

## **Is local government fragmentation politically motivated? An empirical study on Bangladesh**

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**Abstract:** Recent literature suggests that administrative fragmentation can be politically motivated. This paper contributes to the literature by investigating the determinants of administrative fragmentation at the subnational level of a unitary country- Bangladesh. The study conducts a panel data analysis at the district level covering the period from 2001 to 2010 and tests some conventional theories of distributive politics. The objective is to identify whether ‘political motive’ or ‘administrative need’ plays the key role in the local government unit creation process. Two alternative indicators of fragmentation- Units per district land area and Units per district population were regressed against the political variables (district’s core vote share for the ruling party, number of ministers, and the number of MPs aligned with the ruling party) and the conventional indicators of fragmentation (e.g., land area, population, poverty level, administrative convenience). Spatial regression analysis (applying both Spatial Lag Model and Spatial Error Model) was conducted to capture the impact of the possible spillover effects in the unit creation process. Results show that the conventional determinants do not fully explain the fragmentation process. However, political patronage, captured by the number of ministers in a district and local MP’s political alignment with the ruling party in the government plays a significant role in determining the number of local units at the district level of Bangladesh.

### **1. Introduction**

Literature defines government fragmentation or administrative proliferation as the process of creating new small local government units from a large unit by redistributing functions, powers, finances, or people away from the central authority (Dolan, 1990; Lewis, 2017). Theoretically, in implementing fragmentation there is a trade-off between the loss of economies of scale in public service provision and the gains from serving the demand of heterogeneous population more efficiently through preference matching (Pierskalla, 2016; Zax, 1989; Bardhan and Mukherjee, 2005). Countries apply fragmentation to provide more tailored public goods and services according to the local community’s preference and bring the administration closer to the people. Population growth, rapid urbanisation, or ethnic fractionalisation are the conventional determinants that lead to the fragmentation of local government units (Grossman and Lewis, 2016).

An emerging strand in the literature, however, claims that fragmentation is rather used as a tool of distributive politics. The main argument is that politicians design and implement reform processes in such a way that is aligned with their own interests (Van de Walle, 2001). There are several political incentives behind local unit creation. For instance, fragmentation can provide national elites the opportunity to develop and strengthen patronage networks (Green, 2010). New local units create local public sector employment

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that co-opts local elites, provides benefits to lower-level party functionaries, divides the power of the opposition, and reduces the bargaining power of the periphery against the centre (Gottlieb et al., 2018; Green, 2010; Hassan, 2016; Malesky, 2009; Resnick, 2014). Local voters prefer new unit creation as it reduces their distance to the administrative unit's headquarters, increases their status quo and the local control over central government transfers (Grossman and Lewis, 2014). Moreover, it can channel patronage benefits to the local economy or targeted marginalised groups (Hassan, 2016; Kimura, 2012). However, in the opposing strand, it is argued that since creating new administrative units is a costly process and the overall effect of this reform policy is somewhat ambiguous, the politicians are more likely to take alternative policies like spending on local public goods or give promises to increase spending on those goods (Pierskalla, 2016). Therefore, there is a theoretical debate regarding whether fragmentation is influenced by political motives or by conventional determinants.

Empirical studies on administrative fragmentation are extremely concentrated in federal countries. Review of the literature confirms that studies investigating the determinants of fragmentation in the context of developing and unitary countries are very scarce despite the fact that over the last two decades, most of these countries have intensively applied administrative fragmentation at their subnational levels to promote decentralisation (Boex and Edwards, 2016; Bardhan and Mookherjee, 2006). Among the handful of exceptions, Gottlieb et al. (2018) in their empirical investigation on sub-Saharan Africa have shown that unit creation is driven by local political interest. The study found that if incumbents face increased electoral competition, despite the high cost, new units are created to provide a stronger signal to the local voters. On the other hand, Pierskalla (2016)'s study on Indonesia has shown that the unit creation process can also be largely driven by ethnic heterogeneity within the administrative units. Overall, because of the inadequate empirical evidence, it is still not clear whether political motives or the conventional determinants trigger fragmentation in developing countries. More country-specific studies are required to obtain a comprehensive understanding of this issue.

This study attempts to fill the gap in the literature by investigating the determinants of administrative fragmentation in the context of a unitary developing country. The study takes Bangladesh as a case. Local government decentralisation is usually occurring at the subnational level of the country in form of administrative proliferation or fragmentation (Hulme and Siddique, 1999). Literature, although, claims that the local unit creation process in Bangladesh did not follow any pattern or formula, despite having some basic guidelines (Siddique, 2005). A large variation can be observed in the size of these local government units (Union Councils and Municipalities) both in terms of population and land area. Thus, it is possible that clientelistic politics might be playing a significant role here. However, studies have yet to empirically test the political motive in determining the local unit creation in Bangladesh. Therefore, the study examines the determinants of unit creation at the district level of Bangladesh and investigates whether fragmentation is used as a tool of political patronage by testing some of the conventional political distributive theories e.g., the core voter hypothesis and the partisanship hypothesis.

The study constructed a novel panel dataset of multiple political and socio-economic variables at the district level of the country covering the period from 2001 to 2010. Two alternative indicators of fragmentation- *Units per district land area* and *Units per district population* are used as the dependent variable, which are regressed against the political

variables (i.e., district's core vote share for the ruling party, number of ministers, number of MPs aligned with the ruling party) and the conventional indicators of fragmentation (e.g., land area, population, poverty level, administrative convenience). Spatial regression analysis (both Spatial Lag Model and Spatial Error Model) was conducted as OLS fails to capture the impact of the possible spillover effects in the unit creation process. Results of this empirical study show that the conventional determinants do not fully explain the fragmentation process of the country. However, political patronage, captured by the number of ministers in a district and local MP's political alignment with the ruling party in the government plays a significant role in determining the number of local units at the district level of Bangladesh. A set of robustness tests were applied which validated the main findings of this study.

The results of this study have significant policy implications. It is important to understand whether there is any political motive behind the local unit creation process in Bangladesh. New unit creation is a popular demand as local residents expect that it will create an avenue to higher access of government resources. However, so far in Bangladesh, local units have failed to mobilize higher resources and their success in promoting fiscal and political decentralisation is not so promising (Panday, 2016; Fox and Menon, 2008; Ali, 2020). Furthermore, administrative proliferation itself is a costly process. Thus, it is important to study whether unit creation is economically justifiable or it's just another tool of vote buying. To the best of the author's knowledge, this is an area which is yet to be empirically investigated in the context of Bangladesh.

The rest of the paper proceeds as follows: Section 2 reviews the administrative structure and unit creation process in Bangladesh. The section also presents a few of the conventional theories of distributive politics which are applied in this study; Section 3 describes the methodology of the study and Section 4 represents the results of the regression analysis; Finally, the concluding remarks are provided in Section 5.

## **2. Literature Review**

### ***2.1 Administrative Structure and Local Unit Creation in Bangladesh***

There are two separate kinds of local government institutions (LGIs) in Bangladesh: one for rural and the other for urban settings. In the rural setting, there is a three-tier local government system. At the top tier, there are district councils, known as Zila Parishad. In the middle tier, there are sub-district councils or Upazila Parishads (UZP), and in the lowest tier, there are Union Parishad or UPs (each UP is made up of nine Wards. Usually, one village is designated as a Ward, however, Wards are not considered as a separate tier). For the urban setting, there are City Corporations and Paurashava or Municipalities at the lowest tier. Besides these tiers, there is also a separate local government structure for Chittagong Hill Tract areas (three districts—Rangamati, Khagrachari, and Bandarban). Parallel to this structure, there are also deconcentrated local administrative departments operating at different levels (e.g., at the district level there is Zila or district administration, at the sub-district level there is Upazila administration). Government bureaucrats operate these institutes, and they are not under local government division.

The constitution of Bangladesh gives the legal right to the local government units of Bangladesh. The government of the country is supposed to establish devolved or self-government units at all levels of local government structure according to the

constitutional obligation. However, irrespective of having constitutional obligations and well-articulated development policies, till now, the government of Bangladesh has yet to establish local self-government institutions at all tiers (Ahmed, 2015; Panday, 2017). Among all the local government tiers, UPs, Paurashavas and City Corporations, can be considered as local self-government units of Bangladesh as they more or less fulfil the criteria. These units are well-structured and have not much fluctuated from constitutional guidelines (Panday, 2011; Siddique, 2005). This study, therefore, only considers the number of self-government units (i.e., UPs and Municipalities) at the lowest tier per district.

The government of Bangladesh has mainly focused on implementing horizontal fragmentation at the lowest tier of the local government system to promote decentralisation (Ali, 2020). Data reveals that from the year 1971 to 2020, the number of self-government units (i.e., the sum of Union and Municipality number) increased by 816 units, in which, there were 298 new Municipalities and 518 new Unions (BBS, 2015). The National Implementation Committee on Administrative Reorganization/ Reform (NICAR), established in 1983, is responsible to consider and decide delimitation proposals on district/sub-district/union/ municipality boundaries. This committee mentions that the requirement of administration, size of the population, communication system, and aspirations of the people are taken into account in considering the optimal size of different administrative units (Siddique, 2005). In Bangladesh, 15 sq. km of land area, a population of 8,000, and a population density of 2000 people per sq. km is the minimum requirement for the lowest administrative unit (i.e., Unions) according to the administrative Acts of Bangladesh (Siddique, 2005). A wide variation, however, can be observed among the local units. Data of Commonwealth Local Government Handbook, 2005 shows that the average size of the union was 32.9 square km and the average population was 0.028 million. The variation in Union population was 0.001 to 0.125 million. Moreover, literature shows that there is hardly any correlation among area, population, services and facilities such as banks, cooperatives, research centres, Markets and stores, and roads in this local unit (Siddique, 2005). Similar variation is observed among the Municipalities. Census, 2011 data shows that the average size of a Municipality is 15 square km and the average population is 0.052 million. The size of the Municipalities varies from 1.81 sq. km to 68 sq. km (excluding the city corporations) and in terms of population, they vary from 0.0058 million to 0.406 million (BBS, 2015). This confirms that the guideline is not strictly followed while establishing a new local unit. Therefore, the study investigates whether there is any evidence of political patronage in the local government fragmentation process.

## **2.2 Political Distribution Theories**

Over the years, studies have developed several political distribution theories. Among them, the Core Voter hypothesis, Swing Voter hypothesis, Electoral Battleground hypothesis, Minimum winning coalition theory (or the alignment theory), and Political Malapportionment theory are the most discussed ones. This current study tests the *Core Voter hypothesis* and *Political alignment* or *Partisanship hypothesis in the context of Bangladesh*. The Partisanship hypothesis claims that the political alignment of the electoral representative with the ruling party can influence the resource allocation in a particular region. A number of empirical studies have provided supporting evidence e.g., Ansolabehere et al., (2002); Besley et al. (2004); Knight (2002); Mahmoud et al., (2008)

and so on. On the other hand, the *Core Voter* or *Partisan Supporter Hypothesis* asserts that politicians tend to spend more in the areas that contain a larger percentage of their core support. Supporting evidence in favour of this hypothesis was found by empirical studies like Cox and McCubbins (1986); Larcinese et al. (2010); Dasgupta et al. (2008); Dixit and Londergan (1996) and many more. Among the other theories, the Swing voter hypothesis is not that relevant in this context as it is mainly observed in mature democratic voting behaviour (Lindberg and Morrison, 2005) and the limited scope of this study refrained to test the other theories.

A number of contemporary studies (e.g., Gottlieb et al., 2018; Grossman and Lewis, 2014) have also identified that both local and national political incentives can influence the local unit creation process. However, there is theoretical debate. As unit creation is a costly process and the overall effect is somewhat ambiguous, it is also claimed that politicians are more likely to take alternative policies like spending on local public goods (Pierskalla, 2016). Empirical studies on testing distributive political models in Bangladesh are very limited. Among the handful ones, Mahmoud et al. (2008) and Lewis and Hossain (2017) claimed that local MP's affiliation with the ruling party plays a significant role in attracting more public investment in a district. A more recent study by Ali (2020) showed that the district level ADP allocation is also influenced by the share of the core vote and local representative's political alignment with the central government. However, whether fragmentation is used as a tool of distributive politics is yet to be empirically investigated for Bangladesh.

Based on the foregoing discussion, the study constructs the following hypotheses to empirically investigate the impact of political distribution on fragmentation:

*Hypothesis I: Districts with a higher share of the core vote for the ruling party experience a higher degree of horizontal fragmentation.*

*Hypothesis II: local elected representatives' political alignment with the ruling party in the government has a positive impact on horizontal fragmentation at the district level.*

Here, *Hypothesis I* is constructed to test the core voter hypothesis whereas, *Hypothesis II* is to test the alignment theory.

### **3. Research Objective and Methodology**

The earlier discussion revealed that fragmentation of local units might work as a tool of clientelistic politics. Therefore, this study empirically investigates this possibility in the contest of Bangladesh by testing some conventional political distribution theories, precisely, the core voter hypothesis and the partisan alignment hypothesis at the district level of Bangladesh. The conventional determinants of fragmentation (e.g., land area, population, backwardness, administrative convenience etc.) are taken as controls. Therefore, the core objective of this study is to investigate whether political motive or the conventional determinants play a key role in the local unit creation process. The study applies a panel data analysis considering the time period 2001-2010 using three waves of data (i.e., 2001, 2005 and 2010). This time period is selected because of the availability of relevant data. The study is conducted at the district level as district boundaries remained fixed over the years.

### 3.1 Data and Variables

The Study uses *Units per 100,000 capita* and *Units per 1000 sq. km land area* as the dependent variable following the study of Zax (1989), Stansel (2005) and Goodman (2012). The number of self- government units per land area and per capita are the most conventional indicators of local government fragmentation. To construct these indicators, the study takes the total number of Union Parishads or councils and Municipalities per district and standardises it with district land area and district population (literature confirms that only Unions and Municipalities can be considered as self-government units in Bangladesh).

The political variables are the explanatory variable of this study, which were constructed using national election results of 2008, 2001, 1996, and 1991. Constituency-based election results were aggregated to make them representative at the district level following the study of Asfaw, Frohberg, James, & Jütting (2008) and Imai & Sato (2012). To test the *core voter hypothesis*, the variable - *Core vote share* is constructed following the work of Larcinese et al. (2006; 2013). The variable shows the share of the core vote in a district for the ruling party considering the past three national elections. The last three elections were considered to capture the long-term relation and also to avoid the endogeneity issue (for details see Larcinese et al, 2016). Therefore, for the first two years of the panel (i.e., 2001 and 2005), the national election results of 2001, 1996, and 1991 are used to construct the political variables and for the last year (2010), the election results of 2008, 2001, and 1996 were considered. The variable *Core vote share* is constructed in the following manner: First, for each constituency, the vote share for the ruling party (core vote) is obtained from the election results. Then to make the variable representative at the district level, a weighted average of all the constituency core vote share in a district is computed. Each constituency's vote share out of total vote cast in the district is considered as the weight. Finally, the indicator *Core Vote share* is constructed by taking the average of last three election's district core vote share for the ruling party.

This study uses two separate variables to test the Partisan alignment theory. The first variable is *Partisanship*, which shows the share of elected representatives from the ruling party out of total elected representatives of a district (following Arulampalam et al., 2009). Therefore, if all the constituency representatives of a district are from the ruling party, the variable takes the value '1', and '0' if none of them is from the ruling party. The second variable, *Number of Ministers*, is constructed (following Golden & Picci, 2008) by taking the number of elected representatives from a district who served in the government as a Minister/ State or Deputy Minister/ Special advisors of the Prime Minister (enjoying the status of a Minister).

The study introduced a set of control variables that can influence the fragmentation of local units. Land area, population, backwardness and administrative convenience are considered as the determinants of fragmentation according to NICAR. Therefore, the study has included land area and population growth rate (of the last five years) of the district. Poverty level and GDP growth rate is taken as a proxy of backwardness of the district. Distance from the capital, length of paved road (as a % of total road) and length of major river is taken as a proxy of administrative convenience and remoteness of the district.

Table 1: Summary statistics of the dependent and explanatory variables

Variable		Mean	Std. Dev.	Min	Max
Number of Units per 100,000 residents	overall	4.146229	1.321205	0.747262	10.06306
	between		1.313435	0.863599	9.11176
	within		0.1963	3.274777	5.097531
Number of Units per 1000sqkm	overall	36.47046	13.20717	6.697924	71.63743
	between		13.24281	6.921188	68.7251
	within		0.945263	31.00598	40.40565
Core vote share (core vote share for the ruling party in the district)	overall	0.398202	0.109119	0.052362	0.908726
	between		0.046778	0.254104	0.478795
	within		0.0987	0.000699	0.857063
Partisanship (share of the number of MP from the ruling party)	overall	0.700546	0.364256	0	1
	between		0.167075	0.333333	1
	within		0.32413	0.033879	1.367213
Number of Ministers (Total number of Ministers from the district)	overall	0.875	1.146358	0	6
	between		0.915283	0	4.666667
	within		0.696538	-1.791667	3.541667
Lower Poverty (% of people living below the lower poverty line)	overall	25.31218	10.92132	0.8	55.00105
	between		7.604919	6.76129	45.95505
	within		7.876928	4.503728	43.08972
Land area	overall	2305.766	1177.835	684	6116
	between		1184.05	684	6116
	within		0	2305.766	2305.766
Growth in log of pc nominal GDP	overall	4.444619	2.049815	0.06752	11.59688
	between		0.737425	3.171087	6.174133
	within		1.914063	0.414829	9.867365
Growth in log of population	overall	1.390467	0.905637	-0.567559	6.558128
	between		0.798552	-0.096433	4.462752
	within		0.434937	-0.943459	3.485843
River length	overall	392442.7	237876.3	82442.31	1113131
	between		239131.6	82442.31	1113131
	within		0	392442.7	392442.7
Share paved road (out of total in %)	overall	71.01225	19.00785	17.70624	99.89725
	between		11.73651	43.40111	94.09513
	within		14.99983	36.31774	102.9817
Distance from the capital	overall	194.1719	96.64891	0	443
	between		97.15894	0	443
	within		0	194.1719	194.1719

N=192, n=64, T=3

Moreover, year dummies are also included to incorporate the effect of any policy change and administrative act that might have affected the fragmentation process. Table 1 provides the description and summary statistics of all the explanatory and control variables included in the model. Furthermore, Table A1 (in appendix) shows the construction and the data source of the variables.

### 3.2 Empirical Estimation Method

Since the study uses district-level data, it is important to account for spatial spillovers across districts. Pesaran's CD test confirms the cross-sectional dependence in the panel, which might have caused from the spatial effects (test score is 5.65 and which is statistically significant at 1% level of significance as  $p < 0.01$ , hence, rejecting the null hypothesis of cross-sectional independence in the panel data). Therefore, spatial regression analysis was applied in this study as OLS fails to capture the impact of the spillover effect and creates a large bias to the standard errors (Anselin, 2001, 1988; Driscoll and Kraay, 1998). This study applied both the Spatial Lag Model (SLM) and Spatial Error Model (SEM) to identify determinants of fragmentation. SLM is a spatial autoregressive model that includes a spatial lagged dependent variable. The dependent variable is a weighted average of its neighbour's value. This model is appropriate when the focus is on the spatial interactions of the dependent variable. However, if the structure of the spatial relationship is not known, it is better to use SEM which includes spatial correlation errors due to unobservable features or omitted variables associated with location (for details see Anselin, 2001; 1988).

In the context of Bangladesh, it can be assumed that the fragmentation variables are spatially correlated, which makes the SLM appropriate. However, as it is a district level study, the error term of the model might have spatial correlation with unobservable features associated with location. Therefore, this study applies both SLM and SEM into the analysis, which also helps to check the robustness of the estimates. The SLM and SEM are as follows, respectively:

$$\text{Fragmentation}_{it} = \beta_0 + \rho \cdot W \cdot \text{Fragmentation}_{it} + \alpha P_{it} + \theta X_{it} + \varepsilon_{it}$$

$$\text{Fragmentation}_{it} = \beta_0 + \alpha P_{it} + \theta X_{it} + \lambda \cdot W \cdot \varepsilon_{it} + u_{it}$$

Where,  $\text{Fragmentation}_{it}$  is the fragmentation indicators – *Units per 1000 sq km of land area* and *Units per 100,000 capita*. Separate regression models are used for them to avoid the correlation between themselves.  $W$  is the spatial weight matrix,  $\rho$  and  $\lambda$  are coefficients on spatial lag and spatial error terms, respectively.  $P_{it}$  is the vector of political variables. The vector  $X_{it}$  represents control variables;  $\varepsilon_{it}$  is the error term. The spatial weight matrix  $W$  is constructed based on distance where cross-sectional units with distance  $d_{ij}$  receive a weight that is inversely proportional to the distance between the units and zero if they are



beyond a certain distance band D. Stata command “Spatwmat” is used to construct W using the X and Y coordinates of each district.

#### 4. Result Discussion

Before presenting the main results, the study conducts the diagnostic tests to confirm the rational for using spatial econometric model. Test results show that while considering *Units per land area* as the dependent variable, the Moran’s I (error) value is 8.50. The Lagrange multiplier or LM (error) and LM (lag) test scores are 12.22 and 7.25 respectively. All the test statistics are also statistically significant ( $p < 0.01$ ), therefore, rejecting the null hypothesis of classical linear regression model has the correct specification. Again, using *Units per capita* as the dependent variable, the Moran’s I (error) value became 4.28. The LM (error) and LM (lag) scores are 4.11 and 4.29, respectively, and the estimates are also statistically significant at 1% and 5% level of significance. This confirms the OLS regression will produce biased estimates. Applying the robust LM tests for model specification purposes (see Anselin, 2001 for details), the test scores in both cases (i.e., using *Units per land area* and *Units per capita* as the dependent variable) confirm that the SEM is preferable than the SLM. However, both the models are presented in this study.

Next, the spatial regression results are presented in Table 2. Column 1 and 2 shows the regression results of SEM and SLM, respectively while using *Units per 1000 sq.km of land* as the dependent variable. Column 3 and 4 shows the results of SEM and SLM, respectively, when *Units per 100,000 capita* is the dependent variable. Starting with the first variable *Core Vote share*, both SLM and SEM regression results confirm that *Core vote share* does not have any significant association with either Units per land area or Units per capita. Therefore, we reject the hypothesis that core vote share for the ruling party influences the fragmentation process at the district level.

However, the variable *Number of ministers* show a positive and statistically significant association with both Units per land area and Units per capita. In case of *Units per 1000 sq.km*, regression coefficients of the variable *Number of ministers* are 0.22 and 0.24 for SEM and SLM, respectively. Both the coefficients are statistically significant (as  $p < 0.001$ ). While considering *Units per 100,000 capita* as the dependent variable, the coefficient of the variable is 0.35 in both regressions, and they are statistically significant. This implies that the number of ministers of a district significantly influences the number of local units per capita and the number of units per land area.

Turning to the next political variable- *Partisanship*, results show that the variable shows a positive and significant association with *Units per 100,000 capita* at 5% level of significance both in SEM and SLM regression (see column 3 and 4). However, *Partisanship* fails to show any strong association with *Units per land area* (only significant at 10% level of significance).

Table 2: Spatial regression results

Variables	Dependent variable			
	Units per 1000 sq.km		Units per 100,000 capita	
	(SEM)	(SLM)	(SEM)	(SLM)
	(1)	(2)	(3)	(4)
<b>Political variables</b>				
Core vote share	0.280 (0.802)	0.347 (0.813)	0.385 (1.093)	0.275 (1.092)
Number of Ministers	0.223*** (0.0561)	0.244*** (0.0579)	0.346*** (0.0766)	0.348*** (0.0779)
Partisanship	0.322* (0.204)	0.383* (0.207)	0.494** (0.278)	0.519** (0.278)
<b>Controls</b>				
Land area	0.0006*** (8.13e-05)	0.0007*** (7.81e-05)	0.0004*** (0.0001)	0.0005*** (0.0001)
Population growth rate	-0.166* (0.0735)	-0.101 (0.0690)	-0.348*** (0.0967)	-0.306*** (0.0921)
Lower poverty	-0.0054 (0.0069)	-0.0059 (0.0069)	0.0083 (0.0095)	0.0066 (0.0092)
Growth of pc nominal GDP	0.00534 (0.0328)	0.0143 (0.0333)	-0.0245 (0.0446)	-0.0243 (0.0447)
River length	-2.91e-07 (3.81e-07)	-4.11e-07 (3.66e-07)	-1.63e-06*** (5.23e-07)	-1.63e-06*** (5.00e-07)
Paved road	-0.0048 (0.0041)	-0.0042 (0.0039)	-0.0120* (0.0057)	-0.0128* (0.0054)
Distance	-0.0061*** (0.0008)	-0.0043*** (0.0008)	0.0022 (0.0011)	0.0015 (0.0009)
Year dummy, 2005	0.145 (0.162)	0.153 (0.164)	-0.223 (0.220)	-0.215 (0.220)
Year dummy, 2010	0.391* (0.231)	0.377 (0.231)	-0.116 (0.315)	-0.112 (0.311)
Constant	6.863*** (0.699)	3.538*** (1.021)	4.523*** (0.737)	2.014 (1.390)
Observations	192	192	192	192

Standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Therefore, we conclude that *Partisanship* has a robust association with Units per capita but an insignificant association with Units per land area. This implies that higher the share of the local elected representatives of the constituency who are aligned with the same political party in the government, higher is the number of local units per capita.

Regarding the controls, results show that district land area has a positive and significant association with fragmentation which is expected, although the magnitude of the coefficient is not that large. Contrarily, *population growth rate* does not hold the expected sign. Result shows that districts with higher population growth rate rather shows low level of fragmentation. One possible explanation can be the highly populated districts of Bangladesh are Dhaka (the capital) and the districts surrounding it. As these districts already are highly fragmented therefore, during our study period, we have observed an inverse association between population and number of units.

Regarding backwardness and economic condition, we find that fragmentation does not have any significant association with *poverty level* or the nominal GDP of the district. District's river length is expected to have a positive association with fragmentation. However, results show that *River length* shows negative significant association with Units per capita, and no significant association with units per land area. Similarly, district's length of paved road does not show any significant association with fragmentation. The variable *Distance* shows negative and significant association with units per land area which implies that relatively isolated districts (measured by distance from the capital) experiences low level of fragmentation measured by units per land area. However, the variable does not show any significant association with units per capita. In summary, except district land area, the conventional determinants are not significantly associated or does not show the expected association with the level of fragmentation at district level. Therefore, we conclude that the conventional determinants do not play any significant role in determining role in the unit creation process.

#### 4.1 Robustness Check

Several robustness checking techniques were applied to validate the regression results. The first set of robustness check involves regressing the political indicators separately against the dependent variable. Table A2 (panel a and panel b) in the appendix shows the regression result. Results again confirm that *Number of ministers* has a significant association with fragmentation (either standardised by land area or capita). On the other hand, *Partisanship* only shows significant association with units per 100,000 capita. However, it fails to show any significant association with units per 1000 sq.km land area. Therefore, results are consistent with the main results of Table 2.

Next, the study has applied the regression using the dependent variable- *Total number of LG units*. This variable is constructed by taking all the local units of each tier (i.e., considering the number of upazila parishad and zila parishad along with the number of UPs and Municipalities). Results are reported in Table A3 (in the appendix). Again, results are similar to Table 2.

Finally, the last robustness test is related to changing the number of observations. Three tribal hill districts-Bandarban, Rangamati, and Khagrachari are excluded from the analysis. These districts are under Special Affairs Division with separate local government act and land administrative Law. Fragmentation as well as political

decentralization criteria and objective does not apply for these districts, and they need separate analysis. We, therefore, exclude them from the data set and run the spatial regression. The regression result is reported in Table A4 (in the appendix). Results again confirm that *Number of ministers* has a significant association with fragmentation. *Partisanship* only shows significant association with Unites per capita. On the other hand, *Core vote share* does not show any significant association with the fragmentation indicators. Overall, the robustness tests confirm the main results (of Table 2) of this study.

## 5. Conclusion

This empirical study examined the determinants of local government fragmentation at the subnational level of Bangladesh. The objective was to test whether the local government unit creation process is influenced by political motive. The study conducted a panel data regression at the district level (covering the period from 2001 to 2010) of Bangladesh and tested few conventional models of distributive politics, namely, the core voter hypothesis and the political alignment hypothesis. The study applied spatial econometric models (Spatial Error Model and Spatial Lag Model) in the investigation to capture the possible spillover effect that is created in the fragmentation process. The conventional determinants of fragmentation (e.g., land area, population growth rate, poverty, length of river, length of paved road) were considered as controls.

Empirical findings of the study claims that most of the conventional determinants (except land area) are not considered in the unit creation process. Rather, fragmentation is significantly influenced by political motive. Results of the spatial regression analysis confirms that the number of ministers is significantly associated with the number of local units (standardised by both district population and land area). Similarly, the share of local elected representatives (MPs) who are politically aligned with the ruling party in the government, higher is the number of local units per capita. This confirms our hypothesis that political partisanship has a positive significant association with fragmentation of local units at the district level. However, the study found that core vote share for the ruling party in a district does not have any association with local decentralisation, i.e., rejecting the core voter hypothesis. Among the conventional determinants only land area of the district shows significant association with the number of local units implying that larger districts (in term of land area) have experiences higher degree of decentralisation which is expected, although the magnitude of the association is very low. Other determinants like population, poverty (proxy for backwardness), length of river, length of paved road, distance from the capital (proxy for administrative convenience) failed to show the expected association with the dependent variables. Overall, results confirm that rather than the conventional determinants, political motive has played the viral role in the unit creation process.

Findings of this study have significant policy implications. In Bangladesh, fragmentation of local government unit is implemented to promote both political and administrative decentralisation, where the objective is to create the scope of local participation and representation (Faguet and Ali, 2009; Mujeri and Sing, 1997). The Sustainable Development Goals (in particular, Goal 16 & 17) have also emphasised the need for developing effective, accountable, and transparent institutions to ensure responsive, inclusive, and participatory decision making and strengthening domestics resource

mobilisation at all levels (U.N., 2017). Therefore, understanding whether political motive or the administrative necessity plays the key role in the fragmentation process is vital. Descriptive analysis of this study shows that there is wide variation among the same type of local units in terms of land area and population. This confirms that the conventional criteria are not followed strictly. Furthermore, empirical findings of this study show that the unit creation process is politically motivated. However, administrative fragmentation should be executed with greater caution as the process itself is costly and it might create an adverse impact on public service delivery efficiency by causing diseconomies of scale.

Finally, there are some scopes for further investigation. This study did not investigate the efficiency argument of fragmentation due to lack of data regarding public service. Moreover, the study used constituency level election results and disaggregated it at district level to construct the political variables as during the study period, the local elections were not under political party banner. Future studies can use the recent local election data which are now under party banner to construct the political variables and conduct a cross sectional analysis at lower levels to investigate this issue. However, severe data constraint is a major challenge to conduct any comprehensive empirical study below the district level of Bangladesh.

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