Oageng, M., & Boitumelo, M. (2017). Effects of external debt on national savings in Botswana. *African Journal of Economic Review*, 5(1), 69-83.

Odhiambo, N. M. (2009). Savings and economic growth in South Africa: A multivariate causality test. *Journal of Policy Modeling*, 31(5), 708-718.

Okafor, L. E., & Tyrowicz, J. (2009). Foreign debt and domestic savings in developing countries. *Latin American Business Review*, 9(3-4), 189-226.

Oladipo, O. S. (2010). Does saving really matter for growth in developing countries? The case of a small open economy. *International Business & Economics Research Journal* (IBER), 9(4).

Oropesa, R. S. (1993). Female labor force participation and time-saving household technology: a case study of the microwave from 1978 to 1989. *Journal of Consumer Research*, 19(4), 567-579.

Oshikoya, T. W. (1992). Interest rate liberalization, savings, investment and growth: the case of kenya/liberalisation des taux d'interet, epargne, investissement et croissance: le cas du kenya. *Savings and Development*, 305-320.

Přívara, A., & Trnovský, K. (2021). The impact of remittances on household savings in the Baltics. *Investment Management and Financial Innovations*, *18*(1), 335-345.

Shuaib, I. M., & Ndidi, D. E. (2015). Capital formation: impact on the economic development of Nigeria 1960-2013. *European Journal of Business, Economics and Accountancy*, 3(3), 23-40.

Sheikh, M. R., Kattumuri, R., Chaudhry, I. S., & Kumar, A. (2019). What determines bilateral trade flows? Evidence from ECO region. *Review of Economics and Development Studies*, *5*(1), 165-182.

Sheikh, M. R., Chaudhry, I. S., Gul, N., & Mushtaq, M. I. (2018). Economic Determinants and Trade Potential of Bilateral Trade Flows: A Panel Data Analysis. *Pakistan Journal of Social Sciences*, *38*(2), 447-462.

Sheikh, M. R., Abbasi, M. N., & Abbas, A. (2015). Is External Debt a Boon or Curse? Evidence from Pakistan. *Journal of Managerial Sciences*, *9*(1).

Verma, R., & Wilson, E. J. (2005). Savings, Investment, Foreign Inflows and Economic Growth of the Indian Economy 1950-2001. Department of Economics, University of Wollongong, 2005. https://ro.uow.edu.au/commwkpapers/129

Waithima, A. K. (2008). The Egg or the Chick first; saving or GDP Growth: Case for Kenya. KCA Journal of Business Management, 1(1), 1-10.

Yamada, T., Yamada, T., & Liu, G. (1990). Determinants of saving and labor force participation of the elderly in Japan (No. w3292). National Bureau of Economic Research.