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IMPACT OF INTEREST RATE ON PRIVATE SECTOR CREDIT; EVIDENCE FROM PAKISTAN

NADEEM AFTAB
KHALIL JEBRAN
IRFAN ULLAH
Capital University of Science and Technology, Islamabad, Pakistan
MUHAMMAD AWAIS
Foundation University, Rawalpindi, Pakistan

ABSTRACT

This study explored the long and short term effect of interest rate on private sector credit on Pakistan for the period of 1975 to 2011. The Stationary of data was analyzed by Augmented Dickey Fuller and Phillips Peron test. This study applied Auto Regressive Distribution Lag (ARDL) model for the purpose of analyzing long and short term relationship. The results revealed significant negative effect of interest rate on private sector credit in the long run, and also in the short run. The results also indicated significant positive effect of inflation on private sector credit in long and short run. However, exchange rate was found to have no effect on private sector credit.

INTRODUCTION

Interest rate is the cost of borrowing money by the borrower. It is also return to the depositor in his/her account in bank, or return on investments such as government bonds. It is the channel through which the funds flow from savers to borrower. Usually these funds are generated from financial intermediaries like scheduled banks, development banks, mutual funds and insurance companies etc. It is an indicator that determines the flow of funds from savers to borrowers directly, or through financial intermediation. If the supply of loanable fund is more than the demand of loanable fund, interest rate falls, and if the demand is more than the supply, interest rate rises. Fluctuation in interest rate and changes in the quantity of loanable funds affect the economic indicators (GNP, employment of resources, level of income and general level of prices).

According to Keynesian and Monetarists' views, the impact of interest rate on investment is still a dominant topic of debate. One school reports that it has minimal effect on investment, while the other argues that interest rate is a strong determinant of investment. The Keynesian school avers that interest rate is explained by the supply and demand of money. This school argues that interest rate is not a strong determinant of investment. So, when money supply increases it decreases interest rate, enhancing investment and employment, and lead to higher economic growth. The Monetarists believe that interest rate is a function of real economy that is explained by demand and supply of loanable funds. When there is increase in interest rate, it causes investment to decrease. They argue that demand for investment is inelastic interest. Therefore, changes in interest play an important role in investment decision, and also have an impact on the determination of prices of assets.

In economics and finance, there are several theories that try to describe that how interest rate affects the economic activities and how the interest rate is used to forecast the future changes, namely classical liquidity preference, loanable funds and rational expectation theories. This study uses the loanable funds theory. Loanable funds theory or neoclassical theory of interest rate describes that interest rate is determined by supply and demand of loanable funds. According to the theory, demand for loanable funds is created from domestic consumer's business government and foreign borrowers; whereas, the supply is created by domestic savings, banking system and capital inflows in borrowing.

A strong financial system makes an economy prosper, while a developed economy is an indicator of strong financial system. A developed economy will raise demand for credit and hence lead to credit growth. The moderate monetary policies and vigorous banking

sector of an economy will tend to increase demand for credit; whereas, strict monetary policies will discourage investors to invest and hence lower the credit and economic growth. State bank of Pakistan (SBP) has the only authority to make and implement monetary policies for the purpose of encouraging economic activities. The objective of monetary policies has been setup in compliance with SBP act 1956. The monetary policies' compliance can be divided into two regimes; before and after 1990's. SBP is used direct and indirect instrument for implementing monetary policies. The direct instruments were adapted before 1990's, while indirect instruments were used after 1990's. The direct instruments include; reserve ratio, cash reserve, fixed margin requirements statutory liquidity ratio and restriction of credit to different sectors etc. The indirect instrument includes; open market operations, discount rate, statutory reserve ratio, T-bill auction rate, etc.

In case of Pakistan, the domestic banking sector credit declined from 51.1 to 46.8 percent of GDP from 1971 to 2010 (World Development Index, 2011). The various factors that has been found to influence negatively the banking sector credit allocation decision beside investors own characteristics include; unstable economic and legal conditions, political environment and government policies. It was also found that credit growth was high before liberalization and low after liberalization. So, in case of Pakistan, liberalization doesn't enhance credit growth rate.

Interest rate is one of the most important parameters of an economy; this parameter not only determines the financial decision of the firms in private and public sectors, but also all types of real decisions related to Pakistan's economy. So, the main objective of the study is to examine the short run and also long run effect of interest rate changes on private sector credit.

The macroeconomic and political factors such as interest rate, inflation rate, regime change or certain political events may have a significant impact upon the private sector credit. Discount rate is also an important instrument that is used by State Bank of Pakistan to formulate monetary policy. This is a benchmark rate that is revised on quarterly basis. The private sector credit is affected by changes in interest rates which are changed because loosing or tightening of monetary policy formulation by regulatory authorities. Investors respond quickly to any change in interest rate, either positive or negative. The main theme of the study is to examine the impact of interest rate on private sector. This study will provide insights of whether the changing in interest rate has impact on private sector credit. Finding of the study would be useful for investors, shareholders, financial institutions and related government departments.

REVIEW OF LITERATURE

There are many studies which indicate that lending rate effects private sector credit. Gupta (1987) studied the significance of two important factors, that is, financial intermediation and real interest rate. Using pooled time series data, a model of savings was anticipated for Latin American and Asian countries. There is no clear support for the effect of each of the two factors on Latin America countries, but showed some robustness for Asian countries.

Akkina and Celebi (2002) explored factors that can effect fixed investment in private sector and relationship among public and private sector investment in Turkey, considering the period of 26 years from 1970 to 1996. The authors used neoclassical investment model and reformulated flexible accelerator in investment model. The results showed that public and private investment act as substitutes for each other, and size of investable funds is of equal importance as cost incurred for employing capital. On the other hand, at medium term lending rate, financial and liberalization reforms implemented in 1983 did not show any positive impact on private investment.

Alessandria and Qian (2005) studied the financial intermediation, which were facing difficulties due to high monitoring cost. They examined the effect of starting the capital account on welfare and structure of lending deals. They described that competent financial intermediaries in small economies are not important nor enough for capital account liberalization for better welfare.

Khawaja and Din (2007) investigated the factors that effect the interest rate spreads in Pakistan by analyzing the data of 29 banks from 1998 to 2005. They considered real output, inflation, real interest rate, deposit inelasticity with firm level variables, asset quality, market share, administrative costs and liquidity. They concluded that macroeconomic and firm specific variable better clarify the interest rate spread in different banks.

Khan and Gill (2009) elaborated the relation between public sector borrowing, and private investment by using Johansen co-integration and error correction model over the period 1971-2006. They concluded that public borrowing has crowd in effect on private sectors' investment. Their results also indicated insignificant relation between lending interest rate and private sectors' investment in Pakistan.

Bader and Malawi (2010) examined the effect of interest rate on investment in Jordan, by using co-integration analysis. The results indicated that investment was negatively affected by real interest rate. The results highlighted that one percent increase in rate of interest reduced the investment by 44 percent, while income level affects investment positively.

Aisen and Franken (2010) studied eight countries

and found that bank credit growth rate was high before financial crises, as compared to post financial crises period. They said that monetary policies play an important role in dealing with financial crises. They suggested to make suitable monetary policies to enhance the economic growth of an economy.

Guo and Stepanyan (2011) found positive relationship of domestic and funding with credit growth. They said that increase in economic growth leads to increase in credit growth, whereas increase in inflation leads to decrease in credit growth of an economy. They further concluded that monetary policies play a significant role in credit growth of an economy and expansionary policies increases credit, whereas contractionary policies decrease credit growth rate.

Ihsan and Anjum (2013) studied the effect of money supply (M2) on GDP of Pakistan. They took three indicators for that, i.e., interest rate, CPI and inflation rate, because money supply (M2) is affected through one of them. Using regression analysis, they found that inflation has no significant relation with GDP of Pakistan, but Interest rate and CPI have a significant relation with M2 and GDP of Pakistan.

Giannetti and Jentzsch (2013) examined the effect of credit reporting and identification system on financial intermediation covering the data from 2000 to 2008 of 172 countries. Result showed that identification system has a positive relation with financial intermediation in those countries where credit reporting system prevails.

Abubakar & Gani (2013) studied the impact of banking sector expansion on the economic development of Nigeria They used annual time series data that covered the period from 1970 to 2010. Their data was acquired from the Central Bank of Nigeria's annual report. The result of their study showed that the credit granted to private, government expenditure and interest rate have a negative impact on the economic development over the long run. In making remark on the result of the study by the authors, high interest rate and considering few sectors at the expenses of others, as well as channeling huge amount of the fund in purchasing government treasury bills, are the some of the sources of this negative impact on the Nigerian economic development.

RESEARCH METHODOLOGY

This study considered time series annual data from 1975 to 2011. The data was obtained from various sources, i.e., World Development Indicator, State Bank of Pakistan, and International Financial Statistics.

Interest Rate

Interest rate (LR) plays an important role in private sector credit. Investors seek to invest in the market which offers low rate. So, for a country like Pakistan, it is necessary to keep interest rate as low as possible to attract investors. The real interest rate can be measured as

Real interest rate = Nominal interest rate – Inflation

Private Sector Credit

Private sector credits are claims of financial institutions on non-financial sector to GDP, which reflects domestic asset allocation. This reflects increase in private sector activity in investment.

Inflation

This is the average rate at which prices of consumer goods increase in a specific period. Consumer price index (CPI) is a widely used indicator of inflation. CPI is measure as the mean change in the price of goods and services in a specific period.

Exchange Rate

Exchange rate of country may play a significant role in investment. Many researchers argue that domestic currency appreciation positively affect income of domestic investor, because host country appreciation increases the wealth of domestic investor, and hence increases private investment. Country can attract more domestic investors by appreciation of currency, due to which domestic investors can earn high return. It can be measured as

Exchange Rate (local currency units per dollar)

To check the effect of interest rate on private sector credit, the following model was applied.

$$PSC = f\ (CPI, EXR, LR) \quad (1)$$

The equation 1 can be formulated into equation 2 as follow

$$PSC = \beta_0 + \beta_1\ CPI + \beta_2\ EXR + \beta_3\ LR + \varepsilon \quad (2)$$

Where, PSC represents Private sector credit; LR represents Lending rate; EXR represents Exchange rate; CPI = Consumer price index and ε represents Error term. The logarithmetic transformation was made to all variables.

Auto Regressive Distributed Lag Approach

This study opted Autoregressive Distributed Lag

Approach (ARDL) to test co-integration developed by Pesaran, Shin, and Smith (1999). This model has advantage over traditional co-integration model, because of its applicability when the model is a mixture of I(1) and I(0) integrated variables. Second advantage of the model is that it is suitable for relatively small sample size. The basis here for opting ARDL model was to analyze long run and short run effect of lending rate on private sector credit. The equation (2) can be formulated into ARDL model as follows. The long run relationship between private sector credit and lending rate was analyzed using ARDL equation (3). The short run association between private sector credit and lending rate was analyzed using ARDL equation (4).

$$PSC_t = c + \varphi 1\ PSC_{t-i} + \varphi 2LRt\text{-}i + \varphi 3\ ERt\text{-}I + \varphi 4CPIt\text{-}i + \varepsilon_t$$

$$\Delta PSC_t = c + \psi_1 \sum_{t=1}^{p} \Delta PSC_{t-1} + \psi_j \sum_{j=1}^{a} \Delta LR_{t-j} + \psi_k \sum_{k=1}^{a} \Delta ER_{t-k} + \psi_i \sum_{t=1}^{a} \Delta CPI_{t-1}$$

In above equations (3), represents the long run parameters. In equation (4), Ψ_l, Ψ_j, Ψ_k, Ψ_i represents short run parameters, represents the 1st difference of variables and shows the speed of adjustment that can be adjusted over long run.

RESULTS AND DISCUSSION

Unit Root Test

Before estimation of ARDL model, data was tested for time series properties. For this purpose, Augmented Dickey Fuller (1979) (ADF) test and Phillips Perron (1989) (PP) test were applied to know about stationarity of variables. The results of ADF and PP test are reported in Table (1). The results show that all variables have unit root at level while stationary at first difference.

Lag Order Selection

The next step was to select the suitable lag value that will be used in order to estimate ARDL model. The suitable lag value was selected on the basis of VAR statistics. In VAR statistics, Schwartz Criterion is mostly widely used. The selection of suitable lag value was based on the minimum value of Schwartz criterion on a specific lag order. The result of VAR statistics is given in Table (2). The result indicates that Schwartz Criterion is minimum at lag 1, which points to select lag 1 for estimating ARDL model.

Long Run Equation Results

Table 3 represents ARDL long run equation results. The analyses revealed significant negative effect of lending rate on private sector credit in the long run. This point to the evidence that increase in lending rate discourages investors to take more credit investment, and hence decreases private sector credit, and vice versa. The phenomena can be explained as; when government increases its expenditure for investment and current expenditures by borrowing from scheduled banks, then less funds will be available for the private sector companies and general public, as a result of which the interest rate will increase, and hence public borrowing crowds out domestic private investment in the long run.

TABLE 1
Unit Root Results

Variable	ADF		PP		
	Level	1st diff	Level	1st diff	Inference
PSC	-1.729368	-4.350015***	-1.577354	-4.202776***	I(1)
LR	-2.887382	-4.657127***	-2.235115	-3.985243***	I(1)
ER	0.224282	-4.145903***	0.098055	-4.096962***	I(1)
INF	-0.000298	-4.204796***	0.075770	-3.301215**	I(1)

Critical values at 1%, 5% and 10% are -3.661661, -2.960411, -2.619160
****,** and* represents significance at 1%,5% and 10%.*

TABLE 2
Lag Order Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	48.82774	NA	8.41e-07	-2.636926	-2.457354	-2.575687
1	227.6302	305.0160	5.88e-11	-12.21354	-11.31568*	-11.90735
2	251.7898	35.52874*	3.80e-11*	-12.69352*	-11.07737	-12.14236*
3	259.0832	9.009514	7.09e-11	-12.18136	-9.846930	-11.38525

** represents significance at 1%,*

Consequently, private investment will reduce. The results also points to the evidence that inflation significantly and positively affect the private sector credit in the long run. The exchange rate has insignificant effect on private sector credit in the long run. The results are consistent with Kashif and Nishat (2011) study on private sector credit in Pakistan. The exchange rate results are inconsistent with Selin (2001) which points out that exchange rate effect the private sector credit.

TABLE 3
Long run equation results

ARDL (1,0,0,0)			
Variable	coefficient	Standard error	t-statistics
LR	-.50747	.18937	-2.6798**
ER	-.14270	.28649	-.49809
INF	1.9428	.25843	7.5174***
C	21.7329	.52122	41.6962***

Dependent Variable = PSC
****,** and * represents significance at 1%, 5% and 10%.*

Short run Equation Results

The short run ARDL equation results are reported in Table (4). The significant negative value of error correction term reveals confirmation of long run relationship in our model. The error correction term shows that approximately 27% disturbance is adjusted over the long run.

TABLE 4
Short run equation results

ARDL (1,0,0,0)			
Variable	**coefficient**	**Standard error**	**t-statistics**
ΔLR	-.13903	.065536	-2.1214**
ΔER	-.039094	.076508	-.51098
ΔINF	.53224	.17230	3.0891***
C	-5.9540	1.8231	3.2659***
ECT(-1)	-.27396	.087101	-3.1453***
Dependent variable = PSC			
R-square	0.30303		
Adj. R-square	0.21310		
F-statistic	3.3696***		
DW-stat	1.6830		
Lm test	.95592		
Heteroscadas-ticity	.11223		

****,** and* represents significance at 1%,5% and 10%.*

The results show evidence of significant negative effects of lending rate on private sector credit in the short run. This point to the evidence that any change in lending rate will effect private sector adversely in the short run. The analyses also showed evidence of significant positive effect of inflation on private sector credit in short run. The exchange rate was found to have an insignificant effect on private sector credit in the short run. The diagnostic tests revealed that there was no issue serial correlation, heteroscadasticity and autocorrelation.

For checking robustness of long run and short run results, we applied cumulative sum (CUSUM) test and cumulative sum of squares (CUSUMQ) test. The figure 1 and 2 represents the results of CUSUM and CUSUMQ test respectively. The results show that the straight line of CUSUM and CUSUMQ lies in bounds of 5% significance level which shows that the model is stable.

FIGURE 1
CUSUM

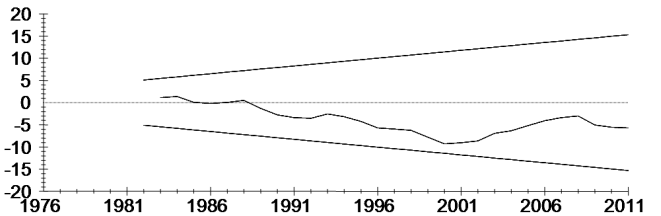
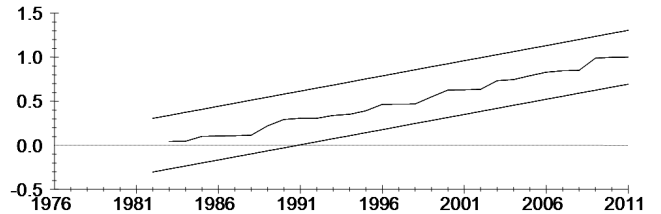


FIGURE 2
CUSUMQ



CONCLUSION AND RECOMMENDATIONS

This study examined the relationship between interest rate and private sector credit in Pakistan covering the period 1975-2011. The Autoregressive Distributed Lag approach was employed for estimation of long and short run relationship. The study supports neoclassical theory of interest rate (loanable fund theory). Lending rate was used to accommodate the neoclassical theory, as the theory suggests that interest rate is determined by supply of loanable funds and demand for credit. The study concludes that lending rate influence significant negative the private sector credit in the long run, and also in the short run. The inflation rate has significant positive relationship with private sector credit in the short run and also in the long run. The exchange rate is found to have no

effect on private sector credit.

This study suggests that policy makers may make monetary policies for the purpose of managing interest rate, because increase or decrease in interest rate will adversely effect private sector credit. Therefore, private sector may be encouraged for the credit investment because it is also a source of financing for economy. As long as excess liquidity exists in financial system, the domestic resources other than State Bank of Pakistan may be used to cover the public expenditures and deficit without exploiting private sector investment. High amount of financing would be given to the private sector by bank at low rate to encourage the business activities in the economy. There is a need of more deregulation of private sector and financial liberalization, so that foreign investors take interest in investment in private sector.

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