Do Electoral Politics Matters in MG-NREGS Implementation? Evidence from Village Council Elections in West Bengal

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***Abstract*:**

Do ruling parties in a democratic government positively discriminate towards their own party constituencies from constituencies ruled by opposing parties in allocating social welfare expenditures? If they do, do they gain electorally in engaging in such clientelist behaviour? This paper tests whether such type of political behaviour, which we call *Political Nepotism*, exists in allocation of funds for India's flagship programme, National Rural Employment Guarantee Scheme (NREGS), and whether there is any feedback effect of *Political Nepotism* on the outcome of the following election. To test these hypotheses, we use Village Council Election data for 2008 and 2013, and NREGS expenditure for 2010 to 2012 for a panel of 569 wards (Gram Sansad) over 49 Gram Panchayats from 3 districts of West Bengal. *Fuzzy Regression Discontinuity Design* is employed as our main quasi-experimental regression design for identifying the presence of political nepotism. We find in general, the Village Council level ruling-party spends significantly more in their own party constituencies as compared to opponent constituencies. We also find strong evidence of electoral returns in political nepotism, with the probability of re-election and vote share of the incumbent party increase in constituencies which observed increases in NREGS expenditures due to the practice of nepotism. However, we find that the results differ between the two main political parties. The *Right Populist Party (Trinomool Congress-TMC)* which practised political nepotism in 2010-2012, reaped significant electoral returns in the 2013 panchayat elections, whereas the *Left Party* who did not behave in this way, did not observe such electoral gains in their own constituencies. This study gives empirical evidence and an analytical explanation on why incumbents may differ politically in allocating welfare funds in pursuing their electoral objective. Our finding is contradictory to the predictions of standard voting model which postulates that political leaders who are concerned with re-election would focus on delivering benefits to 'swing voters' and not the loyalists.

Key Words:
MG-NREGS, West Bengal, Political Nepotism, treatment effect, feedback effect, Fuzzy Regression Discontinuity Design

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1. Introduction

Does the incumbent ruling party in a democratic government allocate more public funds to its own constituencies? If it does, does it impact on the incumbent's electoral outcome in the following election? In this paper we investigate the relative importance of electoral politics and heterogeneous policy preference of different ruling parties, in delivering public work programme funds in the context of the local government (i.e. Village Council or Gram Panchayat) in the Indian state of West Bengal. In doing so, we will also investigate the feedback effect of this heterogeneous policy preference of the ruling parties on the next electoral outcome in terms of incumbent ruling party's vote share and probability of getting re-elected.

This paper is primarily motivated from the literature of political economy of redistributive politics (see, for example, Bardhan and Mookherjee 2010a, 2010b;Benhabib and Przeworski 2006; Dixit 1996; Dixit and Londregan 1996) and the feedback effect of this politics of redistribution (see, for example, Finan and Schechter 2012; Litschig and Morrison 2012; Werker et al. 2012) on electoral outcome. We particularly focus on the politics of distribution of funds under India's flagship programme - Mahatma Gandhi National Rural Employment Guarantee Scheme (MG-NREGS, hence forth NREGS) at the local government level and how this politics of distribution shapes the following electoral outcome in the context of Village Council (the *Gram Panchayat* in Indian context) election.

The theoretical literature of political economy of redistributive politics are largely classified conferring to the motivation and incentive of the contesting parties, "…as either *purely opportunistic* (where they care only about the probability of winning election), or where they have intrinsic policy preference derived from their *ideology* (defined broadly to include interest of the constituents they represents)…" (Bardhan and Mookherjee, 2010a:1573). Our quest will start from whether these divergent motivations and incentives of contesting political parties who are in power of the local government in the form of Village Councils, at all exist in delivering NREGS funds. These issues of motivation and incentive have been substantially addressed in the context of land reforms and other targeted public intervention by local government in West Bengal (ibid, Bardhan et al. 2009; Bardhan and Mookherjee, 2012), but not in the context of the biggest publicly sponsored programme of India i.e. NREGS. This study not only tries to contribute in that direction by focusing on the politics of distribution of NREGS, but also investigates the feedback or reciprocity effect (Finan & Schechter, 2011) of divergent motivations of the contesting political parties in delivering NREGS on the next electoral outcome. Such feedback or reciprocity effects in different forms

have been discussed in the context of Cash Transfer and other public distribution programmes (see ibid, Manacorda et al. 2011). However, to the best of our knowledge, this is the first study which discussed both the issues of redistributive politics and its feedback effect within a single work focusing on the same set of local governments or Village councils.

During our study period (2008 to 2013), there were two principal contesting parties in West Bengal with dissimilar political ideologies: a coalition of Leftist parties led by the Communist Party of India (Marxist) (CPIM) with apparently stated commitment of democratic decentralisation, land reforms, pro-poor inclusive development (see CPIM party Panchayat Election Manifesto 2003, 2008, 2013) and a populist Trinamool Congress (TMC) with apparently populist agenda of giving direct benefits to its supporters, a reluctant attitude of power devolution, and no clear perspective on decentralised governance (Bhattacharia 2012, Mallik 2013). Given the nature of these two political parties and key constituencies of the two parties, our first objective is to see whether there is any heterogeneous policy preference of these two parties in respect of delivering NREGS funds from the Gram Panchayat (hence forth GP i.e. the village council) to Gram Sansad (hence forth GS i.e. the ward of the village council) and second objective is to see whether there is any heterogeneous feedback or reciprocity effect from the part of the constituents following the heterogeneous policy preferences of the contesting political parties.

This study uses a novel primary data set from 569 villages (or village council wards) over 49 Village Councils from 3 districts of West Bengal. This village level panel data had 3 waves (2010, 2011 and 2012) preceded and followed by one election year i.e. 2008 and 2013 respectively. We used a quasi-experimental approach in the form of Fuzzy Regression Discontinuity Design (FRDD) as our principal estimation method to address our empirical investigation. Based on FRDD approach our empirical results show following major conclusions in respect of our study. First, after 2008 Panchayat[1] Election ruling party at the GP level has significantly spent more NREGS funds in all the following years in their own party constituencies i.e. their own party GS compared to opponent party's GS. We term this attitude of spending more in their own constituency by the ruling party as *own party positive discrimination or political nepotism*[2]. Second, when we investigated whether this aspect of political nepotism exists across the all parties, we found strong evidence of such political nepotism in TMC run GPs i.e. where TMC is the ruling party but not in CPIM run GPs. Third, following this second observation we find GPs ruled by TMC after 2008 Panchayat Election

[1] Panchayat: Village council in India called Gram Panchayat and the system is called the Panchayati Raj

[2] Political Nepotism: A situation where political master preferentially allocates public programme benefit discriminately more in their own party constituencies compared to opponent party's constituencies.

managed to secure higher percentage of vote in their own constituencies in following Panchayat election in 2013 out of their nepotistic behaviour and their probability of getting re-elected increases with the promotion of strong political nepotism in the previous years. On the contrary GPs ruled by CPIM after the 2008 Panchayat Election did not realise any statistically significant impact on their electoral outcome in 2013, out of their non-nepotistic behaviour in the previous years.

The remainder of this paper is organised as follows. In section 2, we will present three sub-topics. Section 2.1 will set the background of the political space of West Bengal in recent past. Section 2.2 will briefly summarise the structure of the local government in West Bengal and section 2.3 will summarise the programme NREGS. Section 3 will analyse both theoretical and empirical literature on the redistributive politics public fund and its effect on the incumbent's re-election outcome. Section 4 will discuss the survey design, survey instrument, data and descriptive statistics in reference to our research objectives. Section 5, will describe the empirical strategy along with main identification issues in line of FRDD. Section 6 present estimation results and discussion on result. Section 7, will discuss the analytical explanation of unique results and section 8 concludes the study.

2. Political Space, Local Government and NREGS in West Bengal

2.1.Political Space in West Bengal

Amongst all Indian states, West Bengal is the only state where a Left political coalition (the Left Front) led by the Communist Party of India (Marxist) (CPIM) had uninterruptedly been in power both at the state (i.e. Provincial level) and the local levels of government for more than three decades starting from 1977 to 2011. This has been a unique phenomenon both in India as well as in the world. In 1977, the Left Front (LF) came into power in the State Assembly by defeating the Indian National Congress (INC). A year later for the first time local government (i.e. the Panchayat) elections were held in West Bengal and here too Left Front came into power in all tiers[3] of local government across the state. In Table 1 below we present State level assembly election results in terms of share of seats won by the LF from 1977 to 2011. It shows a clear dominance of LF till 2011.

[3] Tiers of Local Governments: Local Government in Indian context is called Panchayat and Panchayat has 3 different tiers of governance. District Level tier of government is called District Panchayat or *ZillaParishad*, Sub-district level tier is called Block Panchayat or *Panchayat Samity* and lowest tier is called the Village Panchayat or *Gram Panchayat*.

Table-1: Year wise Left front seat share in the State Assembly Election (1977 to 2011)

Year of Assembly Election	Percentage of seat won by Left front
1977	60.20
1982	77.55
1987	82.31
1991	81.97
1996	69.05
2001	66.05
2006	79.93
2011	21.09

Source: Official website of West Bengal State Assembly: http://wbassebmly.gov.in and official website of Election Commission of India: http://eci.nic.in/eci/eci.html

Till 1997, the INC was the major opponent political party in West Bengal but from 1st January 1998 a fraction of the Congress party broke away and formed a new political party- the All India Trinamool Congress (TMC) led by Mamata Banerjee, who is the current Chief Minister of the state of West Bengal. Soon after its inception TMC had been able to establish itself as the main opponent of the LF in the state. The ideology of the TMC could be broadly classified as Right Populist (Mallik, 2013; Bhattacharaya, 2012; Rana 2013).

From the early 1980s onwards, the LF had managed to get strong popular support which has been reflected in electoral mandates based on programmes such as land reform, tenancy reform and effective decentralisation and devolution of power to the grass root democratic organisation i.e. the panchayats. However, with the fading away of their progressive agendas in late 1990's (Barua, 1990; Webstar, 1992) and with the advent of contentious issues such as the acquisition of land for industry from 2006 onwards, the popularity of LF gradually shrunk (Mallik, 2013; Williams, 2001). Further, in the 2000s, the cadres of the LF increasingly intruded into the daily life of citizens leading to increasing unhappiness of voters with the rank and file of the Left parties (Chatterjee, 2009; Bhattacharyya, 2009). Moreover, during this period the basis of success in elections shifted from *institutional effectiveness* and political mobilisation to *clientelism* in which LF made the disbursement of government benefits conditional on continued electoral support for them (Chatterjee, 2009; Bardhan and Mookhjee 2006). As a consequence of all these factors, there was a rapid erosion of the support base of the LF towards the end of the first decade of the 2000s, and there was a sharp increase in the electoral success of the TMC in local and state assembly elections. Table 2 shows how the vote share of Left Front fell sharply in Gram Panchayat (GP) elections from 1978 to 2013.

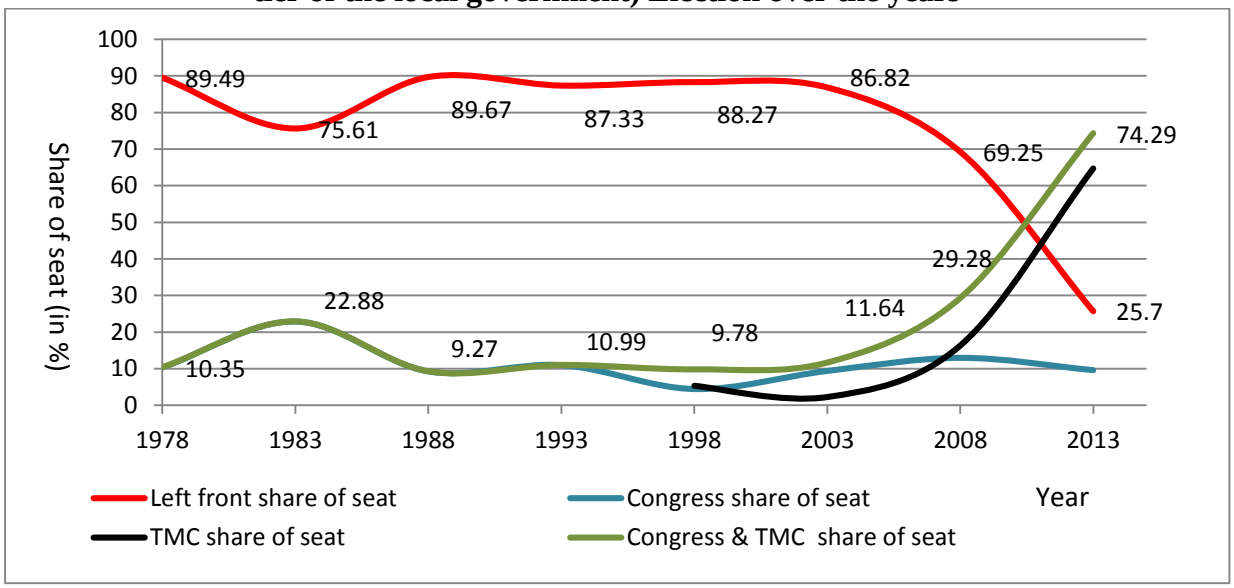
Table-2: GP level Vote share of Left Front in Panchayat Elections, 1978-2013

Year	GP level Vote Share of the Left Front
1978	70.28
2003	65.75
2008	52.98
2013	32.01

Source: Author's calculation from CPIM party documents and West Bengal State Election Commission Website.

Figure 1 shows the seat share of major political Parties (or party coalition) in Zilla Parishad (i.e. the district level tier of local government) election over the years in West Bengal. It clearly shows that from 2003 onwards, the TMC started gaining in electoral success and by 2013 it became the ruling party in the district level local governments as well. Figure 2 shows the winning party in each district in Zilla Parishad elections in 2003, 2008 and 2013. In 2003, most Zilla Parishads were ruled by the LF; however, by 2013, the LF had lost control of most of these district level local governments to the TMC.

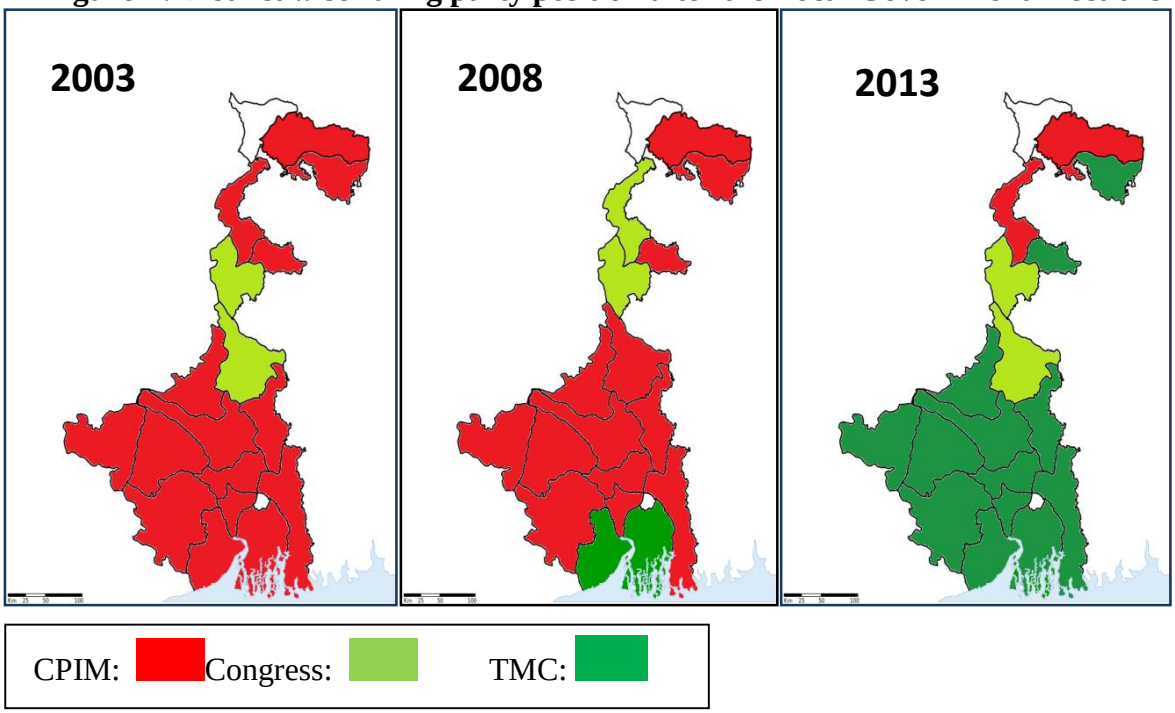
Figure-1: Seat share of major political parties in Zilla Parishad (i.e. the district level tier of the local government) Election over the years



Source: Author's calculation from

a) West Bengal State Election commission website
b) Panchim Banga Saptam Panchayat nirbachan-2008: Porisankhan-o-Parjalochana, from communist party of India (Marxist) West Bengal State committee, 2013.

Figure-2: District wise ruling party position after the Local Government Elections



Note: White sections in the maps above show the area where there was no District Panchayat
Source: Author's calculation from West Bengal State Election commission website

2.2.Structure of Local Government in West Bengal

The system of local government in rural India is known as Panchayati Raj[4], which was originally a Gandhian idea based on village of self-government. This idea of Panchayati Raj was embodied as an aspiration in 1950 constitution of India but devolved to the states for implementation (Crook and Sverrisson 2001). In 1992, with the 73rd amendment of Indian constitution, the Government of India made it mandatory to constitute Panchayati Raj or local governments for each state in India. West Bengal was a pioneering state in passing its first Panchayat Act in 1973 and the 1st Panchayat election was held in 1978, much ahead of any other state in India, and regular Panchayat elections have been held every five years till 2013. The Panchayat or rural local government in India has three tiers. District level government is called the ZillaParishad (ZP) and sub-district or block level government is called the Panchayat Samity (PS) and lowest tier of government is called the Gram Panchayat (GP). We will focus our study at the GP level. Village Council or GP is also termed as Rural Municipality. Like other municipalities, a GP has a number of Wards or called Gram Sansad (GS). A GP normally has 10-15 GS. In every five years there is a Rural Municipality level or

[4] The term Panchayati Raj came to refer all governmental organisations below the state level in rural India. The term 'panchayat' is derived from the word of five, panchayat, meaning forum of five village elders (Mathew 1996)

GP Election across the whole state. Election is held at the ward or GS level to choose a ward representative from each of the ward under the GP. This election is a multi-party election (precisely 7 political parties took part in context of our study area). However, major contesting parties are mainly two in West Bengal viz. ***Right-Populist*** (called TMC) and ***Left*** (basically the ally of all different communist parties in the state lead by CPIM). In West Bengal we have 3357 GP and around 45552 GS/wards (Source: Official Website of West Bengal Panchayat and Rural Development Department). Elections are held in all these wards in every five years. Within a GP, a party which wins the majority of wards or GS forms the GP board and become the GP level ruling party and runs the GP for 5 years. Around 25 poverty alleviation and public works programmes are implemented by the GP. Among these programme NREGS is the most important and endowed with highest proportion of money. An average GP normally spends around 25 to 30 million INR (i.e. 250-300 thousands GBP) among which 85% to 90% allocation comes from NREGS. A ward or GS normally has 350 to 400 households and in a GP, the number of household ranges from 3000 to 5000. Our sample comprises of 49 GPs (i.e. roughly 1.5 % of GP in the state) and 569 GS. We will illustrate more on this in our data section.

2.3.NREGS and West Bengal Scenario.

National Rural Employment Guarantee Scheme or NREGS has followed from National Rural Employment Guarantee Act (NREGA) which was passed in the Indian Parliament in September, 2005. Based on this NREGA, the programme 1st came in operation in February 2006 in the most backward 200 districts of India including 10 districts from West Bengal. Subsequently as 2nd phase of the programme NREGS has been scaled up to another 130 districts of India by 2007 including 7 districts from West Bengal and finally in its 3rd phase remaining 285 districts including remaining 1 district from West Bengal were brought under the purview of the act in April 2008. Theoretically NREGS is a self-targeted universal programme where people choose by themselves whether to participate or not in this programme. In some other literature this is also known as a programme where government is appearing as the employer of last resort. This act makes a statutory obligation for the government to provide minimum 100 days of employment on demand to each rural household in India. In other words NREGA provides an opportunity for each rural household of India to get at least 100 days of unskilled employment on demand. The government has to provide unemployment dole to the household as equivalent to NREGS wage when GP could

not provide jobs on demand within 15 days from the date of demand. Moreover, the job has to be provided within the 5 km vicinity of the residence of the job demander, and providing a job beyond 5 km will involve a certain amount of travel expenses, which will be claimed by the job demander from the government. NREGS encompasses great degree of community stake in the form of social audit, information dissemination up to village level, and highly decentralised programme delivery mechanism. Unlike other development interventions, GPs are considered as the main programme implementing agency (PIA) in its implementation. Wage payment of the job demanders under NREGS is fully institutionalised i.e. it is made through bank and post-office accounts. Finally, unlike other development interventions NREGS uses latest information and technology to a great extent for its data management, tracking of the expenditures, and maintaining muster roll of the work beneficiaries.

In terms of financial allocation NREGS is the largest ever social protection intervention by the Indian government since its independence. As per the India government's official website for NREGA (i.e. www.nrega.nic.in), this programme has been spending on an average 6.5 billion USD per year for the last 9 years. In terms of household coverage at present this is the world's largest social protection intervention and annually this programme reaches around 45 million households on average for the last 6 years. However, in spite of its huge fiscal allocation, NREGS's uptake is far behind from its statutory 100 days provision. The national average uptake of the programme in terms of annual average days of NREGS work availed by a household in the recent years ranges between 40 and 50 days and for West Bengal it is far below the national average except for last couple years when West Bengal's average was close to the national average.

Lower uptake of the programme against the statutory provision of 100 days can be explained both from demand and supply side. Studies have shown that people are not getting jobs on demand under NREGS, rather there were evidences of rationing of jobs in the event of excess demand against the overall supply (Ravallion et al. 2012). On the other hand institutional bottleneck, payment delay, timely availability of NREGS funds from respective higher tiers, alternative livelihood options, minimum open market wage etc. play crucial roles in generating lesser demand for NREGS work (Chopra, 2014).

3. Related Literature

In the area of redistributive politics and its prospect in terms of electoral outcome, there is a large literature both in terms of theory and empirics. Most of the literature tries to test the incumbent's motive towards the manipulation of the spending of public funds and how this may influence their re-election possibility. However, there are virtually no studies to explain the divergent attitude of incumbents across different party line in different political context. Though our paper essentially contributes to the latter aspect, but in this section we will try to summarise the existing literature on the local electoral impacts of redistributive politics.

Exiting theoretical literature to explain the re-election motive of incumbent by using public funds is broadly divided into three major strands.

First, there is a literature that focuses on "core vs. swing voters". Here researchers find that the distribution of public fund either favour core or swing constituencies in order to influence voters' choices or simply convince people to vote (Cox & McCubbins, 1986; Dixit & Londregan, 1996; Lindbeck &Weibull, 1987; Nichter, 2008). Politicians who engage themselves in the core voter strategy focus on voters with similar ideological preferences or who are easy to identify through their observed political activities (like campaign, rallies, meeting etc.) Here social ties and history of past interaction could be of great importance to lower the cost of screening for the politician in the core constituencies. Proponents of the core voter hypothesis believe that incumbent targets existing network to expand their support base (Fried. J. Brian, 2011). In the context of our paper, this core hypothesis suggests that Village Council Chairman (i.e. GP Pradhan) would target villages (i.e. village council wards) that have exhibited high level of support for the GP level ruling party. On the other hand swing voters constituencies are those where voters do not show any particular resemblance towards one party or other consistently. This assumes that incumbent politicians direct the public funds to swing voter's constituencies believing that targeting voters who already have political inclination towards them is wasteful and probability of re-election would increase by allocating funds towards undecided voters. However, it is also possible that both the strategies are used in different context (Dunning & Stokes, 2009).

A *second* strand of theoretical work is based on the argument of political patronage and clientilism (Bardhan & Mookherjee, 2006, 2012; Caselli and Michaels, 2009). Much of the literature here assume that incumbents' public spending go to fund political patronage, benefiting only certain groups of the society. While most of the work under this category has focused on authoritarian regimes, recent work has looked as such patronage effect in the

contexts of democracies with similar conclusion of vote buying to retain power (Bardhan & Mookherjee, 2012; Gervasoni, 2010; Goldberg, et al. 2008).

The *third* strand of theoretical literature studies the determinants of politicians' behaviour and the consequences of their behaviour when voters are imperfectly informed about the state of the budget of the public fund at the local government level (Persson and Tabellini, 2000; Litschig and Morrison, 2012). With strategic behaviour on the part of politicians and retrospective voters, this strand of literature predicts that voters reward politicians for past behaviours (Labonne, 2013). Here, a sudden influx of fund or windfall revenues (more like NREGS funds at the GP level) at the government level are in one hand associated with increased corruption or patronage and on the other hand, increases the probability of re-election. The empirical challenge in this literature is to identify the causal story between public welfare expenditure and incumbent's vote share or re-election probability as the source of variation in the government spending is very hard to identify and in most cases, endogenous, leading two main concerns regarding causal interpretation of the estimates. The first problem is unobserved heterogeneity of incumbent politician which would lead omitted variable bias. Second problem is the reverse causality between programme spending and incumbent's vote share. Therefore, to tackle these challenges, credible estimates of the impact of the welfare programme's spending on incumbent's vote share followed experimental or quasi-experimental approach. However, two papers namely Levitt and Snyder's (1997) and Sole-Olle and Sorribas-Navarro (2008) have dealt with endogeneity of government spending using an Instrumental Variable (IV) approach. Studies based on survey data use direct comparison between recipients and non-recipients in respect of voting to the incumbent. But these types of studies may face the issue that self-reported turnout and vote choice are prone to social desirability response bias (Gonzalez-Ocantos et al. 2012). That is, programme recipients are more interested to manifest support for the incumbent when responding to a survey than when casting the vote, or reluctant to declare that they did not turn out, then conformity bias leads to wrong estimations. To tackle these aspects with a survey data many studies use Propensity score matching to tackle comparisons that conflate programme impacts with pre-existing differences (Diaz-Cayeros et al. 2007, 2009; Zucco 2010). Rest of this section will summarise the empirical literature which has either used quasi-experimental or experimental design to estimate the causal impact of government spending of welfare programme on incumbent's vote share or re-election probability.

This section of literature is largely motivated by two somewhat related but different presuppositions. One set of studies is motivated by the idea that introduction of government

welfare programme actually offers an opportunity for incumbents to assert the credit for positive programme outcomes (see for detail Pierson, 1996). These set of studies are motivated by the idea that strategic allocation of the public resources effectively influence the voters in favour of the incumbent (for detail see Cox, 2010). However, the actual empirical findings are inconclusive. Cerda and Vergara (2008) estimate that in Chili throughout in the 90s direct welfare programmes were electorally profitable for the incumbent parties. Manacorda et al. (2011) find that cash transfer in Uruguay generated support for the incumbent party even after the discontinuation of the programme. On the contrary, Levitt and Snyder (1997) estimate that in the United States, public expenditures such as Medicare, retirement benefit, low-income housing payment have no electoral benefit. Nazareno et al. (2006) have shown within countries welfare programmes produce inconsistent electoral outcome. In their study they find for some province implementation of unemployment benefit improved electoral performance but other province there was no such effect observed. Using the randomised component of Progresa (the CCT in Mexico) De La O (2013) has shown that early enrolment in the programme led to substantive increase in the voter turnout and the incumbent's vote share in 2000 presidential election. Labonne (2013) assesses the impact of targeted government transfer on local incumbent's electoral performance using randomised roll-out of CCT in Philippines and finds a 26 percentage point higher vote share for the incumbent party in the municipalities where programme was implemented in all villages than in municipalities where the programme was implemented in half of them. Brollo et al. (2010) using fuzzy regression discontinuity (FRD) approach finds an increase in the re-election probability of the incumbent by 4.1 percentage points with increase in the government transfer in Brazil. Using same FRD approach in the context of Brazil Litschig et al. (2010) finds 10 percentage point increase in the re-election probability of the incumbent with 20% extra increase in local government spending per capita.

In contrast to most of the studies discussed above, we examine the presence of nepotistic behaviour of politicians as well as the electoral feedback effect of such behaviour within the same framework. Further, our paper extends earlier literature on the electoral drivers of redistributive politics by looking at an episode where a regime change was anticipated to occur, and to see whether the behaviour of the incumbent party may differ from the entrant party in such a regime transition. After 2008 Panchayat Election and 2009 Parliamentary Election in West Bengal, political commentators were repeatedly saying that there would be a regime change in next state assembly election which indeed happened in 2011 with the fall of

35 years Left rule. Therefore one of our interests in this paper was to see whether during the period 2010-2013, the Left as the incumbent ruling party behaves differently from the TMC as the incumbent ruling party as the GP level. In section 7 we provide a discussion on this.

4. Data, Summary Statistics and Graphical Analysis.

4.1.Data

The unit of our study is Gram Sansad (or village i.e. ward of the village council). Our sample consists of a three waves (2010, 2011, 2012) panel of 569 villages from 49 different Gram Panchayats (i.e. the Village Councils) over 3 districts of West Bengal, namely South-24 Parganas, Purulia and Jalpaiguri. This panel data set contains village wise yearly information on NREGS implementation during 2010-2012, Gram Panchayat Election 2008 and 2013 outcomes for each village, socio-economic-demographic information for each village, monthly and annual average rain fall for each village. From our primary survey we collected information on village/GS wise NREGS implementation and other public expenditure through GP at the village level. 2008 and 2013 GS wise election outcomes were collected from the official website of the West Bengal State Election Commission. Village/GS wise socio-economic information was collected from the West Bengal Rural Household Survey-2011. Demographic information was collected from Census-2011, Government of India. Finally the rainfall data were collected from the precipitation data available from the Centre for Climate Research at the University of Delaware. The data include monthly precipitation values at 0.5 degree intervals in latitude and longitude. To match the data at the village/sansad level, nearest latitude-longitude to each village was taken.

In our study, we first examine whether the GP level ruling party positively discriminates its own party GS or constituency (i.e. village or ward) in terms of NREGS implementation. Second, we investigate whether this ruling-party positive discrimination varies across political parties mainly between CPIM and TMC. Third, we study the feedback or reciprocity effect following the ruling party positive discrimination on the following election outcomes for major contesting political parties.

Table 3 provides a party-wise allocation of winning seats at Gram Sansad level in respect of our sample of 569 villages in two successive Panchayat Elections 2008 and 2013. This clearly shows that even for our sample villages from 3 districts of West Bengal there is a clear picture of shifting of election outcomes in favour of TMC from 2008 to 2013 and this is also similar with the trend of the state during this period as depicted in section 2. Table 4 shows the GP board by different party. From this table 4 we can see that out of our sample of

49 Gram Panchayats, in 2008 there were overall 30.61% of GPs where TMC was the ruling party and 57.14% GPs where Left Ally was the ruling party. In 2013 previous trend has changed dramatically, in 61.22% GPs TMC has appeared as the ruling party and only 24.49% GPs are ruled by the Left Ally.

Table 3: Party wise Gram Sansad level winning seat allocation.

Party	% of seat won in 2008	% of seat won in 2013
TMC	27.89	48.68
CPIM	48.51	29.88
Left Ally	7.62	4.92
Congress	11.42	6.50
SUCI	1.58	2.64
Independent	2.69	3.69
Other (JMM, BJP, etc.)	0.29	3.69
Total	100	100

Source: From West Bengal State Election Commission website for 569 study Gram Sansads.

Table 4: GP board allocation in the sample in terms of percentage

Year	District	% GP board by TMC	% GP board by CPIM & Left Ally	% GP board by Congress	% GP board by other
2008	S-24pgs	45.45	45.45	4.55	4.55
	Purulia	31.25	50	12	6.25
	Jalpaiguri	0	90.91	9.09	0
	Overall	30.61	57.14	8.16	4.08
2013	S-24pgs	59.09	36.36	0	4.55
	Purulia	93.75	6.25	0	0
	Jalpaiguri	18.18	27.27	27.27	27.27
	Overall	61.22	24.49	6.12	8.16

Source: From West Bengal State Election Commission website for 49 Gram Panchayat.

Tables 3 and 4 also show the representativeness of our sample with reference to the overall trend of the state. In Table 5 we are showing the similar story not in terms of winning GS seats or ruling GPs rather in terms of actual vote share secured by different parties at GS level between these two successive panchayat election years 2008 and 2013 in context of 569 GS.

Table 5: Sansad wise percentage of vote received by different contesting party.

Year	District	% TMC Vote	% CPIM vote	% other Left vote	% Congress Vote	% SUCI vote	% Indep. Vote	% other vote
2008	S- 24pgs	30.69	45.86	7.83	4.537	3.16	4.66	0.464
	Purulia	23.72	44.85	5.345	10.69	0	6.760	3.3744
	Jalpaiguri	4.47	46.93	15.935	24.21	0	3.3544	1.695
	Overall	22.79	45.82	8.94	10.73	1.55	4.97	1.57
2013	S-24pgs	44.37	34.19	5.96	1.50	5.817	2.14	1.063
	Purulia	44.63	29.84	3.9	9.47	0.525	4.44	0.7038
	Jalpaiguri	21.15	20.62	6.71	21.76	0	10.77	12.41
	Overall	39.23	29.89	5.54	8.34	2.99	4.74	3.51

Source: From West Bengal State Election Commission website for 569 study Gram Sansads

4.2.Summery Statistics

In our study we used data from two consecutive election years 2008 and 2013. To see whether there is any great degree of divergence in terms of summery statistics of the variables related to election outcomes, in table 6 we present the GS level average values of the election related variables over the two elections years over our sample of 569 villages/GS

Table-6: Summary stats on election related variables over 2008 and 2013 at GS level.

Category	Average value in 2008	Average value in 2013	t-statistics mean difference.
Total voters in a GS	1003.243	925.66	8.83***
Percentage of voters casted vote	85.8589	85.76464	0.3418
Percentage of vote received by the winning candidate	56.74265	51.0522	13.4066***
Percentage of vote received by nearest defeated candidate	35.0773	35.52725	-1.2415
Margin of Win	189.5647	126.3175	8.7037***
Winning margin as percentage of total vote casted	21.66535	15.5413	8.6436***
Percentage of vote other defeated candidates received altogether.	8.172214	13.41469	-15.0694***

Source: Authors calculation from Election outcome data on sample 569 GS from West Bengal State Election Commission website: http://www.wbsec.gov.in

Table 6 shows that from 2008 to 2013 average number of voters in each Gram Sansad have decreased by around 78 but percentage of voters casted their vote remains almost same. Points to note from tables-6 are follows. First, the vote share received by the winning candidate fell by 5.69 percentage points from 2008 to 2013. Second, margin of win as a percentage of total votes casted reduced by 6.12 percentage points from 2008 to 2013. Thirdly, percentage of vote received for all other defeated candidates (i.e. other than the 2nd highest vote getting candidate) increased from 2008 to 2013. These three points can be attributed to one of the ground facts that in 2008 the Congress party (supposedly the 3rd largest party in West Bengal) was in a coalition with TMC at the state level and they jointly fought against CPIM and Left coalition in 2008 election in most of the constituencies but in 2013 Congress broke up their ally with TMC and fought as a single party in 2013 Panchayat election. This could imply that in 2013 in most of the constituencies in West Bengal, Congress has appeared as a third largest party in terms of vote share in presence of a direct fight between TMC and CPIM in most of the seats. This eventually increases the percentage of vote other defeated candidates (which now includes the Congress as well in most of the cases) received altogether and thereby reducing the winning margin between the 1st and 2nd

highest vote getting candidate. It also seems that such increase in the vote share within the 3rd position and rest are coming from the winning candidates who realised a fall in the vote share in 2013 compared to 2008. In a nutshell we can say that from 2008 to 2013 TMC has appeared as a winning party in larger number of constituencies like CPIM in 2008 but TMC as winning party in 2013 realised a little fall in their vote share which was attributed to Congress as anti-Left vote. This phenomenon could be interesting when we will see whether being ruling party there is any heterogeneity in the policy responses in respect of public good distribution by the GP.

Now we would like to see in table7 whether the villages (i.e. GS) are systematically different in terms of different village level characteristics other than the fact that each of these studied villages is either a ruling party village or opponent party village. Later on we will also explore how such variability in terms of descriptive stats at the village level varies across different ruling parties.

Table-7: Summary statistics of village level variable by ruling party village.

Variable (values refer the average value at GS level)	**Avg. value in ruling party village (T=1)**	**Avg. value in not-ruling party village (T=0)**	**t-stats from t-test for mean difference.**
NREGS Expenditure (Y)	457512.8	422547.9	0.82
NREGS days Generated annually	3780.465	3415.59	1.0323
NREGS days worked by Per NREGS HH (Y7)	32.11855	30.36	0.4821
NREGS Wage	121.2386	122.825	1.2491
Average expenditure per schemes (Y6)	143901.8	124960.5	1.7028*
No. of total Job Card (Y3)	260.913	268.5875	0.7110
No. of active Job card (Y4)	154.1523	137.9208	1.4587
2008 ruling party vote share at GS in 2008 election (X)	57.58612	32.3459	21.129***
Total Voters in 2008 Election	1011.253	1007.204	0.1772
Percentage of voters casted their vote in 2008	86.40609	88.63127	2.95**
Total monsoon rain annually (in millimetre)	1535.444	1581.955	0.8427
No. of households (as per RHS)	371.5831	407.375	2.397**
Percentage of BPL household	42.44	40.67	0.8716
Percentage of Minority household	4.47	9.98	4.83***
Worker to Non-worker ratio	0.6580254	0.6172715	4.2139***
Percentage of male GS-member 2008	58.79	62.91	1.038
Percentage of female GS-member 2008	41.21	37.09	1.038
Percentage of General caste GS-member 2008	45.78	43.75	0.5032
Percentage of SC GS-member 2008	27.71	31.66	1.0726
Percentage of ST GS-member 2008	15.66	8.7	2.53**
Percentage of OBC GS-member 2008	5.06	4.6	0.2724
Percentage of Minority caste GS-member 2008	5.78	11.29	2.5242**
Total Voters in 2013	946.6434	917.3083	1.5652
Percentage of voters casted their vote in 2013	86.413	87.469	1.8689
2008 ruling Party's vote share at GS in 2013 election	42.22	35.33	3.99***

Source: Calculation from primary pooled survey data from 569 Gram Sansads for 2010-2012.

In Table 7 we try to compare the village level average value of the variables between ruling party village (where GP level ruling party is the winning party) and *not* ruling party village (where GP level ruling party is not the winning party). With the simple comparison of village level average values it appears that ruling party villages constitute relatively higher value of NREGS related outcome variables (highlighted in table-7). However, such mean differences are mostly statistically insignificant as shown from the t-values of the t-test of the mean differences. This table also gives a gross idea on how far these ruling party and not ruling party villages are comparable. In appendix we also report two similar tables, one of which captures the same information considering CPIM as the ruling party (appendix-1) and another one with TMC as the ruling party (appendix-2). Both appendix-1 and 2 show that whoever be the ruling party, a basic pattern with higher values of NREGS related outcome variables in ruling party village is observed as in table 7.

Following 2008 Panchayat Election, in table 8 we tried to explain the pattern of NREGS outcomes (in terms of NREGS expenditure and average days worked by a representative NREGS household) in pooled time period between the period 2010 and 2012 and how it varies across the following 3 cases. Case-1, we simply looked at the average value of the NREGS related outcome variable at the GS (i.e. villages) across different parties. Here we considered all sample GPs. Case-2, same exercise but only in TMC ruled GPs and case-3, the same exercise only in CPIM ruled GP. Table-8 summarises the results.

Table-8: Village (GS) level variation of annual values of NREGS outcome

Party Affiliation of winning member	Percentage of seat after 2008 election (In study villages)	Case-1 NREGS Outcome (in Pooled GP)		Case-2 NREGS Outcome (TMC as GP level ruling party)		Case-3 NREGS Outcome (Left as GP level ruling party)	
		NREGS Expenditure (in INR)	Average days per hh worked	NREGS Expenditure (in INR)	Average days per hh worked	NREGS Expenditure (in INR)	Average days per hh worked
TMC	32.98	461269.4	39.98	595593.7	50.75	257253.8	25.54
Left	52.37	403762 (1.87)**	25.59 (3.89)***	316900.8 (2.20)**	32.75 (1.52)	419145.9 (2.91)**	27.72 (0.55)
Congress	9.92	659454.3 (0.98)	38.76 (0.58)	924633.7 (0.67)	106.16 (0.82)	601747.4 (0.76)	20.48 (0.88)
Others	4.73	331942.5 (0.37)	21.99 (0.38)	-	-	358006.3 (0.48)	22.92 (0.77)
Overall	100	444701.2	31.47	567248.7	51.93	398873.6 (3.49)**	25.39 (6.57)***

Source: Authors calculation from primary survey.

Note: Values in the bracket show the value of t-statistics of t-test for mean difference of that respective mean value and corresponding mean value in TMC village or TMC GP.

From table 8 under case-1 when we consider all the GPs in our sample, we can see that village wise average NREGS expenditure and average NREGS days worked by a representative NREGS household in TMC villages are higher compared to Left villages. These differences are also statistically significant as evident from the t-test of mean differences between TMC and Left villages. These values in Congress villages are also higher compared to TMC villages but such differences are not statistically significant. Case-2 in table-8 shows the same outcomes comparison but only within the TMC GPs i.e. GPs where TMC is the ruling party. It should be noted that both the outcomes which are used here constitute much higher values in TMC villages compared to Left villages when TMC is the ruling party at the GP level. These differences are also statistically significant in terms of conventional t-test for mean comparison. In Congress villages when TMC is the ruling party, those average values show much higher value compared to TMC villages but as these results are based on very few number of cases (as only very few number of cases Congress became the winning candidate at the village level when TMC is the ruling party at the GP level.), results are not statistically significant. In case-3 in table 8 we show the same mean comparison of NREGS outcome variables but only within the Left rule GPs. It shows when Left is the ruling party at the GP level, the average values of NREGS outcome variables are higher in Left villages compared to TMC villages. Moreover, such differences are also statistically significant. However, in Congress villages under Left rule GP, average values of these outcome variables again show higher value compared to Left villages but such differences appeared to be statistically insignificant. Finally, when we compared the village level values of NREGS outcomes between TMC ruled GP and Left ruled GP, we find annual average NREGS expenditure in a village (i.e. GS) under TMC GP is INR 567248.7 and that in Left ruled GP is INR 398873.6 and this difference is also statistically significant as the value of t-stat is 3.49.

We obtain a similar set of results if we use the average NREGS days worked by a representative NREGS household at the village level as our measure of NREGA outcomes. The following four conclusions can be derived from Table 8. First, on average TMC villages spend INR 57507.40 more than Left villages in terms of NREGS expenditure and households in TMC villages work 14.39 days more in NREGS than Left villages. Second, TMC villages under TMC GP receive INR 278692.90 more NREGS fund on average compared to Left villages under TMC GP and households in TMC villages work 18 days more in NREGS compared to Left villages under TMC GP. Third, in Left villages under Left GPs, receive INR 161892.10 more NREGS fund on average compared to TMC villages under Left GP and

households in Left villages work 2.18 days more in NREGS than TMC villages under Left GP. Finally, on average a village receives INR 168375.1 more in terms of NREGS expenditure when GP level ruling party is TMC instead of Left and households at the village work 26.54 days more in a TMC rule GP compared to a Left rule GP.

The results in the Table 8 show a general pattern that constituencies won by ruling parties tend to exhibit higher values of NREGS outcomes as compared to opponent party constituencies and this trend holds across two major competing political parties in West Bengal. From the average values in Table 8 we cannot claim that whether 'being a ruling party village' (i.e. ruling party effect) is the cause of having higher values of NREGS outcome in ruling party constituencies. The cause of such positive discrimination in ruling party villages may be explained in terms of other village level covariates other than the fact that the village is a ruling party village. Moreover, there could be some unobserved heterogeneous factors at the TMC and CPIM villages which could explain the different average NREGS values in ruling party villages. Unless we do the confirmative data analysis based on causality relation through regression, we can't comment on that. We explain in section-5 how Fuzzy Regression Discontinuity Design (FRDD) as a quasi-experimental method is used to trace the causal relation of having higher NREGS outcome in ruling party villages.

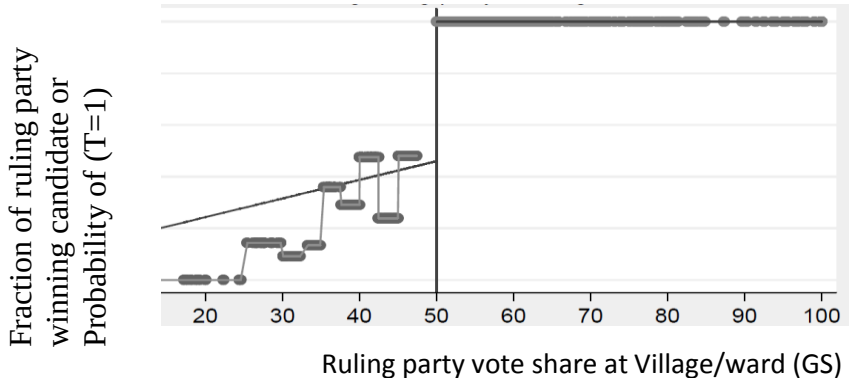
4.3. Graphical Analysis

To examine the effect of the ruling party on village level NREGS outcome, we present a set of figures that show the relationship between GP level ruling party's vote share at GS and different NREGS outcomes at the GS level (i.e. village). However, before these explorations we will graphically examine the relationship between the ruling party's vote share at GS and the proportion of ruling party's winning candidate at the village or GS level in respect of our sample villages. In Figure 3 we show this relationship. On the horizontal axis we plot the vote share of GP level ruling party at the GS/village level and in the vertical axis we plot the winning probability of GP level ruling party at the GS level i.e. Probability of T=1 i.e. P(T=1). Here T is a treatment dummy which is 1 if the GP level ruling party is also a winning party at GS level and 0 otherwise. By construction $0 \leq P(T=1) \leq 1$. Here we restrict our attention to vote shares of the ruling party (or '*the ruling-party's vote share'*) in each village and do not consider those of other parties.

It is to be noted that in our study area we have multi-party Panchayat election i.e. more than two political parties are contesting for each of the village level seats under each GP. This implies that a political party securing less than 50% vote share can also be a winning

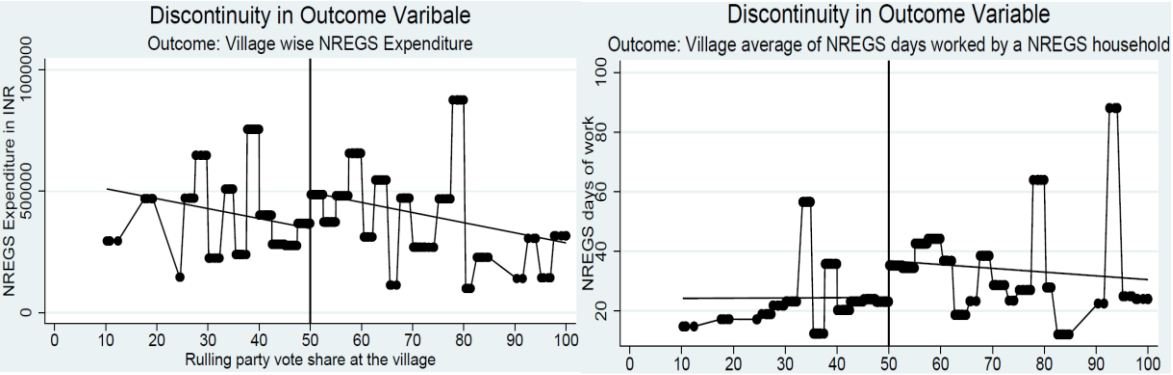
candidate at the village level if more than 2 parties are contesting in the village. However, if a contesting political party's candidate secures more than 50% vote share then with certainty that political party's candidate would be the winning candidate at the village level regardless of the number of parties contesting in the village. From figure-3 we can see that even after getting close to 25% vote share, fraction of 'GP level ruling party's winning candidate at GS level' or P(T=1) is almost zero and it increases as ruling party vote share increases. But once the ruling party's vote share crosses 50% all the ruling party's contesting candidates become the winning candidates and accordingly the value of fraction of ruling party's winning candidate is 1 or P(T=1)=1. Each point on the following graphs represents the mean value of y-variables (measured in the vertical axis) within a band of ruling party's vote share at GS with a band width of 2.5. For instance, in the band of 40-42.5% (or 45-47.5%) of ruling parties vote share, the number of villages where the ruling party's contesting candidate became the winning candidate is equal to the number of villages the ruling party's contesting candidate lost the seats in our sample area. Accordingly y-axis takes the value of 0.5 or P(T=1)= 0.5. Purely for descriptive purposes, the fitted line is drawn based on local linear fit on below and above 50% vote share. Vertical line at 50% vote share denotes the cut-off where there is a discontinuity in the value of P(T=1).

Figure-3: Ruling party vote share and fraction of ruling party winning candidate at village



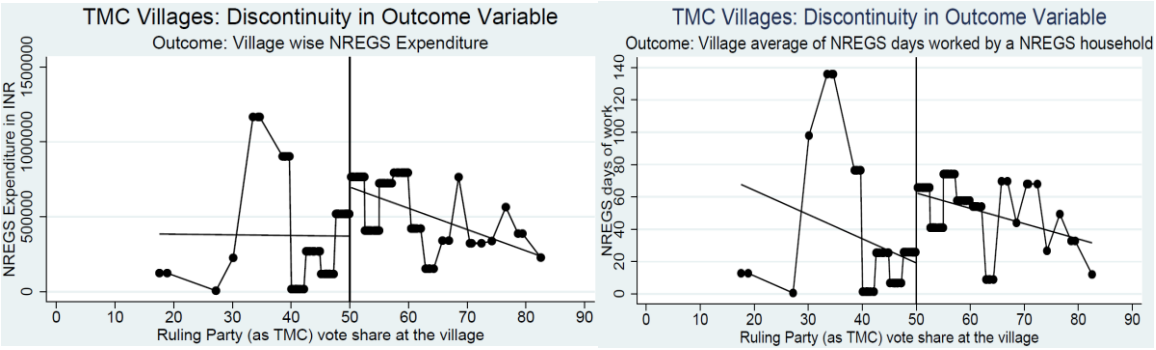
Discontinuity in figure-3 is quite obvious and also intuitively clear in multi-party election system. Next we would like to see that following the discontinuity in figure-3 if there is any discontinuous relation between the NREGS outcome variable and the ruling party's vote share at the village. In figures 4 to 6 we present that graphical exploration with different ruling party combination. First, we looked at the GP level ruling party's vote share at each GS and value of NREGS outcome variables at each GS without specifying the ruling party. We can see from figure 4 that in respect of both the NREGS outcome variables, as the GP level ruling party's village level vote share crosses 50% then there is a positive discontinuous shift in the value of the outcome variables.

Figure 4: Effect of <u>any party</u> being GP level ruling party on village/GS level NREGS outcome



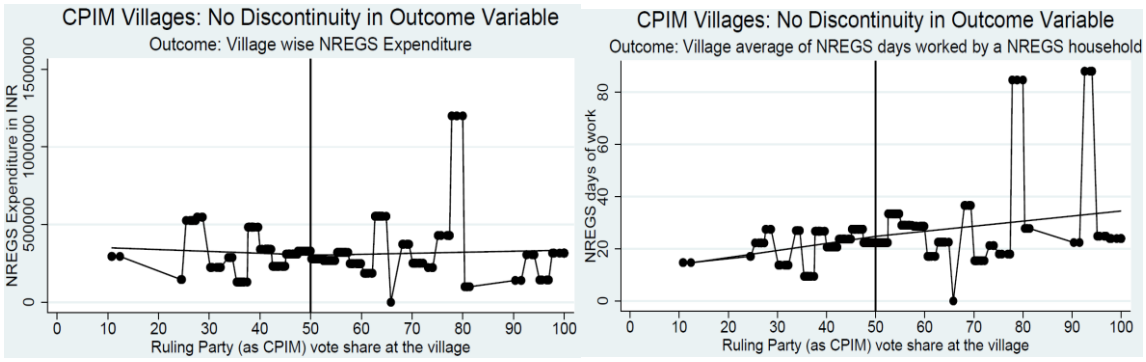
In Figure 5 we performed the same previous exercise but this time only in respect of the TMC GPs i.e. where TMC is the ruling party. Therefore we are now specifying TMC as the GP level ruling party and accordingly we are considering TMC's vote share at the GS or village level. On the vertical axis we are still measuring the village level value of NREGS outcome variables. From Figure 5 we can see that as TMC party's village/GS level vote share crosses 50% there is a positive discontinuous jump in the values in outcome variables.

Figure-5: Effect of <u>TMC</u> being GP level ruling party on village/GS level NREGS outcome



In Figure 6 we did the same exercise but this time considering CPIM as the GP level ruling party and we focused in the CPIM GPs. This is interesting to note that from figure-6 we cannot see any discontinuity like in Figures 4 and 5.

Figure 6: Effect of <u>CPIM</u> being GP level ruling party on village/GS level NREGS outcome



Meaning of discontinuity in our context implies as the ruling party's village level (i.e. GS or ward or constituency) vote share crosses 50% they suddenly start spending NREGS funds

more (and hence having higher NREGS expenditure and higher NREGS days of work) in their own constituencies. However, based on the above graphical explorations we cannot judge whether having (or not having) such discontinuity is a result of *ruling party effect* i.e. effect out of being a ruling party's winning candidate at the village level. If we were operating in only two parties contesting Panchayat Election then less than 50% vote share for ruling party's candidate at the village level would have necessarily implied that the ruling party's candidate was a losing candidate at the village level and anything more than 50% vote share would have implied only the possibility of winning. In more than two parties contesting elections by getting less than 50% vote share one GP level ruling party's candidate could be a winning candidate at the village level. Therefore discontinuity in above figures would have been clearly the *ruling party effect* if we were operating strictly in a two parties Panchayat Election. Here we cannot say this discontinuity on outcome as the exact ruling party effect.

If we define '*treatment'* as the event where GP level ruling party's contesting candidate at the village level becomes the winning candidate at village level then we would like to see the effect of this *treatment* on the village level outcomes in respect of NREGS. Since our unit of study is village therefore in our context a village will be called a *treated* village when people's representative from that village belongs to the ruling party at the GP level. In other words, a village is a treated village if the political party of village's winning candidate is same as a GP level ruling party. Otherwise, a village will be a '*not treated* village' i.e. the village where the winning candidate does not belong to GP level ruling party. We would like to see whether the treated village has any systematically different pattern in respect of NREGS outcome variables compared to not treated villages. In the following section we will present our full empirical model with a complete set of controls and specification tests to trace out treatment effect on the outcome variable. In the methodology and result sections, we will also present the empirical design and the results of feedback effect respectively.

5. Empirical strategy and identification issues.

The nature of the discontinuous relation between the NREGS outcome and the treatment provides us with an opportunity to estimate the causal effect of treatment on NREGS outcome using a regression discontinuity design (RDD). In this paper we address two research questions. First, what is the treatment effect on treated village in terms of village level NREGS outcome? If a GS is a ruling party winning village then that GS is considered as treated village. In other words, does GP level ruling party spend more NREGS fund in their own constituency? We termed this as '*Ruling party Treatment Effect'.* Second, what is

the reciprocity or feedback effect of 'Ruling party Treatment Effect' on next election outcome of the previous ruling party? We termed this as '*Ruling party Reciprocity Effect'*. To address the first research question we will use Fuzzy Regression Discontinuity Design (FRDD). For the second research question we will employ an alternative version of Indirect Least Squares (ILS). The use of FRDD is a novel idea to utilize the data structure.

5.1 Empirical strategy for estimating '*Ruling party Treatment Effect'*

As mentioned earlier, while elections are typically fought among 7 political parties, the state of West Bengal has two major political parties. Most of the GPs in the state as well as in our sample are run by either of these two major political parties. We claim that if vote share of any political party in a ward/constituency is more than 50 % then that party will definitely be the winning party in that constituency. However, if that party gets less than 50% vote share, then they may or may not be the winning party in that constituency. In a two party election system like in US, if vote share of any party is below 50% then definitely that party will be the losing party in that constituency. In our setting of multi-party, even getting vote share below 50%, one party can become the winning party. We exploit this idea to set our Fuzzy RDD (FRD).

Following the RDD structure here our assignment variable (X) is the GP level ruling party's vote share in each village/ward/constituency and the treatment variable (T) is a (0,1) dummy showing 1 if the village level winning candidate belongs to GP level ruling party and 0 otherwise. This assignment variable could be anything ranging from 0 to 100. If X>50 then GP level ruling party is also the winning party at the village level and hence T=1 and making 100% compliance. But if X<=50 then that GP level ruling party member may or may not be the winning candidate as we are operating in more than two parties election here. In other words we can say that probability of getting treated i.e. [i.e. P(T=1|X)]=1 if X>50 but it will not necessary be 0 if X<=50 and this makes the RDD as fuzzy unlike sharp RDD structure in a two parties voting system (like in US) where P(T=1|X)=1 if X>50 and P(T=1|X)=0 if X<=50. We expect there should be a jump in probability of getting treated at just below and just above the cut-off X=50 or a discontinuity in P(T=1|X) at the cut-off X=50. More precisely there should be a sudden increase in the treatment probability with a range of discontinuity at the cut-off X=50. Our next question is whether such jump of this treatment probability or discontinuity in probability of treatment has any effect on the outcome variable Y which is in our case village wise NREGS expenditure (or any outcome related to NREGS implementation). We will verify this discontinuity in probability of treatment in result section.

5.1.1 Identifying Treatment Effect under Imperfect Compliance through the FRDD

The basic idea of RD design is that the probability of receiving a treatment (a village/ward being a GP level ruling party's village) is a discontinuous function of a continuous treatment determining variable (i.e. X= GP level ruling party's vote share at the village). However, treatment in our case does not change from 0 to 1 at the cut-off point (i.e. X=50). In our case treatment will be 1 for X>50 (perfect compliance) but for X<=50 treatment may not necessarily be 0 (imperfect compliance). In such a case FRDD is appropriate because it allows for a smaller jump (less than one) in the probability of treatment at the cut-off. In case of a binary treatment FRD design may be seen as a Wald estimator (around the discontinuity c) and the treatment effect can be written as

$$\sigma_{FRD} = \frac{\lim_{\varepsilon \downarrow 0} E[Y \mid X = c + \varepsilon] - \lim_{\varepsilon \uparrow 0} E[Y \mid X = c + \varepsilon]}{\lim_{\varepsilon \downarrow 0} E[T \mid X = c + \varepsilon] - \lim_{\varepsilon \uparrow 0} E[T \mid X = c + \varepsilon]} \tag{1}$$

where, in our case, c is the cut-off point; X is the GP level ruling party vote share at village; T is the treatment. In the following sub-section we explain how we can estimate σ using Two Stage Least Square or IV estimation technique

5.1.2 Estimation strategies for the Local Treatment Effect under FRDD

In this study, the outcome denoted by Y is the village-wise NREGS expenditure. T denotes a binary treatment variable taking 1 if the village-level winning candidate belongs to GP level ruling party and 0 if he or she does not belong to GP level ruling party. After normalising 'X' into 'x', where x=(X-50), the cut-off is at x=0. Potential outcome can be written in the following structural form equation (Angrist & Pischke, 2009):

$$Y = f(x) + \sigma T + e \tag{2}$$

where σ denotes the local average treatment effect on Y. This is estimated in FRDD by extrapolating the compliance group (Imbens & Angrist, 1994), and:

$$Y = \begin{cases} Y_1 = f_1(x) + \sigma + e & \text{if T=1} \\ Y_0 = f_0(x) + e & \text{if T=0} \end{cases} \tag{3}$$

where Y_0 denotes the potential outcome i.e. village-wise NREGS expenditure that is explained by X in $f_0(x)$ and other (observed and unobserved) covariates in the error term denoted by e. In other words Y_0 is the village-wise NREGS expenditure in non-ruling party

villages and Y_1 is the potential outcome i.e. village wise NREGS expenditure with treatment i.e. village wise NREGS expenditure in ruling party's villages, where σ is added with Y_0.

The conditional probability of treatment P(T=1|x) is expected to be discontinuous at the cut-off, x=0. Thus, it can be written in the following form:

$$P(T=1|x)=E(T|x)=\begin{cases} g_1(x) & \text{if } x>=0 \\ g_0(x) & \text{if } x<0 \end{cases} \quad (4)$$

where, $g_1(0) > g_0(0)$ indicates discontinuity in P(T=1|x) at x=0. Now E(T|x) can be written in the following functional form:

$$E(T|x)= g_0(x) + [g_1(x) - g_0(x)]Z = g_0(x) + \pi Z \quad (5)$$

where $g_1(x) - g_0(x) = \pi$ and Z is an instrumental variable for endogenous treatment variable T. Z determines the eligibility of village to be a treated village (i.e. ruling party's village) or non-treated village (i.e. non-ruling party's village). Thus, Z is constructed as follows

$$Z=\begin{cases} 1 \text{ if } x>0 \\ 0 \text{ if } x<=0 \end{cases}$$

Thus treatment equation for T can be written as

$$T= g_0(x) + \pi Z + \xi \quad (6)$$

where ξ denotes an error term that captures observed and unobserved factors plus measurement error in x influencing T. Equation (6) is a reduced form equation, while equation (2) is a structural one. From equation (2), the local average treatment effect (i.e. effect on Y of being a ruling party ward), σ, is not identified as E(T,e)≠0, which indicates that T is an endogenous variable.

A more intuitive explanation is given below on why T is endogenous. T=1 implies that GP level ruling party's contesting candidate who fought in the election at the GS level (i.e. village or ward level) is a winning candidate. Now probability of winning an election at the village level depends on many unobserved factors like presence of party's hooligan power that could capture the election at the village election booths, party's internal fractured anti-force who could work against the party during election, swing voters who behave differently with a tiny monetary benefit in the night before the election etc. There are enough anecdotal evidences of these factors in the newspapers especially in the time of Panchayat elections.

These said factors can also influence directly the NREGS allocation and outcome at the village level. This clearly makes our treatment dummy T as endogenous.

Now the treatment effect 'σ' can be identified applying either indirect least squares (ILS) or two stage least squares (2SLS) (i.e. same as instrumental variable techniques). Under ILS, we need to substitute Equation (6) into equation (2). After doing this, we have the following reduced form equation of outcome variable Y:

$$\left.\begin{aligned} Y &= f(x) + \sigma\{g_0(x) + \pi Z + \xi\} + e \\ &= f(x) + \sigma g_0(x) + \sigma\pi Z + \sigma\xi + e \\ &= k(x) + \sigma\pi Z + \psi \end{aligned}\right\} \quad (7)$$

where $f(x) + \sigma g_0(x) = k(x)$ and $\sigma\xi + e = \psi$. Now we can estimate the local average treatment effect σ, dividing $\sigma\pi$, the co-efficient of Z in equation (7), by π, the co-efficient of Z in equation(6).

Alternatively, we can run IV or 2SLS regression:

$$Y = f_0(x) + \sigma E(T|x) + e \quad (8)$$

where the coefficient at $E(T|x)$, σ, is the local average treatment effect of compliers, and $E(T|x)$ comes from equation (6), which can be treated as the first stage regression of IV(or 2SLS).

Following Lee and Lemieux's (2009) suggestion, we will estimate the parameter of interest σ using two different methods. The first one is based on a local linear regression around the discontinuity choosing the optimal bandwidth in a cross validation procedure that we discussed in Appendix 3. The second method makes use of the full sample using a polynomial regression in which the equivalent of the bandwidth choice is the choice of the correct order of the polynomial by using AI (Akaike Information) Criterion (see Appendix 4). In both cases, we estimate the treatment effect using 2SLS which is numerically equivalent to computing the ratio (as illustrated in equation-1) in the estimated jump (at the cut-off point) in outcome variable over the jump in the probability of treatment, provided that the same bandwidth or same polynomial order is used for both equations. This allows us to obtain directly the correct standard errors that are robust and clustered at the village level.

Our assignment variable X (which after normalisation is x=X-50) which shows the GP level ruling party's vote share in each ward is constructed on the basis of the GP election results

from 2008 election. The outcome variable(Y) is from the ward/village level pooled panel data on NREGS implementation from 2010 to 2012 and other village level covariates are also from 2010 to 2012. In online appendix (A-1) we discuss in details all the identification issues and test for validity of RD design.

5.2 Empirical strategy for estimating '*Ruling party Reciprocity Effect'*

In this sub-section we are addressing the empirical strategy for our second research question i.e. what is the reciprocity or feedback effect of 'Ruling party Treatment Effect' on next election outcome of the previous ruling party? We termed this as '*Ruling party Reciprocity Effect'*. If due to ruling party treatment effect, GP level ruling party spends more (or less) of NREGS funds (or showing better NREGS outcome) at their own party constituencies then what is the feedback effect that these GP level ruling parties (based on 2008 election) are realising in terms of election outcome (i.e. both in terms of vote share and probability of re-election) in 2013 Panchayat Election? Here we are trying to estimate this *'Ruling party Reciprocity Effect'* by an alternative version of indirect least square estimation. In equation 8 σ captures the treatment effect. Now we can derive the estimate of Y from equation 8. Then the predicted value of Y (say, Y_hat) for T=1 for each village will explain that part of Y which is explained by the ruling party-treatment effect and the rest of Y [i.e. (Y-Y_hat)] will show the value of Y which is explained by other observed and unobserved factors. We are now using this Y_hat as our main explanatory variable to estimate the 2008 ruling party's vote share in 2013 election. The empirical specification to estimate the ruling party reciprocity effect is the following.

$$V_{i\_2013} = \alpha_0 + \alpha_1 Y\_hat + \gamma K + d + t + \varepsilon_i \quad \text{..... (9)}$$

where V_{i_2013} is the 2008 ruling party's vote share in 2013 panchayat election at village i, Y_hat is the predicted value of Y for T=1 from equation 8 and K is the vector of other village level characteristics 'percentage of winning margin to total vote casted in 2008 election', 'percentage of vote received by all other contesting candidates excluding the total vote of 1st and the 2nd placed candidate in 2008 election' 'no. of household', 'percentage of BPL households', 'percentage of minority households', 'worker to non-worker ratio'), 'd' district fixed effect and 't' time fixed effect and ε_i is the unobserved error. We will be particularly interested to see the sign, magnitude and statistical significance of α_1. Equation 9

will be estimated by using Ordinary Least Square (OLS) estimation technique[5]. As part of robustness check we will also try to estimate the probability of the 2008 ruling party getting re-elected in 2013 election. In that case our specification will remain same except the dependent variable (say R) will be 1 if the ruling party gets re-elected and 0 otherwise. In that case we will estimate 'Probability (R=1)' by probit regression.

6. Results

6.1 Results for the Treatment Effect.

In this section we start by presenting the estimated *treatment* effect i.e. the effect of 'being a ruling party winning candidate at the village level' on NREGS outcomes namely the 'village wise NREGS expenditure' and 'average NREGS days of work availed by a household in the village' using local linear regression. In appendix 3 we discuss the cross-validation procedure suggested by Imbens and Lemieux (2008) for choosing the optimal bandwidth. This procedure results in an optimal bandwidth that is calculated to be 5 on both sides of the discontinuity for estimating the treatment effect on the outcome variable. However, in Tables 9 and 10 we explore the sensitivity of the results to a range of bandwidth (as h) that goes from 5 to 10 around the discontinuity x =0 or X=50.

Table 9 and 10 show the estimated treatment effect on NREGS outcome at the village level. For both Table 9 and 10, the results are shown for 3 different samples. First, we present the results based on the whole sample covering all the GPs in the sample without specifying which party is the ruling party at the GP level. The second set of results is based on a sub-sample of GPs where we only considered TMC ruled GPs i.e. where TMC is the ruling party at the GP level. The third set of the results are based on a sub-sample of GPs where we only considered CPIM ruled GPs i.e. CPIM is the ruling party at the GP level. The last row of each table reports the F-test on the excluded instrument- the dummy variable indicating the effect of the treatment.

If we report the results with optimal bandwidth (i.e. 5) then from table 9 we can observe that treatment effect is INR 38749.8 when we use the whole sample. In other words we can conclude that due to being a ruling party's winning village that village receives INR 38749.8 more in terms of NREGS expenditure compared to a non-ruling party's village and this result is statistically significant at 1% level. However, this treatment effect gets more pronounced when we run the results only within TMC GPs. It is evident from Table 9 that when TMC is

[5]It should be mentioned that here in equation 9 we use Y_hat instead of Y to deal with the endogeneity associated with Y.

the ruling party they tend to spend INR 125253.6 more funds in their own village or constituency compared to opponent's village and this result is also statistically significant at 1% level. It is interesting to note that when we run our results only within CPIM GPs the sign of the treatment effect is negative but statistically insignificant which implies when CPIM is the ruling party they tend to spend less in their own villages. However, the treatment co-efficient is statistically insignificant. It is also to note that the treatment effect is robust enough with any change in bandwidth as the sign and significance remain almost same.

Table 10 shows similar results with a different outcome variable. Here we use 'average days of NREGS work availed by a household at the village level'. From table 10 we find that the direction of treatment remains exactly same as with Table 9. When we run the results with the whole sample of GP we obtain a small treatment effect i.e. households in the ruling party's village receive 3.59 days more of NREGS work compared with the households in the non-ruling party's village. However, when we run the result in the TMC GPs then we can see households in the TMC villages receive 13.702 days more of NREGS work than the households in the non-TMC villages within the same GP. Both these results are statistically significant and robust with the change in the bandwidth. Results in the CPIM GPs show households in the CPIM villages get less days of work compared with non-CPIM villages within the same GP, but this negative treatment effect is also statistically insignificant.

Table-9: Treatment effect on Village wise Expenditure. (Local Linear Regression)

	From whole sample					
	h=10	h=9	h=8	h=7	h=6	h=5
Treatment Effect	26394.42	32139.11	37265.5	32605.9	32989.57	38749.8
	(1.01)	(1.35)	(2.09)**	(1.77)*	(1.90)*	(2.65)***
N	573	553	517	490	474	457
F-test	4.80	4.27	2.94	3.08	3.04	3.55
From sub sample with only TMC GPs (i.e. TMC is the ruling Party)						
Treatment Effect	61935	70328.21	83093.85	103427.3	108499.1	125253.6
	(2.23)**	(2.33)**	(2.21)**	(2.29)**	(2.88)***	(2.66)***
N	156	150	144	138	132	121
F-test	2.62	2.67	2.54	2.59	2.64	3.01
From sub sample with only Left GPs (i.e. Left is the ruling Party)						
Treatment Effect	-16113.87	-27902.66	-17439.02	-20343.15	-21287.08	-21108.5
	(1.38)	(0.05)	(1.28)	(1.34)	(0.19)	(0.98)
N	356	342	320	300	264	246
F-test	1.33	0.13	0.94	0.91	0.65	0.48

Table-10:
Treatment effect on days of NREGS work availed by per household. (Local Linear Regression)

From whole sample						
	h=10	h=9	h=8	h=7	h=6	h=5
Treatment Effect	2.506801	3.328229	4.017379	3.65656	3.636281	3.596163
	(2.30)**	(2.84)***	(2.75)***	(2.49)**	(2.21)**	(2.04)**
N	573	553	517	490	474	457
F-test	6.38	5.49	5.27	5.52	5.70	5.65
From sub sample with only TMC GPs (i.e. TMC is the ruling Party)						
Treatment Effect	7.142116	7.988581	9.708789	12.37074	11.57289	13.702615
	(2.88)***	(2.94)***	(2.76)***	(2.81)***	(2.58)**	(1.93)**
N	156	150	144	138	132	121
F-test	4.06	4.23	3.80	3.87	3.69	4.16
From sub sample with only Left GPs (i.e. Left is the ruling Party)						
Treatment Effect	-4.833532	-2.974933	-0.0896552	-1.984952	-1.182715	-0.5383194
	(0.51)	(0.32)	(0.01)	(0.17)	(0.44)	(0.03)
N	356	342	320	300	264	246
F-test	1.85	0.40	0.76	0.41	0.14	0.58

Note: Significance levels: * 10%level, ** 5% level, *** 1% level. In the above table 'h'denotes bandwidth selection from 10 to 5 and this is in terms of x i.e. X-50, where X is the ruling party's vote share at the village/ward level. |t|-stat (i.e. absolute value of ratio of estimated co-efficient and standard error)| value is in the bracket. F-test shows the F-stat value from F-test on the excluded instrument.

To check the robustness of our results, we estimated treatment effect on the village level NREGS outcome using the polynomial regression instead of local linear regression above. The results and discussions from this polynomial regression (online appendix A2) along with the results from the different identification test (online appendix A3) for validity of FRD design are also presented in online appendix. We also check the sensitivity of the treatment effect with inclusion of all covariates with local linear regression (see appendix 5 table A&B).

6.2 Estimation results on reciprocity or feedback effect

In section 6.1 we presented the treatment effect on the village level NREGS outcome variable and we found that in general treatment effect on outcome variables are positive. This implies that a better NREGS outcome (both in terms of NREGS expenditure and NREGS days of work availed by a household) tends to be observed in GP- level ruling party's villages than the opponent party's villages within the same GPs. We also found that these treatment effects are more pronounced at the TMC GPs, while there is no statistically significant clear evidence of such treatment effect in CPIM GPs. In this section we will present the feedback effect of these treatment effects (reflected on village level NREGS outcome) on the 2013 election outcomes of the 2008 ruling parties. Before presenting the regression results, we refer to appendix-6 table-A where the descriptive results are presented on the village (or ward)

level vote share of two major parties namely TMC and CPIM after 2008 and 2013 Panchayat election respectively by GP level ruling party and by treatment effect. It is interesting to infer from appendix-6 table-A that after 2008 election where TMC was the ruling party at the GP level and also the winning party at the village level within those GPs, TMC improved their vote share from 55.01 percent in 2008 to 62.98 percent in 2013. After 2008 election in which CPIM was the ruling party at the GP level and also the winning party at the village level within those GPs, CPIM suffered a fall in their vote share from 61.82 percent in 2008 to 34.90 percent in 2013. It is even more interesting to note that in these constituencies where TMC was the losing party in 2008, TMC improved their vote share from 12.46 percent in 2008 to 34.04 percent in 2013. One explanation of this could be that in these constituencies CPIM did not seem to reap out the benefit of treatment effect and people did not support them in 2013. On the other hand, although TMC was a losing party in 2008, it increased the vote share in 2013 out of this people's dissatisfaction in CPIM villages under CPIM GP. But the latter could be a general effect out of a regime change. In this section, our regression analysis, as outlined in section 5.2, will try to find what percentage points of gain in the vote share of TMC can be attributed to the treatment effect.

We know the treatment effect in TMC GPs is positive and significant and the treatment effect in CPIM GPs is negative but insignificant. In our formulation *Y_hat* represents that part of Y which is explained by the treatment effects only and it in turn has feedback on election outcomes 2013. From Table 11 we can see such feedback effect is positive and significant in terms of increase in the vote share in 2013 election in villages where TMC was the ruling party after 2008 election. But for CPIM ruling party villages such feedback effect is negative but insignificant once we control for district and time fixed effect.

Table 11: Feedback effect on ruling party's vote share in 2013 election.

	Vote share of TMC	Vote share of TMC	Vote share of TMC	Vote share of CPIM	Vote share of CPIM	Vote share of CPIM
(Y_hat)*100000	2.07	2.21	1.48	-1.11	-1.12	-0.92
	[3.28]***	[3.98]***	[2.92]***	[-3.25]***	[-3.17]***	[-0.48]
Margin of win as percentage of total vote caste in 2008		0.649	0.578		-0.0706	-0.033
		[6.86]***	[5.68]***		[-2.52]***	[-1.03]
Percentage of total vote others defeated candidates got in 2008		0.232	0.023		-0.254	-0.261
		[0.81]	[0.08]		[-2.96]***	[-2.93]***
HH_RHS		-0.027	-0.022		0.002	0.001
		[-1.89]	[-1.87]*		[0.19]	[0.22]
Percentage of BPL HH		0.482	0.371		0.045	0.024
		[3.67]***	[3.62]***		[0.59]	[0.55]
Percentage of Min. HH		-0.324	-0.251		-0.276	-0.106
		[-1.69]*	[-1.25]		[-1.72]*	[-1.23]
Worker to Non-Worker ratio		-7.283	-5.7935		2.786	3.108
		[1.78]*	[-1.91]*		[1.89]*	[0.35]
District Fixed Effect		No	Yes		No	Yes
Time Fixed Effect		No	Yes		No	Yes
Observations	329	329	329	673	673	673
R^2	0.0639	0.331	0.433	0.0374	0.0641	0.156
F	10.75	24.45	12.221	10.59	8.88	5.76

From Table 11 we can say that TMC, as a ruling party after 2008 election at the GP level, has realised 1.48 percent increase in their vote share in their own villages in 2013 election by spending extra INR 100000 NREGS funds in their own constituencies compared to opponent party constituency. In other words we can say that by spending INR 100000 extra NREGS funds TMC as ruling party gained 1.48 percent vote share in their own constituencies after 2013 election. While CPIM as ruling party in 2008 election realised a fall in their vote share in their own constituencies after 2013 election, once we control for district and time trend in the state, such a fall in the vote share becomes statistically insignificant. This means that fall in CPIM vote share in their ruling villages in 2013 cannot be attributed to the ruling party treatment effect. This is expected because for CPIM ruling villages we did not get any significant treatment effect earlier.

In Table 12 we obtain similar results in the case where the dependent variable is a dummy variable which takes 1 if party gets re-elected and 0 otherwise. Here regression results show

the marginal effect of the probit regression. Before presenting the regression results we refer to the Appendix –6 table-B where we show re-election scenario by treatment and by party. From Aappendix –6 table-B we can infer that in 44.30 percent of the total constituencies, TMC candidates got re-elected in 2013 election whereas CPIM candidates got re-elected only in 26.15 percent of the total constituencies in 2013 election. But when we try to look this same re-election scenario within the treated villages, then we can see that TMC got re-elected in 63.83 percent seats within the treated village whereas CPIM got re-elected in 22.10 percent seats within the treated villages. This indicates that treatment certainly has some contribution in increasing the probability of getting re-elected.

Table-12: Marginal effect on ruling party's probability of getting re-elected in 2013 election

Xs (explanatory variables)	dY/dX (marginal effect on probability of re-election in 2013 in TMC villages when T=1)	X-bar (Average value of Xs in TMC Villages when T==1)	dY/dX (marginal effect on probability of re-election in 2013 in CPIM villages when T=1)	X-bar (Average value of Xs in CPIM villages when T=1)
(Y_hat)*100000	0.113959	(512345.33)* 100000	-.08001	(411326.78)* 100000
	[2.37]***	-	[-0.71]	-
Percentage_margin_ win2008	0.176337	22.25	-.00489	24.78
	[2.33]**	-	[-1.55]	-
Percentage_vote_ot hers_defeatedcandid ate2008	-.164855	6.65 -	-.007345	6.33
	[-2.05]**		[-1.66]*	-
HH_RHS	-.0003211	350.55	.0003172	375.132
	[-0.95]	-	[1.75]*	-
pct_BPLhh_rhs	-.0005659	42.97	-.0015378	40.09
	[-0.19]	-	[-1.06]	-
pct_MINhh_rhs	.0008952	3.97	.0015921	5.42
	[0.16]	-	[0.57]	-
WtoNW_Raio	.1992362	0.625	-.3784496	0.666
	[0.24]	-	[-1.21]	-
District Fixed Effect	Yes		Yes	
Time Fixed Effect	Yes		Yes	
Observations	329		673	
Pseudo R^2	0.1657		0.0705	
Prob>Chi2	0.0018		0.0000	

In Table 12 we present marginal effects of preferential spending of NREGS funds in ruling party's villages on probability of getting re-elected. We can see that TMC by spending extra INR 100000 NREGS fund in their own villages realized 11.39 percentage point increase in

their probability of getting re-elected in their own villages whereas CPIM realized 8 percentage point fall in the probability of getting re-elected but the result is statistically insignificant with district and time fixed effect.

This result section clearly shows following major findings. First, in general there is a ruling party treatment effect on NREGS outcome meaning ruling party's villages show better NREGS outcome. This trend gets much more pronounced when TMC is the ruling party and we find TMC as ruling party spends around INR 125K to 150K more NREGS funds annually in their own villages compared to non-TMC villages. On the contrary, we did not find such trend when CPIM is the ruling party. CPIM as a ruling party spends less in their own party villages, but this result is statistically insignificant. Following this heterogeneous treatment effect we tried to see the feedback effect of this treatment effect on the 2013 election outcome of the 2008 ruling parties. We find that due to this positive treatment effect, TMC as a ruling party gained both in terms of the vote share and the higher probability of getting re-elected in 2013 panchayat election in their own party villages, while CPIM as a ruling party could not reap out such a benefit as for CPIM villages there is no significant feedback effect out of the treatment effect. So given the scope of *Political Nepotism* and its potential positive effect on incumbent's following electoral outcome, it seemed that TMC did behave in a nepotistic way and reap out significant electoral benefit, whereas CPIM did not behave in a nepotistic way and could not reap out any electoral gain.

7. Why did the two incumbent parties behave differently in allocating NREGS funds?

A striking and interesting result that we have obtained is the differences in the '*ruling party treatment effect'*. We find that the CPIM as an incumbent ruling party did not spend more NREGS fund in their own party villages than opponent parties' villages, whereas TMC as an incumbent ruling party spent more NREGS fund in their own party villages compared to its opponent party villages. Why should there be differences between the two parties in practicing political nepotism, especially given the fact that there was a clear positive electoral return to discriminating in favour of own constituencies in the allocation of NREGS expenditures and work provided? In this section, we provide possible explanations of the heterogeneous treatment effects that we observe across the two main political parties.

Firstly, we suggest that the different behavior of the LF as compared to the TMC may be related to an impending change in the political regime that the LF could foresee. During regime transition, the incumbent may behave differently compared to a normal time,

especially when the incumbent can foresee that regime change (Peng, 2003; Vergne, 2006; Snyder and Mahoney, 1999; Kitschelt, 1992; Gandhi, 2014). Regime transitions have an important impact on the capacities and functioning of the incumbents who try to defend them and similarly regime institutions also influence the strategies of the challengers or *entrants* who seek to transform them. We discussed already that after 2008 Panchayat Election and 2009 Parliamentary election in West Bengal, people expected a regime change and it eventually happened in 2011 state assembly elections. More than three decades of the Left political regime came to an end in 2011 and there was a change of regime to the TMC. Since 2009 onwards, it was a common perception among the political class in West Bengal that a regime change would likely to happen in the 2011 Assembly election. This aspect of regime change was popularly known as '*Poribartan'* (i.e. Bengali synonym of *Change)* during the period 2009 to 2011. Such a perception of *Change* was readily observed from newspaper article and academic writings of that period (Dasgupta, 2009; Chatterjee, 2009; Bhattacharyya, D., 2009; Bardhan et al. 2009), and political briefings. Foreseeing the regime change and especially after the change in the ruling party in state assembly elections in 2011, the Panchayat election in 2013 was a losing battle for CPIM. For the CPIM-led LF, there was no strong electoral reward anticipated in practicing political nepotism during the period 2010-2012. On the contrary TMC has a strong reason to practice nepotism to consolidate their hold over Panchayat governments in West Bengal. This may explain to a large extent why the LF did not practice nepotism in its own constituencies, even when it was in its interest to do so.

A second explanation we offer is to do with the class interests and core ideology of the LF, and the social base of their support in the years that they formed the local and state governments in West Bengal. The Left, and the CPIM in particular, is historically a political party based on middle and small peasantry class in West Bengal (Chakraborty, 2015). During its years in government, the CPIM's main focus was placed on land reform and tenancy reform whereby it protected the interest of the small and marginal farmers (ibid.), and secured their votes for regime survival (Bardhan and Mookherjee 2006, 2012) On the other hand, the NREGS is a programme which primarily targets agricultural labours who are mostly landless and who have historically not been the support base of CPIM. Thus, the lack of nepotistic behavior practiced by the LF when it came to the NREGS may be seen as being more in line with ideology based theories of political behavior, where incumbent parties do not directly use public programmes under their control for clientelist purposes, even when it is in their short-term interests (Lipset 1960, Besley and Coate 1997)

8. Conclusion

At the outset of the paper we defined the term 'Political Nepotism' which is a behaviour of the existing ruling party in a democratic set up to positively discriminates its own party constituencies in terms of allocating more public funds compared to opponents party's constituencies. We tested the existence of such Political Nepotism in the context of Village Council (i.e. Gram Panchayat) level ruling party in West Bengal Panchayats in distributing the NREGS funds using a quasi-experimental research design by Fuzzy Regression Discontinuity Design. We find the existence of this political nepotism in general. However, looking closely at the two major political parties in West Bengal - the TMC and CPIM, we find TMC practiced this political nepotism strongly in their villages where they were the ruling party after 2008 election. In contrast, the CPIM has not practices a similar type of behaviour successfully with respect to the NREGS. We also investigate the feedback of this political nepotism of the 2008 ruling parties' on the election outcome after 2013 election. We find that the nepotistic behaviour of TMC was rewarded in terms of the better election outcome in 2013, whereas CPIM could not reap out any significant electoral gain in the following election due mainly to their non-nepotistic behaviour. We suggest that the differences in behaviour between the two political parties can be attributed to the anticipation of regime change in the state, which provided little incentive for the CPIM in engage in political nepotism, as well as the class background of the potential beneficiaries of the NREGS, who have historically not been the core supporters of the Left regime in West Bengal.

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Appendix

Appendix-1: Summary statistics of village level variable by ruling party village (When CPIM is the ruling party)

Variable (all values refer the average value at GS level)	Values in Ruling party Village (K=1)	Values in Not-ruling party Village (K=0)	t-test for mean difference
NREGS Expenditure (Y)	330148.4	302944.9	0.6495
NREGS days generated annually	2749.887	2365.5	1.0731
NREGS days worked by Per NREGS HH (Y7)	24.8656	25.657	0.2344
NREGS days worked by Per HH (y)	8.74	7.504	1.0729
NREGS Wage	121.624	123.395	1.0721
Total Schemes completed in a year (Y5)	2.788	2.7266	0.2065
Average expenditure per schemes (Y6)	126268.1	121001.5	0.4441
No. of new schemes completed (Y1)	2.2448	2.214815	0.1132
No. of existing schemes completed (Y2)	0.735	0.661	0.4983
No. of total Job Car (Y3)	251.879	247.97	0.2582
No. of active Job card (Y4)	138.40	92.87	3.2771***
GP level ruling party vote share at GS (X1)	58.5022	39.48648	12.915***
Total Voters in 2008 Election	974.9	983.187	0.2948
Percentage of voters casted their vote in 2008	87.484	90.326	3.5651***
Total monsoon rain annually (in millimetre)	1414.14	1242.549	3.6178***
No. of households (as per RHS)	375.132	397.23	1.1490
No. of BPL households (as per RHS)	152.352	155.53	0.2343
No. of minority households (as per RHS)	20.2	58.93	5.3631***
Worker to Non-worker ratio	0.66698	0.5826725	5.9496***
Percentage of male GS-member 2008	62.4	61.15	0.2425
Percentage of female GS-member 2008	37.6	38.85	0.2425
Percentage of General caste GS-member 2008	34.4	34.53	0.0263
Percentage of SC GS-member 2008	42.4	39.57	0.5422
Percentage of ST GS-member 2008	12.8	2.16	3.5630***
Percentage of OBC GS-member 2008	4	6.47	1.0841
Percentage of Minority caste GS-member 2008	6.4	17.26	3.4233***
Number of observation	250	139	

Appendix-2: Summary statistics of village level variable by ruling party village (When TMC is the ruling party)

Variable (all values refer the average value at GS level)	Values in Ruling party Village (L=1)	Values in Not-ruling party Village (L=0)	t-stats from t-test for mean difference.
NREGS Expenditure (Y)	595593.7	499220.7	0.8414
NREGS days generated annually	4803.382	3967.204	0.9406
NREGS days worked by Per NREGS HH (Y7)	50.75019	54.777	0.3451
NREGS days worked by Per HH (y)	15.33158	17.0314	0.4039
NREGS Wage	120.6	122.56	0.7327
Total Schemes completed in a year (Y5)	2.964912	3.2553	0.6190
Average expenditure per schemes (Y6)	167777.4	114349.4	2.0401***
No. of new schemes completed (Y1)	2.508772	2.5106	0.0039
No. of existing schemes completed (Y2)	0.5098039	0.9210	2.5645***
No. of total Job Car (Y3)	246.6833	256.06	0.4927
No. of active Job card (Y4)	124.3898	109.48	0.9770
GP level ruling party vote share at GS (X2)	57.80032	27.83477	14.0582***
Total Voters in 2008 Election	1073.217	1083.74	0.2065
Percentage of voters casted their vote in 2008	85.25379	87.2757	09467
Total monsoon rain annually (in millimetre)	1301.06	1255.124	1.3164
No. of households (as per RHS)	350.5583	420.64	2.4049**
No. of BPL households (as per RHS)	151.7333	146.3	0.3229
No. of minority households (as per RHS)	12.575	32.42	2.9931**
Worker to Non-worker ratio	0.6251478	0.6245263	0.0421
Percentage of male GS-member 2008	58.33	56	0.2790
Percentage of female GS-member 2008	41.67	44	0.2790
Percentage of General caste GS-member 2008	20.84	44	3.1480***
Percentage of SC GS-member 2008	60.83	48	1.5420
Percentage of ST GS-member 2008	6.66	2	1.2364
Percentage of OBC GS-member 2008	5	0	1.6126
Percentage of Minority caste GS-member 2008	6.67	6	0.1601
Number of observation	120	50	

Appendix-3: Cross Validation Procedure.

The optimal bandwidth is chosen with a 'leave one out' procedure proposed by Imbens and Lemieus (2008). For each observation 'i' on the left of the cut-off point, we run a linear regression using only observation with value of X (i.e. the treatment determining assignment variable) on the left of $X_i (X_i - h \le X < X_i)$, while for observation on the right of the cut-off point we use only those on the right of $X_i (X_i - h \le X < X_i)$. Then we repeat this procedure for each 'i' in order to obtain the whole set of predicted value of Y that can be compared with the actual value of Y. In terms of formal expression, the cross-validation criterion is defined as the following expression

$$CV_Y(h) = \frac{1}{N}\sum_{i=1}^{N_h}\left\{Y_{(i)} - \hat{Y}[X_{(i)}]\right\}^2,$$

where $\hat{Y}[X_{(i)}]$ represents the predicted value of Y using the above described regression. The optimal bandwidth is that value of h that minimises the criterion function. In our case this optimal bandwidth is 5 in local linear regression. Following Imbens and Lemieus (2008) suggestion we used same bandwidth for both outcome and treatment equation and use the smallest bandwidth which is 5 selected by the cross validation procedure.

Appendix-4: Akaike Information Criterion.

Our second estimation procedure is based on polynomial regression. Under this polynomial regression main problem is to choose the optimal order of polynomial of the assignment variable to capture the true functional form of the f(x) in equation 2. Here we use Akaike information criterion (AIC) as defined below

$$AIC = N\ln(\hat{\eta})^2 + 2p,$$

Where $\hat{\eta}$ is the mean square error of the regression and p is the number of the parameters in the model. Based on AIC criterion we use quartic form x i.e. polynomial of order 4 as the optimal order.

Appendix-5:

Table-A: Treatment Effect on *Village Wise NREGS Expenditure*: With whole sample (Local Linear Regression with all Covariates at different band width)

	h=10	h=9	h=8	h=7	h=6	h=5
T(Treatment Effect)	30451.991	34201.978	27227.890	31361.727	36008.329	40698.225
	[2.23]**	[2.38]**	[1.82]*	[1.80]*	[1.94]*	[2.00]**
x (Assignment var.)	-2122.234	-2269.529	-2616.791	-3156.087	-3516.364	-4583.301
	[-2.19]**	[-2.19]**	[-2.27]**	[-2.11]**	[-2.11]**	[-2.39]**
Z*x (interaction)	2000.174	1889.584	2777.160	3330.787	3272.374	3672.016
	[1.46]	[1.30]	[1.68]*	[1.77]*	[1.61]	[1.73]*
Total_voters_2008	24.648	25.538	27.422	30.058	25.273	23.399
	[2.91]***	[3.00]***	[3.25]***	[3.39]***	[2.87]***	[2.73]***
%_vote casted_2008	-14.312	-18.902	104.571	78.792	139.508	-218.936
	[-0.06]	[-0.08]	[0.44]	[0.30]	[0.52]	[-0.87]
%_margin_win2008	-328.021	-343.316	-257.602	-264.862	-232.248	184.404
	[-0.89]	[-0.92]	[-0.66]	[-0.50]	[-0.43]	[0.29]
%_vote_others_defeatedcandidate2008	-899.020	-904.278	-1132.115	-1258.442	-1170.361	-1708.368
	[-2.17]**	[-2.14]**	[-2.51]**	[-2.02]**	[-1.86]*	[-2.26]**
Monsoon rain	-40.493	-46.608	-50.868	-52.798	-43.763	-44.487
	[-3.16]***	[-3.63]***	[-3.80]***	[-3.86]***	[-3.13]***	[-3.03]***
Average HH size	5.169	-6.654	-5.261	-4.608	-5.531	2.193
	[0.42]	[-0.57]	[-0.44]	[-0.37]	[-0.43]	[0.17]
pct_BPLhh	378.907	390.001	415.825	420.347	391.147	421.919
	[4.86]***	[4.78]***	[5.09]***	[4.92]***	[4.52]***	[4.74]***
pct_Minority_hh	-61.818	-65.403	-55.990	-23.078	-24.738	-28.393
	[-0.63]	[-0.67]	[-0.57]	[-0.21]	[-0.22]	[-0.25]
Worker to Non-Worker Ratio	163637.8	150541.2	183791.5	190298.8	196755.3	212840.8
	[4.77]***	[4.29]***	[5.06]***	[4.79]***	[4.84]***	[5.14]***
sex_member_2008==Male	1062.033	3306.529	5263.393	5855.626	6852.083	4389.197
	[0.26]	[0.82]	[1.28]	[1.33]	[1.54]	[0.97]
caste_member_2008==SC	-8201.632	-7838.989	-5599.000	-6592.914	-6352.226	-5938.386
	[-1.73]*	[-1.64]	[-1.20]	[-1.31]	[-1.24]	[-1.15]
caste_member_2008==ST	16634.416	14943.420	20959.475	20596.319	23019.469	27124.371
	[1.67]*	[1.46]	[1.98]**	[1.70]*	[1.71]*	[1.91]*
caste_member_2008==OBC	11225.206	10562.695	13722.923	16281.933	17281.309	23675.966
	[1.12]	[1.06]	[1.25]	[1.42]	[1.47]	[1.84]*
caste_member_2008==Muslim	-18748.01	-18973.61	-22803.24	-24162.27	-23252.85	-25927.21
	[-2.62]***	[-2.66]***	[-3.23]***	[-3.29]***	[-3.07]***	[-3.29]***
year== 2011	13155.079	12665.737	11585.097	10950.848	14262.143	14678.502
	[2.28]**	[2.12]**	[1.92]*	[1.73]*	[2.28]**	[2.28]**
year== 2012	-6983.160	-6179.342	-6912.327	-7262.633	-1424.847	-1441.184
	[-1.28]	[-1.14]	[-1.25]	[-1.30]	[-0.26]	[-0.26]
district==Purulia	-101856.5	-118305	-131594	-136746.1	-113964.7	-113526.7
	[-3.95]***	[-4.69]***	[-4.94]***	[-5.02]***	[-4.02]***	[-3.75]***
district==South 24 Parganas	-55679.81	-67492.14	-72369.29	-72542.51	-52208.64	-43279.03
	[-2.58]**	[-3.18]***	[-3.28]***	[-3.13]***	[-2.12]**	[-1.65]*
Observations	573	553	517	490	474	457
R^2	0.252	0.253	0.316	0.310	0.279	0.290
F	8.470	8.769	9.096	8.877	8.003	7.517

t statistics in brackets; * p<0.10, ** p<0.05, *** p<0.01

Table-B: Treatment Effect on *Village Wise NREGS days availed per NREGS household*: With whole sample (Local Linear Regression with all Covariates at different band width)

	h=10	h=9	h=8	h=7	h=6	h=5
T(Treatment Effect)	3.5126	3.8010	4.2274	4.1777	4.3570	4.8186
	[2.92]***	[3.11]***	[2.98]***	[2.71]***	[2.63]***	[2.66]***
x(Assignment Var.)	-1.920	-2.053	-3.043	-2.946	-3.332	-4.268
	[-2.66]***	[-2.54]**	[-2.71]***	[-2.30]**	[-2.27]**	[-2.55]**
Z*x (interaction)	1.216	1.148	1.936	1.206	2.050	2.153
	[1.17]	[1.04]	[1.29]	[0.80]	[1.17]	[1.19]
Total_voters_2008	0.021	0.022	0.024	0.026	0.028	0.026
	[1.91]*	[1.93]*	[2.04]**	[2.12]**	[2.15]**	[1.96]*
%_vote casted_2008	-0.023	-0.033	0.142	0.127	0.144	-0.212
	[-0.11]	[-0.15]	[0.59]	[0.48]	[0.54]	[-0.87]
%_margin_win2008	0.037	0.034	0.257	0.554	0.435	0.887
	[0.11]	[0.10]	[0.60]	[1.02]	[0.79]	[1.46]
%_vote_others_defeatedcandidate2008	-0.821	-0.845	-1.231	-1.426	-1.475	-1.985
	[-2.74]***	[-2.61]***	[-3.19]***	[-2.71]***	[-2.79]***	[-3.12]***
Monsoon rain	-0.003	-0.004	-0.007	-0.006	-0.006	-0.007
	[-0.35]	[-0.59]	[-0.86]	[-0.72]	[-0.70]	[-0.74]
Average HH size	0.010	0.003	0.001	0.000	0.002	0.010
	[0.84]	[0.24]	[0.10]	[0.00]	[0.14]	[0.70]
pct_BPLhh	0.033	0.032	0.040	0.033	0.017	0.043
	[0.55]	[0.51]	[0.57]	[0.46]	[0.22]	[0.58]
pct_Minority_hh	-0.074	-0.071	-0.055	-0.051	-0.041	-0.044
	[-0.81]	[-0.76]	[-0.56]	[-0.46]	[-0.37]	[-0.38]
Worker to Non-Worker Ratio	137.556	133.851	147.600	154.738	160.002	175.135
	[4.98]***	[4.74]***	[4.86]***	[4.79]***	[4.73]***	[5.13]***
sex_member_2008==Male	-0.376	1.105	2.629	1.778	2.525	-0.124
	[-0.11]	[0.31]	[0.68]	[0.45]	[0.62]	[-0.03]
caste_member_2008==SC	-9.109	-9.051	-7.631	-7.705	-8.454	-7.782
	[-2.16]**	[-2.12]**	[-1.73]*	[-1.69]*	[-1.84]*	[-1.68]*
caste_member_2008==ST	-2.147	-1.183	2.685	3.221	9.374	13.677
	[-0.34]	[-0.18]	[0.32]	[0.34]	[0.86]	[1.18]
caste_member_2008== OBC	-7.745	-8.167	-6.837	-3.047	-2.471	0.663
	[-1.22]	[-1.25]	[-0.96]	[-0.42]	[-0.32]	[0.08]
caste_member_2008== Muslim	-17.392	-17.475	-21.036	-20.666	-19.582	-22.041
	[-3.09]***	[-3.08]***	[-3.77]***	[-3.67]***	[-3.38]***	[-3.62]***
year==2011	12.495	13.334	13.090	13.521	14.137	14.335
	[2.57]**	[2.64]***	[2.48]**	[2.46]**	[2.49]**	[2.47]**
year== 2012	4.670	6.044	5.422	5.846	7.199	7.045
	[1.16]	[1.50]	[1.31]	[1.39]	[1.62]	[1.54]
district==Purulia	6.983	2.932	-2.535	-5.450	-2.668	-1.376
	[0.43]	[0.18]	[-0.14]	[-0.30]	[-0.14]	[-0.06]
district==South 24 Parganas	39.891	37.631	34.693	38.068	42.682	51.219
	[2.91]***	[2.65]***	[2.25]**	[2.31]**	[2.32]**	[2.53]**
Observations	573	553	517	490	474	457
R^2	0.073	0.056	0.073	0.080	0.078	0.099
F	3.167	3.036	3.230	3.047	3.019	3.015

t statistics in brackets ; * p<0.10, ** p<0.05, *** p<0.01

Appendix-6
Table-A:
Comparison of village level vote share of TMC and CPIM in 2008 and 2009 Election: by GP level ruling party and by treatment village

	TMC GP				CPIM GP				Any GP				Any GP	
	T=1		T=0		T=1		T=0		T=1		T=0		Any T	
Ward level vote share / Election Year	TMC	CPIM	TMC	CPIM	TMC	CPIM	TMC	CPIM	TMC	CPIM	TMC	CPIM	TMC	CPIM
2008	55.01	35.05	31.01	43.72	12.46	61.82	39.92	36.88	22.59	49.2	23.23	38.2	22.79	45.81
2013	62.98	29.15	33.18	34.18	34.04	34.90	41.54	32.97	39.80	29.9	37.95	29.8	39.22	29.89
t-test of mean difference	(2.14)**	(1.72)*	(0.77)	(1.08)	(3.82)***	(2.88)***	(1.46)	(0.79)	(2.1)**	(2.2)**	(1.49)	(1.1)	(1.66)*	(1.72)*
N	329	329	121	121	673	673	296	296	1174	1174	533	533	1707	1707

Note: T=1 implies the ward is a ruling party ward and T=0 implies the ward is not a ruling party ward.

Table-B: Re-election scenario by Treatment and by Party.

	sample where T=1 i.e. only in treated village		Sample with any T i.e. any village	
	TMC Village/ward in 2008	CPIM Village/ward in 2008	TMC Village/ward in 2008	CPIM Village/ward in 2008
Share of constituencies where party gets re-elected in 2013	63.83	22.10	44.30	26.15
N	329	673	474	826

Online Appendix: Robustness and validity test of FRD design

Appendix A1: Identification issues and test for validity of RD design

The unique claim of the RD estimation strategy is that it generates estimates that are 'as credible as those from randomised experiments' (Lee and Card, 2008) under certain relatively weak assumptions. The most important assumption is that the conditional expectation of the potential outcomes (village wise NREGS expenditure and days of work availed by the households) with respect to the assignment variable (i.e. X: GP level ruling party's vote share at the ward/village) are smooth/continuous function at the cut-off i.e. X=50 (or $x=0$). This enables us to attribute any discontinuity in the outcome of interest at the threshold of cut-off only to the effect of treatment which is in our case the ruling party effect.

With any identification assumption the assumption of continuity of conditional expectation of outcome variable is directly untestable but, as in the common literature (Lee and Lemieux, 2009), we can perform some indirect tests and these are outlined below.

a) *Continuity of other covariates at the threshold*:

We can test whether there is any discontinuity in predetermined characteristics or covariates for which we have data, but which are known not to have been affected by the treatment. We have already seen in table-7 that the comparison of means of few predetermined covariates do not reject the null hypothesis of equal means. We therefore tested the assumption of zero effect on these predetermined covariates by using the same estimation strategy used for estimating the treatment effect on NREGS outcome variables at the village level. As with previous comparison of means, the results, reported in table-13, do not reject the null of zero effect of the treatment on these covariates.

b) Imprecise control over assignment variable:

Here we are interested to check whether politicians or political parties are able to influence the assignment variable (i.e. X: GP level ruling party's vote share at the village level) and if so, what is the nature of this control. This is also an important assumption that should be checked when we assess whether a particular application should be analysed as RD design. If political parties have a great deal of control over the assignment variable and if there is a perceived benefit to a treatment, particular party would certainly expect villages on one side of the threshold to be systematically

different from those on the other side. In that case even discontinuity of outcome at the threshold may not indicate the treatment effect. Lee and Lemieux (2009) suggest that, unless the individual (i.e. in our case the contesting political parties) has *precise* control (rather than *manipulate*) over assignment variable, use of RDD is valid. In fact in our context politicians or political parties have some manipulative power to influence assignment variable, but, certainly not the precise control over an assignment variable. We cannot test this directly as we will only observe one observation on the assignment variable per individual at a given point in time. However, an intuitive test of this 'imprecise control' assumption is whether the aggregate distribution of the assignment variable is discontinuous. McCary (2008) proposes a simple two step procedure for testing whether there is a discontinuity in the density of the assignment variable. In the first step, the assignment variable is partitioned into equally spaced bins and frequencies are computed within those bins. The second step considers the frequency counts as the dependent variable. Then we run the local linear or local polynomial regression for this frequency count as we did for our NREGS outcome variables. Eventually we will plot the expected value of this frequency count or density of assignment variable. Any discontinuity in this plot will fail to accept the validity of RD design in our contest. We plot this density based on a local polynomial regression in section 6 and that shows no discontinuity and hence holds the validity of RD design or assumption of local randomisation in our context. This test also indirectly checks whether both observed and unobserved covariates that affect NREGS outcome at the village level are continuous (McCary, 2008).

c) *Falsification or placebo test:*

A final set of robustness test for the validity of our RD design (or the assumption of local randomisation) involves estimating the discontinuities in outcomes at the points where there should be no discontinuity in the treatment distribution. These results have reported in Table 13 which does not show any evidence for the presence of discontinuity of the treatment variable in the two subsamples on the either side of the cut-off values of X.

Appendix-A2: Local Polynomial Regression

As further robustness checks, , Tables A1 and A2 report the estimated treatment effect on the village level NREGS outcome using polynomial regression instead of the local linear regression above. We present the results according to different polynomial orders 'k' and the bandwidth 'h'. We used Akaike information Criteria (AIC) (see below) to choose the optimal order of polynomial which is in this case is 4. However, in Tables A1 and A2 we also present the results with different polynomial order at different bandwidth to see the sensitivity of the results.

Table A1: Treatment Effect on Village wise NREGS Expenditure (Local Polynomial Regression)

From Whole Sample					
Polynomial order	h=20	h=15	h=12	h=10	h=8
k=2	27174.02	28497.09	26782.81	41887.13	38061.74
	(2.09)**	(2.20)**	(2.00)**	(2.77)***	(2.07)**
k=3	39481.71	41730.7	55100.38	42007.1	48353.41
	(2.33)**	(2.24)**	(2.38)**	(1.77)*	(1.90)*
k=4	45245.73	44256.06	49451.3	42600.68	48791.39
	(2.26)**	(2.24)**	(2.24)**	(1.76)*	(1.84)*
k=5	44686.13	49664.68	37750.12	49297.84	55937.02
	(1.99)**	(1.89)*	(1.29)	(1.58)	(1.11)
k=6	52883.07	48989.59	40935.45	49980.32	56569.54
	(1.98)**	(1.89)*	(1.46)	(1.54)	(1.11)
N	593	587	573	553	517
From sub sample with only TMC GPs (i.e. TMC is the ruling Party)					
k=2	58720.78	58720.78	73735.03	87102.38	123324.4
	(2.06)**	(2.06)**	(2.00)**	(2.16)**	(2.33)**
k=3	118929	118929	163917.2	165843.9	167175.2
	(2.06)**	(2.06)**	(2.08)**	(1.99)**	(1.66)*
k=4	121185.4	121185.4	154574.6	157143.9	154655.3
	(2.10)**	(2.10)**	(2.10)**	(2.10)**	(1.79)*
k=5	180641.4	180641.4	199279.5	191242.4	180221.8
	(1.84)*	(1.84)*	(1.49)	(1.07)	(0.34)
k=6	162184.7	162184.7	144266.7	136617.4	151527
	(1.93)*	(1.93)*	(1.03)	(1.05)	(0.38)
N	156	156	150	144	138
From sub sample with only Left GPs (i.e. Left is the ruling Party)					
k=2	-15738.1	-10059.08	-14300.93	-5351.552	-18022.71
	(1.37)	(0.97)	(1.35)	(0.48)	(1.28)
k=3	-6372.97	-16142.07	-8381.28	-27180.64	-19426.89
	(0.52)	(0.96)	(0.49)	(1.51)	(1.03)
k=4	-12576.41	-15969.35	-12534	-28076.39	-21378.16
	(0.80)	(1.01)	(0.78)	(1.49)	(1.07)
k=5	-19099.23	-21420.79	-38306.62	-17802.25	-13852.45
	(1.04)	(0.93)	(1.62)	(0.77)	(0.38)
k=6	-18464.43	-28369.41	-31372.82	-19347.71	-11562.85
	(0.89)	(1.29)	(1.40)	(0.80)	(0.31)
N	365	359	356	342	320

Table A2: Treatment effect on days of NREGS work availed by per household (Local Polynomial Regression)

From Whole Sample					
Polynomial order	h=20	h=15	h=12	h=10	h=8
k=2	2.531	2.568	2.601	3.751	4.380
	(2.41)**	(2.47)**	(2.41)**	(3.01)***	(2.82)***
k=3	3.616	4.074	5.194	4.498	3.905
	(2.64)***	(2.66)***	(2.68)***	(2.26)**	(1.86)*
k=4	4.505	4.4107	4.655	4.6166	4.1136
	(2.70)***	(2.69)***	(2.54)****	(2.27)**	(1.87)*
k=5	4.379	4.799	4.0302	3.705	3.308
	(2.35)**	(2.16)**	(1.63)	(1.46)	(0.83)
k=6	5.215	4.721	3.644	3.9078	3.343
	(2.29)**	(2.17)**	(1.60)	(1.46)	(0.83)
N	593	587	573	553	517
From sub sample with only TMC GPs (i.e. TMC is the ruling Party)					
k=2	7.21	7.21	9.46	10.9	15.9
	(2.83)***	(2.83)***	(2.70)***	(2.87)***	(3.06)***
k=3	15.106	15.106	20.062	20.44	19.25
	(2.64)***	(2.64)***	(2.39)**	(2.29)**	(1.83)*
k=4	15.33	15.33	19.19	19.52	17.69
	(2.67)***	(2.67)***	(2.46)**	(2.45)**	(2.06)**
k=5	22.206	22.206	25.03	26	53.56
	(2.09)**	(2.09)**	(1.70)*	(1.30)	(0.56)
k=6	20.32	20.32	18.93	17.59	41.87
	(2.24)**	(2.24)**	(1.31)	(1.38)	(0.68)
N	156	156	150	144	138
From sub sample with only Left GPs (i.e. Left is the ruling Party)					
k=2	-5.54	-2.25	-3.64	-4.14	-1.29
	(0.59)	(0.26)	(0.40)	(0.42)	(0.11)
k=3	-4.63	-7.18	-10.59	-1.31	-3.25
	(0.45)	(0.50)	(0.71)	(0.09)	(0.20)
k=4	-8.38	-4.16	-6.13	-2.06	-4.23
	-(0.61)	-(0.31)	-(0.45)	-(0.13)	-0.24)
k=5	2.83	5.07	-3.88	-0.83	-2.003
	-(0.18)	-(0.25)	-(0.20)	-(0.00)	-(0.06)
k=6	-5.67	-2.68	-3.98	-1.3	-1.85
	(0.32)	(.014)	(0.21)	(0.06)	(0.06)
N	365	359	356	342	320

Results in Tables A1 and A2 show that the pattern, sign and statistical significance of the treatment effect across different samples i.e. whole sample of GPs, TMC GPs and CPIM GPs remain largely same. In fact, the results at the optimal polynomial order show a somewhat higher treatment effect than in the cases based on local regressions in Tables 9 and 10 in the paper. For example, TMC villages under TMC GP spend INR 154655.3 more NREGS funds and households availed 17.69 days more NREGS work compared to non-TMC villages in TMC GP. We also check the sensitivity of the treatment effect with the inclusion of all the covariates with local linear regression (see Table A5 below) and results remain largely same.

Appendix-A3: Results of identification test for validity of FRDD

Here we are presenting the different tests that we perform to verify the validity of our Regression Discontinuity Design as outlined above.

a) *Continuity of other covariates at the threshold*:

Table A3: Checking discontinuity of covariates (or predetermined characteristics): Estimating treatment effect on covariates (Local linear regression at different bandwidth with optimal polynomial order)

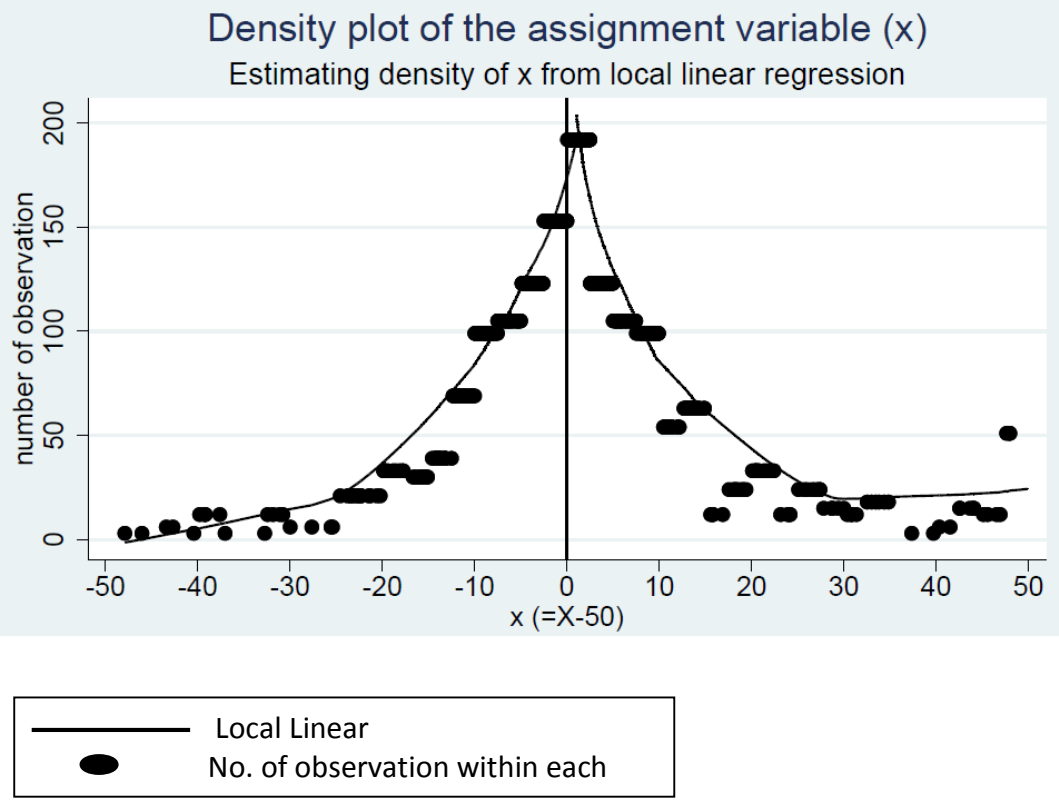
	From whole sample					
	h=10	h=9	h=8	h=7	h=6	h=5
Total Voter_2008	266.137	287.1328	8931.428	3685.22	1967.7	105.041
	(0.38)	(0.33)	(0.06)	(0.28)	(0.43)	(0.09)
Pct_VoteCaste_2008	39.96	39.86	386.5	32.22	32.47	38.76
	(1.02)	(0.84)	(0.06)	(0.19)	(0.33)	(0.58)
Pct_margin__win_2008	31.49	32.64	626.35	149.74	88	39.33
	(1.20)	(1.01)	(0.06)	(0.29)	(0.50)	(0.77)
Pct_vote_othersdefeated_2008	11.65	20.31	142.30	93.52	36.43	26.61
	(0.79)	(0.96)	(0.06)	(0.30)	(0.49)	(0.76)
Monsoon Rain	2312.004	4960.662	59764.09	12021.91	7673.474	4914.31
	(0.95)	(1.01)	(0.06)	(0.28)	(0.47)	(0.72)
Average HH size	-736.53	-308.514	-8509.92	-1088.535	210.73	657.561
	(-1.09)	(-0.54)	(-0.06)	(-0.26)	(0.16)	(0.58)
Pct_BPL_hh	86.64	111.186	3070.15	610.58	320.93	297.77
	(0.91)	(0.83)	(0.06)	(0.28)	(0.47)	(0.75)
Percentage of Minority HH	-2.849	23.219	2334.463	282.034	175.36	45.09
	(-0.06)	(0.32)	(0.06)	(0.25)	(0.41)	(0.36)
Worker to Non-worker Ratio	-0.8319	-1.154	-18.286	-2.1128	-0.6408	0.0042
	(-1.00)	(-0.92)	(-0.06)	(-0.26)	(-0.31)	(0.00)
Member_sex_dummy_2	1.899	3.4008	72.62	19.63	12.45	8.45
	(1.01)	(1.01)	(0.06)	(0.29)	(0.50)	(0.81)
Member_caste_dummy2	0.65990	0.4556	-10.64	-9.027	-4.311	-3.75
	(0.50)	(0.29)	(-0.05)	(-0.27)	(-0.44)	(-0.69)
Member_caste_dummy3	-1.091	-0.3499	-39.049	-3.627	-4.305	-1.1305
	(-0.85)	(-0.28)	(-0.06)	(-0.27)	(-0.47)	(-0.50)
Member_caste_dummy4	0.4289	-0.0213	2.266	5.63	1.88	1.55
	(0.49)	(-0.02)	(0.05)	(0.28)	(0.44)	(0.63)
Member_caste_dummy5	-2.7128	-3.394	-43.21	-7.9008	-4.7238	-3.79
	(-1.31)	(-1.12)	(-0.06)	(-0.29)	(-0.51)	(-0.84)
Year_dummy2	-1.85	-5.83	4.66	2.92	4.69	-6.25
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(-0.00)
Year_dummy3	-1.85	-5.83	4.66	2.92	4.69	-6.25
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(-0.00)
District_dummy2	-1.732	-2.58	-22.39	-0.179	-1.42	-0.39
	(-0.89)	(-0.86)	(-0.05)	(-0.03)	(-0.28)	(-0.17)
District_dummy3	0.876	0.29	-2.77	-5.82	-2.73	-2.46
	(0.55)	(0.17)	(-0.05)	(-0.29)	(-0.45)	(-0.69)
N	573	553	517	490	474	457

Here we test whether there is any discontinuity in predetermined characteristics for which we have data and that are known not to be affected by the treatment as defined in our case. This test is particularly important, because in presence of other discontinuities, the estimated treatment effect may be attributed wrongly to the treatment of interest. We follow the same local linear regression methods (as we followed to estimate the treatment effect on outcome variable) for each of these covariates at different bandwidth. Table A3 above shows that none of the covariates exhibit significant treatment effect, implying that there are no discontinuities in these covariates in the neighbourhood of cut-off. Here we also test the robustness of these results at different bandwidth with optimal order of polynomial i.e. 4.

b) Imprecise control over assignment variable:

Following McCary (2008) test as outlined in section 4 of the paper, we plot the expected value of the frequency counts or density of assignment variable in Figure A1. From this figure we find that there is no discontinuity around the cut-off value. This shows that there was no precise control over the assignment variable and hence it accepts validity of RDD or assumption of local randomisation in our context.

Figure A1: Density Plot of assignment variable following McCary (2008) test



c) Falsification or placebo test:

A final test for the validity of our RD design involves estimating jumps in the outcome variable at the points where there should not be any jump in the treatment effect on outcome variable. For this we followed Imbens and Lemieux (2008) who test for jumps at the median value of the two subsamples on either side of the cut-off value. Now by nature of our problem we will not have any jump in the probability of treatment in the right side of the cut-off value as the probability of getting treated or P(T=1) is always 1 in the right side of the cut-off and hence we will not get any jump of outcome as well by construction. However, we can check the Imbens and Lemieux (2008) test to the left of the cut-off and for that we choose the median value of assignment variable x from the distribution of x and test the treatment effect at that median value. Table A4 presents the results. The results show no significant effect at the new cut-off point which was set at the median value of x to the left original cut-off i.e. x=0. This result suggests that there is no such discontinuity at the non-discontinuity point and hence it passes our falsification or placebo test. Hence RDD is deemed valid in our context.

Table A4: Test of discontinuity at the non-discontinuity point

Sample from below cut-off point (x<=0)						
	Whole sample		Sample with TMC GP		Sample with CPIM GP	
	NREGS Expenditure	NREGS Days	NREGS Expenditure	NREGS Days	NREGS Expenditure	NREGS Days
Treatment Effect at non-discontinuity point	17640.54	17.433	43156.42	11.469	10959.97	-7.1993
	(0.70)	(-0.72)	(0.19)	(0.44)	(0.17)	(-01.29)
N	340	340	65	65	210	210