



DOES FINANCIAL AND TRADE LIBERALIZATION DRIVE PRIVATE SAVINGS IN PAKISTAN?



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ABSTRACT

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This study contributes to the empirical literature by estimating the impact of financial and trade liberalization on private savings in the case of Pakistan. The ARDL approach to cointegration is used to provide empirical evidence of relationship among financial liberalization, trade liberalization, and private savings. The results indicate that the private income, deposit rate (also known as savings rate), financial system liberalization and public savings have a positive impact on private savings. On the other hand, old age dependency, capital account liberalization, and financial openness are negatively associated with private savings. The trade liberalization index is found to be negatively associated with private savings albeit not significant. An important policy suggestion emerging from the results is that it is vital for the government to liberalize the financial system, i.e. bank sector and stock market in order to mobilize the private savings. Practical implications: The private savings should be mobilized as means to create microfinance for individuals and households. Social implications: Social welfare will increase if microfinance can provide a means to poorer households to start small businesses. To the best of the authors' knowledge, this study is the first of its kind to use recent indicators of trade and financial liberalization developed by Lane and Milesi-Ferretti (2007), Wacziarg and Welch (2008) and Chinn and Ito (2006) in the case of Pakistan.

Contribution/ Originality: This study contributes to the empirical literature by estimating the impact of financial and trade liberalization on private savings in the case of Pakistan. To the best of the authors' knowledge, this study is the first of its kind to use recent indicators of trade and financial liberalization developed by Lane and Milesi-Ferretti (2007), Wacziarg and Welch (2008) and Chinn and Ito (2006) in the case of Pakistan.

1. INTRODUCTION

Mckinnon (1973) and Shaw (1973) hypothesize that financial liberalization boosts savings, and improves efficiency. It is the opposite of financial repression. In developing countries, financial sector policies which are regulated and controlled by the authorities tend to influence the performance of financial markets. Among the financial policies are the control of deposit interest rates, exchange rate as well as statutory reserve requirement of

which are imposed on commercial banks. In other words, the supply of financial resources is regulated through various channels to meet the demand of populace and financial sectors.

The consequence of financial liberalization on savings is theoretically ambiguous. [Bandiera et al. \(2000\)](#) show that impact of financial liberalization on savings includes both long-term and short-term effect. The financially liberalized structure may improve the prospect of having more savings with a higher interest on the deposit. A broader range of savings enables the financial system to develop products with risk-return features, to have a number of banks and their branches as well as other financial mediators. The bank lending rates will typically be higher for those borrowers who have some privileged access in the restricted regime, but access to borrowing will be wider. In the longer term, household borrowings are not consumed in total. Hence, easing of borrowing control could enhance the allocation of resources. In short, a financially liberalized structure will enhance income and subsequently, increase the savings.

A liberalized financial structure generates a short-run effect on economic growth and income. Regulation of domestic portfolio can lead to temporary deviation in the size of domestic savings. Liberalization of the international exchange market helps to bring sizeable capital inflows. If such inflows are not properly managed, a credit boom can have a temporary impact on the size of savings. Thus, it is important to understand the impact of financial liberalization on savings of which the short and long-run impact must be considered.

According to [Maizels \(1968\)](#) trade liberalization impacts savings behaviour through exports. He argues that changes in exports result in the changes in domestic savings for three reasons: First, the propensity to save is higher in the export sector than other sectors; Second, Government savings depends on comprehensive tax collection through foreign trade, and third, a constant export growth can increase marginal propensity of savings in other sectors of the economy.

The results on the relationship between private savings and economic liberalization (trade and financial liberalization) are mixed. Some have examined the impact of financial liberalization on private savings indirectly via the link between financial liberalization indicators and consumption behavior of households. [Browning and Lusardi \(1996\)](#) report a positive impact of financial liberalization on current consumption growth. They argue that decrease in liquidity constraint following financial liberalization exerts a positive impact on consumption growth.

In contrast, [Blanchard and Simon \(2001\)](#) conclude in favor of ambiguity – financial liberalization and financial deepening lead to lower consumption volatility. Financial openness increases consumption volatility only after the former has achieved a specific threshold ([Kose et al., 2003](#)). Moreover, [Bekaert et al. \(2006\)](#) find equity market liberalization and capital account openness are related to the lower volatility of consumption growth. [Ang \(2011a\)](#) concludes that financial repression lowers consumption volatility in India. The result remains robust after controlling for a wide range of macroeconomic shocks and variables. The threshold effect shows that an adequate level of financial system liberalization is needed to reduce consumption volatility.

The existing studies use various proxies of financial development as a determinant of savings. [Harrigan \(1995\)](#) and [Johansson \(1996\)](#) use the degree of monetization measured by (M_2/GDP) to capture the impact of financial development on savings. They find a positive impact of financial market development on savings. By employing panel method to the Southeast Asian¹ and the Latin America countries² ([Thimann and Dayal-Gulati, 1997](#)) find that financial deepening (M_2/GDP) positively impacts on private savings. Monetization and financial intermediation as a consequence of financial liberalization show a positive effect on savings rate in Malaysia, Philippines, and Thailand ([King and Levine, 1993](#)).

Similarly, [Touny \(2008\)](#) concludes positive impact of financial development (M_2/GNP) and real interest on private savings in Egypt. In India, banking development positively affects private savings ([Athukorala and Sen,](#)

¹ Indonesia, Malaysia, Philippines, Singapore, Thailand.

² Argentina, Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay, Venezuela.

2004). Ang (2011b) shows that financial development such as an increase in bank density tends to enhance private savings in Malaysia. Larbi (2013) found that financial development, income per capita and inflation have a positive impact on private savings in Ghana.

Bandiera *et al.* (2000) present a comprehensive study on financial liberalization and private savings. They developed financial liberalization index (FLI) for Chile, Ghana, Indonesia, Korea, Malaysia, Mexico, Turkey, and Zimbabwe, but did not find support for the hypothesis that financial liberalization enhances private savings. In contrast, Ozcan *et al.* (2003) suggest a positive impact of financial systems on private savings. The results corroborate (Shrestha and Chowdhury, 2007) in the case of Nepal.

Maizels (1968) uses data from 11 countries to examine whether income from export or non-export is central to gross domestic savings. He finds a positive effect of export on savings rate. Lahiri (1988) explores the link between exports and savings. He uses the rate of growth in per capita income, dependence ratio, inflation and change in terms of trade as control variables. Results from 8 Asian countries show mixed results.³

Ferrantino (1997) employs the two indicators of trade liberalization, exports and trade liberalization index as in Sachs and Warner (1995) to investigate their effect on savings. He finds that higher the share of trade in an economy (export as a share of GDP) the higher is the level of savings in the developed economies. There is no association between trade liberalization index and savings. El-Seoud (2014) includes current account deficit, terms of trade, the average tariff rate, exchange rate and global financial crisis (dummy variable) in his private savings model. It is found that terms of trade and financial crisis have a negative impact on private savings.

We review the literature on the determinants of savings in Pakistan. Khan and Hasan (1998) evaluate the savings function in the case of Pakistan. They find that growth of real income per capita is positively linked to savings rate but real deposit rate is negatively linked to savings rate. By using the quarterly data Sajid and Sarfraz (2008) investigate the causal association among savings and output. They show that unidirectional short term causality from GNP to national and domestic savings, and from GDP to public savings.

Munir *et al.* (2011) empirically examine the impact of remittances, and foreign direct investment in private savings. They find that remittances positively affects private savings while foreign direct investment is negatively linked to private savings. The trade openness and money supply are positively linked with national savings as suggested by Ahmad and Mahmood (2013) although exchange rate and inflation rate are negatively related to national savings. The positive trade openness is also supported by the study of Shaheen *et al.* (2013).

Pakistan's policymaker has commenced the financial and trade liberalization since the late 1980's. The purpose of liberalization is to achieve economic efficiency. As part of liberalization of the financial sector in 1991, the currency Pak Rupee was made convertible in July 1994 under the IMF Article VIII. In addition, the privatization of national bank was introduced to improve the efficiency of the banking sector. In this respect, the interest rate was liberalized by removing the limit on maximum lending rates of banks and NBFIs for trade-related financing since March 1995. The restriction on import of non-capital goods was removed. In order to attract foreign direct investment, most economic sectors were opened for 100 percent foreign ownership. The main objective of the transformation was to achieve autonomy, build up the industrial base, root out inefficiency, increase the exports and reduce the trade deficit.

Previous studies have estimated the savings models in Pakistan. However, they have ignored the important database of finance and trade liberalization developed by Lane and Milesi-Ferretti (2007), Wacziarg and Welch (2008) and Chinn and Ito (2006). Hence, this study intends to investigate the impact of financial and trade liberalization on private savings using the recent indicators of trade and financial liberalization. Autoregressive Distributed Lag (ARDL) approach to cointegration is used to study the long run relationship. The rest of the study

³ India, Indonesia, Korea, Malaysia, Philippines, Singapore, Sri Lanka, Thailand.

is structured as follows. Section 2 presents the theoretical framework. Section 3 describes methodology and construction of variables. Sections 4 reports the empirical results, and the last section concludes the study.

2. THEORIES ON LIBERALIZATION AND PRIVATE SAVINGS

New theories of consumption and its link to income and the parallel link with savings and income are based on models of intertemporal optimization by households (Gersovitz, 1988). Friedman (1957) permanent income hypothesis later is improved by Modigliani (1966) in terms of the life-cycle hypotheses (LCH) which provides for the basis of private savings. It can accommodate various aspect of liberalization, financial and trade. Deaton (2005) and Jappelli (2005) show that LCH is flexible to include additional features i.e. liberalization indicators without having to change its basic structure.

According to LCH, the main objective of savings is to accumulate financial asset to meet the exigencies of retirement in old age. The smoothing of individual consumption over their lifespan – savings during working life to pay for debts incurred in early life, and pay for consumption during retirement (Modigliani, 1986). The LCM is founded on the assumption that during various periods, the utility function stays homogenous (Modigliani, 1986). The individual neither expects to receive nor desires to leave any inheritance.

These two assumptions imply that in any year t , total consumption (C_t^T) of an individual at age T will be proportional to the current value of total income (Γ_t^T) accumulated over his lifespan, denoted as:

$$C_t^T = \theta_t^T \Gamma_t^T \tag{1}$$

In equation (1), θ_t^T represents the proportional of influence a utility function, assets rate of return and the present age of the individual. The current worth of assets at age T is the sum of current income (y_t^T), plus individual income s/he expects to receive over his remaining life (eY_t^T), and his net value passed over from the preceding dated, a_{t-1}^T .

$$\Gamma_t^T = y_t^T \sum_{i=t+1}^{t+(N-T)} \frac{ey_i^T}{(1+r)^{i-t}} + a_{t-1}^T \tag{2}$$

where, N and r respectively, denote old/retirement age and the rate of return on assets. The average annual expected income can be expressed as:

$$eY_t^T = \frac{1}{N-T} \left(\sum_{i=t+1}^{t+(N-T)} \frac{ey_i^T}{(1+r)^{i-t}} \right) \tag{3}$$

Substituting equation (1) into equation (3), we obtain:

$$c_t^T = \theta_t^T y_t^T + \theta_t^T (N - T) eY_t^T + \theta_t^T a_{t-1}^T \tag{4}$$

Assuming that proportional factor (θ_t^T) remains the same for all individuals in an age group T , we rewrite equation (4) aggregating over an age group as:

$$C_t = \theta_t^T Y_t^T + \theta_t^T (N - T) EY_t^T + \theta_t^T A_{t-1}^T \tag{5}$$

In equation (5), C_t , Y_t , EY_t , and A_{t-1}^T are respectively aggregated for the age group T of c_t^T , y_t^T , ey_t^T , and a_{t-1}^T . Finally, combining all age groups, the community consumption function is:

$$C_t = \phi_1 Y_t + \phi_2 EY_t + \phi_3 A_{t-1} \quad (6)$$

In equation (6), C_t , Y_t , EY_t , and A_{t-1} represent the sum that corresponds to C_t^T , Y_t^T , EY_t^T and A_{t-1}^T general age groups T . Since anticipated income is not directly observable, we use $EY_t = \beta Y_t$ and $\beta \approx 1$ so that:

$$C_t = \phi' Y_t + \phi_3 A_{t-1} \quad (7)$$

In equation (7), $\phi' = \phi_1 + \beta\phi_2 \approx \phi_1 + \phi_2$. The savings function is consequently presented as:

$$S_t = (1 - \phi') Y_t - \phi_3 A_{t-1} \quad (8)$$

In above equations, the important determinants of savings are the growth rate of per capita income (Modigliani, 1986) and real interest rate. The impact of real interest rate on savings can go either way, depending on the relative size of the substitution and income effects. The higher interest rates may induce more savings due to the higher price of present consumption relative to the future (substitution effects), but it may also reduce savings if the individual is a net lender (income effects).

As assumed by Ogaki *et al.* (1996) variation in real interest rates may not affect savings if household income levels in developing countries are at subsistence level, making the influence theoretically less certain.

One feature of the LCH is the role of age structure in savings behavior in Pakistan. There are low savings when the dependency rate of the young and the elderly rises. The nations in demographic transition thus may experience major changes in their savings behavior over time.

The government may finance fiscal needs through a bond issue but has to raise taxes in the future to pay back the principal and interest. The households may have to save more in order to pay the future higher taxes, although having more disposable income in the present –the Ricardian equivalence.

The overlapping generation model predicts that rise in government debt does not cause an increase in household wealth, only shifts the burden to another generation. From this hypothesis, a rise in the savings of government will have no impact on total savings, it will be matched by an equal decrease in private savings. If the government runs a budget deficit, the private sector will respond by having extra savings to balance this unwanted influence on the future generations.

Ang (2011b) and Ang and Sen (2011) include financial liberalization in the private savings model by extending the life cycle theory. They point out that the impact of financial liberalization on private savings has received little attention in the context of developing countries.

There exists literature on the determinants of savings which are based on cross-country and panel data. However, Ang and McKibbin (2007) claim that the findings of these studies are unreliable because they fail to capture the aspect of economic history, financial liberalization, and environment.

Shaw (1973) claims that the presence of a well-organized and liberalized financial system can motivate higher savings, and effective financial system decreases information costs and risk, thus increases net real returns to savers. The basic aim of financial sector liberalization is to improve efficiency in the financial system and to achieve a high level of savings, but the impact of liberalization of the financial system on borrowing

constraints cannot be determined a priori, because the borrowing constraints may reduce the motivation to save (Bandiera *et al.*, 2000).

Capital account liberalization may improve the efficiency of the domestic financial system through international competition due to the introduction of international standards, as well as the possible risk of “flight to quality” from the foreign intermediaries (Klein and Olivei, 2008). The branches of foreign banks can increase the total size of the national banking system, and introduce financial innovation that widens the scope of financial services. These efficiencies and scope gains of the financial sector may stimulate the savings both domestically made savings and also through endorsing capital inflows.

The trade liberalization impacts economic growth indirectly through the determinants of growth, i.e., investment (Ferrantino, 1997) or what is termed as the engine of economic growth (Barro and Sala-i-Martin, 1992) and also in the empirical work of Mason (1988) and Levine and Renelt (1992)

The investment includes savings, used in current production (and imports) for except current consumption (and exports). Trade liberalization affects savings through exports, and the propensity to save is higher in the export sector relative to other sectors (Maizels, 1968).

Based on the above theoretical discussion, the private savings function is written as follows:

$$RPS = f(PPI, RDR, OAD, PS, LI)$$

For estimation, the general function in above is rewritten as follows:

$$\ln(RPS) = \beta_0 + \beta_1 \ln(PPI) + \beta_2 (RDR) + \beta_3 \ln(OAD) + \beta_4 \ln(PS) + \beta_5 \ln(LI) + v_i \quad (9)$$

Where, \ln refers to natural logarithms, and β_s to the coefficients of respective variables. The RPS, PPI, RDR, OAD, PS, and LI are the real private savings, per capita real private income, real deposit rate, old age dependency, public savings and liberalization indicators (i.e. financial liberalization index, capital account liberalization index, and trade liberalization indicators), respectively. The v_i is the error term.

3. ESTIMATION STRATEGY

The order of integration is tested by using the ADF unit root test. After determining the level of integration, this study uses autoregressive distributed lag (ARDL) approaches to co-integration to find the long run relationship among variables. The ARDL approach to co-integration is based on estimating a simple Unrestricted Error-Correction Model (UECM) which can be stated as follows – RPS, the real private savings dependent variable, and, PPI, RDR, OAD, PS, and LI indicate per capita real private income, real deposit rate, old age dependency, public savings and liberalization indicators (i.e. financial liberalization index, capital account liberalization index, and trade liberalization indicators) the independent variables.

$$\begin{aligned} \Delta \ln(RPS)_t = & \beta_0 + \beta_1 \sum_{j=1}^k \Delta \ln(RPS)_{t-j} + \beta_2 \sum_{j=0}^k \Delta \ln(PPI)_{t-j} + \beta_3 \sum_{j=0}^k \Delta RDR_{t-j} \\ & + \beta_4 \sum_{j=0}^k \Delta \ln(OAD)_{t-j} + \beta_5 \sum_{j=0}^k \Delta \ln(PS)_{t-j} + \beta_6 \sum_{j=0}^k \Delta \ln(LI)_{t-j} + \\ & + \lambda_1 \ln RPS_{t-1} + \lambda_2 \ln PPI_{t-1} + \lambda_3 (RDR)_{t-1} + \lambda_4 \ln OAD_{t-1} + \lambda_5 \ln PS_{t-1} \\ & + \lambda_6 \ln LI_{t-1} + \mu_t \end{aligned} \quad (10)$$

There are two parts in above equation (10). The first with the summation sings that indicate error correction dynamic whereas the second part with λ link to the long run relationship. The long-run relationship is estimated by using the F-test and t-statistic. In F-test, the critical values are used that present by Narayan (2005).

The null hypothesis of no co-integration $\langle H_0 : \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = \lambda_6 = 0 \rangle$ is tested against the alternate of co-integration: $\langle H_0 : \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq \lambda_6 \neq 0 \rangle$ The t-statistic is tested through $\lambda_1 = \mathbf{0}$ in Eq.

3.1. If a long run relationship is established, the following model is estimated to find long-run coefficients:

$$\begin{aligned} Ln(RPS)_t = & \beta_0 + \beta_1 \sum_{j=1}^k Ln(RPS)_{t-j} + \beta_2 \sum_{j=0}^k Ln(PPI)_{t-j} + \beta_3 \sum_{j=0}^k RDR_{t-j} \\ & + \beta_4 \sum_{j=0}^k Ln(OAD)_{t-j} + \beta_5 \sum_{j=0}^k Ln(PS)_{t-j} + \beta_6 \sum_{j=0}^k Ln(LI)_{t-j} + \eta_t \end{aligned} \quad (11)$$

The Schwarz Bayesian Criterion (SBC) is used in order to determine the optimum lags. The ARDL based error correction model (ECM) can be written as followings:

$$\begin{aligned} \Delta Ln(RPS)_t = & \beta_0 + \beta_1 \sum_{j=1}^k \Delta Ln(RPS)_{t-j} + \beta_2 \sum_{j=0}^k \Delta Ln(PPI)_{t-j} + \beta_3 \sum_{j=0}^k \Delta RDR_{t-j} \\ & + \beta_4 \sum_{j=0}^k \Delta Ln(OAD)_{t-j} + \beta_5 \sum_{j=0}^k \Delta Ln(PS)_{t-j} + \beta_6 \sum_{j=0}^k \Delta Ln(LI)_{t-j} + \delta ECM_{t-1} + \nu_t \end{aligned} \quad (12)$$

Where ECM_{t-1} is the error correction term, defined as

$$\begin{aligned} ECM_t = & Ln(Y)_t - \beta_0 - \beta_1 \sum_{j=1}^k Ln(RPS)_{t-j} - \beta_2 \sum_{j=0}^k Ln(PPI)_{t-j} - \beta_3 \sum_{j=0}^k RDR_{t-j} \\ & - \beta_4 \sum_{j=0}^k Ln(OAD)_{t-j} - \beta_5 \sum_{j=0}^k Ln(PS)_{t-j} - \beta_6 \sum_{j=0}^k Ln(LI)_{t-j} \end{aligned}$$

All coefficients of the short-term equation are related to the short run dynamics of the model converging to equilibrium; and δ representing the speed of adjustment for the short-run discrepancy, approaching the long run equilibrium.

3.1. Data

This empirical investigation uses annual data from 1971-2014. The data is taken from different sources like World Development Indicators⁴, State Bank of Pakistan and Pakistan Economic Survey.

The real deposit rate (RDR) shows the rates of return on deposits⁵ minus expected inflation π_t^* . The π_t^* is not directly observed, so we use the adaptive expectation model to describe the formation of expectations, as proposed by Cagan (1956). We assume that economic agents form expectations based on the past experience; and learning from their errors. The model $\pi_t^* - \pi_{t-1}^* = \gamma(\pi_t - \pi_{t-1}^*)$ suggests that the expectations are reviewed every period by a fraction γ of the difference between inflation rate today (π_t) and its expectation during the previous period π_{t-1}^* . We assume $\gamma = 1$, such that the current inflation rate is same as the expected inflation rate. For inflation rate, we use the GDP deflator. The real interest rate is defined as follows:

⁴ Available at <http://data.worldbank.org/>. Accessed on 31 March 2018.

⁵ The weighted average rates of return on total deposits

$$RDR_t = \text{Rate of Return on Deposit} - \text{inflation rate} \quad (13)$$

This study uses financial liberalization index that is constructed by Hye and Lau (2017). The capital account liberalization index is taken from the Chinn and Ito website⁶. The de facto indicator of financial openness uses the total stock of assets and liabilities as constructed by Lane and Milesi-Ferretti (2007).

To identify the trade liberalization date (de jure), we apply the procedure by Wacziarg and Welch (2008) and the trade openness variable is constructed by taking the ratio of exports plus imports to GDP. The real private savings and real public savings are in millions of US\$. These are in nominal terms so needed to be adjusted by the GDP deflator. We add private consumption and private savings to find aggregate private income but adjust by the GDP deflator to convert into real terms. To obtain the real per capita private income, we divide it by population.

This data is taken from the World Bank, world development indicators. We define the OAD as follows: Age dependency ratio, old, is the ratio of older dependents—people older than 64—to the working-age population—those ages 15–64. Data shows the proportion of dependents per 100 working-age population.

4. IMPACT OF ECONOMIC LIBERALIZATION ON PRIVATE SAVINGS

It is an established opinion that savings offers the capital for financing in physical capital investment and also the significant determinant of economic growth. The savings rate indicates unequal regional trends, which is possibly significant implications for economic growth. The objective of this section of the study is to investigate the impact of financial/trade liberalization on private savings and also determine which liberalization policies are most effective in raising private savings in the case of Pakistan.

The economic liberalization like financial and trade liberalization policies have been followed by various developing countries, including Pakistan to attain and endorse the higher level of output/ economic growth. The relationship between financial/trade liberalization and private savings is not only an important but also a vital topic for both researchers and policymakers. The various researchers have investigated this link, but the results are ambiguous.

According to Mckinnon (1973); Shaw (1973) hypothesis, financial liberalization increases the real interest rate that could induce the savers to save more. The economic growth of any economy subjects on capital accumulation and this needs an investment with corresponding savings (Thirlwall, 2004).

The impact of financial/trade liberalization on private savings is estimated by using the following equation that we derived in section 2.

$$\begin{aligned} \ln(RPS) = & \beta_0 + \beta_1 \ln(PPI) + \beta_2 (RDR) + \beta_3 \ln(OAD) \\ & + \beta_4 \ln(PS) + \beta_5 \ln(LI) + v_i \end{aligned}$$

In the private savings equation RPS, PPI, RDR, OAD, PS, and LI respectively confers real private savings, real per capita private income, real deposit rate, old age dependency, public savings, and financial/trade liberalization indicators i.e. financial liberalization index, capital account liberalization index, trade liberalization, financial openness and trade openness). In the equation, \ln shows the sign of natural logarithms and β_s represent the slope coefficients of respective variables. v_i is the error correction term.

⁶ Available at URL: http://web.pdx.edu/~ito/Chinn-Ito_website.htm. Accessed on 31 March 2018.

Table 1 shows ADF unit root test results. The results indicate that all variables are stationary at first difference except the capital account liberalization.

Table-1. ADF Unit Root Test Results

| Variables | Level | 1 st Difference |
|-------------------|---------------------|----------------------------|
| <i>Ln(PRS)</i> | -2.802 | -5.171 ^a |
| <i>Ln(PPI)</i> | 1.366 | -5.258 ^a |
| <i>RDR</i> | -2.360 | -5.891 ^a |
| <i>Ln(OAD)</i> | -0.809 | -3.089 ^c |
| <i>Ln(PS)</i> | -2.197 | -5.824 ^a |
| <i>Ln(K_Open)</i> | -8.837 ^a | - |
| <i>Ln(FO)</i> | -2.291 | -5.385 ^a |
| <i>Ln(TO)</i> | -1.697 | -4.315 ^a |
| <i>Ln(FLI)</i> | -2.697 | -5.308 ^a |

* Without constant and trend.

Note: Ln refers to natural logarithm, PRS to real private savings, PPI to per capita real private income, RDR to real deposit rate, OAD to old age dependency, PS to real public savings, PI to real public investment, FO to financial openness, TO to trade openness, K_Open to capital account liberalization, and FLI to financial liberalization index.

a: indicates 1% level of significance.

b: indicates 5% level of significance.

c: indicates 10% level of significance.

Table 2 presents the bound critical values and table 3 shows co-integration test results.⁷ The co-integration results indicate that the long run association exists in all the five models. After establishing the long run relationship in next step this study estimates the long run coefficients by using the ARDL approach. Table 4 indicates that per capita real private income is positively related to the private savings (in all five models) with the long run elasticity of **1.288** to 2.304. This finding suggests that private savings increase with the positive growth in per capita private income. Hence the growth-enhancing policies may increase savings by increasing the overall growth. This result is equal to the earlier results of Larbi (2013); El-Seoud (2014) and Gök (2014).

The real deposit rate is also positively associated with private savings, a 1% increase in real deposit rate enhances private savings in the range of **0.023 - 0.039%**. The positive impact of real deposit rate on private savings conforms to the estimates obtained by Athukorala and Sen (2004), Shrestha (2008) and Touny (2008). Based on the results, we conjecture that the interest rate reforms in Pakistan have boosted private savings. Given the low response of private savings to real deposit rates, the effect of interest rate liberalization private savings is expected to be temporary.

The results suggest that public savings are unlikely to crowd out private savings, so the change in government fiscal state may have influenced private savings in Pakistan. A 1% increase in public savings increases private savings from **0.005** to **0.007%**. This finding is similar to those found by El-Seoud (2014) for Bahrain.

⁷ Five models are investigated under two scenarios as recommended by Pesaran, Shin and Smith (2001) which are F_{III} represents the F-statistic of the model

with unrestricted intercept and no trend, and F_V represents the F-statistic of the model with unrestricted intercept and trend. The intercept in all these situations are unrestricted (Pesaran, Shin and Smith 2001)

The long-run results show that old age dependency negatively impacts private savings⁸ and is consistent with the LCM that the private sector saves less particularly, those in older age group relative to working population. This is in line with previous findings, e.g., Ang (2009), Khan *et al.* (2013) and Gök (2014). The emerging demographic transition in Pakistan has played role in increasing private savings.

Financial system liberalization is found to have played a positive part in the stimulation of private savings. A 1 percent increase in financial system liberalization yields approximately a 0.112 percent increase in private savings. This positive coefficient is consistent with the theory that savings rise with the availability of risk-sharing financial instruments and an improvement in the financial system. An important policy suggestion emerging from the results is that it is vital for the government to liberalize the financial system, i.e. bank sector and stock market in order to mobilize private savings.

As observed in table 5, capital account liberalization and financial openness both are negatively associated with the private savings. A 1% increase in capital account liberalization and financial openness decreases private savings respectively 0.133 and 1.09% suggesting that the external financial liberalization has not helped to mobilize private savings in Pakistan efficiently.

The trade liberalization is found to have an insignificant effect on private savings but trade openness is negatively related to private savings. Athukorala and Sen (2004) also find that trade indicator (trade openness) is negatively linked with private savings in India. El-Seoud (2014) documents that trade openness (terms of trade) is negatively associated with private savings. According to Maizels (1968) the trade liberalization affects private savings by increasing export income. Pakistan exports are more biased in favor of agriculture and raw materials. Primary goods face very low price in foreign markets, compared to final goods.

Estimated short-run coefficients presented in Table 5 show that per capita private income, real interest rate, and public savings are positively related to private savings in Pakistan; as is the internal financial liberalization index, which is equal to the long run results.

The results also show that both capital account liberalization and financial openness are negatively related to private savings in the short run which is same as the long run results. The theory capital account liberalization predicts that the effects on private savings manifest through increased efficiency of financial sector thereby boosting capital inflow. Thus, there is a policy required that increase the capital inflow in Pakistan, which has increased the local investment level, economic growth and also private savings.

The results show that the impact of trade liberalization and trade openness on private savings in the short run is insignificant. The error correction term showing the speed of adjustment is negative and statistically significant. The estimates suggest that private savings adjust at an annual average rate ranging between 0.154 and 1.088 towards the long equilibrium.

Table-2. Critical Values for ARDL Modeling Approach

| $K = 5$ | 0.10 | | 0.05 | | 0.01 | |
|-----------|--------|--------|--------|--------|--------|--------|
| | $I(0)$ | $I(1)$ | $I(0)$ | $I(1)$ | $I(0)$ | $I(1)$ |
| F_V | 3.012 | 4.147 | 3.532 | 4.800 | 4.715 | 6.293 |
| F_{III} | 2.458 | 3.647 | 2.922 | 4.268 | 4.030 | 5.598 |
| t_V | -3.13 | -4.21 | -3.41 | -4.52 | -3.96 | -5.13 |
| t_{III} | -2.57 | -3.86 | -2.86 | -4.19 | -3.43 | -4.79 |

Notes: k is the a number of regressors, F_V represents the F-statistic of the model with unrestricted intercept and trend, F_{III} represents the F-statistic of the model with unrestricted intercept and no trend. t_V and t_{III} are the t ratios for testing λ_1 in equation (10) is respectively with and without deterministic linear trend.

Source: Narayan (2005) for F-statistics and Pesaran *et al.* (2001) for t-statistic.

⁸. The negative link between old age dependency and private savings is true in one model, but in other models, the coefficient is statistically insignificant.

Table-3. ARDL Co-integration Analysis of Private Savings Model

| Model | Without Deterministic Trends | | With Deterministic Trends | | Conclusion |
|---|------------------------------|----------------------|---------------------------|---------------------|------------|
| | F_{III} | t_{III} | F_V | t_V | |
| Model – 1: (RPS, PS RDR, PPI, OAD, FLI) | 5.214 ^a | - 5.386 ^a | 4.997 ^a | -5.328 ^a | Rejected |
| Model – 2: (RPS, PS RDR, PPI, OAD, TLI) | 8.667 ^a | -6.778 ^a | 9.068 ^a | -6.966 ^a | Rejected |
| Model – 3: (RPS, PS RDR, PPI, OAD, K_Open) | 3.121 ^a | - 4.405 ^a | 4.163 ^a | -4.331 ^a | Rejected |
| Model – 4: (RPS, PS, RDR, PPI, OAD, FO) | 8.888 ^a | -6.932 ^a | 8.996 ^a | -6.979 ^a | Rejected |
| Model – 5: (RPS, PS RDR, PPI, OAD, TO) | 5.419 ^a | - 4.861 ^a | 5.169 ^a | -4.755 ^a | Rejected |

Note: H_0 indicates no co-integration. The optimum lag is selected by using the Schwarz Bayesian *criterion*. Lag is the number of lags, F_{III} represents the F-statistic of the model with unrestricted intercept and no trend. F_V represents the F-statistic of the model with unrestricted intercept and trend. The t_V and t_{III} are the t ratios are respectively with and without deterministic linear trend.

^c indicates that the statistic lies below the 0.10 lower bound

^b that it falls within the 0.10 bounds and

^a that it lies above the 0.10 upper bound.

Table-4. Long Run Coefficient of Private Savings Model

| | | 1 | 2 | 3 | 4 | 5 |
|----------|------------|----------------------|----------------------|----------------------|----------------------|---------------------|
| | Intercept | -12.224 ^b | -16.159 ^a | -12.779 ^a | 1.095 ^a | -7.189 ^c |
| | Ln(PPI) | 2.304 ^a | 1.288 ^a | 1.998 ^a | 2.297 ^a | 1.667 ^a |
| | RDR | 0.039 ^a | 0.024 ^a | 0.025 ^a | 0.023 ^a | 0.025 ^b |
| | Ln(PS) | 0.007 ^c | 0.005 ^b | -0.032 | 0.037 | 0.045 ^b |
| | Ln(OAD) | 0.104 | 0.375 | 0.437 | -0.108 ^c | 0.773 |
| de jure | | | | | | |
| | Ln(FLI) | 0.112 ^b | - | - | - | - |
| | Ln(TLI) | - | 0.044 | - | - | - |
| | Ln(K_Open) | - | - | -0.133 ^c | - | - |
| de facto | | | | | | |
| | Ln(FO) | - | - | - | - 1.095 ^a | - |
| | Ln(TO) | - | - | - | - | -0.883 ^c |

Note: Ln stands for natural logarithms, PPI for per capita real private income, RDR for real deposit rate, PS for real public savings, OAD for old age dependency, FO for financial openness index, FLI for financial liberalization index, TLI trade liberalization index, K_Open for capital account liberalization index, FO for financial openness, and TO for trade openness.

a; indicate 1% level of significance.

b indicate 5% level of significance.

c indicate 10% level of significance.

Table-5. Short Run Coefficients of Private Savings Model

| | | (1) | (2) | (3) | (4) | (5) |
|----------|------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | Intercept | -0.019 | 0.033 | 0.015 | -0.036 | 0.033 |
| | $\Delta \ln(\text{PPI})$ | 2.184 ^a | 1.607 ^a | 2.501 ^a | 2.797 ^a | 1.662 ^a |
| | ΔRDR | 0.023 ^a | 0.024 ^a | 0.017 ^a | 0.016 ^a | 0.024 ^a |
| | $\Delta \ln(\text{PS})$ | -0.008 | 0.034 ^a | 0.015 ^a | 0.005 | -0.005 |
| | $\Delta \ln(\text{PS}(-1))$ | 0.015 ^c | - | 0.028 ^a | - | 0.033 ^a |
| | $\Delta \ln(\text{OAD})$ | 0.052 | 0.363 | 0.221 | -0.137 | -1.048 ^a |
| de jure | | | | | | |
| | $\Delta \ln(\text{FLI})$ | 0.019 ^b | - | - | - | - |
| | TLI | - | 0.052 | - | - | - |
| | $\Delta \ln(\text{K_Open})$ | - | - | -0.064 ^a | - | - |
| de facto | | | | | | |
| | $\Delta \ln(\text{FO})$ | - | - | - | 0.043 ^b | - |
| | $\Delta \ln(\text{TO})$ | - | - | - | - | -0.031 |
| | $\text{ECM}(-1)$ | -0.932 ^a | -1.006 ^a | -0.667 ^a | -1.088 ^a | -0.154 ^a |
| | R – squared | 0.812 | 0.853 | 0.799 | 0.837 | 0.827 |

Note: Ln shows the sign of natural logarithms, PPI stands for per capita real private income, RDR stands for real deposit rate, PS stands for real public savings, OAD stands for old age dependency, FOI stands for financial openness index, BDI stands for banking sector development index, SDI stands for stock market development index, TO stands for trade openness, TLI stands for trade liberalization index, and FLI stands for financial liberalization index.

a; indicate 1% level of significance.

b indicate 5% level of significance.

c indicate 10% level of significance.

5. CONCLUSION

The study investigates the impact of trade and financial liberalization on private savings by employing the ARDL approach to cointegration. This study found long-run relationship exists and according to the theory the per capita real private income is positively related to private savings in the long run. The real deposit rate is also positively associated with private savings and coefficient is very low (0.023 - 0.039) The low response of private savings to real deposit rates, the effect of interest rate liberalization private savings is expected to be temporary. The results suggest that public savings are unlikely to crowd out private savings, so the change in government fiscal state may have influenced private savings in Pakistan.

Both capital account liberalization and financial openness are negatively related with the private savings and on the basic results of this study concluding that the external financial liberalization has not helped to mobilize private savings in Pakistan efficiently. While the trade liberalization impact of private savings is statistically insignificant. According to Maizels (1968) the trade liberalization affects private savings by increasing export income. Pakistan exports are more biased in favor of agriculture and raw materials. Primary goods face very low price in foreign markets, compared to final good.

The short-run results show that per capita private income, real interest rate, and public savings are positively related to private savings in Pakistan; as is the internal financial liberalization index, which is equal to the long run results. Both capital account liberalization and financial openness are negatively related to private savings in the short run. The error correction term showing the speed of adjustment is negative and statistically significant. The estimates suggest that private savings adjust at an annual average rate ranging between 0.154 and 1.088 towards the long equilibrium.

This study also found a negative impact of old age dependency on private savings. In long run, financial system liberalization is found to have played a positive part in the stimulation of private savings. This positive coefficient is consistent with the theory that savings rise with the availability of risk-sharing financial instruments and an improvement in the financial system. An important policy suggestion emerging from the results is that it is vital for the government to liberalize the financial system, i.e. bank sector and stock market in order to mobilize private savings.

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