

Financial Repression and Financial Depth: A Case Study of Pakistan

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Abstract

The financial sector assumes a prominent place in the economic growth. Financial depth, thus, becomes a tool that can be utilized to further the objective of economic growth. But Pakistan has been experiencing those policies that lead to financial repression. So, it becomes a natural question that how the financial repression has been impacting financial depth. The objective of the study is to investigate the impact of financial repression on financial depth. The study contributes by constructing financial repression index for Pakistan. By employing the Auto-regressive Distributed Lagged Model (ARDL) to estimate the long run relationship between financial repression and financial depth the study finds positive relationship between financial repression and financial depth. This implies that government intervention like directed credit, enhances financial depth in case of Pakistan. Similarly, the bank density has a positive relationship with financial depth. The government intervention might improve financial sector, particularly, in the presence of lack of competitive market structure is the policy implication.

Keywords: Financial Repression Index, Financial Depth, ARDL, Pakistan.

JEL Classification: G10, G21, G28

1. Introduction

The importance of financial sector in the process of economic development cannot be underestimated. This has been emphasized by various authors in literature, for instance, Schumpeter (1912), though before Schumpeter, Bagehot (1873) emphasized that well-functioning capital markets in England played a key role in better resource allocation towards productive investment. Similarly, the book by Schumpeter delineates clearly and candidly the relationship between economic development and financial development since credit and capital and interest on capital are full-fledged chapters in the book. The Schumpeterian innovative process that leads to economic development basically originates from

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financial development. Then the hypothesis was furthered by Patrick (1966) which talked about demand-following and supply-led phenomena.

Similarly, Shaw (1973) and McKinnon (1973) have emphasized the importance of liberalized financial sector as it leads to efficient allocation of resources which ultimately enhances economic growth. McKinnon (1973) aptly describes that the fragmented and less developed financial market fails to mobilize resources towards productive channels and the economic units have to depend upon their own savings for investment. McKinnon also concludes that government interventions are less favorable for better resource allocation. The study by McKinnon also emphasized the importance of disciplined fiscal policy, which is also necessary for the development of financial sector. Similarly, Shaw (1973) can be summarized as that restriction on the free operation of the financial markets is a big hurdle in the development of an economy. Nonetheless, one might argue that financial repression is not the only cause of underdevelopment though it is important one. Lately, King and Levine (1993) find that financial development is one of the major factors in the development of an economy.

This debate seeks that the development of financial markets is sine qua non for economic development, and financial development means absence of financial repression. It was, perhaps, against this backdrop that most of the countries adopted financial sector reforms. The objective of financial sector reform was to eliminate financial repression. Pakistan also adopted these reforms. The theory behind is that elimination of repression will increase financial depth. The debate originates from “financial repressionist” argument that among other things, low or negative interest rate is major obstacles in high saving rate and financial deepening. On the other hand, “financial structuralist” group that is led by Goldsmith (1969) attributes low saving to less developed financial structures. Goldsmith (1959) talking about the role of financial structure states that even the extent of division of labor, the movement of price level, and the saving ratio all depends upon the structure of the financial system. identify Institutions, policy, geography and other variables as determinants of financial deepening has been identified by Huang (2010) and Hung and Lee (2010). Similarly, Law and Habibullah (2009) state that income per capita as well as the institutional quality are major determinants of the banking sector development and the capital market development, however, trade openness remains the most significant determinant so far as the capital market development is concerned.

Giovanni and de Melos (1993) state financial repression serves the government as government is funded at low cost. They calculate the revenue from

financial repression by taking the difference between domestic and foreign cost of funds and then multiplying it by the domestic stock of funds. The study concludes that revenue from financial repression can be significant. Agenor and Montiel (2015, Chapter 4) say that financial repression is a subsidy to the government through the bank financing at below market interest rate. It necessarily means that depositors are also getting repressed rate on their deposits which discourage savers. However, it does not mean that all indicators of financial repression are due to government regulations as Stieglitz and Weiss (1981) show that if information asymmetries are there, it may lead to credit rationing endogenously, instead of resulting from government interventions. On one hand banks are legally required to keep high reserves and on the other hand, they are also required to have high liquidity ratio, specifically, in the form of government securities. Reinhart and Sbrana (2015) identifies features of financial repression as: caps or ceilings on interest rate, and different controls like: capital account restriction and exchange control, high reserve requirement, prudential regulation requiring that financial institutions hold government debt in their portfolio. Lately, Reinhart (2012) states the negative real interest rates after financial crisis 2008 is a sign of financial repression.

In the context of financial sector reforms, the aim of this study is to explore the impact of financial repression on financial depth. The study contributes by constructing financial repression index for Pakistan and uncovering the impact of financial repression on financial depth.

2. Literature Review

Many of the researchers discuss the concept of financial repression with tax evasion. As in fiscal policy for the governments to impose high taxes are usually considered much more difficult than to impose financial repression to generate revenue in the form of interest rate expense saved on domestic debts. So, this is one strand of literature, and the other strand of literature is that how the financial reforms have played a role in decreasing financial repression. Besides, the relationship between financial repression and financial depth has also been discussed along with the link to saving rate. This study reviews all the strands of literature.

Gupta and Ziramba (2008) using overlapping generation model taking consumer, financial intermediaries, firms, and government into account and taking reserve to deposit ratio as proxy of financial repression finds that higher degree of tax evasion leads to higher degree of financial repression. Their results survive to

different values of parameters. The paper avoids Lucas Critique by endogenizing tax evasion.

Giovannini and De Malo (1993) examine the revenue of the government from financial repression and find that even in some countries financial repression generates the revenue equivalent to the revenue from seigniorage. The study is exploratory in nature. Talking about the sequence of reform that study says that tax reforms should precede the financial sector liberalization.

Norkina and Pekarski (2014) explore the financial repression using Diamond-Samuelson overlapping generation model. The study captures the financial repression by taking into account the interest rate on public debt that is lower than the market rate. Captive pension fund, which is most common form of financial repression in developed countries, is the proxy for repression in the study. The study concludes that share of pension saving with lower than market interest rate is a modern form of financial repression in developed economies. Setting the interest rate lower than the market is a part of optimal fiscal policy.

The study by Diaz-Alejandro (1985) talks about Latin American countries. The author opines that liberalization of interest rates and relaxations of controls are not necessarily intermediation encouraging so far as long run is considered. The study also delineates that though in theory the end of financial repression encourages saving but this is not a general rule, for instance, savings did not increase during financial liberalization in South American countries. Similarly, performance on investment front also remained dismal despite financial liberalization.

Khalaf and Sanhita (2009) apply Autoregressive Distributed Lag (ARDL) model to test the financial liberalization and financial repression policies for the period of 1970 to 2007 for Iraq. Proxy for financial development used as $(M2\text{-Currency})/GDP$. Using the supply and demand model for loanable funds the study finds that lower real interest rate reduces the return to deposits and also decreases the supply of funds available for loans. The study concluded that neither financial liberalization nor financial repression led to financial development in Iraq. Thus, the study rejects the McKinnon-Shaw hypothesis that liberalized financial system will bring financial deepening. The possible interpretation of the failure might be weak law and order situation, political instability, and bleak macroeconomic environment. Interestingly, banking density also did not contribute in the financial deepening.

Patrick (1966) giving the significance of demand-following and supply-led phenomenon. The demand-following development in financial division relies on the economic development of the nation. The growth in the economy builds the interest for financial development, and the financial sector reacts to this interest. As per demand-following methodology, finance is passive during the process of economic growth. The other side of the coin is supply-driving phenomenon. This implies that supply makes its own interest like circumstance. This phenomenon is moderately near the Schumpeterian innovative financing. To start with the supply-driving phenomenon may not be productive. In any case, both the phenomenon can't work in vacuum, it is highly likely that simultaneity exists in their operations – that is they interact with each other.

Khan and Aftab (1993) analyze the neo-liberal hypothesis, that is, financial liberalization has variety of benefits. Financial liberalization frees the caps and ceilings on interest rate and thus lead to equilibrium interest rate that is, generally, higher than the suppressed one. Because of this change in the interest rate, the economy is expected to experience positive benefits through financial deepening and investment efficiency. Though the savings are positively related with the real interest rate, but negligible. The study finds that the neo-liberal theory is not working as the theory predicts financial deepening enhances investment efficiency, but the empirics are contrary.

Khan and Qayyum (2007) investigate the impact of financial liberalization and trade liberalization in Pakistan. The data spans from 1961 to 2005. The study concludes that both have a definite role in enhancement of economic growth. The contribution of the paper is that it constructs financial development index. The index comprises of four different variables and has been constructed by using principal component method. The indicators are total bank deposits to GDP, which measures size, the ratio of money cleared through clearing house to GDP, it measures that how widespread is the provision of financial services, private sector credit to GDP to measure the financial intermediation level and the fourth component is stock market capitalization to GDP. The study finds that liberalization policies – trade and financial—are beneficial for economic growth of Pakistan.

Feridun and Nejad (2013) investigate the determinants of financial development in case of Iran. The study uses data from 1965 to 2006. As theory predicts, there exists negative relationship between financial repression and financial development. This calls for market based open and liberal financial system. The repressed financial system also causes curb markets in the economy. The study finds an interesting relationship that increase in inflation leads to

financial development. The interpretation of the result can be sought in the threshold level of inflation. Since Iran has never been under high inflation regime so the results are not out of place at all.

Abe et al. (1977) investigates the McKinnon and Shaw model. The countries included in the sample are Japan, China, Pakistan, Korea, Thailand and Turkey. Authors are candid that this particular sample selection is because either they are authors' home countries, or they have been residing and working in these countries. Thus, any scientific sample selection method is clearly absent. The study finds that savings are influenced positively by rate of interest on deposits and negatively by expected inflation.

Mujeri and Younas (2009) investigate the banking spread using data from 2004 to 2008 for Bangladesh. Financial repressions lead to inefficiencies in the banking system which may cause increase in spread. Financial reforms if decrease market power of few firms by allowing other banks to enter and promoting competition among banks may lead to reduction in interest rate spread. Thus, it can be said that reforms reduce interest rate spreads and then banks look for investments that have high marginal efficiency of capital.

Bandiera et al. (2000) investigates the financial liberalization and private saving. The study concludes that the impact of financial liberalization on savings is dissimilar in the short-run form the long-run. The study constructs financial liberalization index consisting of variables like, pro-competition measures, reserve requirement, interest rate, directed credit, banks' ownership, prudential regulations, securities market and international financial market liberalization. The ambiguity between the relationship of interest rate and saving arises from substitution effect and income effect. Secondly, interest rate liberalization is only one dimension of financial liberalization, other dimensions are: access of household to the consumer credit, access to house financing and this inclusion might increase towards reducing saving rather than increasing them.

One of the purposes of financial reforms is also to instigate competitive forces so that spread could be reduced. Financial repression along with ownership structure of the banking system can explain the causes of spread in a better way. Barajas et al. (1999) finds that average spread did not change between pre-liberalization and post-liberalization period, however, its composition did change. The study concludes that operational cost, financial taxation and improving loan quality is important in determining the magnitude of spread. Similarly, Brown et al. (2009) study is to explore that how did the financial sector reform impact the public confidence on the banking system. The study finds that banking sector

reforms did have impact on deposit rates, that is, deposit rates have been reduced, however, macroeconomic and structural reforms are not having any impact on the interest rate spread. Buffie (1984) highlights that when one is evaluating any policy; the time horizon is of utmost importance. Since the study claims that short run and long run multipliers may differ not only in size but even in sign. The study also emphasizes that the typical characteristics of each country demand thorough investigation when it comes to the impacts of a particular policy. The study says that the existence of curb market is of high importance in making analysis. Bringing the curb market into the model is equivalent to incorporating the informal sector in the economic modeling. Especially, if transactions in the curb market are large, then its modeling do have repercussion on economic analysis. The study agrees with financial repressionist and new structuralists that tight monetary policy causes negative supply side effects. Furthermore, the degree of indexation also becomes important as it has impact on results.

Demetriades and Luintel (1997) investigates the impact of financial repression on financial development. The major channel of influence is real interest rate channel. The study finds that financial repression has negative impacts on financial development. The data ranges from 1960 to 1991 for India. Nonetheless, the study highlights that generalization of results is not straight forward as different countries differ in institutional quality. The study further highlights that if repressionist policies address market failures then financial repression might have positive effects.

Aloy et al. (2014) explore the repercussions of financial repression in the fiscal vulnerability perspective. First the study established that France has been experiencing financial repression after the World War II, then the study uses counterfactual that what would have been the level of liquidation effect if the policies of financial repression would have been continued till now. The study finds financial repression era in France from 1950 to 1980. The study also concludes that if a government chooses to use financial repression as a tool it can save on her public debt. The reduction in debt servicing because of such policy can be palpable. But the results are not normative the study cautions.

Huang and Wang (2011) explore the relationship between financial repression and economic growth, particularly, during the reform period. The results show that because of repressionist policies GDP growth has been down. The study applies PCA method to construct financial repression index. Interestingly, McKinnon and Mathieson (1981) find that that the policies of liberalization may not be productive in the repressed economy. One main reason is the persistent fiscal

deficit. In the sequence of reforms, the ordering of the fiscal house assumes prior position. However, the study says, the second-best strategy could be direct interest subsidy instead of restriction on interest rate; reserve requirement should vary with the fiscal deficit. Flow of capital across border should be subject to reserve requirement and exchange rate should be a bit free to move.

Chirwa and Mlachila (2004) evaluate that how the financial sector reforms had impact on interest rate spread. Textbook economics tells us that as competition decreases the profit margin, in this case, spread should go down. The authors investigate the impact of financial sector reforms on interest rate spread in case of Malawi. Interestingly, using different definitions of spread the study finds that the spread has increased after the introduction of reforms. The interpretation offered is high monopoly power, among other things. The study also developed financial development index from 1987 to 97.

Dorrucci et al. (2009) construct financial development index for 26 emerging market economies. For the construction of index, the study uses following dimensions: (a) institutions and regulations, (b) size and access to financial market, and (c) performance of the financial market. The study ranks 26 emerging market economies according to their domestic financial development level. Comparing the results with advanced economies, the study finds that most of the countries in the sample are lagging in the development of financial markets. The study finds that under-development of financial system is because of capital movement from the South to the North. However, the study supports the argument that catching up in terms of financial development is on its way. The study highlights that the financial crisis of 2007-08 might trigger the interest of the investor towards South. This has glaring implication of diminishing the ability of advanced economies to borrow from the rest of the world as and when required. The study applies GMM and lagged variables have been instrumented.

Ngugi and Kabubo (1998) investigate that do reforms lead to positive real interest rate. The other natural expectation was that cost of intermediation will also go down because of reforms. To this end, the study explores the sequence of reforms and actions taken by the concerned authority. The study finds that financial sector still indulging in negative real interest rate. The study finds that the sequence of reforms was not appropriate that is one cause of lacking in achieving the desired results. The interest rate spread also widened instead of decreasing. Similarly, Van Wijnberge et al. (1989) formulate a framework that takes into account financial sector reforms, external debt and target rate of inflation for financing deficit. The study seeks the consistency between level of inflation and financeable deficit. The

model can be used either to calculate financeable deficit for given rate of inflation or a rate of inflation which does not require fiscal adjustment.

Achy (2003) uncovers the effect of financial liberalization on investment, saving and economic growth. Since it is expected that liberalization would increase availability of funds, i.e. saving, investment and consequently economic growth, the study tests this empirically. The study finds that there exists negative relationship between financial development and investment. The potential explanation study comes up with is that the development of mortgage and consumer finance might have put negative pressure on household savings and availability of credit for the private firms. However, the study does not substantiate this claim with data, rather just says that detailed data is needed to know the allocation of private credit among two economic agents – households and firms. Financial depth also fails to have positive impact on economic growth.

Atiq (2014) sheds light on finance-growth nexus and financial crisis considering financial liberalization. The study investigates two related questions: first one is to uncover the relationship between financial development and economic growth and the second deals with the potential association between financial liberalization and financial crisis. The study employs Dynamic Panel Data for 88 countries for the 1973 to 2005. The study constructs index for financial sector liberalization that comprises of seven dimensions. The results show that as financial development increases, its positive effect on long term economic growth diminishes. The results are robust to different proxies of financial liberalization. The second question that dwells upon the possibilities is that how financial crises in the wake of financial liberalization can be avoided. To investigate this question study constructs a distance measure taking the countries that follow a gradual approach to capital account liberalization as a benchmark. The study measures financial crisis as banking crisis, currency crisis or twin crisis. The thesis finds that the more abrupt is approach towards capital account liberalization the higher is the probability of financial crisis. This demands that there should be a measure approach towards capital account liberalization. The study finds that crisis is related with ordering of liberalization, however, it does not find any definitive ordering for financial reforms. Nonetheless, the capital account liberalization should come at the end of liberalization reform agenda.

Jalil and Feridun (2011) explore the impact of financial sector development on economic growth for Pakistan. Data spans from 1975 to 2008. The study builds a financial depth indicator by employing PCA method and uses ARDL to estimate the empirical relationship between financial depth and economic growth. The study

finds positive relationship. In analytical framework authors introduce production function that depends upon total factor productivity and capital. Then estimate the equation that comprises explanatory variables like index of financial depth, real capital per capita, real lending rate, and trade to GDP ratio. One might argue that in case Pakistan where share of agriculture in total output is reasonably high, to ignore labor in production function is not a good idea. Since agriculture sector is relatively more labor intensive. Against this backdrop, it would have been better had the authors used typical production function and then go on adding other control variables. The robustness check is also missing.

Reynoso-del-Valle (1989) investigates the relationship between financial liberalization, financial repression, and the interest elasticity of saving in developing economies. The study highlights that the size and sign of the interest rate in the sample countries are prone to sample period bias. Distinguishing between low, average, and high real interest rate for the 26 countries the study finds that there exists a Laffer-curve shaped saving function. This Laffer curve function indicates that at a very low real interest rate the elasticity is positive and zero elasticity when real interest rates are close to zero. The Laffer curve relationship says negative elasticity for high real returns. The study seeks the interpretation through share of wage income in total income and finds that if wage income constitutes a major portion of total income, the interest elasticity of current saving will be positive.

Chan (2021) finds that financial repression led to imbalances in the economy which consequently heightens financial risks. The study highlights that the possibility of benefits coming from the low-interest rate environment due to financial repression cannot be ruled out.

Chari et al. (2020) establishes that financial repression can be used by governments to keep their fiscal house in order, particularly in special times like war. The study evaluates financial repression with and without commitment. The study finds that under commitment financial repression is never optimal.

Jafarov et al., (2019) quantifies the losses to economic growth due to financial repression. However, the study also finds that financial repression reduces likelihood of debt crisis thus indirectly affecting growth positively. However, the study concludes net effect of financial repression on growth is negative.

Afrin et al. (2022) concludes that the automations and structural reform can bring the intermediation cost down not the financial repression. The study further posits that repressive policy might have even unintended consequences.

This study contributes by constructing financial repression index for Pakistan to quantify the impact of financial repression on financial depth. A study close to ours is by Khan and Hasan (1988), but the focus of their study is the relationship between low savings and financial development.

3. Research Methodology and Data

Since the data is integrated on different order, the Autoregressive Distributed Lagged (ARDL) model (ARDL). The study applied ADF and KPSS tests to check stationarity.

In this investigation, we used Principal Components Analysis (PCA) to develop the financing repression index by utilizing factors (I) credit allocation control (ii) credit intermediation control (iii) and financing rate control as main segments.

3.1. Model Specification

Various models have been used in literature, for example, some studies use overlapping generation models like Gupta and Ziramba (2008) , Norkina and Pekarski (2014) whereas there is another strand of literature that uses single equation models like Khan and Hasan (1988) and Khalaf and Sanhita (2009).

In this study we use the following model

$$FDEP = f (RGDP, FRI, BD, RIR, REER, CPI) \quad (1)$$

$$\begin{aligned} & \textit{Financial depth} \\ & = f (\textit{Gross domestic product per capita, Financial repression index,} \\ & \textit{Bank density, Real interest rate on deposits, Real effective exchange rate} \\ & \textit{and consumer price index}) \end{aligned} \quad (2)$$

We can write this mathematical model as econometric model such as

$$\begin{aligned} F_DEPTH &= CONSTANT + GDPPC + FRI + B_DENS + RIR_DEPOSIT \\ &+ REER + CPI + \textit{error term} \end{aligned} \quad (3)$$

Now we can write this model in an econometric equation form.

$$F_DEPTH_t = \alpha + \beta_1 GDPPC_t + \beta_2 FRI_t + \beta_3 B_DENS_t + \beta_4 RIR_DEPOSIT_t + \beta_5 REER_t + \beta_6 CPI_t + U_t \quad (4)$$

Where, F_DEPTH is financial depth which has been measured as broad money (M2) minus currency in circulation to GDP ratio. B_DENS is the bank density that indicates higher the bank density higher is the participation of

economic agents in the financial system thus more bank density leads to more financial depth. Financial repression index. (FRI) is utilized to gauge the effect of financial repression polices on financial development. Real GDP per capita has been included following demand-following hypothesis. RIR_DEPOSIT is real interest rate on saving deposits; theoretically speaking, real interest rate has positive relationship with financial depth.

We will use the following equation, for the long run results of ARDL model.

$$\begin{aligned}
 dF_DEPTH_t = & \alpha_{11} + \beta_{11}F_DEPTH_{t-1} + \beta_{12}GDPPC_{t-1} + \beta_{13}FRI_{t-1} \\
 & + \beta_{14}B_DENS_{t-1} \\
 & + \beta_{15}RIR_DEPOSIT_{t-1} + \beta_{16}REER_{t-1} + \beta_{17}CPI_{t-1} + \\
 & \beta_{11} \sum_{i=0}^n dF_DEPTH_{t-i} + \beta_{12} \sum_{i=0}^n dGDPPC_{t-i} + \beta_{13} \sum_{i=0}^n dFRI_{t-i} + \\
 & \beta_{14} \sum_{i=0}^n dB_DENS_{t-i} + \beta_{15} \sum_{i=0}^n dRIR_DEPOSIT_{t-i} + \\
 & \beta_{16} \sum_{i=0}^n dREER_{t-i} + \beta_{17} \sum_{i=0}^n dCPI_{t-i} + \dot{U}_{11}
 \end{aligned} \tag{5}$$

Here “d” used for first difference, i for lag selected and U_{11} for error term.

3.2. Data Description and Economic Rationale of the Variables

The study uses yearly data from 1980 to 2015. The data sources are handbook of statistics, SBP, and World Development Indicators (WDI) World Bank. Financial Repression Index (FRI) consisting of three variables; interest rate control (IRC), credit intermediation control (CIC) both are Dummy variables and credit allocation control (CAC). These variables have been taken from the SBP. Data has been transformed into natural log form.

Where, F_DEPTH is financial depth which has been estimated as broad money (M2) minus currency available as a percent of GDP. It is a better measure of financial intermediation as suggested by Demetriades and Hussein (1996)

B_DENS is the bank density that indicates higher the bank density higher is the participation of economic agents in the financial system thus more bank density leads to more financial depth. This proxy has been utilized as a determinant of financial advancement in a few studies, Demetriades and Luintel (1997) and Laureceson and Chai (1998).

FRI consist of three components which are, (1) Interest rate control (IRC), (2) Credit intermediation control (CIC) and (3) Credit allocation control (CAC). FRI has been calculated by using Principal Component Analysis (PCA) method. Such index has been constructed by Demetriades and Luintel (1997) and Khalaf and Sanhita (2009).

Real GDP per capita has been incorporated after demand following assumption highlighted by Patrick (1966). Robinson contended that financial development follows economic development and articulated this causality by proposing that "where endeavor drives fund follows" Robinson (1952).

RIR_DEPOSIT is real interest rate on savings. This proxy estimates the impact of financial liberalization on financial depth, as estimated by Laurenceson and Chai (1998).

REER is real effective exchange rate. The increase in index shows the real appreciation of domestic currency. The chain of effect runs through the international competitiveness channel as highlighted by Hajilee and Al Nasser (2017).

The literature says that inflation mars the functioning of financial markets, for instance, Boyd et al. (2001). But inflation as such is not that informative, it is the threshold level that carries more importance. The genesis of this debate goes back to the inflation-growth nexus. Since the demand-following and supply-led growth is at the heart of finance growth nexus thus level of inflation enters in the equation indirectly through finance-growth nexus debate.

4. Results and Discussion

4.1. Descriptive Statistics

The first step in econometric analysis is Normality of the data set. In the table below, we present the descriptive measurements of the series that have been utilized in regression.

Table 1. Descriptive Statistics

	F_DEPTH	GDPPC	FRI	RIR_DEPOSIT	B_DENS	REER	CPI
Mean	3.398	6.333	3.406	-2.696	9.080	126.51	8.399
Std. Dev.	0.1080	0.4835	0.1899	4.288	0.2197	39.51	3.85
Skewness	-0.1507	0.6461	-0.8802	-0.6927	-0.0957	1.416	0.654
Kurtosis	1.850	1.999	2.722	3.129	1.808	3.584	3.70
Jarque-Bera	2.119	4.007	4.765	2.904	2.183	12.56	3.31
Observations	36	36	36	36	36	36	36

The estimations of Jarque-Bera and the comparing probability demonstrate that the data are typically appropriated except from real effective exchange scale.

Hence is supported by the estimations of skewness and kurtosis. The Skewness and Kurtosis values are 0 and 3, individually for a regularly distributed variable. The four negative estimations of skewness in the series demonstrate that data is skewed to the left.

4.2. Unit Root Test

4.2.1 Augmented Dickey Fuller Test ADF

To check the stationarity of data Augmented Dickey Fuller Test is utilized. Stationarity of the variables has been checked at none (without intercept, and trend). As results in below Table 2 none of the variable is I(2), two variables real interest rate on deposits and real effective exchange rate are I(0) which implies stationary at level.

Table 2. ADF Stationarity Test

Variable	At Level			At First difference		
	ADF	5%	p-value	ADF	5%	p-value
lnF_DEPTH	0.2330	-1.9503	0.7482	-5.3098**	-1.9506	0.0000
lnB_DENS	0.6136	-1.9506	0.8442	-2.7101**	-1.9506	0.0082
lnFRI	-0.2880	-1.9506	0.5749	-3.8185**	-1.9506	0.0004
lnGDPPC	3.9271	-1.9503	0.9999	-4.1218**	-1.9506	0.0001
RIR_DEPOSIT	-2.2970*	-1.9503	0.0228	-7.1701	-1.9506	0.0000
REER	-2.0061*	-1.9503	0.0443	-4.8998	-1.9506	0.0000
CPI-inflation	-1.244	-1.9506	0.1921	-7.1406**	-1.9506	0.0000

Note: * shows stationarity on level and ** indicates stationarity of first difference, Ln shows Natural Log of the series. The results of the stationarity in Table 2 and Table 3 indicate that with the mixed order of integration ARDL is the appropriate estimation technique. Since there is debate about size and power of the test so this study uses ADS as well as KPSS.

4.2.2. Kwiatkowski-Phillips-Schmidt-Shin (KPSS):

Another strategy used to check the stationarity of data is Kwiatkowski-Phillips-Schmidt-Shin (KPSS). The Table 3 demonstrates the results of KPSS test in the following along with their critical values at different level of significance.

Table 3. Statistics of KPSS test

Name of Variable	LM Stat	Decision (Level)	LM Stat	Decision (First Difference)	
lnF_DEPTH	.4904	Non-stationary	.0871	Stationary	
lnB_DENS	.6120	Non-stationary	.2936	Stationary	
lnFRI	.4492	Stationary	.1875	Stationary	
lnGDPPC	.6891	Non-stationary	.1621	Stationary	
RIR_DEPOSIT	.1897	Stationary	.1031	Stationary	
REER	.5291	Non-stationary	.3999	Stationary	
CPI	0.0645	Stationary	0.1006	Stationary	
Asymptotic Critical Values					
1 % Level	0.7390	5 % Level	0.4630	10 % Level	0.3470

4.3. ARDL Bound Testing Approach

To check whether the long run co-integration or equilibrium exists between the variables or not we apply the technique known as Bound Test Approach. The Table 4, show the results of Bound test for all the three models.

Table 4. ARDL Bound Testing Analysis

Description	Model 1		Model 2		Model 3	
F-Statistics	4.1283		5.1430		5.1279	
Critical Value Bounds	Lower	Upper	Lower	Upper	Lower	Upper
1%	4.29	5.61	5.15	6.36	5.15	6.36
5%	3.23	4.35	3.79	4.85	3.79	4.85
10%	2.72	3.77	3.17	4.14	3.17	4.14

To get the reliable results from the data set we must check the assumption of Ordinary Least Square (OLS). Such as heteroskedasticity, serial correlation, functional form, and normality of the data set.

Table 5. Diagnostics of Models

Description	Model 1	Model 2	Model 3
R^2	0.7900	0.7752	0.7763
Adjusted - R^2	0.7277	0.7190	0.7204
F-Statistics [p-value]	12.69 [0.000]	13.79 [0.000]	13.88[0.000]
DW Statistics	1.89	1.8327	1.8037
Breusch-Godfrey Serial Correlation			
LM Test	[0.3013]	[0.4846]	[0.3901]
Functional Form [Ramsey Reset test]	[0.5014]	[0.6556]	[0.6626]
Normality	[0.929]	[0.985]	[0.9375]
Heteroskedasticity	[0.5863]	[0.2145]	[0.1806]

Results of these diagnostic tests are reported in Table 5. The problem of Autocorrelation is most likely with time series data, but here the diagnostic tests Durbin-Watson (DW) and Breusch-Godfrey statistics shows the absence of serial Correlation. For model selection or the Functional form of model we use the Ramsey-Reset test. Statistical value of this test stats that both the models are correctly specified. Jarque-Bera test shows that residuals from the regression are normally distributed.

As all the three Models satisfy the assumptions of OLS, and long run Co-integration is also as per Bound test results. We are estimating the ARDL model.

4.4. Results and Interpretation

In this study we have used three models: in all the three models, financial depth is the dependent variable, and our variable of interest is financial repression. We have constructed the financial repression index using PCA. Financial repression index turns out to be insignificant at conventional 5 percent level of significance. However, in two of the three models it is significant at 10 percent. It takes positive sign in all the three models.

To begin with the Model 1, GDP per capita, which is insignificant at conventional level with positive sign. The debate of the relationship between financial depth and economic growth captured here through GDP per capita hinges on Patrick (1966) demand-following or supply-led. The growth in economy increases the demand for financial services and thus financial deepening. This leads towards the classic paper by Sims. Sims (1972) finds that causality is unidirectional from money to income supporting the demand-following phenomenon. It is important to mention here that the insignificant, though positive, relationship might also be due to the construction of our variable as currency in circulation is not in the dependent variable and if currency in circulation is increasing rapidly relative to deposits, then the results will not hold true. Thornton (1996) shows that out of 22 countries only six countries show that there exists a positive relationship between economic growth and financial deepening.

Table 6. ARDL Results, Dependent Variable Financial Depth

Variable	Model 1	Model 2	Model 3
Short Run Results			
D(GDPPC)	-0.4020* (0.0052)	-0.3104** (0.0309)	-0.3073** (0.0211)
D(FRI)	-0.2930*** (0.0932)	-0.4944* (0.0049)	-0.3140*** (0.0847)
D(RIR Deposit)	-0.0070** (0.0313)	-0.0050*** (0.0681)	-
D(Bank Density)	0.2523* (0.0105)	-	0.2862* (0.0055)
D(REER)		-0.0008** (0.0139)	-
D(CPI)		-	0.0048* 0.0859
Ect (-1)	-0.3717* (0.0030)	-0.4831* (0.0006)	-0.3798* (0.0037)
Long Run Results			
GDPPC	0.0808 (0.348)	0.1075*** (0.0776)	0.0622 (0.4396)
FRI	0.6977*** (0.0685)	0.2465 (0.1656)	0.6368*** (0.0818)
RIR Deposit	-0.0147*** (0.0890)	-0.0105** (0.0665)	-
Bank Density	0.6789** (0.0417)	-	0.7536** (0.0300)
REER	-	-0.0017* (0.0134)	
CPI	-	-	0.0128*** (0.0839)
C	-5.6385 (0.1566)	2.1103* (0.0141)	-6.0736 (0.1373)

Note: *, **, and *** show 1%, 5%, and 10% significance level, respectively.

Furthermore, financial depth not only is determined by the demand for loans, its deepening and development also is dependent on legal and institutional

environment of the country. Secondly, it is our intuition, although it demands thorough investigation, that if economy is agrarian and credit to agricultural sector is also not dominant then to assume that economic growth will enhance financial deepening seems a bit complex. One limitation here is that a variable capturing shadow economy might have been used as an explanatory variable in the model.

The second variable in the model, Financial Repression Index (FRI) that is also our variable of interest has consistently positive relationship with financial deepening, though insignificant in model II but statistically significant in Model I and Model III at 10 percent. The theory assumes a negative relationship between FRI and FD. Theory guides us that financial repression has negative impact on financial depth, that's why financial reforms are taken, and financial liberalization is adopted. According to Pourshahabi and Eliyasi (2013), reserve ratio that is a form of financial repression, has negative impact on financial depth. This makes sense, as the higher reserve ratio constraint the banking system's capacity of deposit creation which consequently hinders lending to the private sector. The line of reasoning that establishes negative relationship between financial repression and financial depth goes back to Mckinnon and Shaw and assumes that financial market is perfect. However, our study uses more comprehensive measure of financial repression. In our case the financial repression has positive effect on financial depth. The sign is not unusual. For instance, Stiglitz (1993) argues that in the presence of financial market imperfections, intervention by the government that addresses the market failures can improve the financial development. The legal system, property rights and information asymmetries are common characteristics of market imperfections and to assume that these are absent in a developing economy like Pakistan does not sound well. Thus, it is quite possible that deliberate credit intermediation control, credit allocation control and interest rate control lead towards improvement in financial depth instead of otherwise. Furthermore, Mankiw (1986) also supports that government role in credit allocation if the asymmetric information exists.

A natural question that strikes mind at this juncture is that then why the relationship is not statistically significant at conventional 5 percent level in all the three models? One possible interpretation is that sample period includes the time span that consists of financial repression period and the financial sector reform period and after reform period. So taken the whole sample together might have dampened the coefficient.

In the first and second model we have used real interest rate on deposits. The variable is insignificant at conventional 5 percent, however, at 10 percent it is

significant, but the sign is negative. The theory predicts that higher real interest rate on deposits would generate more savings and that will translate into lending by the banking system and thus leading to financial depth. But, in case of Pakistan the real interest rate has been negative in most of the time during sample period (see figure A1 in appendix). So, to assume that the coefficient should turn out to be positive and significant during this regime seems not plausible. It has also mentioned above in the text that suppressed interest rate is also a form of financial repression. Warman and Thirlwal (1994) are of the view that increased real interest rate increases saving and thus investment. This increased saving enhances financial depth. Since the rate on deposit has been negative for most of the time for Pakistan so the theoretical relationship does not hold. Why the real interest rate on deposits has been negative even after reforms and banking spread did not decline is an empirical question and demands investigation.

In the third model, instead of real deposit rate the study used inflation rate. The literature says that inflation mars the functioning of financial markets, for instance, Boyd et al. (2001). However, the results were further investigated by Khan et al. (2006) and found that there exists a non-linear relationship between inflation and financial depth and estimates the threshold level of inflation 3-6 percent. Despite the 8.4 percent average inflation rate during the sample period of this study, the coefficient is positive though insignificant at conventional 5 percent, but significant at 10%. It might be due to the lack of inflation-indexed financial instruments to invest and bank deposits are major destinations for funds.

The real effective exchange rate that has been used in the second model bears negative sign, indicating that when the domestic currency appreciates in real terms financial depth decreases. Hajilee and Al Nasser (2017) find negative sign with real exchange rate. Our results conform to the Hajilee and Al Nasser (2017). This means that appreciation of the currency leads to decrease in financial depth. The channel can be explained through negative impact on exports thus resulting in low demand for investment. The study also used bank density as an explanatory variable. Bank density is statistically significant and positive. Khalaf and Sanhita (2009) show that bank density is insignificant, but our results are different.

To summarize, the results are not clear-cut at conventional 5 percent level of significance, however, financial repressions index consistently hold positive sign and is significant at 10 percent. This supports the Stiglitz (1993) conclusion that in imperfect financial markets financial repression may increase financial development. Thus, the government should be very meticulous when pursuing

financial reforms that other imperfections must also be curtailed to have significantly positive impact of financial development.

4.5. Stability of the Models

To check the stability of the model we used CUSUM and CUSUM Squares. In all the three models the estimated lines are in the upper and lower critical lines.

Figure 1. Cusum Model 1

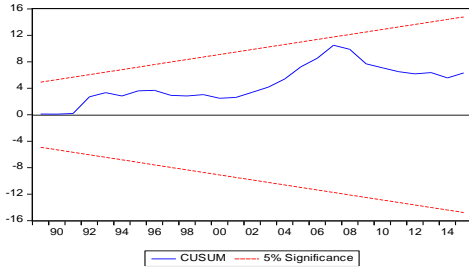


Figure 1. Cusum Square Model 1

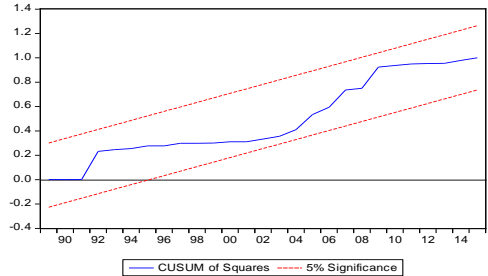


Figure 2. Cusum Model 2

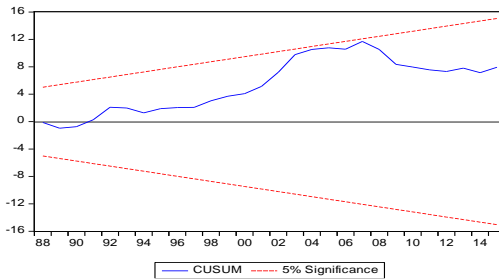


Figure 4. Cusum Square Model 2

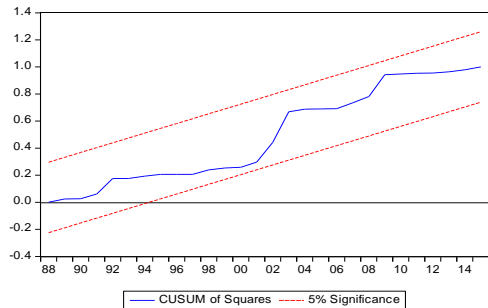


Figure 3. Cusum Model 3

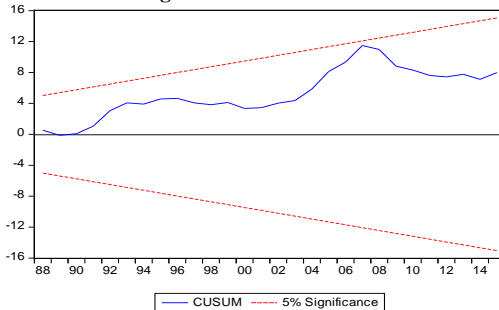
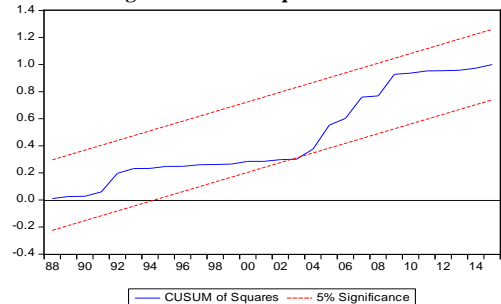


Figure 4. Cusum Square Model 3



5. Conclusion and Policy Implications

This study explores the question that what is the impact of financial repression on financial depth in case of Pakistan. Financial depth has been measured as broad money less currency in circulation to GDP ratio. The variable of interest, financial repression, was constructed using principal component analysis (PCA) and the three components are: Interest rate control (IRC), Credit intermediation control (CIC) and Credit allocation control (CAC). The contribution of this research is twofold: it estimates the impact of financial repression on financial depth. Second, the study did not rely on a single variable to capture the financial repression rather used a comprehensive measure, that is, an index. The study employed ARDL technique, for the sample period from 1980 to 2015 and uses annual data. The study finds that financial repression is positively related with the financial depth. In two out of three models it is significant at 10 percent and in one model it is insignificant. The results are in line with the Stiglitz (1993) that provides explanation of this phenomenon through the lenses of market imperfections.

From all three models estimated it is evident that financial repression bears positive relationship with financial depth that warrants that intervention of government in financial sector in the presence of information asymmetries enhances the depth of the financial sector. This is also substantiated by the bank density variable. The higher the bank density the higher the financial depth. The real interest rate on deposits has negative relationship, which seems queer but the frequent negative real interest rate on deposits sheds light on it.

This implies that government intervention might improve the financial sector if information asymmetries are there and there is lack of competitive market structure that is evident from depressed real interest rate on deposits.

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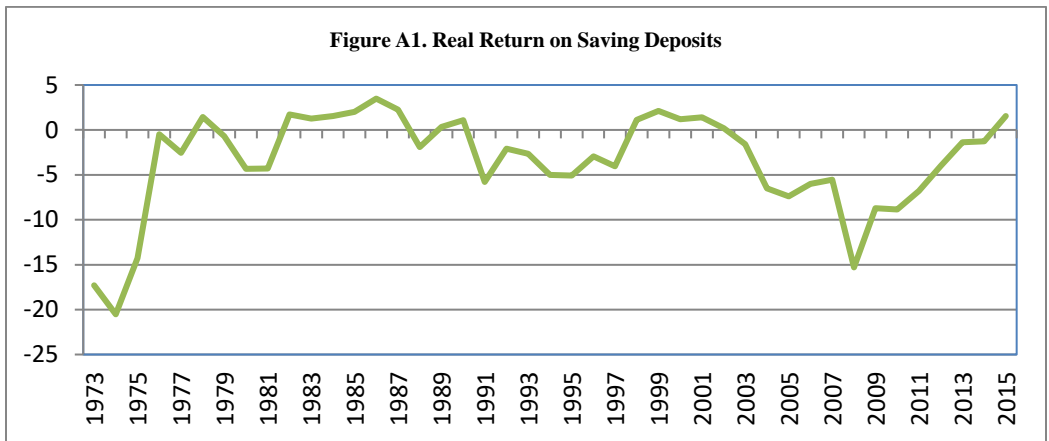
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Appendix



Source: Author's own calculations