The State of Pakistan's Economy and the Ineffectiveness of Monetary Policy

Abdullah, Muhammad and Gul, Zarro and Waseem, Faiza and Islam, Tanweer

National University of Sciences and Technology, National University of Sciences and Technology, National University of Sciences and Technology, National University of Sciences and Technology

2021

The State of Pakistan's Economy and the Ineffectiveness of Monetary Policy

Abstract

Purpose: Higher interest rate policy by the State Bank of Pakistan (SBP) has not only been failed to control inflation in Pakistan but adversely impacted public and private investment. High cost of doing business retarded economic growth as well. Therefore, the aim of this study is to inspects the ineffectiveness of monetary policy measures in Pakistan and suggest possible actions to improve effectiveness of the monetary policy.

Method: This study utilizes the monthly data from 2007(4)-2019(8) to compute the variance decomposition and impulse responses using VAR modelling.

Findings: The impulse response analysis from the VAR model clearly highlights the ineffectiveness of interest rate channel in trying to control inflation in Pakistan. The empirical results indicate that both domestic food price and exchange rate channels are effective means of managing price levels in the country. It is, therefore, recommended that Pakistan should switch from demand side to supply-side policies when forming strategies to control economic vices like inflation.

Originality: This study aims to analyse the effects of supply side shocks; how the monetary policy is failing to address the supply-side and cost-push inflation. This research will further aim to expand the investigation into the inflationary shocks coming from the exchange rate channel and food prices. The purpose of this paper will also involve answering whether the current macroeconomic policy of demand management addresses the issues of inflation correctly or not.

1. Introduction

Pakistan has witnessed a slow and inconsistent economic growth over the last two decades (Ayaz & Ali, 2019). The prevalence of uncertain growth patterns followed by the failure of monetary policy to address the issues concerning the economy has ignited the debate whether the severity of the current economic crisis could be dampened by taking appropriate policy actions. In developing countries like Pakistan, inflation seems to be driven by supply-side factors such as food and oil prices, along with the traditional monetary channel (Azam & Rashid, 2014 and Hanif, 2012). Evidence suggests that monetary policy has failed to control inflation (Qayyum, 2008) regardless of high interest rate of 13.25% (State Bank of Pakistan, 2019) which has persisted for a long time. Meagre economic performance of Pakistan over the last decade with 3.8 percent average GDP growth (Khan, 2019), recent hike in exchange rate, increase in taxes, food and import prices raise the suspicion that Pakistan's economy might currently be facing supply-side shocks which are not curable by demand management policies (Javed, Farooq & Akram, 2010 and Azam & Rashid, 2014).

This study focuses on the issue of effectiveness of monetary policy and the significance of supply-side shocks in determining inflation compared to the interest rate channel. Keeping in view the recent events, we have incorporated the exchange rate and domestic food prices as the major channels of the supply-side shocks. The reason being, that the excessive devaluation of the currency has been a major cause of increasing raw import prices. Domestic food prices have been included as prices of staple foods such as wheat and rice play an important role in setting inflationary expectations and wage setting. The literature on the topic does not emphasize the role of the exchange rate and domestic food prices as significant supply-side shocks. This study aims to cover this gap and investigate the effectiveness of monetary policy in the presence of supply-side shocks in the economy through empirical testing of the following null hypotheses.

H_1: Controlling inflation through interest rate does not yield monetary stability

H_2: Controlling inflation through domestic food prices does not yield monetary stability

H_3: Controlling inflation through exchange rate does not yield monetary stability

The motivation behind this research is to find the reasons behind the inflationary distress in Pakistan; to look for measures that may help solve and bring the country out of this turmoil. It

aims to see why the persistently tight monetary policy is failing to meet the desired objectives and to find the root causes behind the double-digit inflation. The tools that this study will adopt to test the hypothesis will involve impulse response and variance decomposition analysis of time-series data for the period 2007(4)-2019(8).

2. Review of Literature

An increase in aggregate demand leads to real appreciation in exchange rate, inflation and low economic growth. In turn, policy rates shift upward to meet government objectives in terms of inflation and economic growth. However, demand management policies such as a tight monetary policy are not effective in controlling for cost-push inflation. The literature pertaining to Pakistan indicates that inflation is significantly caused by supply-side variables, as raw import prices and food prices have a majority share in CPI inflation compared to private sector credit (Javed, Farooq & Akram, 2010; Khan & Ahmed, 2011).

Furceri *et al.*, (2016) study effects of changes in global food prices on the domestic inflation of 34 developed and 50 developing countries and conclude that global food price shocks have a significant positive impact on domestic inflation. A similar study, using the SVAR methodology, shows that both demand and supply-side shocks have a significant impact on inflation (Nasir & Malik, 2011). The relationship between the structural shocks on the forward-looking monetary policy in Pakistan further shows that only supply-side shocks play a key role in affecting domestic output.

A handful of studies on the subject disagrees with the above notion, putting forth the results of multiple empirical tests carried out in Pakistan to show that monetary variables are the key determinants of inflation in the country (Khan & Schimmelpfennig, 2006). Jongwanich & Park (2009) aim to remove the misconception that global oil and food prices are not the reason behind growing inflation in Asia, rather, the demand-pull factor is. An empirical analysis of the period 2001-2008 shows that blaming external supply-side shocks is of no use and the only solution to lower inflation is to implement a contractionary monetary policy.

Most of the literature agrees that monetary policy is effective only when there is monetary and fiscal coordination to control the money supply (Alam, 2015; Amjad, Din & Qayyum, 2011, Chowdhury & Afzal, 2015; Qayyum, 2008). Moreover, heavy reliance on foreign resource

inflows; along with ineffective policy making on both the aggregate demand and the aggregate supply side, has been attributed to high rates of inflation and stagnant growth. To maintain a good economy along with price stability in the country, there must be a balanced expansion in the money supply. The State Bank of Pakistan (SBP), unfortunately, has failed to achieve this and needs to improve the calculations of the money supply target to combat inflation (Qayyum, 2008).

Munir and Qayyum (2014), on the other hand, highlight the importance of the interest rate channel as an effective means of controlling inflation in Pakistan. The factor-augmented vector autoregressive (FAVAR) methodology on monthly data from the period 1992 to 2010 shows the inverse relationship between interest rate and prices, with a lag of 5 months; thus, accounting it as a powerful instrument to control inflation.

Evidence of the negative relationship of the interest rate and the money supply further raises questions over the effectiveness of the channel (Waliullah & Rabbi, 2011). Most of the literature attributes this failure of the interest rate channel to the lack of coordination between monetary and fiscal authorities. When a tight monetary policy is implemented, it is followed by a depreciation of exchange rate, resulting in deterioration of the economy.

The interest rate channel is shown to be effective after a significant lag of 2 years (Agha *et al.*, 2005 and Arwatchanakarn, 2017). Additionally, Karahan & Yılgör, (2017) and Hamzah & Masih, (2018) prove no significant association between the interest rate and inflation. In fact, Tran, (2018) shows a positive relationship between interest rate and inflation for Vietnam over the years 2001-2015. Thus, using the interest rate as a tool may further lead to cost-push inflation.

Exchange rate pass-through to consumer prices is governed heavily by domestic and global supply-side shocks (Forbes, Hjortsoe & Nenova, 2018 and López-Villavicencio & Mignon, 2017). Exchange rates are shown to have a significant impact on generating inflationary pressure which further emphasizes the importance of the exchange rate as a significant determinant of inflation. It is concluded as a majority solution, that cost-push inflation should be dealt with differently than regular monetary inflation. Khan & Ahmed, (2016) highlights the significance of the exchange rate channel for South Asian countries because contractionary monetary policy has failed to lower inflation in the region.

The previous literature about the ineffectiveness of monetary policy and supply-side shocks, fails to address the exchange rate as a significant supply-side shock. Economic theory treats the exchange rate as a part of monetary policy but considering the real world phenomenon, this paper carefully chooses the exchange rate as a shock to the economy. This is in consideration of recent developments, where the Pakistani rupee has seen unprecedented devaluation, that too under pressure from exogenous sources. Moreover, in Pakistan domestic food prices seem to have a major impact on setting inflationary expectations. Supply of staple crops such as wheat, rice and sugar are exogenous to the monetary policy; and their role in setting general price levels in the economy cannot be ignored. The previous literature does not incorporate the role of domestic food prices to its merit. Global food prices and oil prices have been incorporated previously; however, due to the presence of subsidies and support prices in Pakistan, global food prices fail to capture the impact on domestic price levels (Jongwanich & Park, 2011). This paper hopes to address the roots of inflation in Pakistan by incorporating the exchange rate and domestic food prices as supply shocks. This study also further aims to investigate whether tight monetary policy is a suitable fix for the current state of the economy.

3. Data and Methodology

To examine the effectiveness of monetary policy through interest, domestic food inflation and exchange rate transmission channels, this study employs the Vector Auto-Regressive (VAR) modelling approach. Following Khan & Ahmed (2011), we utilize the reduced form of the Vector Auto-Regressive (VAR) to analyze the transmission channels of the aforesaid variables for Pakistan. We start with the following generalized VAR model:

$$\boldsymbol{y_t} = \boldsymbol{A_1 y_{t-1}} + \boldsymbol{A_2 y_{t-2}} + \boldsymbol{A_3 y_{t-3}} + \cdots + \boldsymbol{A_p y_{t-p}} + \boldsymbol{\varepsilon_t}$$

where $\boldsymbol{y_t} = (\boldsymbol{f_t}, \boldsymbol{e_t}, \boldsymbol{y_t}, \boldsymbol{m_t}, \boldsymbol{i_t}, \boldsymbol{\pi_t})$ is (nx1) vector of endogenous variables in the system (f_t: *food inflation, e_t: nominal exchange rate, y_t: output proxied by IPI, m_t: Money supply, i_t: short-term interest rate and π_t : inflation*), $\boldsymbol{A}$ is (nxn) invertible matrix of coefficients, and $\boldsymbol{\varepsilon_t}$ is (nx1) vector of unobserved independently and identically distributed (iid) error terms. This study uses monthly data from 2007:4-2019:8 for the analysis and the data is extracted from annual reports of SBP and International Financial Statistics (IFS).

VAR estimation is sensitive to lag order of the variables. To avoid the issue of degree of freedom and multi-collinearity, Akaike Information Criteria (AIC) is used to select the optimal lag length to capture the long-term impact of the variables. Ordinary Least Squares (OLS), the underlined methodology for VAR, requires the variables to be stationary or cointegrated. The variables are, hence, tested for stationarity and cointegration. The tests employed are Augmented Dickey-Fuller (ADF) and Johansen Cointegration test, respectively. Both the tests validate the VAR methodology for the analysis (Appendix: Table 1 & 2).

4. Results and Discussion

This study focuses on the issue of effectiveness of monetary policy and the significance of supply-side shocks in determining inflation compared to the interest rate channel. To examine the effectiveness of monetary policy through interest, domestic food inflation and exchange rate transmission channels, we have computed impulse responses and variance decompositions to test the hypotheses formulated in section 1.

First null hypothesis states that interest rate is not an appropriate tool to control inflation for monetary stability. To test this hypothesis, one standard deviation (SD) shock is introduced to interest rate and Fig. 1 & 2 shows the respective responses of interest rate and CPI inflation to the shock. It can be observed from the impulse response functions interest rate increase initially by 0.5 SD and then declines slightly after two months but never returns back to equilibrium. On the other hand, it has negligible impact on CPI inflation (0.05 SD) and inflation converges to equilibrium slowly and gradually. This positive relationship between inflation and interest rate is referred to as the price puzzle in the literature. The variance decomposition results in Table 1 show that over the period of 20-months, only 10.9 percent of inflation is explained by the interest rate. These results are indicative of the ineffectiveness of monetary policy by SBP- achieving monetary stability by controlling inflation through interest rate transmission channel.

Raising interest rates poses yet another threat to the well-being of the economy. Higher interest rates increase the cost of borrowings for the government leading to high total expenditure (Amjad, Din & Qayyum, 2011) resulting in a cut to development expenditure (Khan, 2019). Consequently, public sector investment falls which retards the economic activity. Producers would either raise prices of their finished goods to ensure an adequate profit margin for

themselves or they would cut down on their costs by employing fewer workers. Both scenarios prove to be detrimental to the effective functioning of the economy.

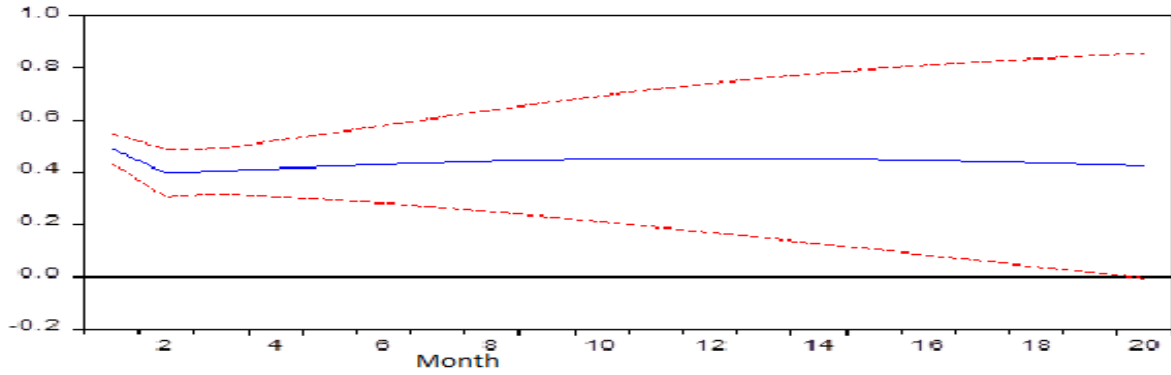Fig. 1: Response of interest rate to its own shock

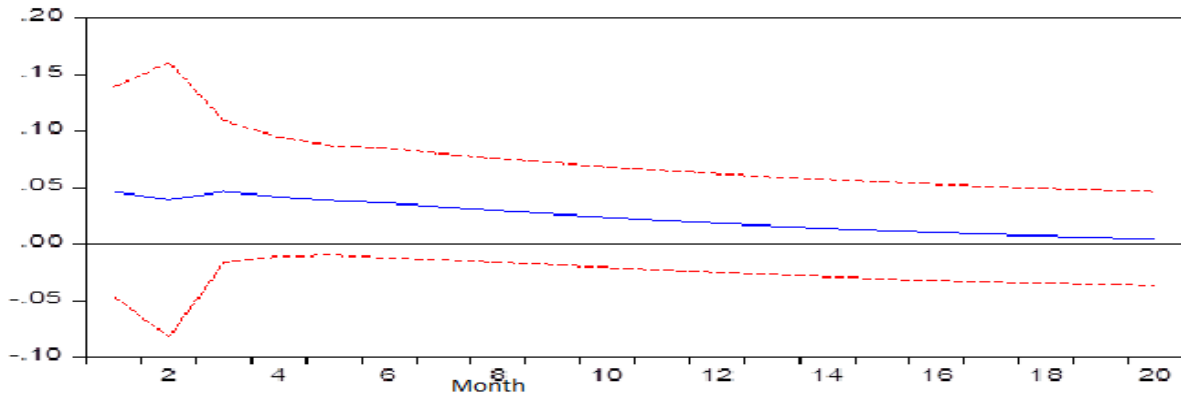Fig. 2: Response of CPI inflation to interest rate shock

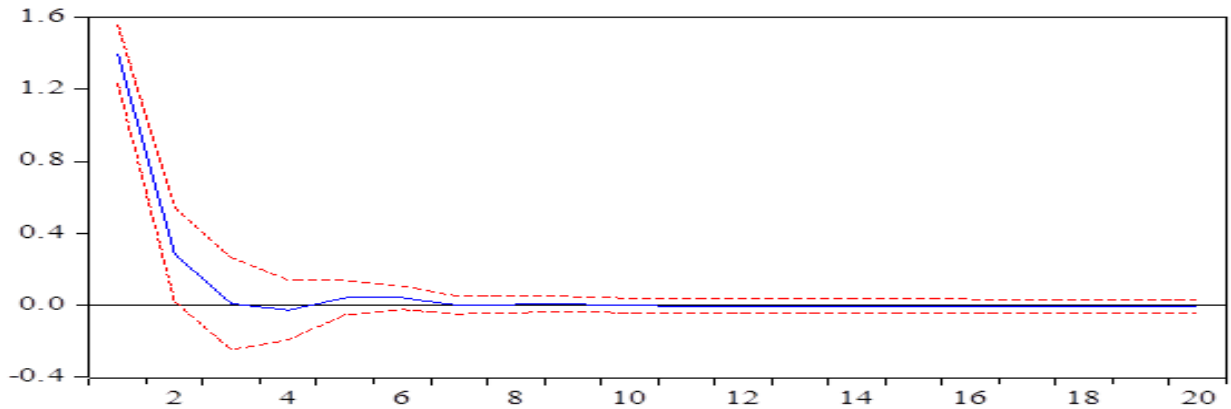Fig. 3: Response of food inflation to its own shock

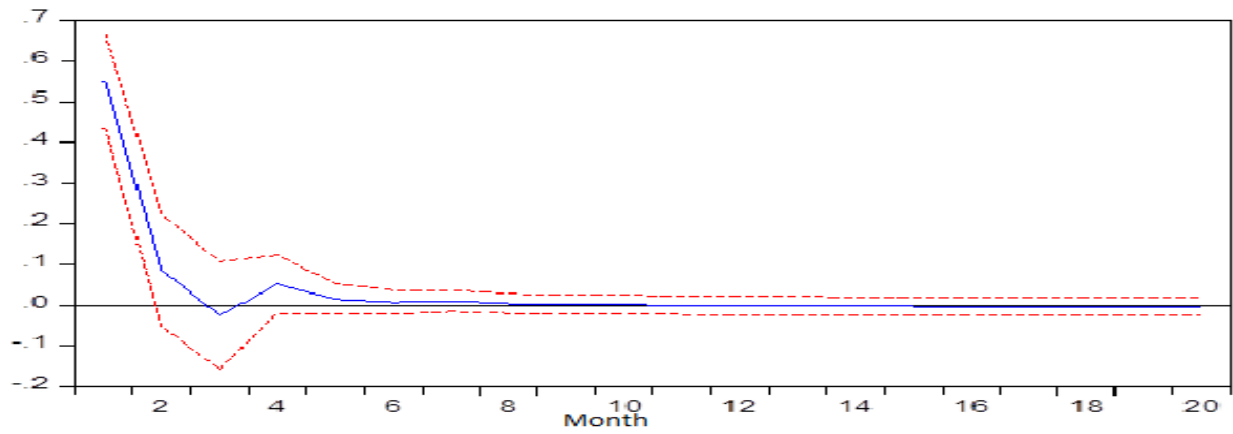Fig. 4: Response of CPI inflation to food inflation shock

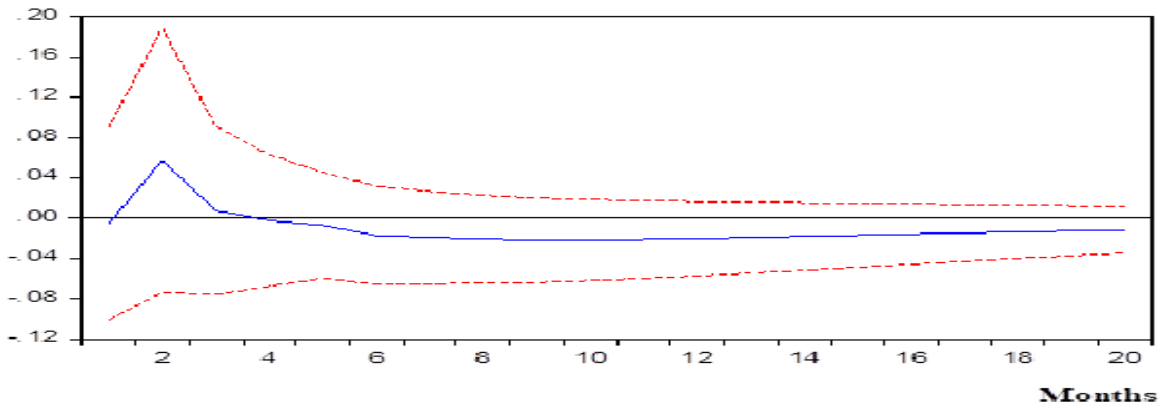Fig. 5: Response of Exchange rate to its own shock

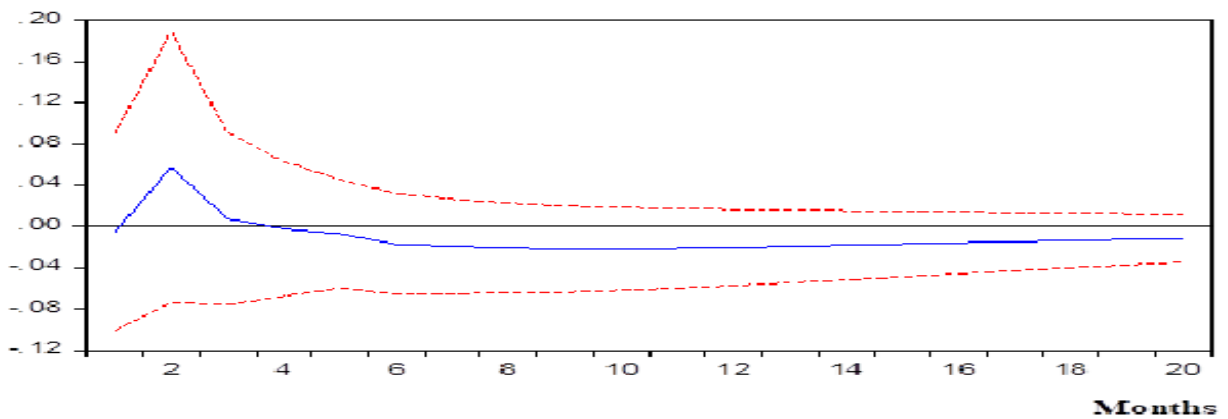Fig. 6: Response of CPI inflation to exchange rate shock

8

Table 1: Variance Decomposition of Interest Rate

Variance Decomposition of TB06:

Period	S.E.	MOMFI	LEXR	LSAIPI	LM2	TB06	100*D(LCPI)
1	0.508013	1.262956	0.578226	3.385295	0.958374	93.81515	0.000000
2	0.666131	0.748720	4.259023	2.021495	2.093731	90.17424	0.702788
3	0.833389	3.759361	7.265305	2.000644	1.654939	81.39768	3.922069
4	0.996867	6.098773	9.580535	2.593435	1.428644	74.18541	6.113202
5	1.155899	7.782488	11.11446	3.522498	1.263706	68.55123	7.765618
6	1.305445	8.955889	12.07680	4.542929	1.137366	64.64161	8.645400
7	1.445582	9.799474	12.55454	5.483027	1.047797	61.90191	9.213253
8	1.577037	10.42757	12.69662	6.305112	0.974944	59.95251	9.643246
9	1.699562	10.88208	12.62971	7.021938	0.912518	58.60863	9.945116
10	1.813672	11.21315	12.42473	7.636516	0.859676	57.69924	10.16668
11	1.920047	11.45700	12.13364	8.159602	0.813576	57.09736	10.33882
12	2.019209	11.63385	11.79424	8.606081	0.772726	56.72084	10.47227
13	2.111708	11.76018	11.43109	8.987321	0.736392	56.50786	10.57715
14	2.198065	11.84852	11.06083	9.313349	0.703833	56.41265	10.66082
15	2.278745	11.90768	10.69462	9.593050	0.674509	56.40238	10.72776
16	2.354170	11.94451	10.33961	9.833700	0.648021	56.45265	10.78151
17	2.424725	11.96427	10.00020	10.04138	0.624023	56.54536	10.82476
18	2.490756	11.97099	9.678916	10.22121	0.602231	56.66714	10.85952
19	2.552577	11.96780	9.376972	10.37740	0.582403	56.80803	10.88739
20	2.610474	11.95716	9.094706	10.51349	0.564333	56.96065	10.90966

Table 2: Variance Decomposition of Domestic Food Inflation

Variance Decomposition of MOMFI:

Period	S.E.	MOMFI	LEXR	LSAIPI	LM2	TB06	100*D(LCPI)
1	1.396146	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	1.568229	82.52523	0.104123	0.000462	0.000965	0.077082	17.29214
3	1.588351	80.45003	0.326671	0.849596	0.046338	0.258269	18.06909
4	1.603541	78.96042	0.411277	1.297586	0.048312	0.336030	18.94638
5	1.606187	78.76885	0.426031	1.349821	0.115636	0.407730	18.93193
6	1.608959	78.56364	0.435644	1.397042	0.115307	0.478130	19.01023
7	1.610062	78.45615	0.449825	1.453962	0.115418	0.534085	18.99056
8	1.610894	78.37569	0.485148	1.470697	0.119351	0.577968	18.97114
9	1.611597	78.30876	0.523538	1.478592	0.119781	0.611740	18.95759
10	1.612177	78.25257	0.562539	1.483853	0.120044	0.636971	18.94403
11	1.612686	78.20361	0.602739	1.485389	0.120912	0.655183	18.93217
12	1.613118	78.16232	0.640535	1.485555	0.121584	0.667839	18.92217
13	1.613494	78.12717	0.675104	1.485198	0.122310	0.676271	18.91395
14	1.613821	78.09715	0.706281	1.484635	0.123215	0.681573	18.90714
15	1.614105	78.07163	0.733781	1.484122	0.124196	0.684640	18.90163
16	1.614353	78.04972	0.757763	1.483762	0.125293	0.686193	18.89727
17	1.614574	78.03074	0.778505	1.483605	0.126519	0.686794	18.89383
18	1.614771	78.01412	0.796308	1.483662	0.127862	0.686870	18.89118
19	1.614950	77.99933	0.811511	1.483922	0.129324	0.686738	18.88917
20	1.615114	77.98597	0.824447	1.484369	0.130905	0.686627	18.88768

Both food and CPI inflation increase (Fig. 3 & 4) in response to one standard deviation (SD) shock to month-on-month food inflation. Food inflation is more responsive to its own shock relative to CPI inflation. For unit shock, CPI inflation increases by 0.55 SD in the first month and it takes three to four months to regain the equilibrium. The variance decomposition (Table 2) shows that up to 18.88% of CPI inflation is explained by month-on-month food inflation up to a

period of 20 months. The variance decomposition results show that a significant portion of CPI inflation is explained by food inflation. This result provides evidence on the hypothesis that domestic food price is a significant explanatory variable of inflation in Pakistan. In developing countries, a major portion of the household's income is spent on food (Furceri *et al.*, 2016). The provision of subsidies by the government to farmers, to win political support, draws a wedge between international and domestic food prices (Jongwanich & Park, 2011). Thus, domestic food prices seem to be more relevant to control inflation in Pakistan as it is better explained by structural variables such as import and wheat prices (Azam & Rashid, 2014).

Table 3: Variance Decomposition of Exchange Rate

Variance Decomposition of LEXR:						
Period	S.E.	MOMFI	LEXR	LSAIPI	LM2	TB06	100*D(LCPI)
1	0.013204	1.368057	98.63194	0.000000	0.000000	0.000000	0.000000
2	0.021240	1.603512	96.30554	0.091722	0.594932	0.195635	1.208655
3	0.028104	4.157521	90.40723	0.173434	0.727946	0.786923	3.746947
4	0.034348	6.853977	84.15372	0.568031	0.861129	1.696174	5.866968
5	0.039930	8.666374	78.86468	1.230546	0.965649	2.841426	7.431321
6	0.044995	9.996045	74.15653	1.998847	1.042889	4.164174	8.641513
7	0.049621	11.00390	69.91004	2.790235	1.122851	5.603841	9.569136
8	0.053875	11.77763	66.01249	3.554350	1.202690	7.119473	10.33337
9	0.057820	12.38128	62.40631	4.266252	1.286138	8.673429	10.98659
10	0.061494	12.84936	59.07761	4.919358	1.374513	10.23639	11.54278
11	0.064930	13.21168	56.00428	5.510204	1.466403	11.78417	12.02326
12	0.068158	13.49055	53.16817	6.040147	1.561636	13.29719	12.44230
13	0.071200	13.70198	50.55558	6.513317	1.659786	14.76097	12.80837
14	0.074073	13.85924	48.15201	6.934212	1.760223	16.16487	13.12944
15	0.076791	13.97299	45.94317	7.307706	1.862551	17.50154	13.41204
16	0.079368	14.05172	43.91524	7.638701	1.966425	18.76649	13.66142
17	0.081812	14.10240	42.05462	7.931786	2.071547	19.95746	13.88218
18	0.084133	14.13072	40.34819	8.191209	2.177702	21.07394	14.07825
19	0.086337	14.14128	38.78340	8.420835	2.284727	22.11677	14.25299
20	0.088432	14.13787	37.34839	8.624129	2.392501	23.08778	14.40934

The impulse response of CPI inflation to a positive exchange rate shock (Figure 5 & 6) shows that CPI inflation spikes when a positive shock is introduced. CPI inflation peaks in the second month following the exchange rate movements and tries to get back to initial position after the third month. Results indicate one-to-one correspondence between exchange rate and inflation in terms of response to unit SD shock to exchange rate. Furthermore, exchange rate can explain 14.4 percent of inflation variation in 20-month time period. These results clearly indicate that inflation is explained by the fluctuations in the nominal exchange rate. Our results corroborate with the findings in Khan and Ahmed (2011). Currency devaluation leads to a rise in import prices (Javed, Farooq & Akram, 2010) and increases the cost of imported capital. This ultimately leads to an increase in domestic inflation and slow economic growth.

Overall, it can be concluded from the results that domestic food prices and exchange rates are much more significant factors of inflation than the interest rate. The empirical evidence supports the claim that inflation in Pakistan comes mainly from the cost-push side than the monetary side. The effectiveness of food prices and the exchange rate in impacting domestic inflation can, thus, be a cause of the ineffectiveness of the interest rate channel in controlling inflation.

5. Conclusion

In Pakistan, monetary policy supports the objective of achieving macroeconomic stability by promoting price stability, stimulating growth, and stabilizing financial markets. Primarily, the State Bank of Pakistan follows the demand management policies to control inflation and achieve growth targets for overall wellbeing in the country. However, demand management policies such as a tight monetary policy are not effective in controlling for cost-push inflation. The literature pertaining to Pakistan indicates that inflation is significantly caused by supply-side variables. Therefore, keeping in view the recent events, we have incorporated the exchange rate and domestic food prices as the major channels of the supply-side shocks.

The empirical results of this study are indicative of the ineffectiveness of the interest rate transmission channel. Inflation, currently prevailing in the country is the result of supply-side shocks, rendering the traditional monetary policy transmission channel as an ineffective mechanism for administering inflation. This study suggests a shift in focus from demand management to the expansion of the productive capacity of the country. It has proven that both the exchange rate and domestic food prices have a significant impact on inflation. The government should move towards a relaxed monetary policy as high policy rates show no significant effect in controlling inflation. Tight monetary policy is designed to control the aggregate demand in the economy. If the interest rate channel fails to control inflation, then it only constricts economic growth without the attainment of its primary goal. There is, therefore, a need to reframe the existing policies to improve the economic performance of the country. The prices of raw imported materials and oil are heavily determined by the exchange rate. The significance of the exchange rate channel as shown by the results in controlling inflation implies that the depreciation under the IMF program has been a major catalyst of inflation in the country. It is crucial for the government to cut down imports through extensive import compression policies to keep the current account deficit in check. The balance of payment deficits must be

managed carefully for the exchange rate to be stabilized sustainably. It is also recommended that fiscal discipline must be practiced by the government when it comes to fiscal financing. Fiscal indiscipline leads to the loss of control over the money supply by the State Bank of Pakistan, which renders monetary policy ineffective.

Appendix

Table 1: ADF Test Results

Variable	t-ADF		CV (5%)	Conclusion
	At Level	First Diff		
Food Inflation	-9.33	-	-2.88	I(0)
Interest Rate	-0.89	-13.06	-3.44	I(1)
Money Supply	-1.72	-13.02	-3.44	I(1)
Output	-3.05	-7.87	-3.44	I(1)
Exchange Rate	-1.95	-8.06	-3.44	I(1)
CPI	-2.83	-5.51	-3.44	I(1)

Table 2: Johansen Test for Cointegration

No. of CE(s)	Trace Statistics	5% Critical Value	Max. Eigen Statistics	5% Critical Value
None*	225.56	117.71	107.89	44.50
At most 1*	117.68	88.80	43.05	38.33
At most 2*	74.62	63.88	38.96	32.12
At most 3	35.66	42.92	16.96	25.82
At most 4	18.70	25.87	12.11	19.39
At most 5	6.59	12.52	6.59	12.52

References

1. Agha, A. I., Ahmed, N., Mubarik, Y. A., & Shah, H. (2005). Transmission mechanism of monetary policy in Pakistan. *SBP-Research Bulletin*, *1*(1), 1-23.

2. Alam, M. R. (2015). Effectiveness of monetary policy in Bangladesh. *The Journal of Developing Areas*, *49*(2), 363-372.

3. Amjad, R., Din, M. U., & Qayyum, A. (2011). Pakistan: Breaking Out of Stagflation into Sustained Growth. *The Lahore Journal of Economics*, *16*, 13–30.

4. Arwatchanakarn, P. (2017). Structural vector autoregressive analysis of Monetary Policy in Thailand. *Sociology Study*, *7*(3), 133-145.

5. Ayaz, A., & Ali, A. A. (2019). What is wrong with our economy? *Defence Journal*, *23*(3), 22.

6. Azam, M., & Rashid, S. (2014). The monetarist hypothesis of inflation in Pakistan – a critique. *Journal of the Asia Pacific Economy*, 20(4), 559–576.

7. Chowdhury, L. S., & Afzal, M. N. I. (2015). The Effectiveness of Monetary Policy and Fiscal Policy in Bangladesh. *The Journal of Applied Business and Economics*, *17*(1), 78.

8. Forbes, K., Hjortsoe, I., & Nenova, T. (2018). The shocks matter: improving our estimates of exchange rate pass-through. *Journal of International Economics*, *114*, 255-275.

9. Furceri, D., Loungani, P., Simon, J., & Wachter, S. M. (2016). Global food prices and domestic inflation: some cross-country evidence. *Oxford Economic Papers*, *68*(3), 665-687.

10. Hamzah, N. H., & Masih, M. (2018). Revisiting effectiveness of interest rate as a tool to control inflation: evidence from Malaysia based on ARDL and NARDL.

11. Hanif, M. N. (2012). Role of demand and supply shocks in driving inflation: A case study of Pakistan.

12. Javed, Z. H., Farooq, M., & Akram, S. (2010). Cost-push shocks and inflation: An empirical analysis from the economy of Pakistan. *Journal of Economics and International Finance*, *2*(12), 308-312.

13. Jongwanich, J., & Park, D. (2009). Inflation in developing Asia. *Journal of Asian Economics*, *20*(5), 507-518.

14. Jongwanich, J., & Park, D. (2011). Inflation in developing Asia: pass-through from global food and oil price shocks. *Asian-Pacific Economic Literature*, *25*(1), 79-92.

15. Karahan, Ö., & Yılgör, M. (2017). The Causal Relationship between Inflation and Interest Rate in Turkey. *European Financial Systems*, *2017*, 309.

16. Khan, A. H. (2019). Pakistan's Experience with the IMF. *S3H Working Paper Series*, (2).

17. Khan, M. A., & Ahmed, A. (2011). Macroeconomic Effects of Global Food and Oil Price Shocks to the Pakistan Economy: A Structural Vector Autoregressive (SVAR) Analysis. *The Pakistan Development Review,50*(411), 491–511.

18. Khan, M. A., & Ahmed, A. M. (2016). Conducting monetary policy in South Asian economies: an investigation. *The Pakistan Development Review*, 161-190.

19. Khan, M., & Schimmelpfennig, A. (2006). Inflation in Pakistan. *The Pakistan Development Review,45*(2), 185-202.

20. López-Villavicencio, A., & Mignon, V. (2017). Exchange rate pass-through in emerging countries: Do the inflation environment, monetary policy regime and central bank behavior matter? *Journal of International Money and Finance*, *79*, 20-38.

21. Munir, K., & Qayyum, A. (2014). Measuring the effects of monetary policy in Pakistan: a factor-augmented vector autoregressive approach. *Empirical Economics*, *46*(3), 843-864.

22. Nasir, M., & Malik, W. S. (2011). The contemporaneous correlation of structural shocks and inflation-output variability in Pakistan. *The Pakistan Development Review*, 145-162.

23. Qayyum, A. (2008). Does monetary policy play effective role in controlling inflation in Pakistan.

24. Shahzad, M. A., Razzaq, A., & Qing, P. (2019). On the Wheat Price Support Policy in Pakistan. *Journal of Economic Impact*, *1*(3), 80-86.

25. State Bank of Pakistan. (2019). *Inflation Monitor September 2019.*

26. State Bank of Pakistan. (2019). *Monetary Policy Statement September 2019.*

27. Tran, N. (2018). The long-run analysis of monetary policy transmission channels on inflation: a VECM approach. *Journal of the Asia Pacific Economy*, *23*(1), 17-30.

28. Waliullah, W., & Rabbi, F. (2011). Effectiveness of Monetary Policy in Pakistan: Empirical Evidence Based on Bound Test Approach. *International Journal of Business and Social Science*, *2*(1).