Analyzing Nexus between Financial Reforms and Savings in Pakistan: An Econometric Investigation

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Development economists and policy makers across the globe extensively discuss the factors affecting the growth performance of developing economies. The recent financial crisis and poor performance of financial sector instigated the economies to shift from suppressive regulations to deregulations of interest rate along with implementation of a few other open options. International funding agencies provided technical as well as financial assistance to carry on the agenda and achieve optimal policy mix. Keeping in view its importance, present study tests the empirical nexus between financial reforms and savings in Pakistan. Data set ranges from 1980 to 2015 and application of econometric method of Johansen co integration method found the short run and long run saving function. Major findings suggested that financial reforms gave a boost to saving rate and hence contributed towards overall performance enhancement in Pakistan. The results of other control variables show positive and robust relationship according to theoretical background.

Key words: *Financial Repression, Financial Reforms, Co-integration, Econometric Techniques*

1. Introduction

Developing countries across the world faced extreme worsening economic performance during and before 1980. Economic policies pursued formerly and external environment have been pointed as major cause for these imbalances. Understanding of the institutional factors and arrangements affecting the economic growth has become a topic of extensive debate, especially in the context of developing countries since last a few decades. The emergence of Asian financial crisis occurred during 1997-1998 and the global financial crisis instigated the political efforts and policy makers to formulate action plans to shift suppressive regulations to deregulation of interest rate along with some other open options. Countries eager to achieve macroeconomic stability and sustainable growth seek for the assistance from International Monetary Fund (IMF) for providing a complete and comprehensive policy package to restore macroeconomic sta5bility. IMF introduced and designed a policy package for developing countries comprising of a Structural Adjustment Program (SAP). This program included several measures as a policy agenda specifically to improve the effectiveness of monetary policy. This includes the inducing of indirect monetary policy instead of direct one that is driven by market forces in large.

Major reforms include liberalizing the interest rate and discouraging the directed credit programs i.e. reducing the government intervention, enhancing the capacity of financial institution for allocation of funds to productive sectors, and enhancing the efficiency of monetary policy instruments. In addition to this, the reforms were initiated with a view to strengthen the role of central bank, accelerating the competition environment through market forces and increasing the overall economic growth performance of the countries.

With regard to Pakistan, it was observed that, financial sector prior to 1980 was only sufficient to fulfill the financing needs of public sector enterprises and government. Sector was extremely protected with entry barriers and this restricted competition. Directed credit program was active to prioritize the government. As a result, real interest rate was negative, heavy taxes on savers and subsidies were only provided to inefficient and less productive investment projects. Overall consequences include the low economic growth performance, low savings and hence private investment in the country.

Against this backdrop, like other developing countries, Pakistan also implemented the reforms package in 1989. It was estimated that these financial reforms will bring economic uplift through efficient mobilization of savings to productive investment opportunities. Review of literature provides information mainly whether the impact of financial sector development on economic growth is positive or negative or assessing the direction of causality between both. However, there is little evidence of empirical studies exploring that whether financial reforms have any impact on domestic savings and capital formation.

1.1 Significance and policy relevance of Study

Better understanding of determinants of domestic savings is a pre-condition for policy makers and development economists, in order to formulate effective policies and policy interventions. These policy interventions include taxation, social security, social safety nets and financial market regulations. Furthermore, there are three aspects through which this study attempts to significantly contribute to the literature. Firstly, it examines the dynamic empirics of relation between financial sector reforms and their impact on savings and capital formation. Secondly, it discusses in details the channel through which economic reforms affect the economic growth of Pakistan. Thirdly, fortunately, we are able to collect sufficiently long sample of time series data (ranging from pre-reforms period to post-reforms period).

1.2 Specific Objectives of the Study

Present study utilized the data set comprising of post liberalization period (1980-2015) and carried out an empirical analysis with following specific objectives

1. To check, whether there a positive and significant correlation between the real deposit rate and savings, as expected under the financial repression hypothesis?
2. To empirically analyze the impact of financial sector reforms on domestic savings in Pakistan.

The study is organized as: section one is introduction, brief review of theoretical and empirical literature is contained in section two. Section three is brief description of trends of savings and financial reforms specifically in the context of Pakistan. Methods and material is stated in section four. Final section gives description of results, conclusion and policy recommendations.

2. Literature Review

There are several studies available in the literature stating the impact of saving and capital formation on economic growth and mainly discussing the determinants of savings. This chapter provides the details of studies available in this context for developing and developed countries separately and finally stating the studies available in the context of Pakistan.

Sahoo and Dash (2013) discussed that savings and investment are two main apparatus that play a considerable role in economic growth. In order to shape the long run relationship between savings and its determinants the study used the Error Correction Method (ECM) method on time series data set. Analysis empirically examined the determinants of domestic savings for five South Asian countries i.e. India, Pakistan, Bangladesh, Sri Lanka, and Nepal. The analysis concluded that the recent increase in savings rates in South Asia is largely explained by the increasing CPI, growth rate, declining Share of agricultural GDP, and financial sector

development. The study also concluded that consumption should not be encouraged as it offset both total and private savings.

Johansso (1998) discussed the constant growth in private Savings rates in Indonesia in the last 25 years. The analysis applied the co-integration and error correction models and used the time series data. The findings suggested that rise in private savings rates is linked to falling dependency ratios in Indonesia. Moreover many factors such as undiversified production arrangement and low income levels, Institutional facial appearance, design of social safety systems, taxation schemes, may confuse the savings choice. Further, terms of trade fluctuations have a considerable impact. Finally the conclusion of the study is that reverberation public finances will have a positive effect on Indonesian capital growth. Similarly Odhiambo (2008) examined the fundamental relationship among financial depth, Savings and economic growth in Kenya over the period 1969 to2005 using a tri-variate causality structure. The study applied Error Correction Method (ECM) and causality tests. The conclusion is that economic growth Granger causes savings while savings Granger cause financial depth in Kenya.

Ahmed (2013) investigated the function of financial liberalization in promoting economic Growth and saving in Sub-Saharan African countries (SSA). The study examined both the direct and indirect impacts of financial liberalization policies on economic growth using a modern financial liberalization dataset. The study used the more efficient GMM estimator in dynamic Panel data and dataset covers 21 countries in Sub-Saharan Africa over the period of 1981–2009., The econometric results recommend that, on average, financial liberalization is negatively associated with income growth in SSA region. The study finds that institutional and human capital factors are important in amplification growth and financial development in SSA countries. Therefore, it is necessary for SSA governments to promote a stronger and more transparent institutional development. Agrawal and Sahoo (2009) discussed that savings behavior is significant because of the close relation between savings and growth. The study assumed individual country analysis of the savings behavior in five major South Asian countries, namely, India, Pakistan, Bangladesh, Sri Lanka and Nepal. The present study concluded that the chief factors positively upsetting total savings rate in these countries are income per capita or its development rate and access to banking facilities and also find that dependency ratio and availability of foreign savings have statistically considerable negative result on savings.

A recent analysis by Ang (2011) highlighted the role of financial factors in mobilizing funds in the private sector. The study focuses on analyzing the determinants of private saving in Malaysia – a country that has one of the highest saving rates in the world. The study concluded that financial deepening and increased banking thickness tend to promote private savings and improvement of insurance markets and liberalization of the financial system, however, have a propensity to exert a dampening effect on private savings. Pina (2012) argue that savings are important to understand the growth effects of different financial reforms and instantaneous reforms of macro and micro scope are linked with larger growth only if the savings rate is large.

This paper, examine macro and micro financial reforms using data for 90 countries between 1973 and 2005 and simple model. The results has presented that Savings relate positively with the micro index, but not with the macro index and that reforms tends to occur more often in only macro dimensions, this analysis is consistent with the view that savings and different types of reform interact in non-trivial ways.

Schmidt Hebbel (2002) discussed that financial reform can affect saving through different possible channels, on the whole its net effect is vague. This paper analyzed the Chilean experience, where financial liberalization was key along with the structural reforms that gave a increase to growth, investment, and saving. The empirical verification showed that financial reform played a significant role in the extension of growth and investment, although its effects on saving were rather indistinct. Brown, Maurer Pak and Tynaev (2009) examined the impact of financial sector reform on interest rate levels in Kyrgyzstan. The study finds that, in addition to macroeconomic stabilization, structural reforms to the banking sector extensively contributed to lower interest rates. Hermes and Lensink (2008) investigates the impact of Financial Liberalization on Saving Investment and Economic Growth. The objective of the study is to find out the relationship between financial liberalization on saving, investment and economic growth using a new dataset for a sample of 25 developing economies used panel dataset over the period 1973-96. The findings showed a negative relationship between financial liberalization and public investment. These results propose that financial liberalization leads to a replacement from public to private investment, which may contribute to higher economic growth.

Bandiera *et al* (1998) checked the robustness of hypothesis that "Does financial reforms raise or reduce savings". It discussed that relationship between financial openness and private savings in not clear in the literature and may be due to the fact that the link between interest rate and saving is not clear. However another reason suggested by the authors includes that financial liberalization is a complex process of series of measures where sometimes it is reversed and the long run effects differ substantially from the short run effects. The study was conducted for eight countries and applying technique of principal component, study constructed a financial liberalization index and found different results for different countries. Overall findings of the study presented an ambiguous argument that there is no evidence of clear positive effects of financial liberalization on economic growth through the channel of private savings. Schmidt-Hebbel (2002) discussed the possibility that financial reform can affect saving through different possible channels, however, on the whole its net effect is vague. The study concluded that Financial reform could lead to better financial intermediation and raise the level or effectiveness (or both) of investment, thus spurring growth. The empirical verification showed that financial reform played a significant role in the extension of growth and investment, although its effects on saving were rather indistinct.

Hermes and Lensink (2008) investigated the impact of financial sector liberalization on savings investment and economic growth of a sample of 25 emerging market countries. The analysis found no positive channel through which liberalization accelerates economic growth. Asamoah et al (2008) checked the impact of financial liberalization on savings, growth of real gross domestic product and investment in Ghana. it was found that more liberalized financial sector stimulates savings, capital accumulation and efficiency which in turn effects economic growth. Furthermore, technological innovations are introduced due to the availability of new financial services and hence more competent projects are implemented. Agrawal and Sahoo (2009) have found causality between saving and growth for Bangladesh. By using time series data they estimated long run total and private saving function for Bangladesh and found that total saving rate in mainly determined by GDP Growth rate, dependency ratio, and interest rate and bank density.

Ogwumike and Ofoegbu (2012) conducted a study for Nigeria based on McKinnon's complimentary hypothesis and applied advanced econometric technique of Auto regressive Distributed Lag (ARDL) to check the existence and nature of relationship between domestic savings and financial liberalization. Findings suggested that financial liberalization's impact was positive but with one lagged period, it turned into negative and significant impact. The reason attributed to this immediate transition was lack of continuity in implementation of reforms policies and poor and unstable macroeconomic environment along with lack of investment alternatives.

Murshed and Robin (2012) analyzed the dynamic impact of financial liberalization policies on savings and banking sector of Bangladesh. The application of motivating portfolio selection theoretical model utilized annual time series data over the post-liberalization period (1981-2008). The study found that hypothesis of positive link between financial development and private savings through raising the interest rate does not work for the case of Bangladesh. Furthermore, the study did not favour the positive link between real interest rate and domestic private savings.

Developing countries try to mobilize their savings to achieve sustained and high economic growth. Sahoo and Dash (2013) investigated the dynamic link between financial sector reforms and domestic saving in South Asian region. The sample countries include Bangladesh, India, Pakistan, Sri Lanka and Nepal. To deal with the problems of heterogeneity and endogeneity, study utilized panel data estimation technique and found that better financial sector is an important determinant of total and private saving, and foreign savings. Further the study found a causal link between financial development and saving where finance leads to better saving mobilizations.

While going through the review of past studies on domestic saving and its determinants, it is found that recent literature is less conclusive on this issue. While a certain degree of clear link is desirable, and there is need to re-examine the nexus. Therefore, present study is an empirical

effort to contribute in the recent stream of studies on finding the dynamic empirics of finance-saving and finance-growth nexus.

2.1 Theoretical Framework/Trends in Pakistan

Till the mid of nineteenth century the dominant view in the finance growth link was of Keynesian , which stated that in order to promote capital formation, the interest rate must be kept low (Sen & Vaidya, 1997). This time period was characterized by directed credit program and ceiling on interest rate. This strategy had been used as a tool to allocate resources to priority sectors at low cost.

This viewpoint of Keynes was challenged by McKinnon and Shaw in 1973. The phenomenon was known as financial repression. In other words, financial repression—a combination of heavy taxation, interest rate controls and government participation in the credit-allocation process—would lead to both a decrease in the depth of the financial system and a loss of efficiency with which savings are intermediated (Sen & Vaidya, 1997). The proponents of financial reform argued that financial liberalization tends to raise ratios of domestic private savings to income (Akyüz, 1995). Therefore, it would lead to significant economic benefits through more effective domestic saving mobilization, financial deepening and efficient resource allocation. The core argument of the McKinnon– Shaw thesis is that savings are assumed to be positively related to the real rate of interest, and that administratively determined nominal interest rates hold the real interest rate below its market equilibrium level. The theory of financial liberalization (Akyüz, 1995) also contends that savings will be allocated and invested more efficiently in a liberalized environment with financial intermediation, than when savings are invested directly in the sector in which it takes place, without financial intermediation.

2.2 Trends of Reforms, GDP and Capital Formation

Savings are classified into three kinds, financial savings, private savings and total savings. However, when the effects of financial liberalization are taken into consideration, private savings seems to be the most appropriate dependent variable of all. Due to constraints on availability of data of private savings, research studies usually take total saving as a proxy for private savings because private savings is an important and major component total savings. It is also argued in the literature that financial liberalization is successful only if raises financial savings instead of private or total savings.

Keeping in view the success story of East Asian economies, Pakistan followed and implemented the financial reforms program expecting the social development and economic development as an outcome of this program. Financial liberalization program includes deregulation of interest rate and more scope is granted to market forces to determine interest

rate and efficiently increase and improve the credit allocation (Caprio, Hanson, & Honohan, 2001). Akyüz (1995) stressed the importance of high interest rate for higher savings which can be further utilized for productive purposes.

3. Model, Methodology and Data

3.1 The Model

In order to examine the empirical link between financial reforms, savings and capital formation, present study adopted the model estimated by Murshid and Robin (2012), and Ahmad (2007). The relationship thus may be expressed in a modified form as under:

$$S_t = A\,(Y_{pc}, Dr, Pop_g, Inf, FLIB\,)\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

Where St is saving rate, Ypc is real *GDP per capita*, Dr represents deposit rate, INF is the inflation rate and FLIB expresses financial liberalization.

Furthermore the capital formation equation is given below:

$$\ln S_t = \alpha_0 + \alpha_1(\ln Y_{pc}) + \alpha_2(DR) + \alpha_3(Pop_g) + \alpha_4\,(Inf) + \alpha_5(FLIB) + u_t \ldots\ldots(2)$$

The ARDL representation of model is given as:

$$\Delta \ln S_t = \beta_0 + \beta_i \Delta \ln S_{t-1} + \sum_{i=0}^{k} \delta_i \Delta \ln Ypc_{t-i} + \sum_{i=0}^{k} \phi_i \Delta Dr_{t-i} + \sum_{i=0}^{k} \varphi_i \Delta Popg_{t-i} +.$$

$$\sum_{i=0}^{k} \gamma_i \Delta Flib_{t-i} + \sum_{i=0}^{k} \lambda_i \Delta Infr_{t-i} + \mu ECM_{t-1} + Ut \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3)$$

Where Δ is the difference operator and ECM_{t-1} is an error correction term, ut is the stochastic error term.

3.2 Econometric Methodology

Given the theoretical model and testable form, the econometric analysis has been carried out in three steps. In step one, unit root properties ate tested using Augmented Dicky Fuller (ADF) test while assuming that individual series are non-stationary. In second step, conditional upon the results of ADF unit root test, we check the co-integration between variables specified in above models using Johansen (1988) and Johansen ans Juselius (1990). In the third and final step on the basis of results of long run co-integration parameters, we will estimate the short run error correction model of each equation.

Short run analysis is carried out using the error correction mechanism (ECM), which states how changes in the explained variable occur due to changes in explanatory variables. Moreover, it also explains the deviation from long run equilibrium through an error correction

term (EC_t). It is of high significance in researches, as it is estimated in first difference form. Secondly, it measures the magnitude of correction from disequilibrium in previous time period. Thirdly, it avoids the issues of spurious regression and removes the element of trend in the variables, thirdly, error term is stationary. Our current analysis follows the general to specific methodology and hence best fits this kind of models and data set of this range. The error correction model formulated for our two equations could be written as:

In empirical analysis availability and use of data making sense is very necessary since the inappropriate data results into incorrect conclusions. Present study checked the data for its consistency and reliability before conducting empirical estimations. This study is time series in nature utilizing the annual time series data over 1975 to 2014. The data on monetary aggregates and macroeconomic variables is taken from handbook of statistics on Pakistan Economy, State Bank of Pakistan, various issues of Pakistan Economic Survey and various issues of International Financial Statistics (IFS), issued by IMF, and handbook of statistics on Pakistan Economy. The financial openness variable used for this study is taken from Journal of Development Economics (JDE). Major variables include:

3.2.1 Real per capita GDP: taken as ratio of nominal GDP with Consumer Price Index (CPI), overall, a positive correlation is expected between incomes and savings rate (Schmidt-Hebbel and Serven, 2002).

3.2.2 Financial Deregulation, Real Deposit Rate, the effect of the interest rate on savings is generally inconclusive, liberalizing interest rates will increase return on savings as the real deposit rate improves and provides incentives for saving in financial form.

3.2.3 Inflation Rate is taken as an indicator of micro economic stability, which negatively influence saving rate.

3.2.4 Government Budget Deficit that is reform related variable, fiscal and other government policies have potential influence on the household savings rate as government expenditures must be paid either in the present period or in the future. A higher government deficit affects private savings negatively. This is because an increase in government spending will lower resources available to the private sector (Masson & Pattillo, 2002).

3.2.5 Number of Commercial Banks and interest Rate Spread, The number of commercial banks and the spread margin are taken to quantify the quality of financial services in the formal financial intermediary sector and to capture the impact of the recent financial reforms (financial liberalization) in this respect. Spread is a measure of banking competition, and it is difference between lending rate and deposit rate. An increase in the number of banks will increase the competitiveness of the banking industry and enhance access to banking services. In addition, because economic liberalization is expected to

improve competition, the interest rate spread (an indicator of inefficiency) should decline and converge to international levels (Brock & Suarez, 2000).

3.2.6 Population Growth Rate is taken as indicator of demographic changes, an increase in population growth (associated with an increase in the dependency ratio of the population) will be associated with a reduction in the savings rate, since the active working group will now have the burden of sharing their income, assuming that they cannot consume independently (Berube & Cote, 2000; Loayza *et al.,* 2000).

3.2.7 External Financial Liberalization: Various studies used a variety of financial liberalization indicators including Quinn's index, and Delphi index. The most recently used indicator is Chinn-Ito Financial Openness index represented in literature by (KAOPEN), which is designed to measure the degree of capital account openness of a country.

4. Empirical Results

Results are presented in three major steps. In the first step, order of integration of all variables in the study are checked and reported. Second step includes, the testing the existence or non-existence of co-integration using Johansen's test. Results of short estimates and the short run diagnostic test are presented in section three.

Results of ADF test below show that all the variables included in the analysis are non-stationary at their level and become stationary after taking first difference. Hence all the variables are integrated of order one. Further, these findings provide a rationale that we can apply VECM methodology.

Table II: Results for Augmented Dickey-Fuller Test of Unit Roots

Variables	ADF at Level	ADF at First difference.	Order
Y_t	1.3793	-5.0453	I(1)
S_t	-0.072	-5.6832	I(1)
RIR	-1.1250	-3.9078	I(1)
PoPg	-0.8163	-4.8871	I(1)
Infr	-1.5217	-3.4933	I(1)
FLIB	1.6458	-7.0567	I(1)
I_t	-1.9167	-6.1431	I(1)

Note: ADF test is based on the Mackinnon (1991) critical values, H0: There is unit root
Source: Authors calculations

4.1 The Long run Estimates: Co-integration Analysis

We used multivariate co-integration method advanced by Johansen (1998), Johansen and Juselius (1990) to find the long run co-relationship between the variables. The model includes unrestricted constant and no trend.

Table III: Johansen Tests for Co integration

Maximum Eigenvalues Test ($\lambda-\max$)				
Null Hypothesis	Alternative Hypothesis	Test Statistics	(T-K/T) Adjusted Max Statistic	5% critical Value
r=0	r=1	45.946*	38.71*	32.78
r=1	r=2	16.889	12.66	17.485
r=2	r=3	22.011*	18.93	20.631
r=3	r=4	7.188	6.64	13.462
r=4	r=5	2.914	2.01	3.6148
Trace Test ($\lambda-trace$)				
r=0	r≥1	106.59*	90.67*	68.818
r=1	r≥2	60.103*	50.94*	46.658
r=2	r≥3	31.213*	27.58*	27.797
r=3	r≥4	10.003	8.294	13.494
r=4	r≥5	1.914	1.30	2.4184

Note.1* indicates significance at 5% level.
Source: Authors calculations

There exist two co-integrating vectors on the basis of the maximum Eigenvalues Test ($\lambda-\max$), while, there exist three co-integrating vectors when we use trace statistics ($\lambda-trace$). Both at the 5 % level of significance. However, adjusted max test statistics indicate that there is one co-integrating vector included in the model and two vectors by using adjusted trace statistics. Our both statistics support the existence of co-integration among saving rate, and all explanatory variables. Next we normalized the first co-integrating vector on the saving rate. Findings are presented below in Table 04 below.

Table IV: Normalized Coefficients of Co integrating Vector on Saving.

Variables	Coefficients	Standard Error	t-Value
$Ln(Y_{pt})$	0.3345	0.1321	2.5321
DR	-0.175**	0.121	-1.4462
Pop_g	0.858*	0.962	0.8918
Infr	0.3101	0.544	-0.5700
FLIB	0.3240	0.2340	1.3846
Constant.	-9. 464	_	_

Note.* indicates significance at 5% level
Source: Authors calculations

In the table given above it is evident that a positive and significant relation between real GDP per capita and saving. Deposit rate caste a negative and robust relationship with saving. The impact of population growth rate on saving is positive and significant. Moreover the impact of inflation rate on saving is negative in the long run. In this table the most important result is of financial liberalization index on saving, which is found to be negative in the long run, the reason attributed to it is the inefficiency of reforms in the long run. The performance of savings because of financial reforms have not been very good in the long run and it has been supported by many studies in the literature including Khan and Hye (2013), Khan and Quyyum (2007).

4.2 Short Run Saving Function

The estimated error correction coefficient (ECM_{t-1})[1] is – 0.0058 and it is significant at 5 % level with theoretically correct negative sign. Likewise the coefficient of lagged private investment is 0.080 and significant at 5 % level

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[1] The term error correction (ECM) consists of residual obtained from the saving (ln(St)) and its function. The estimated error correction coefficient is obtained by resetting the normalizing coefficients obtained from long run growth function.

Table V: Error Correction Model of real (GDP).

Variables	Coefficient	Std. Error	t-Statistic
d(lnYpt))	0.0707**	0.0463	1.744
d(FLIB)	0.1195*	0.0467	2.553
ECM_{t-1}	0.-0058*	0.00085	6.861
R-squared =0.20 Adjusted R-squared=0.13 D.W Test=2.32			

Note *shows Significant at 5% level and ** shows significant at 10% level.
Source: Authors calculations

The results of short run and long run show that a negative link between saving rate and financial deregulation at domestic level exists. While capital account openness is a positive and robust determinant of saving rate. The findings are in line with the studies conducted in the context of Pakistan by Khan and Quyyum (2012).

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