The Impact of Private Sector Credit on Output and the Price Level in Bangladesh

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Abstract

This study examines the relationship if any among private sector credit with output as proxies by the industrial production and the price level (CPI) in Bangladesh. In many developed and developing countries, private sector credit has played a critical role by efficiently allocating resources for investment and is considered to be an engine of economic growth. Impulse Response Functions and Variance Decompositions derived from Vector Auto regression (VAR) and Granger Causality tests are used to examine the relationship for Bangladesh. The outcomes of the econometric results suggest that private sector credit has positive and significant effect on economic growth however, it is also inflationary. This result is consistent with the conventional belief that when an economy starts to grow it creates immediate additional demand for financial services and helps grow a better financial system. At the stage, the positive impact of financial development on economic growth could be modest or negligible. As development proceeds, a better and well functioning financial system is established where it can contribute to a greater extent to income growth. The policy implication of the findings is that careful attention is required while expanding private sector credit so that much of the credit goes for productive investment rather than consumption purposes because of its impact on inflation in Bangladesh.

Key Words: Private Sector Credit, Output and the Price Level

JEL Classification: E50, E51

I. Introduction

The intention of this paper is to identify whether private sector credit (PSC) has any causal relationship with output and the price level in Bangladesh. A World Bank study (Barth and Calari, 2006) estimated that a doubling of the ratio of private sector credit to GDP can add two percentage points to long term economic growth. In many developed and developing

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countries, private sector credit has played a critical role and is considered to be the engine of economic growth and development (e.g., Barth and Calari, 2006; Levine, 1997; Levine and Renelt, 1992; King and Levine, 1993a and 1993b) by providing resources for investment to the private sector. Historically, economists who have focused on banks e.g., Bagehot (1873) and Schumpeter (1912) emphasized the critical importance of the banking system on economic growth and highlighted circumstances when banks can actively spur innovation and future growth by identifying and funding productive investments (Levive and Zervos, 1998).

A country like Bangladesh, where fiscal dominance is at work, it is very difficult to support private sector due to various reasons that includes excessive government borrowings from the banking system to support budgetary expenditure and to finance debt of the public sector. To find out the impact of the borrowing from the banking system by the Government and by the other public sector is not the intention of this study though it has significant implication for the macroeconomic stability of our country, the present study has concentrated on whether private sector credit growth as measure of financial development expedite economic growth and also on inflation in Bangladesh due to its importance in policy making.

The plan of the paper is as follows: after introduction in section-I, section-II discusses the related literature on private sector credit, inflation and economic growth. In section-III an overview of the financial structure is analyzed followed by the methodology, model specification and empirical results in section-IV. Section-V concludes the paper with recommendations.

II. Literature Review

Rajan and Zingales, (1998); Beck, Levine, and Loayza, (2000); and Levine, Beck, and Loayza, (2001), Arestis and Demetriades (1997), Beck and Levine, (2000) who evoked the link between financial development and growth have emphasized the importance of the private sector credit. According to the proponents of this view, financial sector plays a fundamental role in the allocation of savings to productive enterprises, favoring economic efficiency and capital accumulation. In that context, rapid credit growth can, then, be simply the result of a financial deepening that will eventually benefit the economy (Giovanni, Ariccia and Hollar, 2003).

In contrast, Lucas (1988) states that economists 'badly overstress' the role of the financial system, and Robinson (1952) argued that banks respond passively to economic growth. In addition to that a vast number of literatures have documented that episodes of financial distress are likely to follow the periods of strong credit expansion. Goldfajn and Valdes (1997) and Drees and Pazarbasioglu (1998), in their study stated that strong credit growth was observed before most banking crises. (for example bank crises in Argentina in 1980; Chile in 1982; Sweden, Norway, and Finland in 1992; Mexico in 1994; and Thailand, Indonesia, and Korea in 1997). The major reasons behind some of the cases were fast credit growth that was stimulated by the deregulation of the financial sector reduction in banks' reserve requirements following reforms and by various degrees of capital account

liberalization that provided the liquidity to fund the strong credit demand.

Several econometric studies have confirmed the existence of a link between rapid credit growth and banking system fragility. Demirgüç-Kunt and Detragiache (1997) found evidences supporting the idea that an increase in the lending activities leads to banking crises. For example, according to their estimates, in the case of Mexican crisis during 1994, a 10 percent increase in the initial value of lagged credit growth increased the probability of a crisis by 5½ percent. Kaminsky and Reinhart (1999) found that the growth rate of the bank credit to the private sector ratio accelerated markedly as banking crises or twin crises (banking and currency crises) approached, remaining well above the growth rate recorded in tranquil times. Finally, Landerretche et al. (1999) examined a large number of episodes of lending expansion and found that the probability of having a banking crisis significantly increased after such episodes.

A study by Levine and Zervos (1999) used the value of loans made by commercial banks and other deposit-taking banks to the private sector divided by GDP, and controlling for other variables estimated the credit growth relationship for a 49 countries over the periods from 1976 to1993. This paper found a strong, positive link between financial development and economic growth and the results suggested that financial factors were an integral part of the growth process.

Holla et al. (2003) conducted a study on 15 Central and Eastern Europe and Balkans countries and found that these countries are waking up. In some countries bank credit to the private sector has been rising considerably faster than GDP for a few years, with the result that the Bank Credit to the Private Sector ratio has increased at an average pace of some 2½ percentage points of GDP per year; in others, the bank credit to the private sector ratios has started rising only more recently; finally, in a third group of countries there is still no clear increase in the BCPS ratio, but credit to some sectors, notably to households, has accelerated sharply. They attributed the differences due to differences in primarily overall financial deepening, the speed of privatization, crowding-in forces, and overall progress toward market institutions.

Coricelli, Fabrizio and Masten, Igor (2004) using quarterly data from 1993.Q1 to 2003.Q2 found evidence that the development of credit markets played a significant role in affecting both growth and volatility in Central-Eastern Europe countries. It is found that progress in credit market development, through the convergence of the depth and efficiency of credit markets towards the level prevailing in advanced market economies could have a major impact on growth and would sharply reduce output volatility in Central-Eastern Europe countries.

The macroeconomic implication of fast bank credit growth is not straight forward because unlike demand for money, literature on demand for credit is scarce. If demand is rising faster than supply or, more generally, then the economy may be overheating which would result in macroeconomic instability. According to the Modigliani-Miller theorem, at face value, this would imply that the output elasticity of credit is indeterminate, as firms' production decisions are not be affected by the structure of their balance sheets (Carlo et al, 2003). At the empirical level, however, several macro econometric models do include demand for credit equations. However, there is no presumption that the elasticity of credit

with respect to output should be equal to one, i.e., that the "credit velocity" should be constant. A recent model following this approach is presented in Calza, Gartner and Sousa (2003), who find an elasticity of credit demand to GDP well above one.

Most of the empirical studies show that financial services have an independent, positive effect on growth and implying that the more intermediation that is done by banks, more credit goes to the private sector the greater is the economic growth, other things remaining the same.

III. An Overview of the Financial Structure in Bangladesh

The financial system of Bangladesh consists of Bangladesh Bank (BB), the central bank, 4 State Owned commercial banks (SOCBs), 4 government owned specialized banks, 39 domestic private banks, 9 foreign banks and 31 non-bank financial institutions (NBFIs) as of August 2013. The financial system also contains insurance companies, stock exchanges and various co-operative banks, Microfinance Institutions (MFIs) and credit rating agencies. Besides, three state owned development financial institutions namely House Building Finance Corporation (HBFC), Ansar-VDP Unnayan Bank and Karma Shangsthan Bank are operating in Bangladesh. Among them the commercial banks, NBFIs and MFIs are widely engaged in the private sector credit disbursement.

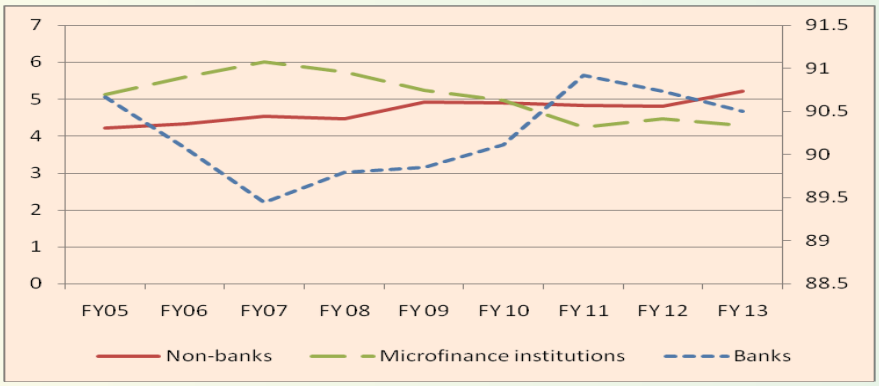
III.1 Trend Analysis

After independence in 1971, the State was given the leading role in the development process in Bangladesh, which was reversed in 1975 and various measures were undertaken to facilitate the private sectors. Various supportive measures were undertaken in favor of privatization in agriculture, private investment, foreign investment, trade liberalization, exports etc. In order to facilitate private sector development, the government has to create an environment which is conducive to investment, fiscal, trade, monetary and financial development such as, good law and order situation, strong physical and infrastructural facilities, suitable macroeconomic policies that are essential for development of the private sector.

A very smooth access to the private sector credit is very essential to create an environment that generates employment; expands opportunities for people to earn income and improve standards of living. It has been argued that a dynamic private sector can develop a tax base necessary to finance socio-economic program which are crucial to making development justly sustainable. In the following paragraphs recent trends in private sector development in Bangladesh has been analyzed.

Historical data show that Chart-1 scheduled banks provide the significant amount of credit of about 91 percent credit to the private sector while the shares of non-bank financial institutions is increasing over time. For example, it went up slightly from 4.2 percent in FY05 to 5.2 percent in FY13 while the share declined for microfinance institutions from 5.1 percent in FY05 to 4.3 percent in FY13.

Chart-1: Share in Private Sector Credit in Bangladesh



Source: Bangladesh Bank Quarterly, BB

Table-1: Trends in Private Sector Credit in Bangladesh

Institutions	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13*
Outstanding (in billion Taka)									
Banks	1107.4	1309.7	1507.7	1901.4	2179.3	2707.6	3407.1	4079.0	4521.6
Non-banks	51.5	63.0	76.6	94.7	119.2	147.4	181.3	216.1	260.6
Microfinance institutions	62.5	81.3	101.3	121.5	127.0	149.6	159.1	200.62	213.95
Total	**1221.4**	**1454.0**	**1685.6**	**2117.6**	**2425.5**	**3004.6**	**3747.5**	**4495.7**	**4996.2**
Growth (in percent)									
Banks	17.01	18.27	15.12	26.11	14.61	24.2	25.8	19.7	10.9
Non-banks	28.11	22.33	21.59	23.63	25.87	23.6	23.0	19.2	20.6
Microfinance institutions	17.92	30.08	24.60	19.90	4.57	17.8	6.3	26.1	6.6
Total	**17.49**	**19.04**	**15.93**	**25.60**	**14.54**	**23.9**	**24.7**	**20.0**	**11.1**

Source: Bangladesh Bank Quarterly, CEU, BB *=Provisional

In the above Table-1, recent trend in private sector credit is shown. It can be seen from the Table-1 that credit given by the NBFIs is the highest in growth terms among MFIs and Banks. Overall the total growth rate of the private sector credit decreased to 11.1 percent in June, 2013 from 17.49 percent in FY05.

In disaggregated level an analysis of trends of the credit to private sector by banks showed that bank lending toward productive purposes increased substantially due to central banks directives to increase lending in the productive sectors e.g. agriculture, SMEs sector and other industry and service sector, while decreased lending in the miscellaneous purposes e.g., credit card, flat purchases.

Bank advance by economic purposes shows that credit to construction sector is the highest followed by the transport and communications which increased by 20.6 percent and 14.3 percent respectively in FY13. Credit to miscellaneous purposes also increased by 4.6 percent in FY13.

Table -2: Bank Advances (Private Sector) by Economic Purposes Growth rate (in percent)

Sectors	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13*
a. Agriculture	-5.08	6.86	-3.57	12.49	11.8	13.2	25.8	4.5	9.5
b. Industry (othe r than working capital)	-10.19	23.64	23.36	23.99	21.2	20.2	29.6	15.8	12.5
c. Working capital financing	-18.69	15.85	11.93	22.77	7.3	7.8	20.6	15.0	11.0
d. Construction	-10.51	17.46	21.84	11.15	23. 3	26.4	33.0	32.4	20.6
e. Transport and Communication	0.89	41.09	52.75	39.57	-9.4	-1.5	43.5	59.0	14.3
f. Storage	-8.33	17.95	-27.17	-22.39	20.5	1.8	-9.0	72.4	-35.1
g. Trade	-9.41	11.66	13.90	29.80	15.3	31.9	26.0	21.4	8.9
h. Miscellaneous	-11.06	23.76	17.15	35.99	12.5	34.9	11.9	36.9	4.6
Grand Total	**-10.79**	**16. 08**	**14.95**	**25.15**	**14.6**	**23.4**	**25.0**	**21.4**	**10.5**

Source: Bangladesh Bank Quarterly, CEU, BB *=Provisional

III.2 Trend in Investment and Private Sector Credit in South Asian Countries

It would be useful to see where Bangladesh stands compared to her neighboring countries. From Table-3 it can be seen that in 2012 in terms of fixed capital formation (in U.S dollars) India ranked the top among four followed by the Bangladesh, Pakistan and Sri Lanka.

Table-3: Fixed Capital Formation/Investment (Billion US Dollars)

Period	Bangladesh	India	Pakistan	Sri Lanka
2000	10.11	102.21	10.47	4.27
2001	10.27	111.70	10.83	3.32
2002	10.92	121.80	11.62	3.40
2003	11.97	150.84	12.87	3.78
2004	13.17	213.72	14.29	4.52
2005	13.73	250.07	18.97	5.61
2006	14.84	304.45	25.70	6.79
2007	16.86	413.68	29.64	8.14
2008	19.17	379.42	26.48	9.86
2009	21.49	432.50	26.24	10.35
2010	24.63	500.62	23.92	12.78
2011	25.92	490.92	23.70	15.56
2012	28.45	531.69	23.22	17.22

III.3. Private Sector Credit in South Asian Countries

In the following Table-4 comparing private sector credit to GDP ratio reveal that in 2012 Bangladesh takes the highest position followed by India, Sri Lanka and Pakistan while in growth terms (Table-5) Sri Lankan's private sector credit is growing faster followed by Bangladesh, India and Pakistan. In Pakistan, high fiscal deficit and difficult business climate contribute to sharp decline in private sector credit growth.

Table-4: Private Sector Credit/GDP (In Percent)

Period	Bangladesh	Pakistan	Sri Lanka	India
	PSC/GDP	PSC/GDP	PSC/GDP	PSC/GDP
2001	27.78	21.78	28.11	29.08
2002	30.15	21.67	27.63	32.81
2003	30.17	24.6	28.92	32.06
2004	32.13	28.74	30.62	35.60
2005	33.81	28.65	32.9	39.26
2006	36.16	28.94	33. 97	43.33
2007	37.29	29.66	33.26	45.17
2008	39.21	29.84	28.94	49.02
2009	41.51	23.54	24.76	49.17
2010	47.05	20.29	26.61	44.82
2011	49.39	18.34	30.64	50.60
2012	49.60	16.40	31.10	48.70

Source: International Financial Statistics, IMF, September, 2013

Period	Pakistan	India	Sri Lanka	Bangladesh
2002	5.27	21.53	14.29	16.93
2003	24.27	9.67	16.59	10.11
2004	35.15	30.57	21.46	17.96
2005	14.87	26.20	26.04	17. 49
2006	18.48	27.55	23.73	19.04
2007	16.62	20.42	19.20	15.93
2008	18.81	22.26	7.27	25.60
2009	-1.87	12.11	-6.39 .	19.23
2010	37.61	12.27	24.77	28.02
2011	10.04	30.26	34.46	19.06
2012	2.49	14.30	17.51	16.66

Source: International Financial Statistics, IMF, September, 2013

III.4. Inflation Scenario in South Asian Countries

We need to see the inflation scenario in Bangladesh compared to her neighboring countries. It can be seen fromTable-6 that in 2012 Pakistan experienced highest average rate of inflation. In case of Bangladesh the rate of inflation remained much below two digit level in most of the years.

Table-6: Trend in Inflation Rate in South Asian Countries

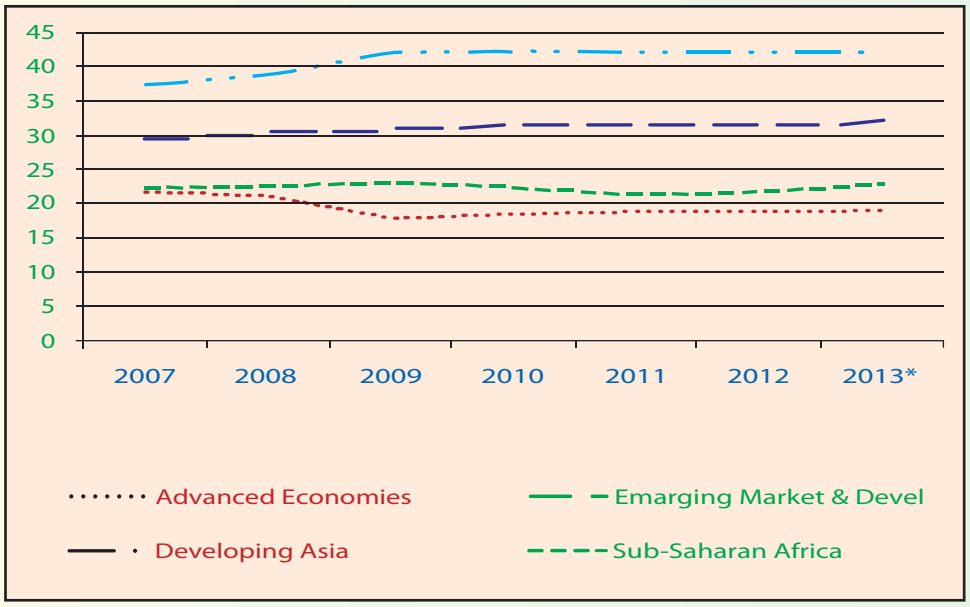
period	Pakistan	India	Sri Lanka	Bangladesh
2001	**4.4**	**3.8**	**14.2**	**1.9**
2002	2.5	4.3	9.6	3.7
2003	3.1	3.8	9.0	5.4
200 4	4.0	3.9	9.0	6.1
2005	9.3	4.0	11.0	7.0
2006	8.0	6.3	10.0	6.8
2007	7.8	6.4	15.8	9.1
2008	10.8	8.3	22.4	8.9
2009	17.6	10.9	3.5	5.4
2010	10.1	12.0	6.2	8.1
2011	13.7	8. 4	6.7	10.7
2012	11.0	10.4	7.5	8.7

Source: World Economic Outlook, IMF, October, 2013

III.5. World Investment and Savings as percent of GDP

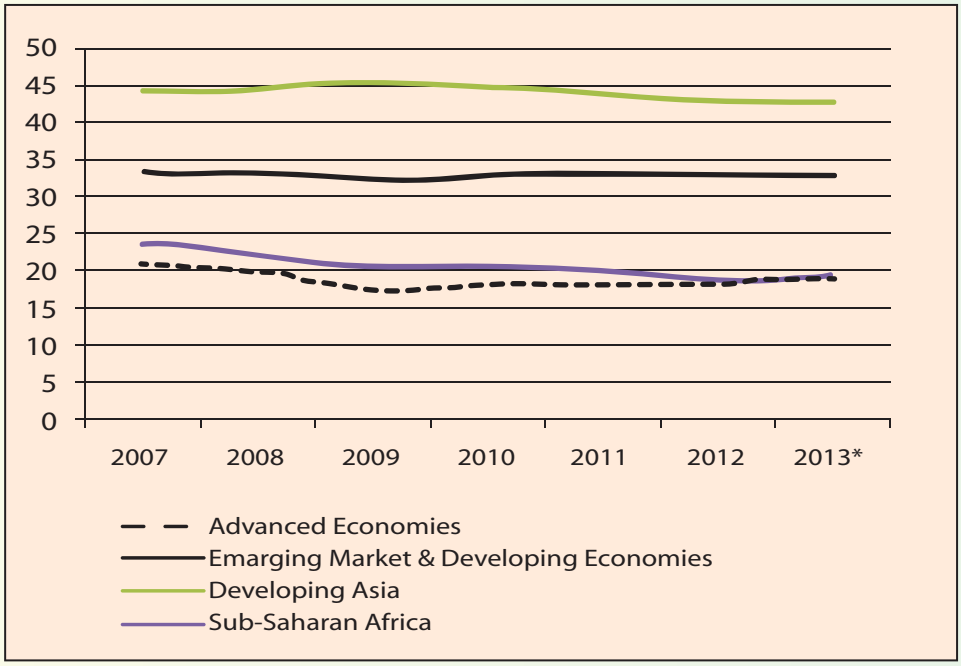
If we look at the world savings and investment as percent of GDP in Chart-2, we can see that Developing Asia's savings and investment is the highest followed by the emerging market and developing economies followed by the Sub-Saharan Africa. Advanced economies ranked fourth among group of four. Savings and Investment in Developing Asia's increased sharply since late 1990s.

Chart 2: Trends of Savings as percent of GDP of the Countries as Group



Source: World Economic Outlook, April, 2013 *= Provisional

Chart 3: Trends in Investment as percent of GDP of the Countries as Group



Source: World Economic Outlook, April, 2013 *= Provisional

IV: Model Variables, Methodology, and Empirical Results

An attempt has been made to examine empirically the nexus among private sector credit with output and price level in Bangladesh. To investigate the responses of the output and the price level to the private sector credit, a VAR approach and Granger causality tests are used for Bangladesh based on the monthly data for the period from 2000:6 to 2013:6. The responses of the output due to the innovations in the private sector credits are analyzed by the impulse response functions (IRFs) derived from VAR model. The IRFs show the dynamic response of each variable in the system to shock from each variable in the system. All data are in log form. The descriptions of the variable are given in the appendix. The model comprises of the following variables:

IV.1 Model Variables, Preliminary Data Analysis and Methodology

LPSC=log of claims on the private sector credit by Banks;

LIPI=log of Industrial Production Index;

LCPI=log of Consumer Price index (1995=100);

In order to make the residual white-noise all the series required to be identified properly. A series of unit root tests, such as Augmented Dickey-Fuller (DF, 1981), Phillips-Perron (PP, 1988) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS, 1992) are used to determine the order of integration (d) for each series. In order to decide the autoregressive parameters (p) and moving average parameters (q), autocorrelation and partial autocorrelation functions are used. The lag lengths of the unrestricted VARs are decided based on Akaike Information Criterion (AIC) that are reported in Table-7.

Table-7: The Results of Identification

Name of the Variable (all in natural logarithmic form)	**Identified as ARIMA (*p, d, q*)**
1. Credit to the private sector (LPSC)	lpc = ARIMA(1,1,1)
2. Industrial production index (LIPI)	lipi = ARIMA(3,1,0)
3. Consumer Price Index (LCPI)	lcpi=ARIMA(6,1,0)

Vector Autoregression (VAR)

Sim's (1980) unrestricted vector autoregression (VAR) model and Granger Causality tests (1969) are used to analyze the results. If we assume the dynamics of Z_t = is a P^{th} order Gaussian vector auto-regression process, we could write: $Z_t = c + F_1 Z_{t-1} + F_2 Z_{t-2} + \ldots + F_p Z_{t-p} + e_t$, where $e_t \sim$ iid, N(0,W) and F_i is a 3x3 coefficients matrix. A vector autoregressive (VAR) model is an appropriate econometric technique when we are interested in dynamic relationships among variables in the presence of possible feedback among the variables and ambiguity about the exogeneity of the right hand side variables (Sims, 1980 and Enders, 1995). Vector autoregression has become quite popular as noted by Keating (1992,

page 37) because of the inability of macroeconomists to agree on the correct structural model of the economy. As noted by Fackler and McMillin (1989), among others, "A VAR technique is well suited to an examination of the channels through which a variable operates since few restrictions are imposed on the way the variables interact" (Fackler and McMillin, 1989:p.995).

This study uses an unrestricted VAR model to derived IRFs. The IRFs show the dynamic response of each variable in the system to shocks from each variable in the system. This study is mostly interested in the responses of the output and the price level due to private sector credit shock. If the responses are significant to a private sector credit shock we would conclude that private sector credit has a significant impact on output and the price level.

Hafer and Sheehan (1991) argued that VAR results could be very sensitive to the choice of lag length. Therefore, Akaike's Information Criterion (AIC) is used to select the lag length for the VAR model. Lag orders of one through twelve are used.[2] A lag order of 4 produces the minimum AIC. Q-statistics are used to see if VAR residuals of each equation are white noise at this minimum AIC, and it turns out that Q-statistics show white noise residuals for each equation at lag order four. Therefore, a lag of four is used to estimate a three-variable VAR model.

To estimate IRFs, orthogonalization of the VAR residuals is required. Cholesky decomposition is used to orthogonalized the residuals. Cholesky ordering requires the variables to order in a particular way where variables placed higher in the ordering have contemporaneous impacts on the variables lower in the ordering, but the variables lower in the ordering do not have a contemporaneous impact on the variable higher in the ordering. Therefore Sims correctly stated, "... in the Cholesky ordering, …due to the cross-equation residual correlation when a variable higher in the ordering changes all the variables lower in the ordering are assumed to change". Therefore, it is important to decide proper ordering of the variables. Because this study is mainly interested in examining the impact of private sector credit on output and the price level therefore PSC variables is placed first followed by output and the price level.[3]

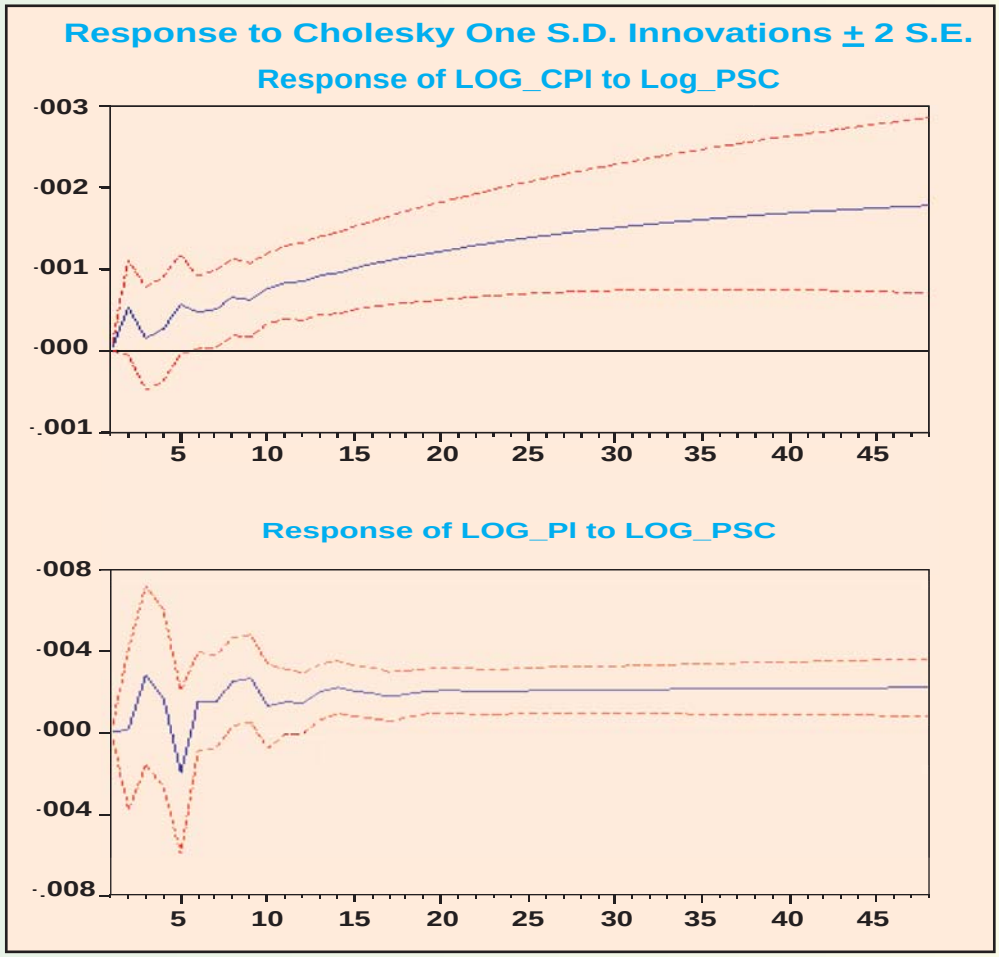
V. Empirical Results

Impulse Response Functions (IRFs): The IRF shows the response of each variable in the system due to a shock from each variable in the system. A two-standard-deviation confidence interval is reported for each IRF. A confidence interval containing zero indicates lack of significance. The IRFs showing the response of the price level and the output due to innovation (shock) to private sector credit is shown in Chart-4.

The Impulse Response Functions (IRFs) of the price level (log_CPI) and the industrial production (log_PSC) of chart-4 indicate that shock to private sector credit have a statistically significant

2. The Maximum lag length of four is used to preserve degrees of freedom.
3. Switching the ordering between the price level and the exchange rate are also attempted. However, policy conclusions remain the same for both the orderings.

Chart-4: Response of the price level and the industrial production due to private sector credit shock



impact on the price level and the industrial production. The top panel shows the response of the log of CPI due to shock to log of private sector credit. IRFs of the price level become significant and positive from the 8th month and remain significant thereafter.

The IRFs of the industrial production become significant and positive from the 8th month and then become insignificant which become significant again from 13th month and remain significant thereafter. The result of pair-wise Granger Causality tests, as reported in Tables -8 supports the finding of VARs analysis that private sector credit causes industrial production and the price level.

Granger Causality Test

Granger causality tests support the hypothesis that there is one-way causality from private sector credit to the price level and the output.

Table-8 Pair-wise Granger Causality Tests

Sample: 2000:6- 2013:6

Lags: 2			
Null Hypothesis:	Obs	F - Statistic	Prob.
LOG_PSC do es not Granger Cause LOG_CPI	155	6.47	0.00
LOG_CPI does not Granger Cause LOG_PSC		0.6 7	0.51
LOG_PSC does not Granger Cause LOG_IPI	153	27.49	0.00
LOG_IPI does not Granger Cause LOG_PSC		0.00	0.99

Variance Decompositions (VDCs): In order to know the impacts of shocks to PSC, VDCs at time horizon of 4 to 48 are computed. The estimates of the forecast error variance are considered significant if the point estimate is at least two times as large as its standard error. Twenty-five hundred bootstrap simulations are used to construct the standard errors for VDCs. Because, this study is mostly concerned with the forecast error variance in CPI and Y explained by PSC, VDCs of only price level and output are reported. In Table-9, point estimates and the standard errors of price level, and output due to a shock in the private sector credit are shown.

Table-9 shows that an innovation to PSC explains significant portions of the forecast error variance in the price level from 12 time horizons and thereafter. On the other hand, an innovation to PSC explains significant portion of forecast error variance of output from time horizons 16 and remain significant thereafter. Private sector credit explain 14.89% of the variation in the price level at time horizon 12 which increased to 41.13% at time horizon 24 and then 70.68% at time horizon 48 while significant portion of forecast error variance of output explained by private sector credit at time horizon 16 is 7.53% which increased to 22.17% at time horizon 48. However, most of the variations in the forecast error in the output are explained by output itself which is 94.51% at time horizon 4 which decreased to 73.10 percent at time horizon 48 months.

Table–9 Forecast Error Variance Explained by Innovation to private sector credit (PSC):

Sample Period: 2000:6 to 2013:6

Lag 4	Variance Decomposition of logCPI			Variance Decomposition of logI PI		
Months	Private Sector Credit (PSC)	Price Level (CPI)	Output (IPI)	Private Sector Credit (PSC)	Price Level (CPI)	Output (IPI)
4	2.63 (3.00)	93.08*** (4.58)	4.29 (3.71)	1.71 (2.87)	3.78 (3.25)	94.51*** (4.21)
8	7.68 (4.99)	84.71*** (6.88)	7.61 (5.90)	3.67 (2.91)	5.09 (3.66)	91.24*** (4.53)
12	14.89*** (7.44)	76.24*** (8.88)	8.86 (7.43)	5.41 (3.43)	5.05 (3.68)	89.54*** (4.79)
16	23.77*** (9.83)	67.41*** (10.44)	8.81 (8.17)	7.53*** (3.93)	5.05 (3.66)	87.42*** (5.02)
20	32.81*** (11.71)	58.87*** (11.56)	8.32 (8.50)	9.35*** (4.40)	5.03 (3.64)	85.61*** (5.25)
24	41.13*** (12.99)	51.22*** (12.25)	7.65 (8.61)	11.24*** (4.93)	5.00 (3.61)	83.76*** (5.55)
28	48.39*** (13.78)	44.67*** (12.59)	6.94 (8.60)	13.16*** (5.49)	4.96 (3.59)	81.88*** (5.89)
32	54.56*** (14.22)	39.16*** (12.70)	6.27 (8.53)	15.03*** (6.04)	4.92 (3.58)	80.05*** (6.25)
36	59.73*** (14.41)	34.59*** (12.65)	5.68 (8.46)	16.87*** (6.59)	4.87 (3.57)	78.25*** (6.64)
40	64.05*** (14.46)	30.78*** (12.51)	5.17 (8.38)	18.68 (7.13)	4.82 (3.57)	76.49*** (7.02)
44	67.66*** (14.42)	27.62*** (12.32)	4.72 (8.31)	20.45*** (7.64)	4.77 (3.58)	74.78*** (7.40)
48	70.69*** (14.32)	24.97*** (12.11)	4.34 (8.25)	22.17*** (8.12)	4.72 (3.59)	73.10*** (7.77)

Note: Asterisks (***) indicate significance of the point estimate. Numbers in each cell are point estimates. Point estimates are considered significant if they are twice as large as the standard error. Numbers in the parenthesis are standard errors.

VI. Conclusion and Recommendations

The purpose of this study is to examine the response of the output and the price level due to shock in the private sector credit. The impulse response functions (IRFs) and variance decompositions derived from a three variable VAR model with Cholesky decompositions and Granger causality tests show that private sector credit contribute to the recent trend of economic growth as in the case of other developed and developing countries. The IRFs, VDCs and Granger Causality tests suggests that the response of the output as proxies by the industrial production is significant and positive due to private sector credit shock in level. This result is consistent with the conventional believe that when an economy starts to grow it creates immediate additional demand for financial services and helps grow a better financial system. At this stage the positive impact of financial development on economic growth could be modest. As development proceeds a better and well functioning financial system is established and a well developed financial system can contribute at a greater extent to income growth.

During the decade of 2000 Bangladesh economy grows at a faster rate than 90 and 80s. We have seen on average 6.2 percent growth during this decade. It has been found from the empirical results of this study that private sector credit helped to increase output as well as inflation. The increase in inflation is much higher and positive than increase in output. Therefore, we need to be careful about the strong private sector credit growth which fuelled inflation much higher which in turn would have adverse impact on much needed economic growth in Bangladesh.

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Variable List

The data period for this paper is from 2001:6 to 2012:6. Descriptions of the variables used in this paper appear below.

LCPI (1995=100) = the log of consumer price index (CPI); the cost of living index of middle income families in Dhaka is used as a price variable. Then the log of CPI is used as a price variable. The seasonally unadjusted monthly data on consumer price index are available from various issues of Economic Trends, a Bangladesh Bank publication.

Source: Bangladesh Bureau of Statistic (BBS) & Bangladesh Bank Research Department

LPSC=Log of monthly private sector credit is as the financial development variable. Seasonally unadjusted monthly data are available from the online version of the International Financial Statistics (IFS), IMF website (www.imf.org).

Source: Economic Trends, Bangladesh Bank, Statistics department

IPI (1995=100) = Industrial production is also used as output variable. The seasonally unadjusted monthly data of the industrial production also available from the online version of the International Financial Statistics (IFS), IMF website (www.imf.org)

Source: Bangladesh Bureau of Statistic (BBS)