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Institutional and Non-Institutional Determinants of Volatile Non-Systematic Discretionary Spending: A Panel Data Analysis

Farhat Rasul¹, Nabila Asghar², Hafeez Ur Rehman³

¹Assistant Professor, Department of Economics and Statistics, HSM. University of Management and Technology, Lahore, Pakistan

²Associate Professor, Department of Economics and Business Administration, Division of Management and Administrative Science, University of Education, Lahore, Pakistan

³Professor/ Chairman, Department of Economics and Statistics. HSM. University of Management and Technology, Lahore, Pakistan

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ABSTRACT

The volatile and patchy nature of discretionary public spending has different implications for overall economic performance. The present study examines the institutional and non-institutional features of non-systematic discretionary public spending. The study considers a panel of 55 economies from 1990 to 2019 and applies GMM estimation technique. The findings suggest that in the aggregated sample, constraints on executives, government stability, bureaucratic quality, economic growth, and size of a nation significantly decrease the instability in non-systematic discretionary public spending; but, presidential system, corruption, and openness of economies promote such spending volatility. Furthermore, disaggregated analysis suggests that in developing economies, constraints on executives become insignificant to lower discretionary public spending volatility, while, in developed economies, the presidential system and corruption appear insignificant to promote volatility in non-systematic discretionary spending.

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Corresponding author's email address: hafeez.rehman@umt.edu.pk

1. Introduction

Over the last few decades, a significant expansion has been recorded in public spending. Where such expansion is observed to translate into a higher level of public debt and the budget deficit (Barro, 1979; Sinha *et al.* 2011). Subsequently, fiscal literature inquires factors, which lead to fiscal deterioration. Nevertheless, fiscal discretion – a deliberate change in spending policy; which is responsible for aggressive use of spending and causes fiscal deterioration is omitted dimension in the fiscal research agenda (Albuquerque, 2011; Fatás & Mihov, 2009). The public authorities use two types of discretion in spending; the

‘systematic discretion’, which is used to smooth out fluctuations in the business cycle to correct the path of investment and growth (Furceri & Poplawski Ribeiro, 2008), and ‘non-systematic discretion’, which is executed as independent of business cycle fluctuations (Fatás & Mihov, 2003). The latter part, which is primarily used for political motives is observed volatile, as evident from figure A1 in the appendix.

Volatility in non-systematic discretionary spending is believed to have severe macroeconomic consequences. For instance, such policy volatility generates macroeconomic uncertainty, which adversely affects the decisions of investors and economic agents and retards economic growth (Albuquerque, 2011; Ali, 2005; Fatás & Mihov, 2009). Therefore, a question arises, whether constraints should be imposed on public authorities to limit discretionary powers. There exist two opinions in this regard: one view suggests that restrictions on fiscal authorities could shrink adverse growth consequences of higher policy volatility triggered by the unbounded fiscal plan (Alesina & Bayoumi, 1996). Nevertheless, the other view suggests that though restrictions could shrink volatility; however, reduces the ability of fiscal authorities to deal with business cycle fluctuations (Lane, 2003). Thus, restrictions delay economic adjustment to unobserved shocks (Ali, 2005; Alt & Lowry, 1994).

The political economy literature extensively discusses the motives of fiscal authorities to use discretion in fiscal instruments. There exists a consensus in the literature that volatility in discretionary spending obliterates monetary commitment (Dixit & Lambertini, 2001), promotes output volatility (Badinger, 2009), and harms economic growth (Fatás & Mihov, 2013). Generally, the economies, which follow more discretionary measures coupled with the large budget deficit, and unstable exchange rates face higher instability and lower economic growth (Acemoglu *et al.* 2003). Despite the higher economic cost, an exclusive institutional structure often motivates office-bearers to exercise discretion in policies. Consequently, with pro-growth and stabilizing characteristics, fiscal measures become the source of macroeconomic instability.

Now, what can be done to restrain authority holders from unnecessary volatile discretionary spending? To answer the question, literature proposes the formation and implementation of budgetary institutions, i.e., designing measures, which keep check and balance over the matter of public finance. Soetjpto, *et al.* (2020) provide a basis for encouraging public sector performance to smoothly all the government projects, especially in the area of public services. Additionally, the matter is associated with fiscal and even political institutions, which shape the behavior of economic decisions (Persson, 2002; Persson & Tabellini, 2001). Therefore, institutional change is required to ensure policy stability. The idea of strengthening the structure of institutions ranges from simple arrangements to comprehensive accountability and transparency of underlying policies. This implies that to precise decide about the volume of the budget deficit, the authority should be handed over to the autonomous committee (Wyplosz, 2005). Nevertheless, in certain situations political factors do not reduce the volatility of discretionary policy, yet, size of government and quality of institutions seem to have significant implications for discretionary fiscal volatility (Albuquerque, 2011).

Driven from the discussion, non-systematic discretionary spending is an undesirable part of public spending. Although, its economic consequences are well explored; however, the factors, which shape the behavior of such spending are largely ignored (Fatás & Mihov, 2003; Albuquerque, 2011). The present study inquires about the institutional and non-institutional factors that affect non-systematic discretionary spending. This study contributes to the existing literature in several ways. Firstly, this study decomposes total public spending and calculates a precise measure of non-systematic discretionary spending, which is not associated with business cycle fluctuations. To do this, the study amends the fiscal rule model

of Fatás and Mihov (2003) by including additional control variables such as the size of the nation, public debt, and tax revenue. Secondly, this study calculates the unconditional and conditional volatility of non-systematic discretionary spending for each entity (economy). Third, this study searches factors that shape the structure of non-systematic discretionary spending for both the aggregated sample of economies and also for the disaggregated samples of developed and underdeveloped economies. Through the disaggregate analysis, the study controls the bias caused by the diversified nature of two sets of economies. Finally, this study conducts a robust check by employing different panel estimation methods; however, rely on the estimates of Generalized Method of Moment (GMM), to overcome the problem of endogeneity in regressions.

2. Literature Review

2.1. Discretion in Fiscal Policy

A systematic body of the political economy literature attempts to bring the structures of political institutions to the spheres of economics and together make it clear to understand the outcomes of any economic policy. The literature explains that fiscal policy is not always executed by benevolent governments; rather such policy is framed by political actors who have certain political objectives. To put it differently, the political actors to achieve political mileage create higher variation in fiscal parameters compared to what is needed if authorities react only to cyclical shocks. Thus, despite a growth-stimulating driver, such kind of behavior results in unfavorable fiscal's plans, which creates macroeconomic uncertainty. Hence, the question arises of what inspires fiscal authorities to exercise discretion in fiscal policy.

Additionally, other studies on the issue, such as Fatás and Mihov (2009), Albuquerque (2011), and Alesina and Drazen (1989) inquire about the issue in more dynamic settings. These studies suggest that restrictions on fiscal authorities and the concentration of government powers can significantly define the structure of non-systematic expenditure. Consequently, two main questions are addressed by literature. First, why there occur changes in fiscal policy. Second, one should be aware of the existing political and institutional setup in a country to comprehend, why some governments prefer to use more discretion in fiscal measures than others.

2.2. The Need for Restraining Discretion in Fiscal Policy

Enormous literature provides evidence about undesirable economic outcomes as a result of substantial volatility caused by the aggressive use of discretionary fiscal measures. For instance, Fatás and Mihov (2003, 2009) and Badinger (2009) provide suggestive evidence that output volatility is strongly influenced by the level of discretionary fiscal measures. This undesirable situation supports the imposition of constraints on fiscal authorities to ensure economic stability instead of leaving them unrestricted. As often, monetary decisions are handed over to independent central banks to avoid high inflationary pressure and improve monetary discipline. Nevertheless, there exists no consensus among policymakers to restrict fiscal authorities from aggressive use of discretionary measures (Albuquerque, 2011). Generally, policies are considered in "rules versus discretion" settings, where debate centers around the substitution between flexibility and regulation. In such circumstances, the policy makers have only one option, i.e., to use the fiscal policy to accomplish their political goals.

Considering this dimension, a considerable amount of literature supports the idea of strengthening budgetary institutions, i.e., devising the rules that keep check and balance over

public finance. This rapid attention to improving feature of institutions are supported by the following views. First, institutions directly affect policy preferences, because restrictions in legislation place conditions on fiscal measures. Second, appropriate institutions reduce or abolish the high budget deficit. Third, the desired economic growth could be achieved in presence of quality institutions (Henisz, 2000).

Nevertheless, restrictions on fiscal policy are debatable and controversial. The proponents of discretion in fiscal policy argue that limiting the power of fiscal authorities would reduce their ability to deal with any unobserved shock. Lane (2003) proposes that limiting the fiscal policy promotes pro-cyclicality. In contrast, the authors like Fatás and Mihov (2003, 2009), Alesina and Bayoumi (1996), and Poterba (1994) suggest that political agents generate high deficits and create higher volatility. This instability can be corrected by imposing limits on fiscal authorities. This restriction ranges from numerical fiscal rules to procedural rules (Hallerberg *et al.* 2007; Fabrizio & Mody, 2006; Yläoutinen, 2004; Gleich, 2003; Debrun *et al.* 2008). They discussed literature agrees that the nature of constraints is valuable to improve fiscal discipline.

Additionally, adverse impact channelized through political and institutional setup (Fatas & Mihov, 2013). Alternatively, strong institutions, which impose higher restrictions on fiscal authorities ensure the stability of policy. This in turn stabilizes private investment, which translates into higher economic growth. Hence, a favorable institutional setup could be used as an apparatus to avoid aggressive policy measures. The strategy to build quality institutions starts from the straightforward measures of increasing transparency in policies formation and accountability of public authorities. In other words, an independent competent agency should decide about changes in fiscal parameters and the size of the budget deficit (Wyplosz, 2005).

In literature, the term restriction appears with the term fiscal institutions or simply “institutions”. This covers different dimensions of the social political and economic arrangement of a country, which considerably shapes the direction of any policy. Additionally, such features encompass a range of themes related to political and institutional procedures. The given studies incorporate implicit limits, like procedural rules, and explicit limits, (e.g managing budgetary process, numerical fiscal rules, arrangement of the electoral system), political setup (presidential or parliamentary), ideological preferences, and political parties concentration in parliament.

2.3. Empirical Review

There exist studies such as, Afonso and Hauptmeier (2009), Debrun *et al.* (2008), Hallerberg *et al.* (2007), Annett (2006), Wyplosz, 2005), Fabrizio and Mody (2006), Persson (2002), Henisz, 2000 and Persson and Tabellini (2001) that inquired the factors of the budget deficit and subsequent accumulation of public debt. While the other studies, like Fatás and Mihov (2003, 2009), Lane (2003) investigated the cyclicity of fiscal policy, i.e., the response capacity of fiscal authorities to output shock. Hence, few studies have unfolded the issue related to policy volatility. Nevertheless, the literature specifically on discretionary fiscal volatility is still very scarce except for Fatás and Mihov (2003, 2009), Afonso *et al.* (2010), and Albuquerque (2011).

Fatás and Mihov (2003, 2009) investigate the cost of volatile discretionary policies and the factors that determine such spending volatility. The authors observe in a large sample of countries that volatility in discretionary spending promotes substantial instability in the macroeconomic system and retards average economic growth. These findings hold even after

controlling endogeneity through Two Stage Least Square (2SLS) and Generalized Method of Moment (GMM). Additionally, they note that such policy is significantly correlated to political and institutional setup in a country, i.e., the countries with presidential systems and lower political constraints on the policymakers continue with more aggressive and volatile discretionary spending. Recently, Ali and Khan (2020) inquire about the cost of a volatile discretionary public expenditure system in a large panel of advanced and emerging economies. They also observe that such spending volatility is strongly influenced by the political system (presidential or political system, number of elections, and concentration of the government in the parliament) and historical institutional setup which is shaped by the settler's mortality rate. Similarly, Khan *et al.* (2019) examine the macroeconomics consequences of discretionary spending volatility in a large panel of economies. The authors use the GMM estimation technique and observe that such spending volatility adversely affects economic growth. Additionally, they observe that discretionary spending volatility is primarily influenced by the political institutions, therefore, the fiscal authorities should be restrained through effective fiscal rule, i.e., numerical constraints on spending. Likewise, Albuquerque (2011) examines the influence of financial institutions on the exercise of discretionary spending volatility for 25 EU countries. In an empirical analysis, the author uses the fiscal rule index (Fatás and Mihov, 2003), delegation index, and political, institutional, and macroeconomic variables (Rehman, 2021).

Similarly, Arsic *et al.* (2017) inquires the institutional and political determinants of discretionary fiscal policy in the case of 11 Central and Eastern European economies and observed no such evidence is observed for the fragmentation of the government. Similarly, Umoh *et al.* (2018) investigate the political economy of fiscal policy formation in West African countries and found (i) that fiscal policy in these economies remains persistent over time, which suggest that government in these economies or either unwilling or unable to adopt the counter-cycle policy, (ii) fiscal policy formation is based on the political and institutional factors rather than an economic system, (iii) the main factors defining fiscal perseverance include government effectiveness, corruption, and rule of law. Van *et al.* (2018) point out the need to strengthen existing regulations and corporate laws to control agency spending to reduce the financial turmoil. Sirimaneetham (2006) examines the factors that motivate policy volatility in less developed economies. Investigating policy uncertainty through the Bayesian approach, the author observes that policy volatility is more prevalent in countries that have a presidential system of government, minimum political constraints on policy formation, unstable government, and remained under British Empire. Likewise, inquiring about budget volatility, Agnello and Sousa (2009) examine various institutional, political, and economic factors in a panel of 125 economies. The results showed less democratic values and higher political instability is the main determinants of high deficit volatility. Furthermore, inquiring factors that cause a budget deficit in South Asia and ASEAN economies, Javid *et al.* (2011) considered institutional, political, and economic dimensions and observed that volatility in the budget deficit is significantly a

Associated with political and institutional variables. Whereas, corruption, unfavorable institutional setup (legal and bureaucratic), as well as ethnic, internal, and external conflicts, promote budget deficit volatility. Additionally, Mara (2012) revealed that only economic growth significantly dampens the budget balance volatility, while the other variables have no significant influence on budget volatility. Afonso and Hauptmeier (2009) observed that degree of decentralization of public spending, the existence of the effective fiscal rule, and the electoral cycle positively and significantly affect nation fiscal decisions.

3. Theoretical Background, Data and Econometric Methodology

This section of the study provides a theoretical framework of our analysis, methodological strategy, and data.

3.1. Theoretical Background

There are three components of fiscal policy. First, the automatic stabilizing part, where the fiscal parameters automatically respond to fluctuations in the economic system without any intervention. Second, a systematic discretionary component is a part where a government systematically and deliberately responds to economic shocks to correct fluctuations. Third, a discretionary and non-systematic component is a part of the policy, where fiscal authorities exercise fiscal power independent of business cycle fluctuations. Alternatively, it is an exogenous part of fiscal policy, which is not associated with the current state of the economy rather such expenditure is made for political motives. To retrieve that exogenous discretionary part of the policy, this study amends the Fatas and Mihov (2003) who suggested fiscal rule equation by taking some additional variables such as the size of the nation, public debt, and tax revenue.

$$G_{it} = \beta_0 + \beta_1 G_{it-1} + \beta_2 Y_{it} + \theta^T \sum W_{it} + \varepsilon_{it} \quad 1$$

G_{it} is current real government expenditure, G_{it-1} is lag government expenditure, Y_{it} is real GDP, and W_{it} includes control variables like time trend, inflation rate, inflation rate square, size of the nation, public debt, and tax revenue. ε_{it} is the residual term. The ε_{it} term is interpreted as non-systematic discretionary changes in policy, which is not related to cyclical fluctuations. To find the aggressiveness/volatility of the non-systematic discretionary component, this study uses three years moving average standard deviation of the residual term followed by Albuquerque (2011) and Fatás and Mihov (2003). In equation 2, δ_{it} depicts volatility of non-systematic discretionary public spending.

$$\delta_{it} = \sqrt{\frac{\sum (\varepsilon_{it} - \bar{\varepsilon})^2}{n}} \quad 2$$

This study also inquires factors, which affect the behavior of non-systematic discretionary spending. For this purpose, the computed volatile discretionary part is regressed on the political, economic, and institutional indicators that explain the variation in the policy.

$$\sigma_{it} = \alpha_0 + \alpha_1 \sigma_{it-1} + \beta^\varphi \sum IT_{it} + \beta^\pi \sum M_{it} + \mu_{it} \quad 3$$

σ_{it-1} is the lag of non-systematic discretionary government expenditures, IT_{it} are institutionally related indicators like government stability (gs_{it}), political constraints (pc_{it}), bureaucratic quality (bq_{it}), political system (ps_{it}), and level of corruption (c_{it}). Where, M_{it} includes non-institutional variables, which consist of macroeconomic variables like GDP growth (y_{it}), population (p_{it}), and trade openness (to_{it}), μ_{it} is the error term.

3.2. Description of Sample Size and Data

The study has employed a panel of developed and underdeveloped 55 economies throughout 1990-2019 (appendix Table A1). To dampen short-run disturbances in economic variables, the study has used the five year average data series (e.g 1990-1994, 1995-1999, 2000-2004, 2005-2009, 2010-2014, 2015-2019). This is a fair and standard approach used in various

studies such as Perera and Lee (2013), Forbes (2000) and Dollar and Kraay (2003).

The data used in this study comprises real government expenditure, real GDP, inflation rate, size of nation, trade openness, public debt, tax revenue, political constraints, government stability, political system, level of corruption and non-systematic discretionary spending. The data sources are World Development Indicators (WDI), International Country Risk Guide (ICRG), Database of Political Institutions (DPI), and Political Constraints Index Database (POLCON), respectively.

3.3. Estimation Technique

Both the underline models, given in Equations 1 and 2, suffer from reverse causality, which is considered a potential source of endogeneity. For instance, in model 1, the level of GDP affects government spending (Wagner law), while in reverse government spending affects the level of GDP (Keynesian view). Similarly, in model 2, the level of GDP shapes the structure of non-systematic discretionary spending (Albuquerque, 2011), whereas in reverse the non-systematic discretionary public spending affects the level of GDP (Fatas & Mihov, 2003). Additionally, both the models incorporate lagged dependent variables on the right side. This situation leads to a correlation between lagged dependent variable and first-differenced error (Lee & Azali, 2010).

The bias and inconsistent estimates can be observed and the lagged dependent variable will be correlated with the error term in the case of the OLS estimation method (Lee & Azali, 2010). The results of the estimation techniques like OLS, fixed effect, and random effect produce bias simultaneity bias which cannot define the causal relationship. To overcome this problem, this study has employed the Generalized Method of Moment (GMM) to avoid the potential problems of endogeneity, heteroskedasticity and serial autocorrelation (Arellano & Bond, 1991; Arellano & Bover, 1995).

4. Empirical Results

The empirical results of the study have been discussed for the aggregate and disaggregate levels. The descriptive statistics are given in appendix tables A3, A4 and A5.

4.1. Empirical Analysis (Aggregated)

This study has estimated different panel models to examine the determinants of volatile non-systematic discretionary public spending and the results have been reported in table 1. However, due to different econometric problems, the study only relies on the estimates of the GMM technique. To check the appropriateness and adequacy of the model, the Arellano-Bond AR (2) test and the Hansen test of over-identifying restrictions are employed. The probability values associated with Hansen and Arellano-Bond AR (2) tests are 0.591 and 0.362 respectively, confirming the exogenous and validity of instruments. Turning to the coefficients of the model, this study observes that lag of policy volatility (σ_{it-1}) appears positive and significant, which implies that current year policy behavior is significantly shaped by previous period policy trend. Furthermore, the persistent volatile practice of policy volatility results in spillover effects where such effects transfer significantly to upcoming periods. The coefficient associated to σ_{it-1} predicts that 47% volatility in current year non-systematic discretionary spending is driven by the previous period non-systematic discretionary policy.

It is interesting to note that almost all the institutional variables (except the corruption in one model) appear significant in all models, supporting the view that economic policies are the outcome of institutions. The political system (ps_{it}), i.e., the presidential form of government in comparison to the parliamentary nature of government significantly intensifies the volatility of non-systematic discretionary spending. The motivation for this intensifying outcome is that the power concentrates in fewer hands under the presidential system and the executives generally face lower restrictions on the budgetary process, which allows them to use more aggressive economic policies for their political motives. The coefficient with ps_{it} suggests that countries with greater intensity to the presidential system have a 23% higher likelihood of practicing the non-systematic discretionary policy in a more volatile fashion. This finding is closely matched to Fatás and Mihov (2003). Additionally, the political constraints (pc_{it}) on the executives significantly lower the use of volatile non-systematic discretionary policy. The sufficient number of constraints make accountable the policy makers, and restrain them to adopt politically motivated policies for their interest.

Table 1: Institutional and Non-Institutional Factors of Non-Systematic Discretionary Spending (Full Sample)

Covariates	OLS	FE	RE	GMM
σ_{it-1}	—	—	—	0.471*** (0.081)
ps_{it}	0.316* (0.167)	0.495* (0.281)	0.580** (0.248)	0.230*** (0.047)
pc_{it}	-0.181** (0.079)	-0.216*** (0.017)	-0.431* (0.236)	-0.523* (0.291)
gs_{it}	-0.294** (0.131)	-0.392*** (0.104)	-0.103* (0.052)	-0.093** (0.047)
bq_{it}	-0.115*** (0.040)	-0.280** (0.123)	-0.138** (0.066)	-0.322** (0.142)
c_{it}	0.253 (0.475)	0.315*** (0.040)	0.162* (0.095)	0.146*** (0.024)
y_{it}	-0.129** (0.063)	-0.132 (0.351)	-0.345** (0.149)	-0.047*** (0.019)
p_{it}	-0.0864 (0.140)	-0.386* (0.223)	-0.215** (0.101)	-0.128* (0.071)
to_{it}	0.113 (0.245)	0.127 (0.659)	-0.131 (0.290)	0.293* (0.160)
Constant	1.089 (0.850)	-3.106*** (0.397)	-2.417* (1.295)	1.421** (0.673)
Observations	330	330	330	330
Number of cross-sections	55	55	55	55
Hansen test of overid_ restriction P-Value				0.591
Arellano-Bond AR(2) P-Value				0.362

Note: *, ** and *** show 10%, 5% and 1% level of significance respectively. There are robust standard errors in parentheses.

The pc_{it} coefficient suggests that a unit increase in the political constraints significantly dampens spending volatility by 52%. This finding is supported by the view of Duma (2015). Stability of the government (gs_{it}) lowers volatility of non-systematic discretionary policy. The finding regarding direction of coefficient is supported by the theory which suggests that stable form of public offices stabilizes economic policies and curtails uncertainty or volatile use of discretionary policies (Dutt & Mobarak, 2016). The coefficient of gs_{it} implies that a unit increment in government stability lowers the incentives for exercising the volatile non-systematic discretionary policy by 9%. Besides, the improvement in bureaucratic quality (bq_{it}) also restrain the hands of public office holders from the volatile use of non-systematic discretionary spending. It is viewed that incompetent bureaucracy as an agent can misinform the principal (government) about the outcomes of economic policies and can change the entire trajectory of policies (Blackburn *et al.* 2005). The bq_{it} coefficient suggests that a unit improvement in bureaucratic quality lower the non-systematic discretionary public spending by 0.32%. Additionally, the level of corruption (c_{it}) incites the public authorities to assume the volatile use of non-systematic discretionary spending. The level of corruption makes the economic policies ineffective and diverts the inclusive level to the exclusive one (Hillman, 2004). The coefficient related to c_{it} implies that a unit increment in the level of corruption at the country level promotes the volatile non-systematic discretionary spending by almost 15%.

Among the non-institutional factors, it is observed that GDP growth is negatively associated with the non-systematic discretionary policy. The coefficient associated with the growth suggests that a unit increase in growth dampens volatility in political spending by 5%. This association is attributed to the fact that with economic development structural changes in an economy happen, which leads to lower the uncertainty of economic policies and specifically the chances of volatile use of non-systematic discretionary spending. This finding is supported by Fatas and Mihov (2013). Similarly, The significant and negative sign for the size of the nation implies a harmful influence on the volatility of discretionary public spending. The finding is similar to Furceri and Poplawski Ribeiro (2008), which suggests that a larger size of nation reduces the instability of fiscal policy. The associated coefficient suggests that a 1% increase in the size of the nation leads to lower discretionary policy volatility by 12%. Unlike other covariates, openness has a positive and significant impact on policy volatility. This finding is in line with the study of Albuquerque (2011), who observed that openness promotes policy volatility.

4.2. Empirical Analysis (Segregated)

The geographic, institutional, and political backgrounds of different economies vary over time. So the diversity of these exogenous factors across the economies may create biases in results. Therefore, different fiscal rules and regulations across the group of countries may also create partial results for the aggregate sample (developed and developing countries). Figure A2 displays country wise volatility of the non-systematic discretionary spending. The graph shows that there prevails a significant diversification in fiscal policy discretion. Moreover, contrary to developed countries the developing countries are working on more volatile discretionary policies. Furthermore, fiscal choices are strictly conditional to fiscal guidelines in developed countries, hence restricting the authorities to exercise violent fiscal procedures. Whereas, the governments of the developing economies use violent discretion in spending because of the absence of policy restrictions. By keeping in view these differences

of the discretionary fiscal regulations in developed and developing countries, it is essential to examine them separately.

4.2.1. Comparative Analysis of Developing and Developed Economies

Similar to the aggregated analysis, in this section, the study makes a comparative inquiry about the determinants of non-systematic discretionary spending by splitting the sample into developed and developing economies. Again the estimates of the GMM model show the probability values of Arellano-Bond AR (2) (0.192 and 0.351) and Hansen (0.273 and 0.181) tests endorse the validity and homogeneity of the instruments for both groups of economies.

The lags' discretionary policy volatility (σ_{it-1}) suggest a significant spillover effect of policy volatility for both sets of the sample. Nevertheless, such transfer is observed higher in magnitude for the developing economies. The coefficients associated with σ_{it-1} predict that 76%, and 43% volatility in current year discretionary policy is driven by the previous years' policy trends for the developing and developed economies respectively. The reason behind the higher effect for developing economies is following the idea of the opportunistic political cycle by the politicians, according to which the politician maximize their probability of re-election (Nordhaus, 2001). However, in the developed economies the voters are very much fiscal conservatives, punishing high spending or deficits through polls. Various studies support the view that voters punish rather than reward election-year deficit spending (Brender & Drazen, 2008; Kraemer, 1997; Peltzman, 1992). Additionally, in both the developed and developing economies the political system (ps_{it}) promote the volatile path of non-systematic discretionary spending. This suggests that developed countries with a presidential system have only 4% higher chances of using volatile non-systematic discretionary spending policy which even appear statistically insignificant, while with the same system the developing economies have almost 53% higher chances of executing more volatile non-systematic discretionary spending policy. This explains that in developing countries, with highly concentrated power in fewer hands, the executives in developing countries intended to follow more volatile politically motivated policies for their enduring interest (Fatás & Mihov, 2009). Unlike the presidential system, political constraints (pc_{it}) on the officials dampen the exercise of volatile non-systematic discretionary policy in both set of sample. However, the effect appears lower in magnitudes (only 4%, and also insignificant) for the less developed economies as compared to the developed ones (0.37%, statistically significant). The finding suggests that with an additional level of constraints, though the use of volatile political.

Table 2: The Impact of Institutional and Non-Institutional Factors on Non-Systematic Discretionary Public Spending

Covariates	Developing Economies				Developed Economies			
	OLS	FE	RE	GMM	OLS	FE	RE	GMM
σ_{it-1}	—	—	—	0.761*** (0.036)	—	—	—	0.428*** (0.001)
ps_{it}	0.164** (0.064)	0.107** (0.024)	0.358* (0.197)	0.525*** (0.031)	0.073*** (0.004)	0.215* (0.114)	0.109*** (0.037)	0.047 (0.138)
pc_{it}	-0.279* (0.128)	- (0.128***)	-0.407* (0.128)	- (0.038)	-0.279* (0.128)	- (0.128***)	-0.407* (0.128)	- (0.371***)

	(0.153)	(0.039)	(0.237)	(0.521)	(0.153)	(0.039)	(0.237)	(0.107)
gs_{it}	-0.342**	-0.192*	-0.531**	-	-0.421*	-	-	-0.215*
				0.308***		0.125***	0.371***	
	(0.235)	(0.104)	(0.239)	(0.051)	(0.225)	(0.004)	(0.071)	(0.117)
bq_{it}	-0.115*	-	-0.036*	-0.431**	-	-0.320*	-	-0.185*
	(0.063)	0.420***	(0.019)	(0.212)	0.415***	(0.175)	0.172***	(0.103)
		(0.123)			(0.009)		(0.025)	
c_{it}	0.591***	0.159**	0.403***	0.271**	0.061***	0.281	0.051	0.114
	(0.075)	(0.072)	(0.164)	(0.124)	(0.034)	(0.171)	(0.041)	(0.291)
y_{it}	-0.309**	-0.092*	-	-	0.148***	-	-	-0.084**
			0.452***	0.175***		0.0609**	0.263***	
	(0.163)	(0.051)	(0.039)	(0.019)	(0.0275)	(0.0249)	(0.0530)	(0.041)
p_{it}	-0.164**	-0.186**	-	-0.186*	-0.202	-	-0.125**	-0.056*
			0.315***			0.361***		
	(0.072)	(0.092)	(0.031)	(0.103)	(0.327)	(0.092)	(0.061)	(0.031)
to_{it}	0.587	0.744**	0.241***	0.105**	0.872***	-0.102*	0.0370	0.370***
	(0.384)	(0.368)	(0.058)	(0.050)	(0.0211)	(0.0577)	(0.125)	(0.125)
Constant	-	1.696	2.405*	0.346**	-	1.767***	2.697	-0.111*
	5.125***				0.919***			
	(0.226)	(3.308)	(1.325)	(0.174)	(0.181)	(0.387)	(2.596)	(0.062)
Observations	198	198	198	198	132	132	132	132
Number of cross-sections	33	33	33	33	22	22	22	22
Hansen test of overid_ restriction P-Value				0.273				0.181
Arellano-Bond AR(2) P-Value				0.192				0.351

Note: *, ** and *** show 10%, 5% and 1% level of significance respectively. There are robust standard errors in parentheses.

spending decrease, however, in developing economies bypassing such limits for the policy makers is not difficult because of the inefficient institutional environment (Hussain & Siddiqi, 2013).

Similar to the political constraints, both the improvement in government stability (gs_{it}) and bureaucratic quality (bq_{it}) lower the volatile use of political spending in both natures of economies. However, it is quite interesting to note that the magnitude of both the covariates is larger in the case of developing economies. The reason for the higher effect is that developing economies largely suffer from government instability (Adefeso, 2018), and inappropriate bureaucratic system (Olowu, 1984), so when regimes stability and improvement in bureaucratic quality happen, there occur higher opportunities for more stable and growth supportive policies (Clague, 1994; Feng, 1997), and since the developed economies have reached to the threshold level of stable government and efficient bureaucratic quality (Acemoglu et al. 2003), therefore, further improvement, though lower the volatility of non-systematic discretionary polices, however, not by the same magnitude as that of less developed economies. Unlike the earlier two, corruption (c_{it}) further motivate the volatility of non-systematic discretionary public spending (Albuquerque, 2011). Yet, such an effect appears significant in the case of a less developed economy, where organized corruption

inflates the spendings in unproductive activities (Sugata & Neanidis, 2017; Yin & Zhang, 2019). The coefficients of c_{it} suggest that one unit surge in corruption significantly enhances volatility in non-systematic discretionary spending by 27% in developing economies, while 12% in developed countries but not significantly.

In the set of non-institutional variables, it is observed that both the economic growth (y_{it}) and size of nation (p_{it}) has a negative impact on the policy volatility for both sets of economies. However, the effect appears larger in the case of developing economies (18% and 19%) as compared to developed (8% and 5%). The reason behind the higher effect for developing economies is that in the transition course of economic development the less developed economies attain more reliable institutions (Boța-Avram *et al.* 2018), which lowers the probability of exercising unnecessary economic policies. Similarly, with the already higher size of the nation, a further enhance in p_{it} decrease the policy volatility in developing economies, because of less exposed to idiosyncratic shocks (Furceri & Poplawski Ribeiro, 2008).

Finally, the openness to_{it} has a positive effect on policy volatility, however, the effect appears larger in the case of developed economies (37%) as compared to developing economies (10%). The greater magnitude in the case of the developed economy appears due to having a larger volume of world trade (Nguyen et al. 2020).

5. Conclusion

This study has envisioned inquiring the factors that affect the structure of non-systematic discretionary public spending for a mixed panel of developing and developed economies. By using the Generalized Method of Moment (GMM) estimation technique, this study performed the aggregated and disaggregated analysis according to the development level of the economies. The findings of the aggregated sample suggested that constraints on executives, government stability, bureaucratic quality, economic growth, and size of a nation significantly reduce the unpredictability of non-systematic discretionary public spending; nevertheless, the presidential system, corruption, and openness promoted such spending volatility. Additionally, the disaggregated analysis suggested that in developing economies, the constraints on executives insignificantly lowered the discretionary public spending volatility, while, the corruption and presidential system are insignificant in the case of developed economies that provide the evidence of instability in non-systematic discretionary spending there.

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Appendix:
Figure A1: Volatile Behavior of Non-Systematic Discretionary Spending

Note: the authors' own calculation, based on the standard deviation of the non-systematic discretionary expenditure

Figure A2: Country Wise Non-Systematic Discretionary Spending Volatility

Note: Authors' own calculation based on the standard deviation of discretionary expenditure.

Table A1 : List of Sample Economics

Developed Sample		Developing Sample	
1	Australia	23	Bangladesh
2	Austria	24	Bolivia
3	Belgium	25	Botswana
4	Canada	26	Brazil
5	Denmark	27	Cameroon
6	Finland	28	China
7	France	29	Colombia
8	Greece	30	Costa Rica
9	Iceland	31	Dominican Republic
10	Ireland	32	Ecuador
11	Italy	33	Egypt
12	Japan	34	El Salvador
13	Netherland	35	Gabon
14	New Zealand	36	Guatemala
15	Norway	37	Honduras
16	Portugal	38	India
17	Singapore	39	Indonesia
18	Spain	40	Kenya
19	Sweden	41	Korea
20	Switzerland	42	Mexico

Table A2: Definition of Variables

Variables		Definitions	
Discretionary Spending	The form of public spending which is not associated with the business cyclical fluctuations of the economy. The data is constructed through the five years standard deviations of the residuals of the fiscal rule model.		Own Developed
Government Expenditure	General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation. Data are in constant U.S. dollars (2005).		WDI
Size of Nation	It is the total population which is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. The values shown are midyear estimates.		WDI
Trade Openness	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.		WDI
Inflation	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly.		WDI
GDP Per Capita	GDP per capita is gross domestic product divided by mid-year population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant		WDI

	2005 U.S. dollars.	
Political Constraints	The index can be used to determine the constraints faced by politicians desiring to change a status quo policy in a country in a given year. Scale 0 (most hazardous - no checks and balances) to 1 (most constrained – extensive checks and balances). Measure the feasibility of change in policy given the structure of a nation's political institutions and the preference of the actors that inhabit them.	POLCON (Henisz data set)
Government Stability	This is an assessment both of the government's ability to carry out its declared program(s), and its ability to stay in office. The risk rating assigned is the sum of three subcomponents i.e. (Government Unity, Legislative Strength and Popular Support) each with a maximum score of 1 point which equates to Very Low Risk and a minimum score of 0 points which shows Very High Risk.	ICRG
Corruption	This is an assessment of corruption within the political system which is a threat to foreign investment for several reasons: it distorts the economic and financial environment; introduces the efficiency of government and business by enabling people to assume positions of power through patronage rather than ability; and, last but not least, introduces an inherent instability into the political process. The value 0 indicates lower corruption level and closer to higher corruption level in the country.	ICRG
Political System	In order to capture the Political system of the country we are using Dummy variable which assigns 1 for presidential system and 0 for parliamentary system. With five year averages, the value close to 1 indicates that count has more intensity towards presidential system and otherwise the parliamentary system.	ICRG

Note: all variables are averaged over the five years from 1990 to 2019.

Table A3: Descriptive Summary of the Variables for Full Sample

Indicators	No. of Obs.	Mean	Std. Dev.	Min.	Max.
Government Expenditures	330	104000	267000	133	2160000
Per Capita GDP	330	14885.65	16412.72	255.6	67804.5
Tot. Population	330	79	212	0.241	1350
CPI Inflation	330	64.44	30.325	4.23	124.71
Eco. Growth (GDP)	330	3.502	3.50	-17.14	19.44
Trade Openness	330	70.38	49.98	0.83	439.65
Political System	330	0.44	0.49	0	1
Political Constraints	330	0.52	0.29	0	0.89
Government Stability	330	0.64	0.16	0.08	0.935
Corruption	330	0.57	0.24	0.34	0.86
Bureaucratic Quality	330	0.63	0.45	0.2935	0.85

Table A4: Development Economics: Descriptive Statistics

Indicators	No. of Obs.	Mean	Std. Dev.	Min.	Max.
Government Expenditures	132	220000	387000	2030	2160000
Per Capita GDP	132	32896.61	10903.67	10406.7	67804.55
Tot. Population	132	34.9	60.5	0.2414	314
CPI Inflation	132	78.4707	18.4001	13.3837	110.0195
Eco. Growth (GDP)	132	2.5061	2.7417	-8.5386	15.2403
Trade Openness	132	82.9261	68.3459	15.9239	439.6567
Political System	132	0.0454	0.2084	0	1

Political Constraints	132	0.7467	0.1740	0.0133	0.8943
Government Stability	132	0.6810	0.1332	0.2638	1
Corruption	132	0.8057	0.1648	0.3333	0.6742
Bureaucratic Quality	132	0.7461	0.2223	0.38761	0.9411

Table A5: Development Economics: Descriptive Statistics

Indicators	No. of Obs.	Mean	Std. Dev.	Min.	Max.
Government Expenditures	198	40900	92500	133	618000
Per Capita GDP	198	6501.93	10838.23	0.33	58009.82
Tot. Population	198	101	255	0.24	1350
CPI Inflation	198	57.62	32.41	3.23	124.71
Eco. Growth (GDP)	198	3.91	3.77	-17.14	19.44
Trade Openness	198	64.19	31.64	0.83	198.78
Political System	198	0.62	0.49	0	1
Political Constraints	198	0.42	0.28	0	0.74
Government Stability	198	0.62	0.17	0	0.52
Corruption	198	0.47	0.20	0.41	1
Bureaucratic Quality	198	0.58	0.46	0.24	0.61