

Mumbai municipal elections: Performance and incumbency effect analysis

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1 Introduction

How to measure the performance of elected representatives is a complicated issue. Factors such as attendance, quality of debate in the assembly, accessibility seem important but don't necessarily translate to development (improvement in socio-economic indicators) on the ground. Presumably, what should really matter to their constituents is better and more roads, reliable garbage collection and disposal, reduction in crime, improvement in health, better access to schools etc.

The tools available to the elected representatives to do this is by creating policies, enacting legislations and keeping check on the government. However, anecdotal evidence from India points to them focusing a lot more attention on ensuring that their constituents perceive them to be accessible and helpful towards resolving their complaints. Obviously, they do this to improve their chances of re-election in the short term thereby possibly impacting the long term betterment of their constituents.

There is little research on correlation between representatives doing their job well and it translating to improvement in socio-economic indicators. And previous work on "performance" impacting probability of re-election in India is also not much. For my initial summer paper idea, I wanted to find evidence on whether performance of elected representatives at the municipal level (lowest urban) level has any impact on the ground in terms of improvement of socio-economic indicators.

To do this, I had come across a non-profit organization (<http://Praja.org>) which had collected detailed and systematic data on crime, education and health indicators for all the electoral constituencies of Mumbai from 2008 onwards. For crime, they had detailed data on crimes reported in all the police stations. Similarly, for education they had enrollment numbers and drop-out rates for all the government schools in Mumbai municipality. Finally, for health they collected the diseases reported/treated in all the medical health centers for the city.

Praja has also been collecting detailed performance indicators of the elected representatives for the municipality of Mumbai. Not only that, Praja have also used the performance data to create indices and rankings of the same elected representatives. This could be sufficient to measure the direct co-relation between performance and improvement in outcomes.

However, as I started exploring the data, I realised that the way that electoral and administrative constituencies are defined. It is not possible to be able to pin point the socio economic indicators to any specific elective constituency in the municipality. The way electoral and administrative constituencies are defined, an administrative constituency (called a ward) consists of multiple elective constituencies (min of 3 and max of 12). Therefore, it is possible that a police station records aggregate crime statistics of multiple constituencies. Same is the case with schools and health centers. As a result, with the data limitations explained above I was unable to progress on the proposed question.

Still, the performance data of the elected councillors for the city of Mumbai which has been collected by Praja is unique and the next question that could be looked into was whether there is any sort of correlation between the quality of work done by the elected representatives and their chances of reelection. There are potentially many issues with the endogeneity of the type of constituencies the representatives get elected from and their performance. For example, it is reasonable to expect that high performing representatives come from more educated and economically better off constituencies. One could also present an argument that since poorer constituencies tend to rely more on the government and state machinery while the well-heeled have systematically opted out of

the government run schools, hospitals etc., the performance of the representatives from the poorer constituencies is better than the ones from richer constituencies. However, all these concerns are worth looking into only once we are able to get a statistically significant relationship. From the basic regressions that I carry out, there is no significant correlation between performance and margin of victory.

I had also collected election data for 2 consecutive election cycles for the year 2007 and 2012. It is interesting to see whether elections at the local level have anti-incumbency or pro-incumbency effects.

In the next section I review the literature that exists on re-election of representatives and their performance. In the data section I describe in detail my data sources. The analysis section describes the regressions that I carried out and the results. Finally, I conclude.

2 Literature Review

Galasso and Nannicini(2009) present empirical evidence that parties in Italy put up higher quality candidates in contestable districts. By that measure it will be interesting to see if constituencies which have closely fought elections have better performing candidates.

Having a greater probability to get re-elected has always been considered a strong incentive to perform well as a councillor. But there are many factors that seem more important and drive the re-election chances than just performance as a councillor. In the context of India, these could be factors such as caste composition of the voters, the perception of the state level parties etc. Interestingly, Ferraz and Finan(2011) show that higher wages also motivate representatives and increase legislative productivity resulting in more legislative bills and public goods provision.

Prior India-focused literature is inconclusive on whether incumbency has an advantage or a disadvantage at the local level. Linden(2004) analyses election data at the national level and argues

that there is an incumbency disadvantage. On the other hand, Uppal(2009) argues that there is an incumbency advantage while carrying out a similar analysis but on the state level elections data. Since I have election data only for 1 city and 2 cycles and therefore it is hard to argue for internal or external validity, I see evidence of incumbency advantage for political parties at the local level.

3 Data

3.1 Performance data

The Constitution of India sets the guidelines for the functioning of the great tamasha that is the Indian democracy. The 73rd and 74th amendments of the constitution act as guidelines for setting the roles and responsibilities of the councillors. According to the councillor report card(2011), "The duties of the Municipal Corporation are laid down precisely under the Mumbai Municipal Corporation Act, 1888. They are further divided into Obligatory duties (Section 61, 62) and Discretionary duties (Section 63). The Obligatory duties include issues related to roads, water supply, sewerage, buildings, disaster management, municipal properties, primary education, health, renaming of roads, etc. are covered. The Discretionary duties include issues related to slum development, open spaces, gardens, road transport, energy, electricity, water bodies (dams, irrigation), community halls/ temples, etc." The perception of the citizens who elect these councillors is also an important parameter to consider.

Praja.org collects detailed data on what can be described as the performance of the urban municipal councillors. This includes the attendance of the councillors in the sessions, the specific questions that were asked by the councillors, the where-how-what of the amounts that were spent by councillors from their discretionary funds. They also had information on the education and criminal records of the representatives. All this information was collected from different government sources such as various departments of the Mumbai municipal corporation, Mumbai Police etc. Finally, they also surveyed 28707 citizens across the city of Mumbai to map their perception of the respective local elected representatives.

Although all the above data (except the survey data) is available from their website. They made using this data even more easier by combining all these numbers to create an index which measures the overall performance of the elected representatives. They also created indices for performance across each of the specific indicators of attendance, number of questions asked, quality of questions asked, criminal record and perceived performance. A snapshot of these numbers is shown in figure 1. A detailed description of the methodology followed by Praja to create these indices can be found in the Municipal councillor report card (2011). They carried out a similar exercise after 2012 elections for the year 2013 as well. But for our purposes, the only data that can be used to compare performance and victory margin is of the year 2011.

3.2 Election data

Elections at the national and state levels are carried out by Chief Election Commission and the results data from those elections is made available online(on the CEC website) in a standard format in regular intervals. However, elections at the local level (urban or rural) are carried out by respective state level election commissions. There is variation in the quality of websites of the state election commissions. Some of them may put up the election results and some of them don't. Also the formatting of the data varies across states and across years.

Luckily, for the city of Mumbai I was able to find election results data for the 2 latest election cycles of year 2007 and 2012. I had the list of all the candidates, their sex, party and the total votes polled for them. There is a lot of flux in candidates in every election cycle especially at such low granularity (local municipal elections). Therefore, I assumed that citizens vote for a party and not specifically for an individual. As a result, I did the analysis at the party-constituency level.

I considered only the top 3 candidates in every constituency. Even though India has a multi-party system, the elections are top-heavy and top 3 candidates generally take up more than 80% of the vote share. For every constituency-party pair I first calculated the vote-share by dividing the

votes polled by the total number of votes. Then I calculated the margin of victory variable. For the winner of the constituency, margin of victory is positive and is equal to vote share of winner minus the vote share of first runner up. For rest of the candidates, margin of victory is negative and equal to their vote share minus the vote share of the eventual winner. For all our analysis, margin of victory is the main variable of interest.

4 Analysis

4.1 Incumbency effects

To see if there is any advantage to being an incumbent I implement a simple regression discontinuity design. As suggested in Lee and Lemieux (2009), I carry out both graphical as well as regression analysis.

4.1.1 Graphical presentation

I make graphical representations of various functional forms. The victory margins in 2012 (I have explained the way I created them above) for each constituency-party pair is the independent variable. The assignment variable in all the cases is victory margin in 2007 (again for a constituency-party pair). Refer to figures 2,3,4,5.

The graphs indicate there may be a minor incumbency advantage at the local urban level. There seems to be a significant advantage when we consider cubic and quartic functional forms for the assignment variable. However, the advantage loses significance when we consider linear or square forms.

4.1.2 Regression methods

I also carry out a numerical regression analysis. I do both simple OLS and fixed effects at the ward level. Standard errors are robust.

$$y_i = f(X_i) + win_i + win_i * f(X_i)$$

Here, y_i is the victory margin in 2012. X_i is the victory margin in 2007 and win_i is the dummy for whether the party-constituency pair won or lost in 2007. Therefore, win_i is 1 if victory margin(2007) is positive and 0 otherwise. Each observation "i" is a constituency-party pair combination. As seen in the equation above, I do not assume any functional form and also have interactions of the dummy and the assignment variable. I carry out the regression for linear, square, cubic and quartic forms.

Table 1 shows regression estimates for all the functional forms. The cubic polynomial estimates for win dummy are significant at the 1% (5% for FE) level. Coefficient in both the cases are of similar size. Winning a closely fought election gives an incumbent party an advantage of around .14 vote share in the next election cycle which seems pretty huge.

As I don't have any control variables available which can be measured at the electoral constituency level, I am unable to carry out robustness checks to verify the "balanceness" of the RD design. In case we decide that I should pursue this further, one way to do this could be to get education and crime information of the candidates and see if those measures are balanced around the cutoffs. Endogeneity is still an issue which I am unable to resolve with the current data.

4.2 Does performance matter?

To see if the performance of the elected councillors has any impact on their chances of re-election, I carried out the below described regression.

$$y_i = f(X_i) + Performance_index_i$$

As before, y_i is the victory margin in 2012 (in table 2) and X_i is the victory margin in 2007. I also do a probit where y_i is a dummy for winning or losing the election in 2012.

Each observation "i" is a constituency-party pair combination but only of winners in 2007 since they are the only representatives for which performance data could have been collected. There are

different types of performance indices that could have been put in the regression. In the main tables I use the aggregate performance index which is close to zero but highly insignificant. I carry out the regression for linear, square, cubic and quartic forms of X 's. Results don't change in significance. Results can be seen in table 2 and table 3.

4.2.1 Does performance matter in close elections?

It is possible that candidates who won a closely fought election perform better or amongst the close call candidates those who perform higher do well in the next election cycle. To test this hypothesis, I modify the regression to:

$$y_i = f(X_i) + Performance_index_i + competitive_i + Performance_index_i * competitive_i$$

Here, competitive is a dummy if victory margin was less than 10% of the vote share. Again the coefficient stays close to zero but insignificant (table 2 and table 3). All this leads me say that despite heterogeneity the performance of elected councillors does not impact their chances of winning the next time.

I replaced total performance index with other smaller measures such as attendance score, crime score, number of questions asked score and quality of questions asked score and perception by voters (table 4 and table 5). The only factor which seems to matter is how the voters perceive the performance of the councillors and that too only in closely fought elections (table 4, columns 7 and 8).

5 Conclusion

Looking at the impact of performance of local elected representatives on the development indicators of the respective constituencies is an important research question. The data that I had currently (ward level measures) did not allow me to probe this question. For future research, collecting data on roads, sewerage, water supply, primary education of the constituencies may be useful in answer-

ing this question.

Doing regression discontinuity analysis on the small set of available data indicates that there maybe incumbency advantage at the local urban level. Doing well in the measurable performance indicators does not seem to have much impact on chances of re-election in the next election cycle. The only factor that seems to matter in closely fought elections is what the voters think of the councilors. It seems reasonable to believe that there are other factors which crowd out performance as a representative at the local urban level - maybe caste, performance of the parties at the state level etc. It may be interesting to explore this question further.

6 References

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Table 1: Victory margin(2012) vs Victory margin(2007) (Main table)

Dependent Variable: Victory margin in 2012								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Victory Margin(2007)	0.459*** (0.0685)	0.485*** (0.0787)	0.185 (0.194)	0.251 (0.152)	0.127 (0.445)	0.121 (0.384)	-0.370 (0.922)	-0.437 (1.013)
Victory Margin(2007) ²			-0.584 (0.385)	-0.502 (0.318)	-0.856 (1.848)	-1.108 (1.740)	-4.912 (6.667)	-5.664 (7.426)
Victory Margin(2007) ³					-0.330 (2.070)	-0.732 (2.078)	-11.59 (17.41)	-13.39 (19.31)
Victory Margin(2007) ⁴							-9.752 (14.41)	-10.96 (15.89)
win	0.0322 (0.0242)	0.0305 (0.0325)	0.0845** (0.0338)	0.0836** (0.0375)	0.144*** (0.0417)	0.145** (0.0524)	0.172*** (0.0540)	0.174* (0.0860)
win*Victory Margin(2007)	0.149 (0.138)	0.101 (0.115)	-0.123 (0.418)	-0.277 (0.403)	-1.694** (0.743)	-1.736** (0.703)	-1.792 (1.505)	-1.744 (1.336)
win*Victory Margin(2007) ²			2.014* (1.077)	2.104 (1.257)	11.46*** (3.419)	11.67** (4.289)	21.27* (12.32)	21.72 (17.92)
win*Victory Margin(2007) ³					-12.30*** (4.185)	-11.61*** (3.795)	-19.52 (36.19)	-16.64 (33.31)
win*Victory Margin(2007) ⁴							27.83 (33.46)	28.29 (43.94)
Constant	-0.0783*** (0.0145)	-0.0738*** (0.0146)	-0.0991*** (0.0199)	-0.0915*** (0.0150)	-0.102*** (0.0272)	-0.0975*** (0.0218)	-0.116*** (0.0366)	-0.114*** (0.0383)
Observations	675	675	675	675	675	675	675	675
R-squared	0.265	0.273	0.271	0.280	0.279	0.287	0.280	0.288
Number of ward		24		24		24		24

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

VM(2007) is ind. variable for victory margin in year 2007

Win is dummy for constituencies where victory margin is greater than 0

Table 2: Victory margin vs performance (Main table)

Dependent Variable: Victory margin in 2012				
	(1)	(2)	(3)	(4)
VM(2007)	-1.596***	-1.481**	-2.210***	-2.237**
	(0.603)	(0.715)	(0.816)	(0.951)
VM(2007) ²	10.76***	10.32***	12.25***	12.18***
	(2.917)	(3.405)	(3.267)	(3.793)
VM(2007) ³	-12.81***	-12.64***	-13.89***	-14.01***
	(3.692)	(4.359)	(3.928)	(4.574)
total_score	-0.000531	-0.000473	-0.00159	-0.000710
	(0.000834)	(0.00121)	(0.00123)	(0.00142)
competitive			-0.164	-0.0825
			(0.102)	(0.110)
total_score*competitive			0.00186	0.000283
			(0.00165)	(0.00145)
Constant	0.0741	0.0665	0.209**	0.170
	(0.0567)	(0.0731)	(0.0997)	(0.119)
Observations	224	224	224	224
R-squared	0.161	0.145	0.170	0.153
Number of ward		24		24

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

VM(2007) is ind. variable for victory margin in year 2007

Competitive is dummy for constituencies which were closely fought in 2007

Table 3: Probability of victory vs performance (Main table)

Dependent Variable: Probability of victory in 2012		
	(1)	(2)
VARIABLES	win(2012)	win(2012)
VM(2007)	-11.50** (5.360)	-18.02*** (6.857)
VM(2007) ²	71.90** (28.70)	84.55*** (31.16)
VM(2007) ³	-83.30** (36.91)	-87.29** (40.42)
total_score	-0.00549 (0.00714)	-0.0121 (0.0108)
competitive		-1.235 (0.894)
total_score*competitive		0.0104 (0.0143)
Constant	0.754 (0.516)	1.977** (0.852)
Observations	224	224

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1a

Table 4: Margin of victory vs performance (Supplementary table 1)

	Dependent Variable: Victory margin in 2012							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
victory_margin	-1.609*** (0.605)	-1.477* (0.728)	-2.173*** (0.810)	-2.170** (0.990)	-1.592*** (0.606)	-1.487* (0.729)	-2.179*** (0.811)	-2.178** (0.966)
victory_margin_sq	10.83*** (2.902)	10.26*** (3.457)	12.07*** (3.221)	11.84*** (3.940)	10.63*** (2.906)	10.25*** (3.420)	12.03*** (3.232)	11.95*** (3.708)
victory_margin_cu	-12.85*** (3.648)	-12.51*** (4.406)	-13.54*** (3.827)	-13.47*** (4.673)	-12.53*** (3.644)	-12.43*** (4.313)	-13.63*** (3.871)	-13.88*** (4.447)
attendance_score	-0.00462 (0.00338)	-0.00404 (0.00331)	-0.0121*** (0.00445)	-0.0105* (0.00532)				
competitive			-0.198** (0.0792)	-0.174* (0.100)			-0.595** (0.253)	-0.632** (0.261)
competitive*attendance_score			0.0141** (0.00660)	0.0108 (0.00747)				
perceived_performance_score					0.00867 (0.00621)	0.00909 (0.00729)	-0.00484 (0.00864)	-0.00568 (0.0106)
competitive*perceived_performance_score							0.0270** (0.0119)	0.0283** (0.0116)
Constant	0.0903* (0.0471)	0.0799 (0.0516)	0.238*** (0.0833)	0.231** (0.103)	-0.131 (0.126)	-0.144 (0.138)	0.216 (0.198)	0.242 (0.271)
Observations	224	224	224	224	224	224	224	224
R-squared	0.166	0.149	0.185	0.165	0.168	0.151	0.190	0.178
Number of ward		24		24		24		24

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5: Margin of victory vs performance (Supplementary table 2)

	Dependent Variable: Victory margin in 2012											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
victory_margin	-1.548**	-1.450*	-2.154***	-2.218**	-1.574**	-1.459*	-2.245***	-2.270**	-1.549**	-1.424*	-2.132**	-2.129**
	(0.604)	(0.708)	(0.813)	(0.928)	(0.610)	(0.719)	(0.830)	(0.943)	(0.608)	(0.756)	(0.825)	(1.012)
victory_margin_sq	10.55***	10.20***	12.02***	12.10***	10.67***	10.23***	12.28***	12.23***	10.45***	9.971**	11.86***	11.73***
	(2.921)	(3.377)	(3.251)	(3.733)	(2.957)	(3.401)	(3.297)	(3.773)	(2.928)	(3.566)	(3.274)	(4.039)
victory_margin_cu	-12.57***	-12.52***	-13.62***	-13.95***	-12.73***	-12.56***	-13.86***	-14.05***	-12.39***	-12.16**	-13.41***	-13.48***
	(3.692)	(4.323)	(3.903)	(4.516)	(3.746)	(4.344)	(3.925)	(4.544)	(3.688)	(4.512)	(3.885)	(4.801)
quality_questions_score	1.14e-05	0.000215	-0.00151	0.000705								
	(0.00176)	(0.00237)	(0.00279)	(0.00263)								
competitive			-0.0866	-0.0509			-0.0402	-0.0199			-0.0533	-0.0651
			(0.0605)	(0.0645)			(0.0525)	(0.0576)			(0.0454)	(0.0535)
competitive*quality_questions_score			0.00258	-0.00120								
			(0.00359)	(0.00292)								
total_questions_score					-0.000789	-0.000112	0.000245	0.00329				
					(0.00246)	(0.00284)	(0.00334)	(0.00296)				
competitive*total_questions_score							-0.00256	-0.00716*				
							(0.00493)	(0.00360)				
criminal_score									-0.00290	-0.00363	-0.00305	-0.00419
									(0.00229)	(0.00244)	(0.00306)	(0.00355)
competitive*criminal_score											0.000984	0.00176
											(0.00461)	(0.00582)
Constant	0.0403	0.0340	0.132*	0.119	0.0471	0.0380	0.120	0.111	0.0483	0.0452	0.118*	0.129
	(0.0386)	(0.0423)	(0.0769)	(0.0745)	(0.0369)	(0.0411)	(0.0758)	(0.0826)	(0.0327)	(0.0363)	(0.0704)	(0.0817)
Observations	224	224	224	224	224	224	224	224	224	224	224	224
R-squared	0.160	0.144	0.167	0.152	0.160	0.144	0.167	0.159	0.165	0.152	0.169	0.158
Number of ward		24		24		24		24		24		24

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1




MUNICIPAL COUNCILLOR	PARTY	GRADE	TOTAL SCORE %	RANK	ATTENDANCE		NO. OF QUESTIONS		QUALITY OF QUESTIONS		LEAST CRIMINAL RECORD		PERCEIVED PERFORMANCE	
					Grade	Actual out of 15	Grade	Actual out of 15	Grade	Actual out of 28	Grade	Actual out of 5	Grade	Actual out of 30
 Shantaram S. Bhosale	 SS	C	69.35	#48	A	14.73	E	7.05	D	16.69	A	5.00	C	18.88
Age: 60 yrs, Edu.: Eleventh, Ward: P/South, Area: Dindoshi - Pandurangwadi, Constituency No.: 46					Member: Works Committee (Suburbs), Ward Committee P/South									
 Sunil V. Prabhu	 SS	B	72.63	#28	B	10.78	A	14.93	C	18.47	F	0.00	B	21.45
Age: 42 yrs, Edu.: S.Y.B.A., I.T.I., Ward: P/South, Area: Aarey Colony (East), Constituency No.: 47					Member: Ward Committee P/South, Standing Committee, Tree Committee									
 Sumangal S. Kolatharkar	 SS	C	61.39	#106	A	12.88	E	7.05	F	9.65	A	5.00	C	20.81
Age: 50 yrs, Edu.: Upto SSC, Ward: P/South, Area: Nirton - Krushi Vidyaapeeth - Jaiprakash Nagar, Constituency No.: 48					Member: Women and Child Welfare Committee, Ward Committee P/South									
 Sameer K. Desai	 INC	B	73.41	#23	A	13.67	B	11.43	E	13.44	A	5.00	A	24.87
Age: 43 yrs, Edu.: Not given, Ward: P/South, Area: Unnat Nagar - Motilal Nagar No. 2 & 3, Constituency No.: 49					Member: Ward Committee P/South, Standing Committee, Tree Committee									

Figure 1: Snapshot of performance index

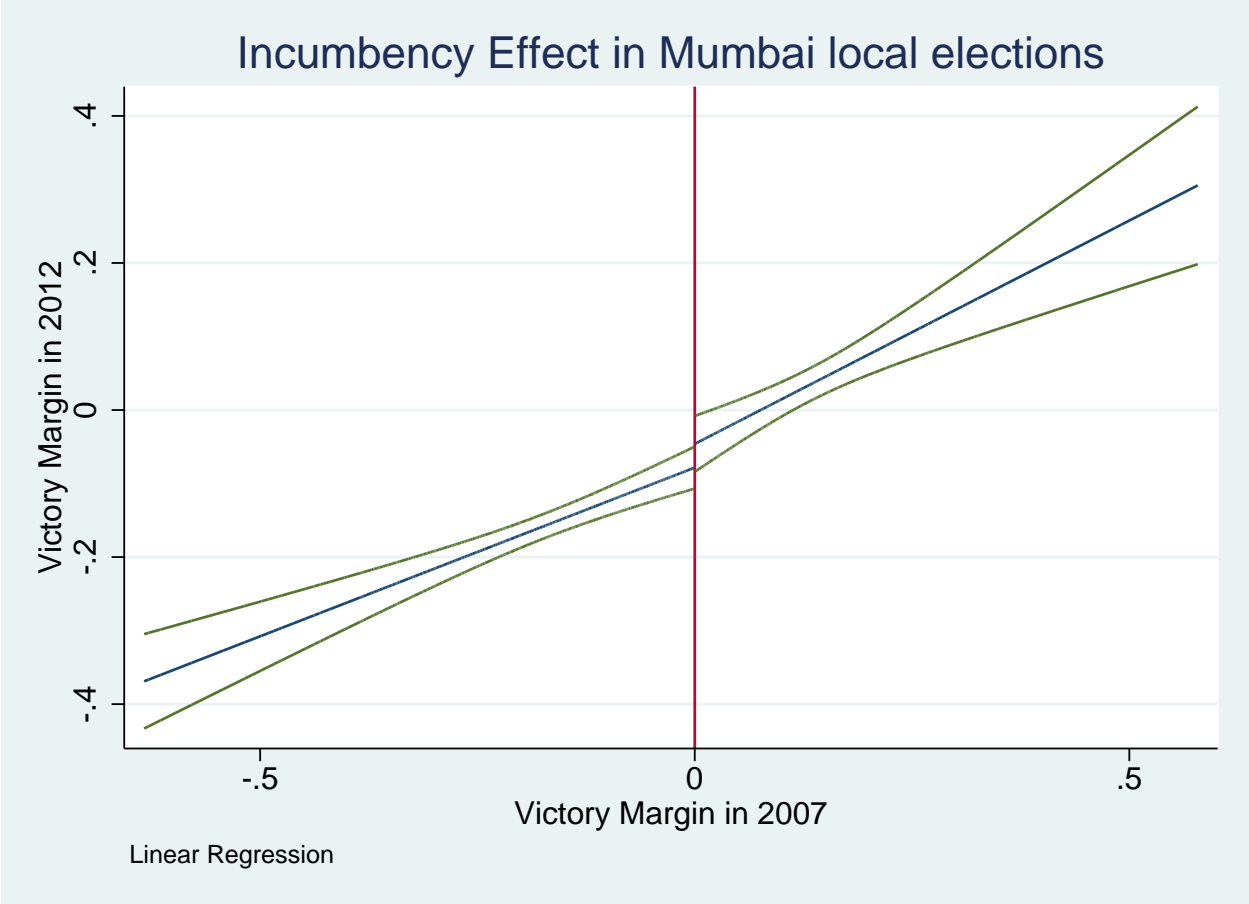


Figure 2: Incumbency effect RDD, linear

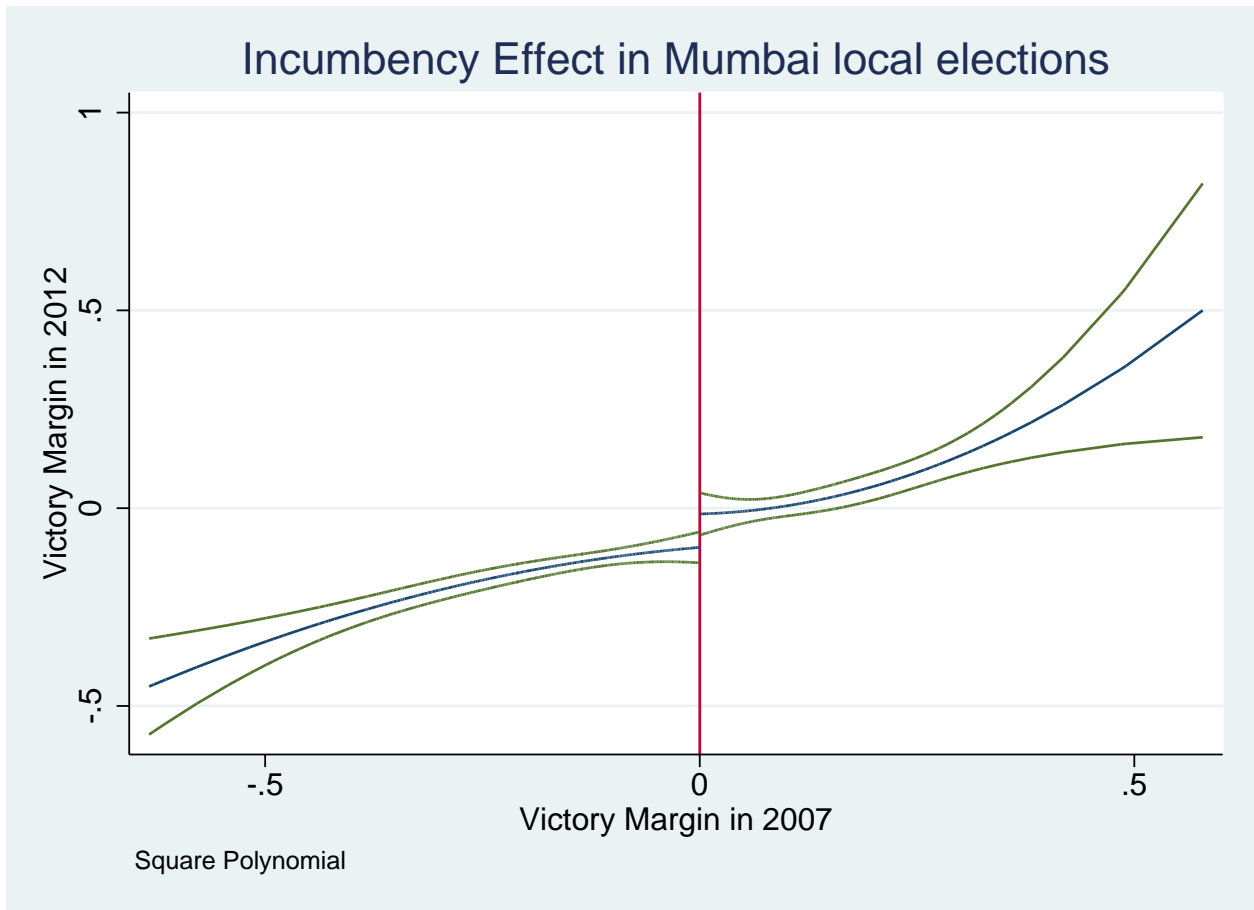


Figure 3: Incumbency effect RDD, quadratic

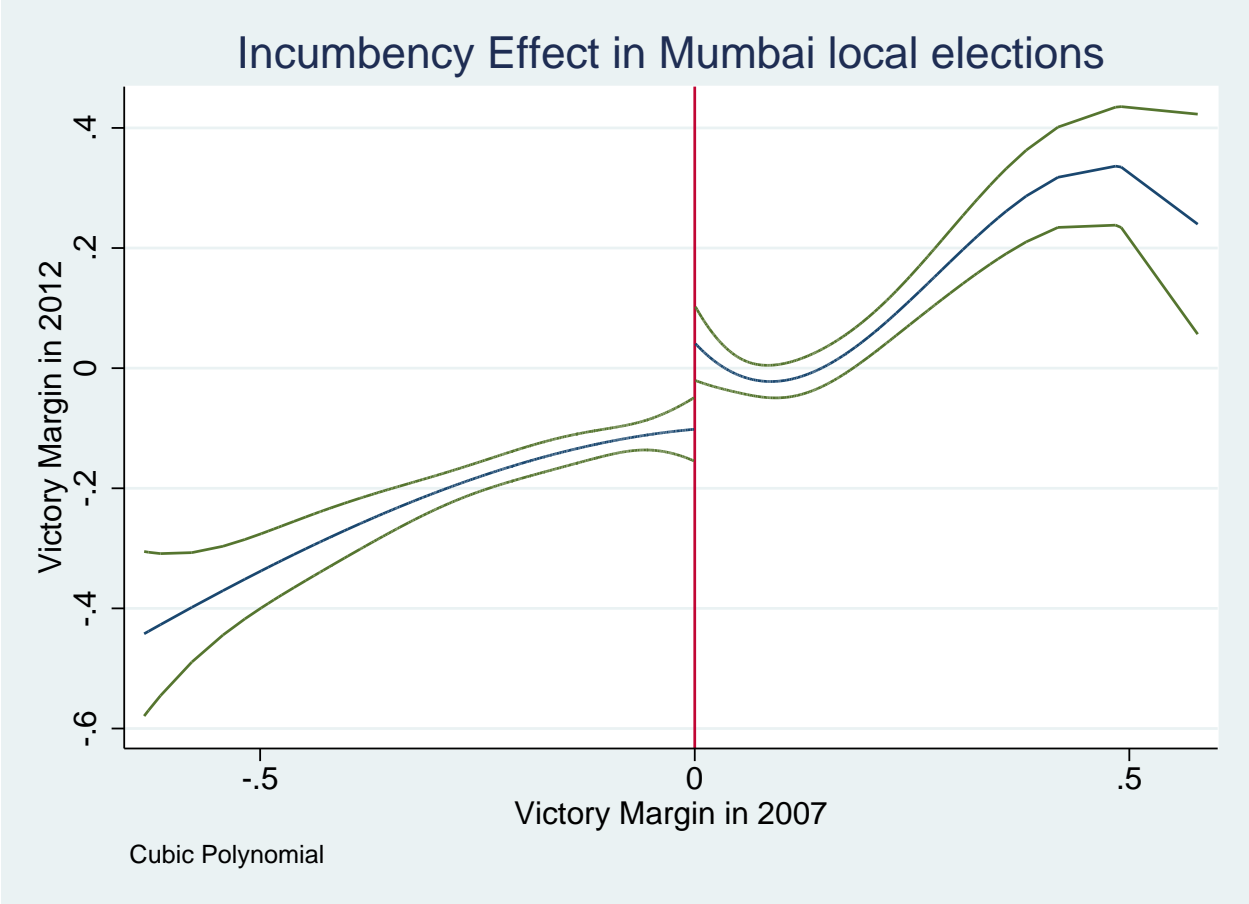


Figure 4: Incumbency effect RDD, cubic

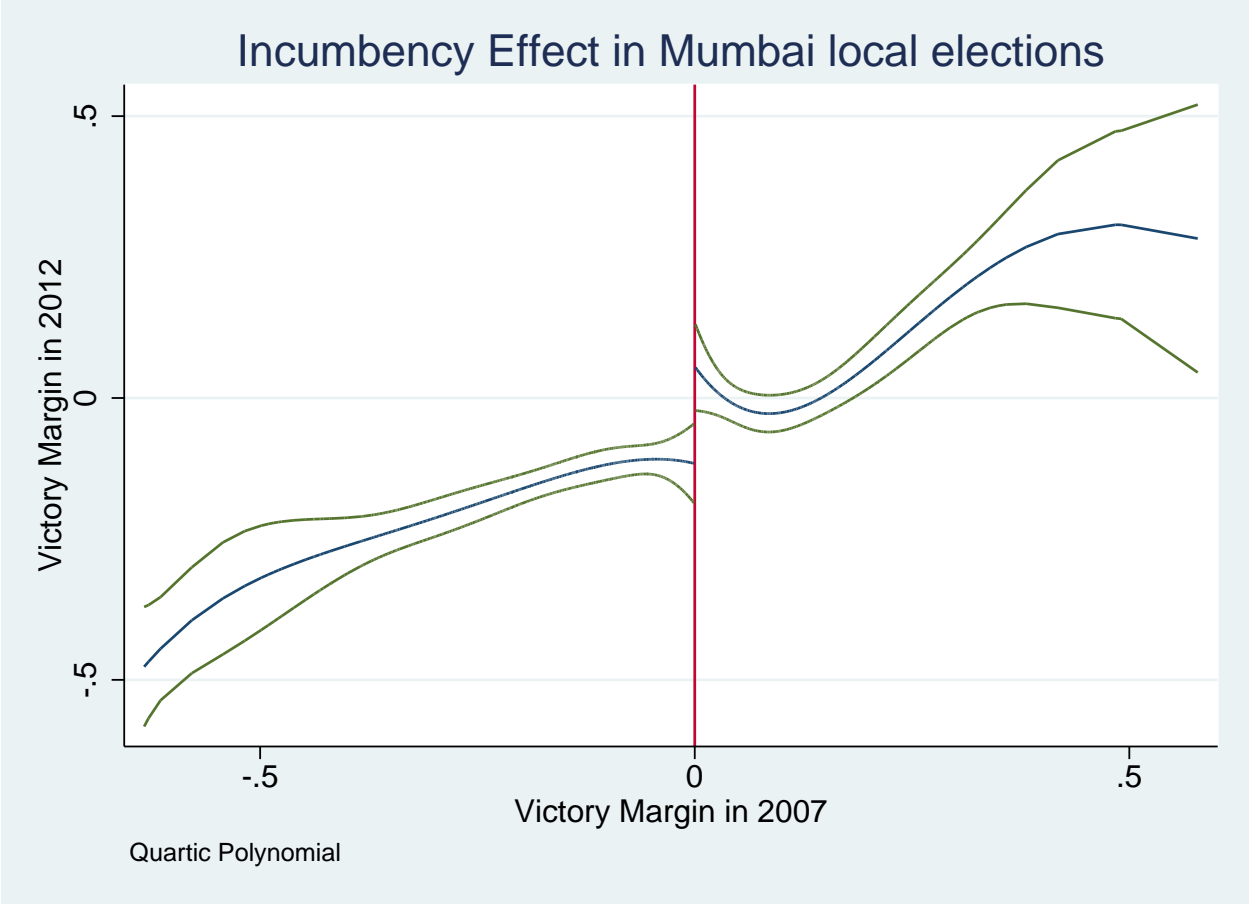


Figure 5: Incumbency effect RDD, quartic