Does Financial Liberalization effect Credit allocation to Private and Public Sector in Pakistan?

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Abstract

Financial liberalization is considered as an important pre-requist for economic growth and development of an economy. Theories suggest that it is one basic requirement for an efficient allocation of capital. This is achieved when liberalizing allow markets to function freely and set a suitable market adjusted interest rate which then stimulate saved funds, cash holdings and less productive self-investments to freely position themselves hence facilitating financial intermediation inclusively. This study aims to investigate the impact of Financial Liberalization on the credit allocation to the private and public sectors in Pakistan. The index of financial inclusion index is computed using Principal component analysis. Financial inclusion, trade openness, inflation rate, interest rate and exchange rate are used as control variables. All these variables are integrated at order one I(1).Therefore, the Vector Error Correction (VECM) approach is used to estimate the impact of financial liberalization on allocation of credit to private and public sector for the period of 1990 to 2014. It is found that financial liberalization has a negative and statistically significant impact on the private sector credit. However, positive and significant relationship exists between financial liberalization and public sector credit of Pakistan.

Introduction

Evidence from the countries worldwide presents that credit allocation has remained a government controlled task (Ahmad and Islam, 2009). In Pakistan also, credit allocation was initially controlled by the government. Later, keeping in view the benefits of financial liberalization, many countries including Pakistan liberalized its financial activities to achieve efficient allocation of credit across the sectors(He, 2012; Abaid, Oomes, and Ueda, 2005; Muhammad, A., & Wizarat, S. 2011). Pakistan liberalized its financial system in late 90s. Studies on Financial liberalization signifies that a healthy liberalized financial system can accelerate efficient allocation of credit (Abaid,Oomes, and Ueda, 2005). Under the liberalized financial system, the intermediaries functions to stimulate saving and hence channelize them in a manner that they are taken back from the less efficient industries to the industries yielding higher contributions towards overall productivity in the economy (Beck, Levine, and Loayza, 2000).

Financial Liberalization basically comprises of three major reforms: freeing the flow of capital, deregulation of lending and deposit rates to allow interbank competition and opening the national financial market to the international financial market (Muhammad, 2016). Literature highlights that countries, in the wake of this Liberalization vibe, "eliminated the interest rate ceilings, lowered reserve ratio

requirements, reduced government interference in credit allocation decisions, and privatized many banks and insurance companies". Some countries also induced the development of local stock markets and relaxed the procedures to actively allow foreign financial intermediaries to enter in the domestic financial market (Richey, 2019).It is a viable way to bring financial market at its competitive equilibrium by setting the interest rate free to adjust accordingly. Which then stimulate saved funds, cash holdings and less productive self-investments to freely position themselves across borders or in other words improving financial intermediation inclusively (Khan and Aftab, 1993; Chaudhry, 2007). Moreover, this potential granted to financial intermediaries has resulted in rapid industrialization as they get chance to easily and freely participate in allocating the investments to the projects promising long term permanent gains (Kabango and Paloni, 2011; Beck, Levine, and Loayza, 2000). In various cases it has been observed that ever since the controlled regime been replaced by the financial liberalization policies, the process of allocation of resources has affected automatically (Wang and Giouvris, 2019; Guha-Khasnobis and Bhaduri S. N, 2000; Schiantarelli, Galindo, and Weiss, 2007).

Pakistan economy has observed extreme apices of growth trends since its inception. That is the years of tremendous growth in the sixty's decade and also an era of low and slow growth in 1998-2000.Several policies were enacted by the government to increase growth rate in the past few years. Financial Liberalization is one of those policies (Sheera & Ashwani, 2019). Considering the Government shift towards financial liberalization, this study is aimed to analyze the extent to which financial liberalization has effected the credit allocation across the public and private sectors in Pakistan. Similar proposition is hypothesized in

various studies which highlights that Financial Liberalization has achieved favorable allocation of credit towards the sectors with best productivity (Hamdaoui & Maktouf, 2019). However, this study hypothesizes that financial liberalization positively impact credit allocation to Private Sector.

Econometric Methodology

Data and Variables:

To investigate the impact of financial liberalization on allocation of credit to private and public sector in Pakistan, the sample period covers24 years (1990-2014).The relevant annual data is collected from The State Bank of Pakistan, Economic Survey of Pakistan published by Economic Adviser's Wing, Finance Division, Government of Pakistan, Islamabad and the Global Economy Website.The dependent variables are credit allocated to private and public sector measured as bank credit to public and private sectors as percentage of GDP respectively.To measure the financial liberalization, we use the Financial Liberalization Index computed by Querashi, (2018) using principal component analysis. Similar PCA technique was also used by Sheera & Ashwani (2019) in their study over Financial Deepening in South Asian Countries. The measures of financial liberalization to compute the index include privatization reforms, institutional strengthening, nonperforming loan, debt management, monetary management measures, exchange payment, capital market reforms, banking reforms, and prudential regulations taken as the number of a policy measures implemented in respective.

Apart from financial liberalization, we consider a small set of control variables. We restricted our choice of control variables to financial inclusion, trade openness, exchange rate and interest rate in order to avoid the excessive loss of degree of freedom as we have a small size. This is so because Pakistan started taking measures of financial liberalization in early 1990s (Querashi, 2018). Financial Inclusion is defined as a phenomenon of building a culture of inclusive financial system in a country(Nanda, 2017; Dhungana and Kumar, 2019).Its index is computed using principal component analysis equation as follows;

$$FI = \omega_1 NBB + \omega_2 AA + \omega_3 NDA \qquad (1)$$

Where, FI is a measure of Financial Inclusion, NBB is the number of bank branches taken over 1000 adults, AA is number of advance accounts as percent of GDP and NDA is Number of Deposit Accounts calculated as rupee Deposits as percent of adult population. The ω weights taken for each of the component of financial inclusion are the eigen vectors calculated for the first principal component obtained through PCA technique. The first principal component is computed as a linear combination of 3 dummy variables taken as a measure of Financial Inclusion. The similar measure is used by Yormulaz, (2018).

The Trade openness (to) is measured as ratio of sum of export and import to real GDP, (export + import/real GDP). It is taken as control variable for a reasons that it can act as a proxy of bringing allocative efficiency (Abaid, Oomes, and Ueda, 2005). The change in *exchange rate* is the real effective exchange rate of the time t and is calculated as log ($reer_t/reer_{t-1}$). It effects the investment to the private sector positively (Harchaoui, Tarkhani, and Yuan, 2005). Lastly, the interest rate(IR) is taken as a proxy of cost of financing. It is calculated as average of monthly call money rate averages and is taken as control variable in the model as it directly effects the investment tendency i.e. higher the interest rate lower will the investment take place and vice versa(Keynes, 1936).

Econometric Model:

We consider the following model to investigate the impact of financial liberalization on allocation of credit to private and public sector;

$$(PvC)_t = \alpha_0 + \alpha_1(FL)_t + \alpha_2(to)_t + \alpha_3(FI)_t + \alpha_4(REER)_t + \alpha_5(IR)_t + \varepsilon_t \qquad (2)$$

$$(PbC)_t = \alpha_0 + \alpha_1(FL)_t + \alpha_3(to)_t + \alpha_3(FD)_t + \alpha_4(REER)_t + \alpha_5(IR)_t + \varepsilon_t \qquad (3)$$

Equation (2) and (3) will be computed separately.

Results and Discussion

Before, we move to estimate the model 3 and 4, we run the unit root test to examine the stationarity of the variables.

Augmented Dicky Fuller test is used to test the stationarity and the results are produced in Table 1.

Table 1:Unit Root Test

Variables	I(0)	I(1)
Private/GDP	-0.467282	-3.761193[***]
Public/GDP	-0.400588	-5.659881[***]
Financial Liberalization Index	-3.401472	-3.990042[***]
Financial Inclusion Index	-1.330317	-4.340368[***]
Interest Rate	-2.090362	-4.298901[***]
Real Effective Exchange rate	-2.059881	-5.323598[***]
Trade Openness	-2.499409	-6.627797[***]

Note: The level of significance at 1% is shown by ***, 5 % is by ** and 10% by *.

The results in the above table show that all variables are stationary at first difference. In this case we may run regression with all the variables by taking first difference. However, this will remove the long run dynamics of the variables. These variables may be cointegrated i.e. they may observe long run relationship. To test for cointegrating relationship, we run the Johansen cointegration test (Johansen, 1988). The selection of lag length is based on AIC criterion. The optimal lag length is 2 for model specified in equation 2 and 1 for the model specified in equation 3.

The results of cointegration test (reported in Appendix Table A-1) suggests that the variables are cointegrated implying that they observe long run relationship. According to the criteria for the Johansen co-integration test, the max statistics is checked to be lesser than 5% critical value. Results given in the tablespecifies that there exist3 co-integrating equations in case of private credit to GDP (equation 2) and 1 co-integrating equation in case of public credit to GDP (equation 3). These findings suggest that there exists a long run relationship between the variables. The variables deviate from the long run relationship in short run, however they converge to long

run equilibrium with certain speed known as speed of adjustment. The appropriate model in this situation is the vector error correction model.

VECM Model (Vector Error Correction Model):

This model is run on the series integrated at order I(1). It adjusts with sufficient numbers of lags (p-1) in the model and estimates the short-run relationship between the variables and deviations from their equilibrium. The coefficient of the ECM is the speed of adjustment of the short-run disequilibrium to the long-run equilibrium(Andrei and C. Andrei, 2015). Equation in the VECM model is as follows:

$$\Delta Y_t = \mu + \sum_{i=1}^{k-1} \Gamma_i \, \Delta Y_{t-i} + \Pi EC_{t-1} + \varepsilon_t \qquad (4)$$

Where, μ in the model is intercept, Π is the long run co-integrating matrix and helps in identifying the long run relationship. This Π can be decomposed as $\Pi = \alpha\beta'$, where α is the speed of adjustment towards the equilibrium and β' represent the long run coefficients matrix. Γ_{in} the model is short run coefficients between variables, EC is the error correction and k is the optimal lag as determined by VAR.

2: Estimated results of VECM (private credit as dependent variable)

Regressor	Coefficient	t-stats
C	-7.048479	-1.60796*
D(Fin. Liberalization)	-8.329916	-2.48432**
Trade Openness	0.315179	2.31959**
Interest Rate	-0.407844	-2.10980**
Fin. Inclusion	0.305029	1.04679
CointEq1	-0.018911	-1.20312
R-Square	0.669770	
F-statistics	5.408513**	

The level of significance at 1% is shown by ***, 5% is by ** and 10% by *.

The estimated VECM is reported in Table 2 and 3. To be precise and relevant we are only reporting the results estimated for equations where dependent variable is private credit (for equation 2) and for equation 3 where dependent variable is public credit. The results showed a negative and significant effect of financial liberalization on private credit whereas positive and significant effect on public sector credit allocation.

Our results shown in Table 2 may be explained as the empirical evidences available in the literature on financial liberalization states that in developing countries, financial liberalization has not brought positive results towards achieving high level of economic development through it channel of private credit allocation in the short run. This also clearly identifies that any such policy which covers an overall country domain does not show positive effects on private credit allocation right after the policy is implemented as financial market in the transition phase cannot achieve efficient allocation of credit in the early years (Arestis and de Paula, 2008). Another reason of significantly negative relationship of financial liberalization with private credit is that the increase in the investment in the private sector depends upon the available saved fund remained after the public sector allocation at a certain time. However, in the case of developing economy of Pakistan such funds turns to be the short. Also, since the relationship of financial liberalization with interest rate is

negative, a conclusion can be generalized that negative private credit coefficient is due to fever deregulation of interest rate in Pakistan (Munir, Awan, and Hussain, 2010). This point also leads to the conclusion that since the private sector credit is negatively influenced by the interest rate, therefore the higher the interest rate lower will the credit allocation towards private sector take place. It shows that the private sector credit in the country is constrained by the cost of financing at a time (Majeed and Khan, 2013).

The Co-integration coefficient for model-1 (equation-2) is -0.018911 and is insignificant. The negative sign with the co-integration coefficient is rightly specified and if the series deviates from its equilibrium then it comes back to its equilibrium at a speed of 1.89%. The probable reason of this small magnitude of adjustment of 2% is the small sample size. Also, because of the sluggish nature of Pakistan economy this small percentage seems justified.

Table 3: Estimated results of VECM (public credit as dependent variable)

Regressor	Coefficient	t-stats
C	3.068198	1.68774[*]
(Fin. Liberalization)	11.21775	3.35459[***]
Exchange Rate	-61.09612	-2.39721[**]
Interest Rate	-0.410684	-2.12550[**]
Fin. Inclusion	-0.421018	-1.38753[*]
CointEq1	-0.002017	-4.25639[***]
R-Square	0.594299	
f-statistics	4.980548[**]	

Note: The level of significance at 1% is shown by ***, 5 % is by ** and 10% by *.

The results for the model when public sector credit allocation in Pakistan is taken as dependent variable are reported in Table 3. This shows positive relationship at five percent level of significance. The results lead to the conclusion that financial liberalization has positively impacted the public sector credit. Nonetheless, there are the following reasons withstanding the results for this model. Firstly, the issue that remained unsettled in the pre-reform period is that in Pakistan the flow of "directed credit" to the selected sectors in the post-reform period was discontinued but the same is still in practice through various other ways (Khalid and Nadeem, 2017). Secondly, it can also be concluded that public sector credit has always been favored in terms of credit allocation as the government has been serving this sector by continuous credit injections for achieving various long term plans (Majeed and Khan, 2013).

The Co-integration coefficient for model-2 (equation-2) is -0.002017 and is significant. The negative sign is a satisfactory and it can be interpreted as when the series deviates from its equilibrium, it comes back to its equilibrium at a speed of 0.207%.

Diagnostic tests:

Models are diagnosed for the heteroscedasticity, serial correlation, normality and mis-specification.

For heteroscedasticity, White (1980) test is used. The null hypothesis of this test is that there is no heteroscedasticity (Narayan, 2003). For checking the serial correlation, Breusch-Godfrey Serial Correlation LM test is used. Serial Correlation defines that the residual values of the model are correlated with each other. Lagrange Multiplier test also known as Breusch-Godfrey Serial Correlation LM Test is used to test the serial correlation.

For testing normality, Jarque Bera (1980) test is used. The null hypothesis of this test is that the residual series is normal.

The diagnostic test results shown in table 4 indicates that the models are well specified. None of the statistics shown in the table are significant.

Table 4: Diagnostic Tests

Dependent Variable	LM test	White test	JB test
Private/GDP	0.911043 (0.4722)	36.60910 (0.4404)	3.019437 (0.5546)
Public/GDP	1.325382 (0.2849)	24.96839 (0.7266)	7.707874 (0.1029)

LM as Bruesch-Godfrey test for Serial Correlation
White test for heteroscedasticity
JB as Jarque Bera test for normality

Conclusion:

This study was conducted to investigate the effect of financial liberalization on credit allocation towards private and public sectors for the economy of Pakistan over the period of 1990 to 2014. The study used Augmented Dicky Fuller test of unit root to test for the stationarity of data. Next, the Johansen Cointegration test was used to check for the long run cointegration of the model. VECM model was then used to check for the short run dynamics of the models since the variables were stationary at order I(1). The results showed that financial liberalization has a negative and statistically significant impact on the private sector credit in the short run. However, positive and significant relationship exists between financial liberalization and public sector credit.

The negative coefficient in the case of private sector credit and a positive coefficient in the case of public sector credit implies that financial liberalization as an output of improving the private sector credit was not a success story and is contrary to the hypothesis presented for financial liberalization. The necessary measure in this regards should be a proper implementation of the policies encompassing financial liberalization in the country. Which means, it is necessary to allocate a separate proportion of private sectors credit out of the total credits available. There is also a requirement of making concerted efforts towards strengthening the financial institutions to function favorably towards supporting the private sector and also to attracting the external funds. Additionally, in the developing economy of Pakistan, there is an intense requirement of settling a relatively favorable interest rate in order to boost up the private sector.

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Appendix

Table A-1: Johansen Co integration Test

Test for equation 2 (for private credit)			Test for equation 3 (for public credit)		
Hypothesized No. of CE(s)	Max Statistic	0.05 Critical Value	Hypothesized No. of CE(s)	Max Statistic	0.05 Critical Value
None *	46.16935	27.58434	None *	43.57814	40.07757
At most 1 *	43.91338	21.13162	At most 1 *	30.94676	33.87687
At most 2 *	15.94064	14.2646	At most 2 *	28.82804	27.58434
At most 3	1.938737	3.841466	At most 3	16.3268	21.13162
			At most 4 *	4.721839	14.2646
Max-eigenvalue test indicates 3 cointegrating equations at the 0.05 level			Max-eigenvalue test indicates 1 cointegrating equation at the 0.05 level		