

Pro-Cyclical of monetary policy with Graduation, Institutions and governance: A case study of Pakistan

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Abstract: Monetary policy role in stability has immense importance especially in the perspective of institutions and governance of a country. This policy performs well in the presence of well-functioning institutions and good governance. Generally, monetary policy adopted by the developed countries is counter cyclical whereas developing economies like Pakistan adopt pro-cyclical policy. Although, developing economies' institutional qualities are key elements in determining their ability to graduate. Ordinary Least Square (OLS) and Two Stage Least Square (2SLS) techniques are applied to evaluate that monetary dogma is either counter cyclical in nature or pro-cyclical in Pakistan. It is established that monetary strategy is pro-cyclical. High profile institutions and good governance is indispensable for counter cyclical monetary policy. Pro-cyclical policy is taken on due to low performing institutions with their lower qualities and poor governance. The financial institutions should take the appropriate measures to manage the pro-cyclical approach of monetary policy. This is one of the initial studies that investigate the cyclical nature of monetary strategy and role of institutions and governance in Pakistani context.

Keywords: Monetary Policy, Cyclical, Pro-cyclical, Counter Cyclical.

JEL Classification: E50, O43, G30

1. Introduction

Stability is a significant goal of nations in this global world. So as to accomplish this aim, definite passageways and strategies are required. Acemoglu *et al* (2003) explicated that growth strategies have considerable part in attaining the growth stability.

The risks in selecting the right growth policy are high (Lucas, 2003). Macroeconomic policies are concentrating to stabilize business-cycle instabilities. Comprehending economic business cycles and their consequences for optimum monetary strategy remain a principal

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experiment for research economists. Monetary policy target is to unwavering business-cycle instabilities and oscillations are normally considered such as optimum (Woodford, 2001). Hence, counter-cyclical strategies are so focused with an opinion of minimizing output instability and stabilizing inflation at a satisfactory level. A monetary policy strategy which soothes mutually inflation and output about the agreed targets is counter-cyclical in nature. The present study analyzes the part of monetary strategy in the viewpoint of institutions and governance of Pakistan.

In contradiction of advanced industrialized economies, emerging economies (EEs) and developing economies are regarded as these economies adopted procyclical or, counter cyclical monetary policy. Lane (2003), inveterate that state banks among developing economies incline to escalate interest ratios through recessions as well as vice versa. In the same way, procyclical monetary policy caused to destabilize the economy (Kaminsky et al. 2004). The cyclicity of monetary strategy varies among different country groups. There is abundant indication that advanced economies incline to track counter-cyclical macroeconomic strategies (Melitz (2000), Gali and Perotti (2003), though most evolving and developing economies conduct procyclical monetary policy (Gavin and Perotti (1997), Ilzetski and Vegh (2008).

Besides this institutions have significant role in implementing growth policies. Developing economies are still deficient in the procedure of economic growth as of developed economies and the ratio of per capita earnings is not adequate. Moreover, the solemn problem of their sluggish growth is halted anywhere else. Therefore, hurdles of sluggish economic growth specify only design of growth and growth of per capita GDP (Lucas, 1988). So, dissimilar economies have the diverse shape and foundations of economic growth. This alteration is perceived through institutional design of advanced and less developing economies.

North and Thomas (1973) explained the originality, capital accretion plus edification, are not considered as causes of economic growth; actually these are true economic evolution. Factor congregation and originality are simply contiguous reasons of actual growth. Therefore, principal explanation of proportional growth is distinction among institutions.

Calderon *et al.* (2004 and 2012) focused the significance of robust political and economic institutions for the countries to execute counter-cyclical type macroeconomic growth strategies. As well this institutional potentials and qualities have significant contribution regarding on graduation from monetary pro-cyclical. It is observed that as qualities of institutions accelerate the procyclicality of growth policy decreases. There are four phases of graduation; 1. Established Graduate (EG) (Counter cyclical) 2. Still in School (Procyclical) (SS) 3. Back to School (BS) (Procyclical) 4. Recent Graduate (RG) (Counter cyclical) (Frankle et al. 2011).

Institutions assist as contributor to governance. The likelihood of crashes is diminished and assists to achieve the contracts via the legal method. Institutions provide pure and ostensible device to direct businesses, therefore to minimize dishonesty and bureaucracy intended hurdles (Grigorian and Martinez 2000).

There is a pioneering application of governance gauges since the preceding twenty years. These gauges are frequently applied to evaluate the efficiency of advanced and underdeveloped countries. A massive exertion on governance gauges is completed in a number of organizations as World Bank and Development Assistance Committee (DAC). Hence, the governance indicators and measurements of first generation are equipped by the key persons of World Bank and numerous researchers as Rodrik (1997) and Isham *et al* (1997). These indicators pull our devotion to the exact matter of governance in both advanced and under developed countries. Though, the formation of first generation indicators has trouble to regulate with applied issues and could not provide any greater grasp on reform objectives. After that the next or second generation gauges have definite method and attempt to shield the deficiencies of first generation developed indicators. Therefore, Second generation gauges are categorized as translucent, precise and definite (Knack and Manning, 2003). The indicators as Civil liberties and Political Rights are established by Freedom House and used in present study to measure governance. Scully (1998) and Levine and Renelt (1992) applied such indicators in their practical studies.

The less developed economies espouse pro-cyclical policies owing to meager efficiency of institutions (Tornell and Lane, 1999). So, the developing countries still face hurdles like less GDP, a little saving ratio, squat investment, amassed unemployment, mounting government's disbursements particularly non development expenses, agrarian contextual and pitiable tax assortment. By way of all these features, the fantasy of economic steadiness is becoming further problematic. Together with these dishonest bureaucracy and unproductive administration machinery marks the execution of growth strategies convoluted and tough. One of the vigorous foundations of realization is monetary strategy which is elaborated in case of Pakistan.

Being developing economy, Pakistan's monetary strategy has healthy part to bring stability. However, Pakistan's monetary policy is operationalized by State Bank of Pakistan (SBP). Pakistan adopted monetarism to attain monetary stability. Monetarism is that monetary policy is a leading foundation for controlling the business rotation fluctuation and an unceasing monetary evolution rule can be trailed in order to suave out the uncertainties in output. State Bank of Pakistan (SBP) managed progression in M2 contained by required bounds. Broad money is issued on the source of a projected money demand purpose by keeping in view government's per annum economic growth and inflation goals for the year. (Hanif *et al.* 2016). SBP shifted from monetary targeting to a wide-ranging technique and exchange rate has the major role of market motivated. The operative objective has been converted from backup money to the market place repo ratio. Therefore, monetary strategy position is gestured through variation in discount ratio and legal liquid proportion.

The major objectives of the study are as follows

- To analyze whether Pakistan is Sill in School (SS) phase of Graduation regarding monetary Policy
- To evaluate the role of Economic Institutions and Governance in adopting the Pro-cyclical Monetary Policy
- To assess the role of Political Institutions and Governance in adopting the Pro-cyclical Monetary Policy

The structure of this paper is like. Segment II comprises review of significant literature; Segment III elaborate the theoretical context of the

study, methodology of the paper is explained in the next segment IV, empirical conclusions are given in segment V and in segment VI conclusion are elaborated and strategic suggestions and repercussions are also suggested.

2. Review of Literature

Monetary strategies are mostly planned to establish business-cycle oscillations that are ordinarily identified as optimal strategy (Woodford, 2001). Monetary pro- cyclicity strategy is followed by central or state banks to gain integrity (Calvo and Reinhart, 2002 and Mendoza, 2002). It is joint occurrence that state banks in the less developed economies of the world incline to raise interest ratios through slumps and reduce in enlargement. This is too establishing fact regarding pro-cyclicality of monetary policy which is the robust basis to produce the economic instabilities in newly evolving countries (Dolado and Dolores, 2001, Gerrard et al. 2003, and Kaminsky, *et al*, 2004). Though, state banks in advanced OECD economies usually implement monetary policies which are counter-cyclical by nature (Lubik and Schorfheide, 2007). Pro-cyclical monetary policy are repeatedly followed when state banks had deficiency of credibility (Calvo and Reinhart, 2002; Mendoza, 2002). Pro-cyclical type monetary dogma is damaging as it supports the business rotation (Kaminsky *et al.*, 2004).

Duncan (2014) examined the links among institutional superiority, cyclicity of monetary policy and instability of output. The developed economies have strong institutions and shows positive output interest rate relation whereas developing economies show negative relation due to weak institutions.

Coulibaly (2012) emphasizes on Emerging Markets interest amounts and credit evolution through the latest catastrophe. It is discovered that the indication of adopting the countercyclical type monetary strategy and assigns this to aspects like macroeconomic weaknesses, liabilities, financial segment modification, and implementation of Trade openness besides more counter cyclicity observed in EMs as these factors upgraded. Numerous present studies as Calderon and Schmidt-Hebbel

(2008), Calderon *et al.* (2012), Duncan (2014) examined the substantial part of organizations and institutions in implementing counter cyclical, acyclical or procyclical monetary strategy in advanced and unindustrialized countries respectively. However, the role of institutions has given no significant position till 1970s. Institutions' role is vibrant in gaining growth goals. Institutions are foremost source in acquiring growth stability. The existing literature has authenticated role of institutions in the progress of a country. As Mauro (1995) and Roderik *et al.* (2004) elaborated the function of a country's institutions is vital for economic growth. Rodrik (2008) exactly stresses the requirement of institutions "Getting the institutions right first" to attain the stability.

The evolution of institutions is elaborated by (North, 1981). The dissimilarity between contract theory and predatory concept is elaborated regarding institutions. In line with the first scheme, the administration and associated institutions present the lawful edifice that certifies private treaties to support economic contacts which curtail the transaction costs. Nevertheless, the predatory scheme describes that the government is a method for flowing resources from one group of individuals to another.

In institutional erection amid developing countries, the function of colonial supremacy is too foremost. The colonial powers of Europe have developed gigantic colonial kingdom. The colonial governments established institutions in keeping their own individual benefit. The region, in which the death rates are lofty, the colonial governments' decide not to inhabit in these countries eternally and establish pull out institutions like African country, Congo. These pull out institutions are not interested in providing security of property right and no system is there in disagreement to the government expropriation. Alternatively, the region where weather is supportive, like USA, the colonial governments establish superior institution resembling the institutions of Europe. Such institutions are functioning in ex-colonial countries (Acemoglu *et. al.*, 2001).

Numerous robust empirical studies like Dawson (1998), Heckman and Stroup (2000) and Bangoa and Sanchez (2003) explained that economic institutions have noteworthy connection to enhance the per capita GDP. Du. Plessis (2006) elaborated that South Africa has experienced a segment

of noteworthy stabilization since 1990s. The structural (SVAR) procedure is applied to debate the cyclical of fiscal and monetary policy. The time span of the present study is 1994-2006. It is commonly recognized that monetary strategy has noteworthy part in soothing the economic condition of the country. Though, the part of fiscal strategy is not so robust in this affection. It is established that monetary strategy has steadying role while fiscal strategy is offering procyclical part particularly in contemporary era. Besides institutions, governance is now becoming an indispensable subject matter of research in the present world, particularly in the under developed countries. In 1970s, Word governance is gone off from shadows to brighter shining day in the history of economics. This word, governance is used just five times in the decade of 1970s. In 1980s, it is used 112 times and in the decade of 1990s it is used 3,825 times (Dixit, 2009).

Chaudhry (2009) examined the effect of different noteworthy economic and social variables on indicators of governance. The findings of the study propose that societal and economic (fiscal and monetary) variables have actually sturdy effects on the issue of governance. Sharma (2007) explained the effects of poor governance on economy which holds back the economic growth procedure

Akram *et al* (2011) examined the dominant poverty in Pakistan. It is instigated due to two major reasons one is meager governance and the other is income inequality. The present study attempts to discover the impact of meager governance and rising inequality. The study covers the time period from 1984 to 2008. Time series approach, Autoregressive Distributive Lag (ARDL) is used to observe the association between poor governance and poverty. No doubt there is robust association among these two variables. Hence Governance should be upgraded to diminish the level of poverty.

Coulibaly (2012) and Vegh and Vuletin (2012) found the evidence of graduation among emerging economies (EM). These economies became graduate (adopt counter cyclical monetary policy) as increasing the quality of their institutions.

Frankel *et al*. (2013) elaborated that numerous developing economies are converted from executing pro-cyclical type fiscal strategy to

accomplishment of counter-cyclical fiscal strategy in the early period of 2000s. Though, it is claimed that by upgrading the institutional qualities, this conversion is acquired.

Kifayat Ullah *et al.* (2016) elaborated the role in institutional quality regarding monetary policy of Pakistan. The variable of institutional quality is insignificant in the long run ARDL findings.

3. Theoretical Consideration

The classical approach of monetary policy is double the money and doubles the price. According to the classical economists, money has no significant role in economic growth. However, Keynesians do not support this direct link of money with the price level. In present ear, monetary policy is performed by the central bank of a country. It controls the money supply and rate of interest to gain the stability in the economy. Through changing the interest rate, the spending level will be increased or decreased. In order to change the spending level, the money balance also has significant effect. Chari, *et al* (1995) elaborated the role of money in the economy. Money significantly affects the price level.

The theoretical foundation of the counter-cyclical policy method is the new Keynesian open economy model, which proposes that under full unification, the case wherever an economy can borrow and loan easily in the worldwide financial markets, the optimum policy method is counter-cyclical whereas for economies which are autarky, pro-cyclical growth policies are perfect (Yakhin, 2008). There are a numerous pragmatic studies on the nature of monetary policy in developing countries. These include Coulibaly (2012) and Du-Plessis *et al.* (2007), Takáts (2012), Yakhin (2008), Kaminsky *et al.* (2004), Calderon *et al.* (2003) as well as Lane (2003) elaborated pro-cyclicity of monetary dogma.

Cyclicity (pro-cyclicity, counter-cyclical or acyclical) regarding growth policies (Fiscal and Monetary) is because of weak national financial arrangement, increasing debt quantity, and low reliability in economic growth strategies (Talvi and Vegh, 2005). Slimane *et al* (2010) examined that less developed countries implement pro-cyclical economic growth policies because of weak institutions. The economies committing pitiable

growth strategies possess fragile institutions, inescapable corruption rate, be lacking in the execution of property rights, repudiation of bonds, occurrence of weak political structure of institutions (Acemoglu, *et al*, 2003).

The usage of term institution is at present common in the area of social sciences in current years. It reveals that the evolution in institutional economics and the usage of the institution perception in numerous other areas, as well as philosophy, social work, political science, and geography. This notation has an extensive antiquity of practice in the social sciences, seeing back as a minimum to Giambattista Vico in his famous *Scienza Nuova* of 1725 (Hodgson, 2007).

Likewise, the neo classical economists had not focused to the part of institutions in the growth procedure. The classical and neo classical economists only stress to production activities and technical enhancement. They do not concentrate fully to legal property civil rights and defense issues (Rodrik, 2000). Institutions have sturdy role in economic growth and intensified by numerous researchers. Wolf (1955) elaborated that economic institutions stimulate or hinder procedure of progression. Besides this governance has also significant role in growth accelerating activities. Poor governance hinders the smooth functioning of monetary policy. The thought of governance is not new. There is a revolutionary usage of governance signs since previous twenty years. Such governance gauges are applied to evaluate the efficiency of both less developed and developed countries. A massive toil on governance is completed in various organizations as World Bank and Freedom House. However, the indicators regarding governance could not gain significant importance till 1990s and then special attention is given through the World Bank. The World Bank's head explained that Bank necessarily analyze the procedure of loan. This loan would be connected with political efficiency like lower the level of corruption (Arndt and Oman, 2006).

4. Data Sources and Methodology

4.1 Sources of Data

The data in present study is time series and the time duration is 1980-2016. The data is composed from World Development Indicators and hand book of Statistics published by State Bank of Pakistan.

4.2 Methodology

The robust aim of this study is to perceive the nature of cyclicity of monetary strategy by keeping in view both the institutions (Economic and Political) and governance. The part of institutions is particularly concentrated; robust institutions support the government in executing monetary growth policy. Though, institutions and variables regarding growth may be the basis the endogeneity (Falcetti, et al. 2002). Correspondingly, the dataset about institutions may be source of multicollinearity. Therefore, Principal Component Analysis (PCA) approach is used.

4.2.1 Principal Component Investigation

The foremost objective of this approach is to declining dimensionality in the data. Preisendorfer and Mobley (1988) elaborated Beltrami (1873) firstly recognized the singular value decomposition (SVD) in this way that planned contemporary PCA. Nevertheless, this is commonly anticipated that the preliminary explanations of current PCA is presented by Pearson (1901) and Hotelling (1933). This approach is linear amalgamation or alignment of the arbitrary variables X_1, X_2, \dots, X_n and be reliant on the covariance milieu.

4.2.2 Order of Identification

For order condition the following formula is used.

$$K - k \geq m - 1$$

m = Number of endogenous variables in the equation to be identified.

K = Number of predetermined variables in the model.

k = Number of predetermined variables in the equation to be identified.

$$K - k \geq m - 1 \quad K = 14, k = 11 \text{ and } m = 1$$

So order condition is fulfilled.

4.3 Two Stage Least Square (2SLS)

Two SLS procedure was advanced by Theil (1953a and b) independently. Basman (1957) and Sargan (1958) added a lot to the 2SLS. The dependent variable of one equation may appear as independent variable in other equation. The variables used in this method are not independent of each other. The use of OLS will produce inconsistent result. 2SLS can be applied to individual equations. This methodology is easy to apply as there is only need to identify the sum of exogenous variables. The plain hint behind the 2SLS method was to substitute the random endogenous regressor with one which is non-random and subsequently autonomous of the error term (Asteriou, 2006). 2SLS estimation was carried out by single equation method. The estimation of single equation was unaffected by the other equation of the system in 2SLS (Creel, 2006).

Suppose the estimate vector η (eta) in the regression model. Estimate of η required variables which are instruments. A variable correlated with endogenous variable in z_t and uncorrelated with error μ_t is called a valid instrument.

$$y_t = \eta' z_t + \mu_t \dots \dots \dots (1)$$

$$y_t = \eta_1 + \eta_2 z_{2t} + \eta_3 z_{3t} + \eta_4 z_{4t} + \eta_5 z_{5t} + \mu_t$$

Consider regression of z_{it}

$$z_{it} = \delta'_t x_t + e_{it} \dots \dots \dots (2)$$

Fitted value for regression given by

$$\hat{z}_{it} = \hat{\delta}'_t x_t \dots \dots \dots (3)$$

Suppose where

$$\delta_t = \left[\sum_{t=1}^T x_t x_t' \right]^{-1} \left[\sum_{t=1}^T x_t z_{it} \right] \dots\dots\dots(4)$$

$$\hat{z}_{it} = z_{it}$$

$$\hat{z}_t = \delta' x_t \dots\dots\dots(5)$$

Transpose

$$\hat{\delta}' = \begin{bmatrix} \hat{\delta}'_1 \\ \hat{\delta}'_2 \\ \cdot \\ \cdot \\ \hat{\delta}'_k \end{bmatrix} = \begin{bmatrix} \sum_{t=1}^T z_t x_t' \\ \sum_{t=1}^T x_t x_t' \end{bmatrix}^{-1} \dots\dots\dots(6)$$

So

$$\eta_{2sls} = \left[\sum_{t=1}^T \hat{z}_t' \hat{z}_t \right] \left[\sum_{t=1}^T \hat{z}_t y_t \right] \dots\dots\dots(7)$$

Putting the value $\delta' x_t$ from equation no 5

$$z_{it} = \hat{\delta}'_i x_t + e_{it} = \hat{z}_{it} + \hat{e}_{it} \dots\dots\dots(8)$$

By the condition of orthogonal

$$\sum_{t=1}^T x_t \hat{e}_{it} = 0$$

Put the values \hat{z} from equation no 5

$$\sum_{t=1}^t \hat{z}_{jt} \hat{e}_{it} = \hat{\delta}'_j \sum_{t=1}^T x_t \hat{e}_{it} = 0$$

Multiply equation 8 by \hat{z}_{jt}

$$\sum_{i=1}^t \hat{z}_{jt} z_{it} = \sum_{i=1}^t \hat{z}_{jt} (\hat{z}_{it} + e_{it})$$

By the definition of Kronecker delta $z_{ji} = (1 \text{ if } i=j, 0 \text{ if } i \neq j)$

$$\sum_{i=1}^t \hat{z}_{ji} z_{it} = \sum_{i=1}^T \hat{z}_{ji} \hat{z}_{it}$$

$$\sum_{i=1}^t \hat{z}_i z_i = \sum_{i=1}^T \hat{z}_i \hat{z}_i$$

$$\eta_{2sls} = \left[\sum_{i=1}^T \hat{z}_i \hat{z}_i' \right] \left[\sum_{i=1}^T \hat{z}_i y_i \right]$$

Put the value of $\hat{\delta}'$ from equation 6

$$\eta_{2sls} = \left[\left[\sum_{i=1}^T z_i x_i' \right] \left[\sum_{i=1}^T x_i x_i' \right]^{-1} \left[\sum_{i=1}^T x_i z_i' \right]^{-1} \right] \left[\left[\sum_{i=1}^T z_i x_i' \right] \left[\sum_{i=1}^T x_i x_i' \right]^{-1} \left[\sum_{i=1}^T x_i y_i \right] \right]$$

Consider the special case in this number of instruments is exactly equal to number of endogenous explanatory variable

$$\eta_{IV} = \left[\left[\sum_{i=1}^T x_i z_i' \right]^{-1} \left[\sum_{i=1}^T x_i x_i' \right] \left[\sum_{i=1}^T z_i x_i' \right]^{-1} \right] \left[\left[\sum_{i=1}^T z_i x_i' \right] \left[\sum_{i=1}^T x_i x_i' \right]^{-1} \left[\sum_{i=1}^T x_i y_i \right] \right]$$

Above equation is also known as instrumental variable (IV) (Hayashi, 2000).

4.4 Test For Endogeniety

This endogeneity test is established by Durbin (1954), Wu (1973) and Hausman (1978). These tests, evaluate the given model via using mutually Ordinary Least Square and IV approaches. The assessment can basically be executed by amassing the residuals of all endogenous right-hand side variables, such as meaning of the complete exogenous variables.

5. Empirical Findings

5.1 Going on Graduate from Monetary Pro-cyclicality

Going on graduate from monetary pro-cyclicality is evaluated through institutional qualities. There are four variables of institutional qualities; Investment Profile, Corruption, Law and Order and Bureaucratic Quality are applied to evaluate the cyclicality. An index is constructed through applying equal weight. The institutional qualities index is ranges from 0 to 1. The average value of the Index is 0.39. Lower values of Index shows the pro-cyclicality of monetary policy. It is found that Pakistan “Still in School (SS)” phase of graduation. The findings are in accordance with Frankel et al (2013).

5.2 Selection of Pragmatic Model

So as to evaluate cyclicality of monetary policy, monetary response is assessed through the domestic credit to private sector, output gap and a few control variables. In order to find the output gap, Hodrick-Prescott (HP) filter is applied, as Kaminsky *et al* (2004). Therefore, to suave time series annual data, the parameter is adjusted at 6.25 as recommended by Ravn and Uhlig (2002). By way of cyclicality is a foremost hint which assists to understand the pathway of monetary strategy. In this study, the following model is used to estimate cyclicality.

$$\text{LogDCP}_t = \alpha_0 + \alpha_1 \text{LogY}_t + \alpha_2 \text{LogX}_t + \varepsilon_t \quad (\text{Eq 1})$$

DCP is domestic credit to private sector, Y is the output gap estimated as the cyclical element of quantity produced divided by real production, X is the control variables, ε_{it} disturbance term, α_0 is intercept and all α s are coefficients and t is for time.

$$X_t = DCP_t, GDPH_t, LDCP_t, POL_t, FDIP_t, EXP_t, GOVI_t, GCEG_t, INF_t, IMP_t, POPT_t, ECO_t, UNEM_t, GFCCG_t$$

DCP = Domestic Credit to Private Sector

GDPH = GDP hodrick-prescott

LDCP = Lag of DCP

POL = Political Institutions

FDIP = Foreign Direct Investment

EXP = Export

GOVI = Governance Index

GCEG = Government Consumption Expenditure Growth

INF = Inflation

IMP = Import

POPT = Population Total

ECO = Economic Institutions

UNEM = Unemployment

GFCCG = Gross Fixed Capital Growth

With the aim of to estimate the monetary strategy, either it counter cyclical or pro cyclical, DCP is used as dependent variable as kaminsky et al, (2004) elaborated that it has a cyclical constituent. This study applies OLS and Two Stage Least Square (2SLS) approaches to evaluate the cyclicity of monetary policy. The following models are used in this study.

5.2.1 Models of the Study

The following are the models of the study.

5.2.1.1 Model 1: Monetary Policy Cyclicity, Economic Institutions and Governance

$$\log DCP_t = \alpha_0 + \alpha_1 \log GDPH_t + \alpha_2 \log LDCP_t + \alpha_3 \log ECO_{it} + \alpha_4 \log UNEM_t + \alpha_5 \log GCEG_t + \alpha_6 \log EXP_t + \alpha_7 \log GFCG_t + \alpha_8 \log GOVI_t (\log POPT_t = \log IMP_t, \log INF_t) \quad (\text{Eq } 2)$$

5.2.1.2 Model 2: Monetary Policy Cyclicity, Political Institutions and Governance

$$\log DCP_t = \beta_0 + \beta_1 \log GDPH_t + \beta_2 \log LDCP_t + \beta_3 \log POL_t + \beta_4 \log FDIP_t + \beta_5 \log EXP_t + \beta_6 \log GOVI_t + \beta_7 \log GCEG_t + (\log INF_t = \log IMP_t, \log POPT_t) \quad (\text{Eq } 3)$$

5.3 Empirical Results

Cyclicity of monetary policy, institutions and governance relationship is analyzed. In this regard descriptive statistics are elaborated first.

5.3.1 Descriptive Statistics

The foremost structures of numerical description of the given variables are presented in the following table.

Table 5.1 Descriptive Statistics

	L D C P	LD CP	L E C O	LE XP P	LG CE G	LG DP H	LU NE M	LG FC G	L G O VI	LP OP T	L P O L	L I N F
Mean	3.06	3.07	2.44	2.69	2.04	25.51	1.52	1.41	1.73	18.72	2.04	2.2
Median	3.19	3.17	2.43	2.71	2.11	25.35	1.53	1.46	1.74	18.64	2.08	2.18
Maximum	3.21	3.27	2.49	2.82	3.02	26.05	1.83	1.99	1.85	19.04	2.08	2.51
Minimum	2.76	2.8	2.4	2.5	0.41	25.06	1.14	0.92	1.45	18.46	1.95	1.97
Std.	0.	0.2	0.	0.1	0.9	0.4	0.2	0.4	0.1	0.2	0.	0.

Dev.	21		04	3	5	2	4	1	5	4	06	21
	-	-	0.	-	-	0.4	-	0.0	-	0.4	-	0.
Skewness	0.71	0.59	0.43	0.24	0.72	0.9	0.34	0.33	1.18	0.8	0.71	0.3
Kurtosis	1.52	1.54	1.58	1.39	2.49	1.55	2.15	1.82	3.25	1.56	1.55	1.62
Jarque-Bera	1.05	0.88	0.68	0.69	0.58	0.76	0.29	0.35	1.42	0.75	1.06	0.56
Probability	0.59	0.64	0.71	0.71	0.74	0.68	0.86	0.84	0.49	0.68	0.58	0.75
Sum	18.34	18.43	14.69	16.15	12.22	153.06	9.12	8.45	10.36	11.23	12.21	13.22
Sum Sq. Dev.	0.23	0.2	0.007	0.09	4.52	0.86	0.29	0.86	0.11	0.29	0.023	0.22
Observations	6	6	6	6	6	6	6	6	6	6	6	6

The variables used in this study are twelve and the time period is 1980-2016. . The mean and median values of above mentioned variables are very adjoining and this show symmetry among variables. These variables are closely spread from the mean values as specified by the minor standard deviations. LPOL is less volatile variable. The variables used in this study are not greatly skewed as their skeweness values are near to zero. The values of kurtosis are not remote from three. Jarque- Bera values display the standard distribution of all variables used in the study.

Model 1: Cyclicity of Monetary Policy, Economic Institutions and Governance

So as to evaluate the cyclicity of monetary strategy, OLS and 2SLS techniques are used in present study. The variables Economic institutions and governance are too used to evaluate their role in monetary strategy. The outcomes are prearranged in the following Table.

**Table 1: Monetary Policy, Eco Institutions and Governance
(Dependent Variable: LogDCP)**

Variables	OLS		2SLS	
	Coef.	P	Coef	P
loggdp	6.2407	0.072***	10.0366	0.068***
logLdcp	0.4962	0.027**	0.4889	0.043**
logeco	-3.7649	0.107	-4.8659	0.088***
lognem	0.0308	0.868	0.1221	0.588
loggceg	-0.0201	0.369	-0.0244	0.337
logexpp	0.5985	0.045**	0.6769	0.048**
loggfcg	0.0827	0.094***	0.086	0.114
loggovi	0.3068	0.128	0.3751	0.113
logpopt	-10.857	0.072***		
cons	52.6624	0.055	82.0622	0.058

The OLS and 2SLS results elaborate that the monetary strategy in Pakistan is procyclical as LogLDCP is noteworthy in our two models and possesses affirmative coefficient sign. Besides this, the Loggdph is also significant that also elaborated the cyclical behaviour of monetary strategy. Both the variables are robust in determining the cyclicity of monetary policy. The positive coefficient signs elaborate that the monetary policy is pro-cyclical. The economic institution variable Logeco is significant and has negative coefficient sign. These findings are similar as of Kaminsky et al, (2004) and Calderon *et al* (2012). This elaborates that Pakistan adopts pro-cyclical monetary policy. It is owing to meager performance of institutions (Duncan, 2012). Logeco is significant and possesses negative coefficient sign that show the weak efficiency of our

institutions. Hence, governance variable Loggovi is insignificant. The variables logUnem, Loggfcg and Loggceg are insignificant in both models. The diagnostic tests; Auto, Hetro and Ramsey P. Values are 0.3418, 0.4894 and 0.5380 respectively. Endogeniety test is also performed and the P. value is 0.0000 which show that endogeniety exist in the model.

Model 2: Cyclicity of Monetary Policy, Political Institutions and Governance

So that, estimate the cyclicity of monetary strategy, OLS and 2SLS tests are used in this model. The variables of Political institutions and governance are applied to evaluate their part in monetary strategy. So, the findings are provided in the following Table.

Table 2: Monetary Policy, Eco Institutions and Governance (Dependent Variable: LogDCP)

Variables	OLS		2SLS	
	Coef.	P	Coef	P
loggdph	0.4007	0.019**	0.3994	0.021**
logLdcp	0.2512	0.097***	0.2526	0.098***
logpol	-0.3531	0.058***	-0.3498	0.061***
logfdip	0.0631	0.035**	0.0625	0.037**
logexpp	0.277	0.007*	0.2772	0.007*
loggovi	0.1272	0.017*	0.1277	0.016**
loggceg	0.0073	0.028**	0.0074	0.029**
loginf	-0.0512	0.026**		
cons	12.37	0.023	12.33	0.024

The OLS and 2SLS results indicate regarding the monetary strategy in Pakistan is pro-cyclical. The LogLDCP variable is significant in OLS and 2SLS and the sign of the coefficient is positive. The variable Loggdph is noteworthy that elaborates the cyclical behaviour of monetary strategy. As both the variables are significant and have positive coefficient sign which depict that monetary policy is pro-cyclical in Pakistan. The political

institution variable is significant and negative coefficient sign. The results of two key variables are identical as of Calderon *et al* (2012). This elaborates that Pakistan adopts pro-cyclical type monetary strategy. This is caused by pitiable performance of institutions (Duncan, 2012). Logpol is significant and negative coefficient sign which elaborates the meager performance of political institutions. All other variables logfdip, logexp, loggovi and loggceg are significant. The diagnostic tests; Auto, Hetro and Ramsey P. Values are 0.7099, 0.7198 and 0.5082 respectively. Endogeneity test is also performed and the P. value is 0.0000 which show that endogeneity exist in the model.

6. Conclusion and Policy Recommendations

The present study has elaborated the cyclical association amid monetary strategy, institutions and governance in Pakistan. Besides this, pro-cyclicity of monetary dogma with graduation is also elaborated. Institutional quality matters a lot regarding adopting cyclicity of monetary dogma. The countries having high quality institutions adopt counter cyclical monetary dogma. As there are four phases of graduation but Pakistan is still in the phase of “Still in School” (SS). It clearly depicts that Pakistan is still adopting Pro-cyclical monetary strategy. The time series data for the period of 1980-2016 is applied for pro-cyclicity of monetary policy in Pakistan. So as to appraise the cyclical aspect of monetary strategy in Pakistan, the part of institutions with governance is also examined. In order to evaluate the monetary policy cyclicity, Ordinary Least Square (OLS) besides Two Stage Least Square (2SLS) techniques are used. The OLS and 2SLS outcomes show that the monetary strategy in Pakistan is procyclical. LogLDCP and LogGDPH are significant and robust in OLS and 2SLS models and have affirmative coefficient sign. This elaborates that monetary policy is procyclical in Pakistan. The role of institutions is vigorous in cyclicity of monetary dogma. The variables regarding economic and political institutions are significant and possess negative coefficient sign suggest the weak quality of institutions. So due to weak institutions, Pakistan adopt pro-cyclical monetary policy. Governance variable is insignificant in model 1 and significant in model 2. The variables logfdip, logexpp and loggceg are

significant in model. The results are as in study of Calderon *et al* (2012). This clearly shows that monetary policy in Pakistan is pro-cyclical.

There is dire need to improve the performance of Economic and political institutions. Pakistan should strengthen economic and political institutions with good governance to apply counter cyclical monetary policy. Besides this, FDI and Exports should be focused by the government as both increase the level of domestic credit to private sector. As FDI increases, the local investors will be motivated, further more increase infrastructure facilities due to FDI also allures the investors and banker to take active part in economic activities. Accelerating exports also play robust role in increasing DCP.

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