

Māori in New Zealand: Voting with their Feet?

Guillem Riambau *
Yale-NUS College

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Abstract

Māori in New Zealand have the right to choose which electorate to vote in: they can choose to vote in a ‘General district’ (with other Māori and all non- Māori), or to vote in a ‘Māori district’, where only Māori are allowed to register. Every five years there is a period known as Māori Electoral Option, during which Māori are given the option to either stay in their current district or switch. This offers an ideal setting to analyze whether Māori voters strategically choose to register where they expect the race to be closer. To that avail, I use data from two Māori Electoral Options, two general elections, and two censuses. Results suggest that only a very small fraction of Māori (less than 2%) seem to respond to the strategic incentives described. Two forces seem to play a much larger role in enrollment choices: cultural allegiances and socioeconomic status. Māori with a stronger sense of Māori identity and Māori living in socially disadvantaged areas tend to overwhelmingly enroll in the Māori districts. The implications of these results are discussed.

Keywords: Strategic behavior, elections, Māori, pivotal probabilities, New Zealand.

*Department of Social Sciences, Yale-NUS College, 6 College Avenue East, Singapore 138614. I would like to thank Joseph Altonji, Laurent Bouton, Joshua Gottlieb, Jordi Jaumandreu, Daniele Paserman, Francesco Trebbi, Jack Vowles, Eric Weeser and the audiences at the University of British Columbia, Yale University, and the MPSA and EPSA conferences for extremely useful comments. The usual disclaimer applies. E-mail: guillem.riambau@yale-nus.edu.sg

1 Introduction

Inferring the extent of strategic voting in elections has been a recurrent topic in both economics and political science. Most of the literature has focused on whether actions are strategic in the voting booth. This paper extends the analysis to the sphere of enrollment choices: if agents are free to choose what district to vote in, do they choose the one in which they expect their pivotal probabilities to be higher? This is the question this paper addresses, using data from New Zealand, where some voters are allowed to regularly update –if they so wish– which district to vote in.

In New Zealand, there are two kinds of electoral districts (called ‘electorates’): General and Māori. All citizens are required to register as voters when they turn 18. All non-Māori citizens have to register in the General Roll. Māori citizens (roughly, one sixth of the population) have however the option to choose: they can opt to enroll in either the General or the Māori Roll — i.e., only Māori can register in the Māori Roll. There are 64 General electorates and 7 Māori electorates (62 and 7 in 2005, the first year in my dataset). These districts overlap (Figure 1). Hence, any household belongs to both one particular General electorate and one particular Māori electorate. Other than the voters registered, there are no differences between both types of districts (Geddis, 2006): all districts of either Roll are roughly equal in population size, all parties can compete in either Roll, and each electorate chooses one Member of Parliament (MP) by First Past the Post (FPP).

Māori have the option to switch Rolls every five years: there is a period of a few months known as the ‘Māori Electoral Option’ during which Māori are allowed to change the Roll they are registered in. Switching is essentially a costless action. Although the Electoral Commission updates the electoral map every five years (after the Census and the Māori Electoral Option), district boundaries changes are usually minimal. Hence, in practice, by choosing either the General or the Māori Roll, the vast majority of Māori *de facto* choose between a particular General district and a particular Māori district.

This scenario provides an ideal setting to check whether voters base their enrollment choices on their pivotal expectations. To do so, this paper assesses whether Māori choose to register in the electorate in which they expect future races to be closer. To the best of my knowledge, this is the first paper that aims to do so using observational data.

The consequences of these choices are not irrelevant. First, the local MP is decided at the district level. Second, winning the election in one district guarantees parliamentary representation for a party, which may have dramatic consequences for small parties. Third, and perhaps most importantly, the number of Māori and General electorates depends critically upon the number of Māori registered in the Māori Roll. By law, each district must be around one sixteenth of the population size of the South Island, with very tight bandwidths. The electorate size after the last electorate review (2013) was just below sixty thousand people. In other words, for roughly every new 60,000 citizens registered in the Māori roll, a new Māori electorate is created.¹

¹See the Supplementary Materials (Section 1) for more details on how electorates are created.

More formally, at time t , Māori choose which Roll to register in (or whether not to take any action at all). They can choose between voting in a Māori electorate or a General electorate. If they are strategic, they will register in the one they believe their vote is more likely to be pivotal when elections take place at $t + 1$. Following the literature on Large Poisson games, I assume that pivotal probabilities are orders of magnitude larger in districts where two candidates are believed to be front-runners than in those where there is a clear expected winner (Myerson, 2000; Castanheira, 2003; Bouton and Castanheira, 2012; Spenkuch, 2017). Given that I do not have information on individuals' expectations, I use past election results (in $t - 1$) as a proxy for future expected closeness. The data show that this is an accurate measure (closeness of elections before and after the Māori electoral option have a correlation coefficient of 0.46 and 0.97 for each of the cycles I have data for —Figure 2).

In order to empirically test whether Māori act strategically, I construct a panel dataset. Unfortunately, no individual level data exist that describe the choices of Māori voters. The smallest unit of analysis for which data is available is the 'meshblock'. A typical meshblock has slightly over one hundred people living in it. For each meshblock, I know how many Māori are registered in each Roll at the end of the 2006 and 2013 Māori Electoral Options. I merge this dataset with the 2006 and 2013² censuses (the smallest unit of analysis in the New Zealand Census is the meshblock). These contain the usual information on socioeconomic characteristics of the population at the meshblock level. Since I can locate each meshblock in the electorate it belongs, I use 2005 and 2011 elections to construct a measure of expected closeness of future elections (2008 and 2014). This measure of closeness is based on the distance in percentage of votes between the winner and the runner up in each district.³

Results suggest that strategic enrollment is at place. However, the size of the effect is small: districts where the race is expected to be extremely close have one percentage point more registrations than districts where the race is expected to be won by a landslide. Given that switching is essentially costless, one should expect much larger differences if Māori aimed to affect election results. On the other hand, the data suggest that strength of allegiance to the Māori culture plays a much larger role. Using ability to speak Māori language as a proxy for strength of Māori identity, results show that voters with a strong Māori identity overwhelmingly register in the Māori Roll, regardless of expectations of electoral competition. This could be in fact regarded as strategic behavior: if the main aim of Māori with a strong sense of Māori identity is to increase the number of Māori seats in parliament, then their best strategy is to register in the Māori Roll, regardless. Results uncover a second interesting pattern: *caeteris paribus*, Māori in 'white collar' areas tend to register in the General Roll, whereas Māori in 'blue collar' areas tend to prefer the Māori Roll. This suggests that social inequalities have political implications that manifest themselves beyond the preferences expressed on election day. It should be noted that whereas results presented in this paper may suffer from ecological fallacy and have to be treated with caution, research

²The Māori Electoral Option and Census of 2011 were postponed to 2013 due to the Christchurch earthquake, which took place on February 22, 2011.

³Even if some meshblocks switch electorate between elections, from the point of view of the voter this cannot be rationally foreseen.

conducted using survey data confirms some of the patterns described here (UMR, 2006; Fitzgerald et al., 2007; Greaves et al., 2017). Future research (possibly using individual level data) should further confirm (or disprove) all results in this paper.

On the whole, results presented here have several implications. Strategic behavior seems to be modest. This is in line with previous findings that suggest that strategic behavior is not predominant among voters (Abramson et al., 2010; Alvarez et al., 2006; Blais et al., 2016; Hix et al., 2017; Riambau, 2016).⁴ This could be explained by a variety of factors. Voters may lack information about the Māori Electoral Option (Comrie et al. (2002)), may lack adequate information about expected closeness even if they aim to be strategic, may find switching too costly (even if the cost is only to tick a box in a stamped envelope to send back), or may lack information about the local candidates at each district, making the choice of Roll irrelevant to them. More broadly, the electorate vote is a low stakes vote in a system like the Mixed Member Proportional (MMP) used in New Zealand. In such a system, all voters cast two votes. The ‘electorate vote’ decides the name of the local MP. The distribution of seats in Parliament is however decided via the ‘party vote’. Since all party votes are tallied at the national level (i.e., there is only one electoral district), switching to either Roll has no impact on the distribution of seats in Parliament.⁵ Overall, if Māori are being strategic, it seems that their objective function is to increase the number of Māori seats rather than to be pivotal in the local race. Survey data should corroborate this conjecture.

There are also relevant policy implications. While originally Māori seats were put in place to ensure political integration (Geddis, 2006), results presented here suggest that this may no longer be the case: whereas registration in the Māori Roll is likely to be an affirmative (and hence, positive) statement of Māori identity or a statement of political support to the existence of Māori seats, this need not necessarily be the rationale behind the decision of all voters who enroll in the Māori Roll. Socially disadvantaged Māori could be using their registration in the Māori Roll as a signal of discontent with the political system. That is, those feeling alienated from the social/political system could be opting for the Māori Roll out of a general lack of trust on institutions. Correctly understanding the motive behind Māori choices should be the goal of future research, which in turn should inform policy makers about how to best tailor the role of Māori seats in the future.

2 New Zealand context

This section is intended to give a brief summary of the New Zealand political context. The reader familiar with New Zealand politics may skip to Section 3.

⁴See Herrmann et al(2013) for an extensive review of previous results.

⁵Technically it may have an impact if, by registering in a particular Roll, a pivotal voter casts a decisive ‘electorate vote’ for a small party (< 5% of the ‘party vote’) that manages by winning the local seat to enter Parliament.

2.1 Māori seats

British sovereignty over the territories of New Zealand was declared in 1840. The New Zealand Constitution Act 1852 established the first form of self government. As customary at the time, voting rights were contingent on gender and property qualifications. Given that Māori land was owned communally, this meant that all Māori residents were *de facto* disenfranchised. Māori tensions between Māori and settler society resulted in an increased pressure to institute some form of Māori representation. Finally, the 1867 Māori Representation Act established four Māori seats in Parliament. As a result, people from Māori descent would be able to register and vote in any of the four designated Māori electorates (Northern, Southern, Eastern and Western Māori).⁶ Up until 1993, all MPs were elected under FPP. New Zealand in that period is generally cited as the purest form of Westminster democracy that has ever existed (Lijphart, 1984).

Until 1975, for electoral purposes, citizens were defined as Māori if at least “half their blood” was from Maori descent (Robson and Reid, 2001). While Māori could only register in the Māori Roll, the rest of the population had to register in the General Roll. The General Roll consisted of 72 electorates in 1867. However, the electoral law established that the number of General Roll electorates was contingent on the population in the General Roll. Hence, while the number of Māori electorates remained at four throughout most of the 20th century, the number of General electorates increased up to 83 by 1975 and to 95 by 1993 (Parliamentary Library, 2009). This had dramatic consequences in terms of malapportionment: while each General electorate comprised around 33,000 people (including unregistered voters and people under 18 years of age), each Māori electorate on average included around 90,000.⁷

There were two major changes in 1975. First, identification as Māori in the Electoral Roll became virtually a personal choice (for census purposes this change did not occur until 1986).⁸ Second, the Māori Electoral Option was introduced. The Māori Electoral Option was a new rule that allowed Māori to choose to register in either Roll, and switch their Roll every five years (coinciding with the census) if so they wished.⁹ However, the number of Māori districts was strictly kept at four. By 1993, when the number of Māori seats was still fixed at four, 60% of enrolled Māori had chosen the General Roll (146,689 vs. 101,585).

The 1993 Electoral Act implemented two further dramatic changes: one the one hand, after a referendum, the electoral system was changed from FPP to MMP. With the new MMP system, the number of MPs was set to increase to 120, regardless of the number of electoral districts (more details on MMP in section 2.2). Second, it established that the number of Māori districts would too be contingent on

⁶See Geddis (2006) for a review of the evolving rationale of the Māori seats.

⁷However, given the different age demographics across ethnic groups, and much lower registration rates among Māori, malapportionment in terms of strictly registered voters was reversed. The average number of registered voters in 1975 was 17,608 in Māori districts and 22,502 in General districts (data from Parliamentary Library (2009) and www.idea.int).

⁸According to the Māori Affairs Act of 1974, “Māori means a person of the Māori race of New Zealand; and includes any descendant of such a person”, which, for all practical purposes, meant that “[a] person is said to have Māori ancestry if they claim to have Māori ancestors, no matter how distant” (Statistics New Zealand, 2016).

⁹Interestingly, Māori were allowed to run in General districts since 1967. That is, prior to Māori being able to vote in those.

the population registered in the Māori Roll ([Parliamentary Library, 2009](#)). The implication of this was clear: from then onward, increased Māori registration in the Māori Roll would automatically increase the number of Māori-only districts. In the first election after the implementation of the law (1996) the number of Māori seats already rose to five (while the number of General seats was determined to be 65 for that election). The number is currently seven.

2.1.1 Māori Electoral Option: details

The Māori Electoral Option is the period during which Māori can choose to switch the Roll they are registered in. This is an essentially costless action: at the beginning of the Option, registered Māori voters receive an envelope at home with the relevant one-page form (see Figure 3). If they do not want to switch, they do not have to do anything. If they want to switch, all they have to do is sign the form and then (i) send in back using a Freepost envelope included in the pack; (ii) upload a photo of it online at <https://maorioption.org.nz/maori-roll/>; or (iii) send it back via email to maorioption@elections.org.nz. Alternative ways to switch Roll also exist. Details and images are in the Supplementary Materials (Section 2).

There have been four Māori Electoral Options since New Zealand adopted MMP in 1994: 1997, 2001, 2006, and 2013. The next one is scheduled to take place from April 3 to August 2, 2018. Initially, registration in the Māori Roll increased substantially: from 101,585 registrations in 1993 (40.9% of the total Māori registered) up to 194,114 (55.1%) by 2002 ([Parliamentary Library, 2009](#)). This resulted in an increase on the number of Māori seats from four in 1993 to seven in 2002. Ever since, numbers have stagnated: by the end of the 2013 Māori Electoral Option, 55.3% of the 413,348 registered Māori were in the Māori Roll.¹⁰ This means an increase in 0.2% during the 2002–2013 period.

2.1.2 Voting patterns in Māori electorates

Traditionally, more progressive parties have dominated the Māori electorates. The Liberal Party dominated until 1935. From then up to 1996, the Labour Party was the winner. In 1996, New Zealand First won all Māori electorates, probably the main reason being that its leader Winston Peters was part Māori. However, in 1999 and 2002 Labour regained majority in those electorates. From 2005 onward, both the Māori and Labour Party have disputed the local contests (see Table 1).

Ethnic politics have never played a central role in New Zealand elections. The Mana Māori party took part in all elections since 1993 but never managed to reach 1% of the party vote. Since 2005, however, the newly formed Māori Party has won seats in all general elections (except in 2017).¹¹ It has however always won seats only through the Māori Roll, never achieving more than five seats in a single election.

¹⁰2006 and 2013 data from <https://www.elections.org.nz/news-media/results-2006-m%C4%81ori-electoral-option> and <https://www.elections.org.nz/events/maori-electoral-option-2013/results>. Both accessed on May 4, 2018.

¹¹The Māori Party was formed on 7 July, 2004, by former Labour minister Tariana Turia and the well-known scholar Pita Sharples.

2.2 The Mixed Member Proportional (MMP) system

New Zealand is a parliamentary representative democratic monarchy. This means that the executive branch is not directly elected by the people, but by Parliament, to which it is held accountable. The New Zealand Cabinet is responsible to New Zealand Parliament from which its members are derived. All Cabinet Ministers must be MPs and are collectively responsible to it. Since 1993, New Zealand's Parliament has 120 seats.

Members of Parliament are elected using the MMP electoral rule since 1996 (before then, FPP was used). Each citizen casts two votes: the *party vote* and the *electorate vote*. The party vote consists of choosing among a set of closed party lists. The set of all lists is the same for all citizens across the nation. Citizens can vote for at most one list. All nation-wide votes are tallied together — i.e., there is only one electoral district for the party vote. This determines the composition of Parliament. That is, the number of seats that each party gets.

The electorate vote consists of choosing the candidate that will represent the electorate in Parliament. The set of candidates differs by electorate. Citizens can vote for at most one candidate. The winner is chosen by plurality rule (FPP). Currently there are 71 electorates (64 General and 7 Māori).

The composition of Parliament is determined as follows. First, parties enter Parliament only if (i) they have won 5% of the total number of party votes or (ii) they have won at least one district in the electorate vote. Once the competing parties are determined, seats are allocated taking into account *only* party votes.¹² All nationwide party votes are tallied together, and the allocation of seats is done using the Sainte-Laguë system. While the number of MPs a party gets is fully determined by the party vote (except for a particular situation described below), the *names* of the MPs critically depend on the electorate vote: winning the local race guarantees a seat in Parliament. If a party wins more seats than electorates (which is the usual, given that there are 120 seats and 71 electorates), the extra seats are filled with party members listed in the closed party list.

The impact of the electorate vote on representation is significant in two major circumstances. First, when a party with less than 5% of the party vote wins a district via the electorate vote. In that case, despite failing to meet the threshold, such party enters the competition for party seats: it may even win more than one seat if the percentage of party votes is sufficiently large. Second, when the number of electorate seats won by a party is larger than the number of seats allocated via party vote. In that case the party keeps as many seats as electorates won —this is the only situation in which the party vote shares do not fully determine the number of seats in Parliament. As a result, the number of MPs in that particular legislature is increased to match the number of electorate seats won by that party. For instance, if the distribution of seats according to the party vote gives one party 45 seats, whereas this party has won in 48 electorates, then the number of parliamentary seats is increased to 123. This is known as overhang. If a party does not have enough people on its list to fulfill its quota, then there is

¹²If an independent candidate has won an electorate seat, the the number of seats to be distributed is reduced to 119.

an underhang (the number of MPs for the legislature is reduced to less than 120). No underhang has occurred thus far. However, overhangs have occurred: 121 MPs in 2005, 2011, and 2014, and 122 MPs in 2008.

2.3 New Zealand party system

New Zealand politics were by and large a two party system until the turn of the century. The Labour Party and the National Party dominated the scene since 1935 (the United & Reform coalition government from 1931 to 1935 was the last one not to be led by either National or Labour). With the FPP system in place, they together won more than 90% of the MPs in all elections. Nonetheless, since the establishment of MMP in 1994, other parties have become quite relevant in the political arena, sometimes even having the option to bargain which of the two big parties would lead the government.

Table 1 shows the results and seat distribution for the elections before the two Māori Electoral options in my dataset. A coalition agreement was needed after all three elections. In 2005, the government formed was a minority coalition between Labour and the Progressive Party, with parliamentary support from New Zealand First and United Future. In 2008, National formed a minority government with confidence and support from the ACT, United Future and Māori parties. In 2011, National reached an agreement with ACT and United Future to form a minority government.

What election results unambiguously reveal is that the Māori seats have proven essential for Māori Party representation in Parliament. Strictly speaking, we lack counterfactual results to claim so (perhaps in the absence of Māori seats, Māori Party supporters would coordinate the party vote). On the whole, however, given the 5% threshold to achieve Parliament via the party seat, winning the local electorate races has proven critical for the presence in Parliament (and likely survival) of small parties in New Zealand, in particular for the Māori Party.

As a result, nowadays, when Māori decide which Roll to register in, there is more at stake than the name of the local MP. Parliamentary presence and even the capacity to directly affect government policies of Māori parties hinge on their ability to secure Māori seats. If a voter's objective function is solely to secure Māori parties MPs, then there is little reason for her to register in the General Roll.¹³

3 The Data

This paper merges four different datasets. The first dataset I use are census data from 2006 and 2013.¹⁴ The unit of analysis is the meshblock. This is the smallest available unit in the New Zealand census. There are slightly more than 100 residents in typical meshblock — in urban areas they may be as small as one block, whereas in rural areas they may cover a few inhabited hectares.¹⁵ New Zealand census

¹³Ironically, those Māori who oppose the Māori Party have an incentive to register in the General Roll, in order to reduce the number Māori seats.

¹⁴Census data available at <http://www.stats.govt.nz>

¹⁵As Statistics NZ defines it, “[a] meshblock is the smallest geographic unit for which statistical data is collected by Statistics New Zealand. Meshblocks vary in size from part of a city block to large areas of rural land. Each meshblock

data includes all standard socioeconomic variables that most census usually include. The second dataset are the general election results for 2005 and 2011.¹⁶ These are used in order to construct a measure of closeness of elections at the electorate level. Hence, I only need the results for the electorate vote.

The third dataset contains information on the number of Māori registered at each Roll at the meshblock level right after the 2006 and 2013 Māori Electoral Options were closed. Finally, the fourth dataset links each particular meshblock to the electorate it belongs to. Given that electoral boundaries undergo minor changes with relative frequency, a few meshblocks switch electorate in my dataset.¹⁷

I merge these four datasets. The final dataset includes 331,832 Māori for 2006 and 374,390 for 2013. This represents 86% and 91% of the total Māori registered each year. In the dataset, the proportion of Māori registered in the Māori Roll is 57.1% for 2006 (57.6% in the official statistics), and 54.8% for 2013 (55.3% in the official statistics). Whereas the data does not match exactly the official statistics, these discrepancies are rather small: it is reasonable to argue that all results in this paper most likely reflect overall population patterns. No electorates are left out and no region is left out in a systematic way. The Supplementary Materials (Section 3) give the exact dates when all censuses, Māori Electoral Options, boundary reviews, and general elections used to construct this dataset took place.

3.1 Descriptive Statistics

Table 2 provides the descriptive statistics at the meshblock level for each census year. We can see that, on average, the proportion of Māori who chose to enroll in the Māori Roll diminished from 2006 to 2013. It should be noted that even though these data reflect meshblock (and not individual) statistics, they resemble very closely country-individual statistics. For instance, whereas the median household earned \$51,400 in 2006,¹⁸ the median household in the median meshblock earned \$50,800, according to the 2006 census.

4 Identification Strategy

Let me first describe how I construct a proxy for expected pivotal probabilities. Even though pivotal probabilities are remarkably small, survey data suggests that Māori believe in the importance of their vote — see Figure 4. Whereas the two survey questions I use do not explicitly refer to pivot probabilities, this data suggests that at least a non-negligible fraction of Māori could indeed regard their vote as decisive.

Since there is no information on voters' expectations on election results at the electorate level, I use past election results in order to proxy for expected closeness in future elections. To be precise, I use 2005

abuts another to cover all of New Zealand, extending out to the 200-mile economic zone (approximately 320 kilometres). Meshblocks aggregate to build larger geographic areas, such as area units, territorial authorities, and regional councils." <https://datafinder.stats.govt.nz/layer/8347-meshblock-2013/>.

¹⁶Source: <http://www.electionresults.govt.nz/>

¹⁷I am especially grateful to working staff at Statistics NZ and the Electoral Enrollment Centre for having provided me with the two latter datasets.

¹⁸Source: <http://archive.stats.govt.nz/Census/2013-census/profile-and-summary-reports/quickstats-income/household-income.aspx>.

(2011) general election results to impute expectations at the time of the Māori Electoral Option of 2006 (2013). Given that registration choices can only influence district results, I use only ‘electorate vote’ data to construct this variable.¹⁹

Let us define distance of contention in a particular electorate e as follows:

$$DC_e \equiv \text{Share of votes } 1^{st} - \text{Share of votes } 2^{nd} \quad (1)$$

From (1), one may define the following measure of closeness:

$$\text{Close}_e \equiv 100 - DC_e \quad (2)$$

‘Close’ takes values between 0 (if the winner won all votes in the electorate) and 100 (if the winner and the runner up received the exact same number of votes). Each Māori voter may choose between voting in general district g or Māori district m (for simplicity, I am assuming no voters expect their meshblock to switch electorate). When a voter i aims to be pivotal, she is likely to prefer the electorate in which the race is expected to be closest. In other words, she is likely to compare Close_g to Close_m . Hence, I construct a variable that captures this comparison:

$$\text{DIFF}_i \equiv \text{Close}_m - \text{Close}_g, \quad (3)$$

i.e., this variable takes values between 100 (the race in the Māori district was neck-and-neck, whereas the race in the general district was won by one party with all votes) and -100 (vice-versa). A value of 0 means that both races were equally close (and so the voter should be indifferent if her choices are solely based on pivotal considerations). The closer the results in the Māori district compared to the general district, the larger the value DIFF takes. If Māori voters register where they expect to have higher chances of being pivotal, they should register in the Māori Roll when the value of DIFF is greater than 0, and in the General Roll when it is negative. That is, we expect to find a positive correlation between percentage of Māori registered in the Māori Roll and the variable DIFF.

In order to check whether this relationship exists, I use a partially linear model:

$$\%MAO_i = X_i\beta + g(\text{DIFF}_i) + \varepsilon_i \quad (4)$$

where i is a meshblock, %MAO is the percentage of Māori registered in the Māori Roll in meshblock i , $g(\cdot)$ is an unknown function, and X_i is a vector of sociodemographic characteristics of the meshblock. Section 4 in the Supplementary Materials gives details on how to estimate g . The controls used are the following percentages over the total resident population in the meshblock: female, home owners, college degree holders, fully employed, unemployed, managers, elder (65 or older), adults (15 to 64 years old), and regular smokers. I also include percentage of residents who are Māori, and percentage of Māori who speak Māori. Finally, I include meshblock median household income. Section 5.2 discusses how these

¹⁹‘Party votes’ are tallied at the national level — there is only one district.

control variables correlate to registration patterns. All regressions include meshblock and time fixed effects. When weights are used, these are based on the total Māori population in the meshblock (as a proportion of total Māori in the country).

As a robustness check, I also use a linear specification:

$$\%MAO_i = \alpha + X_i\beta + DIFF_i\gamma + \varepsilon_i \quad (5)$$

Finally, I also allow election results to enter non-linearly in the regression.

$$\%MAO_i = \alpha + X_i\beta + DIFF_i\gamma_1 + DIFF_i^2\gamma_2 + \varepsilon_i \quad (6)$$

All throughout, I check whether closeness of the general district alone may explain registration choices. To do so, I use ‘Close_g’ instead of ‘DIFF’ in all three specifications. Māori districts are generally less competitive: in the data, only three of them were won by a margin smaller than 10% (and none by a margin smaller than 5%). On the other hand, 27 General Roll districts were won by a margin smaller than 10%, three of those in fact smaller than 1%. Hence, it is plausible that some voters who take into account pivotability chances base their decisions on the general electorate results only. This is more likely to be the case where information constraints or recall inaccuracies exist. One could argue that poorly informed Māori voters, in fact, can only accurately recall Māori district results. Whereas this is plausible, I cannot check if Māori district results alone explain registration choices: this is because there is not enough variability in the data (there are only seven Māori electorates each election).

5 Results

5.1 Expected pivotability

Figure 5a shows the results for the main regression specification — expression (4). It suggests that, controlling for a wide range of socioeconomic characteristics, the closer the race in the Māori electorate, the more likely the average Māori voter is predicted to register in the Māori Roll. Whereas the relationship is quite strong, the size of the effect is modest: the predicted probability of registering in the Māori Roll when the general electorate is expected to be won by a landslide (25 percentage points) is only one percent larger than the predicted probability when the race in both districts is expected to be equally close. In other words, a landslide victory in the General district seems to motivate one Māori in one hundred to switch rolls. Figure 5b confirms the results when using closeness of General Roll district alone: the pattern seems robust, but the magnitude seems small.²⁰

As a robustness check, I run an OLS model as specified in (5). Results are shown in Table 3. There are six regressions in the table, so that all possible clusterings are taken into account (no clusters, robust clusters, and district level clusters). Similarly, I run each of these cluster specifications with and without

²⁰Note that partially linear regressions are unweighted: hence, the average registration rate in the Māori Roll is around 47% instead of around 55%.

weights.

Panel A shows the results when the independent variable of interest is difference in closeness between General and Māori districts. The direction is positive as expected. However, if there is an effect, this regression does not pick it: only two of the six specifications turn out to be significant, and only at a 10% level. On the other hand, Panel B shows that when we use closeness in General Roll districts alone, results are always significant. *Caeteris paribus*, if the distance of contention in the General Roll district reduces from 20 percentage points to 0, the proportion of Māori registering in the General Roll increases by 1.1%. Figure 6 shows what happens when the variables of interest enter non-linearly in the OLS regression — expression (6). It confirms the patterns revealed in Table 3: only when using General Roll district results does the effect seem sizable.

5.2 Other explanatory variables

This section is devoted to understand what else may explain the fact that 6.3% and 4.4% of registered Māori chose to switch Roll in 2006 and 2013. To that avail, I check whether any of the control variables used in (5) is correlated with registration patterns. Table 4 shows the results. As before, there are various OLS specifications in order to check for the robustness of results to different clustering and weighting strategies. All columns, however, show (nearly) the same results. Two patterns clearly emerge. First, we can see that Māori who live in relatively wealthier areas tend to prefer the General Roll: meshblocks with higher levels of full employment and home ownership have lower proportions of Māori enrolling in the Māori Roll. Second, meshblocks with higher concentration of Māori — and higher proportion of Māori who speak Māori — tend to have disproportionately more Māori registering in the Māori Roll.

These effects are large. Increasing the proportion of Māori in the meshblock from 0.01% (the minimum in the dataset) to 50% increases the proportion of registrations in the Māori Roll by 20% (ten percentage points, Figure 7b). Similarly, when the proportion of Māori who speak Māori increases from none to 50%, enrollment to the Māori Roll increases by 10% (five percentage points, Figure 7a). Both Figures suggest a decline in registration in the Māori Roll as we reach full levels of Māori (or Māori who speak Māori). This decline is however equivocal: there are few datapoints beyond the 50% level and therefore the confidence intervals become much wider.

The effects for socioeconomic characteristics are more modest: when the proportion of fully employed increases from 25% to 75% in the meshblock, the proportion of registrations in the Māori Roll decreases by 5% (Figure 7c). The effect of increasing home owners in the same proportion is of the same magnitude (Figure 7d).

6 Discussion

Results presented above suggest that some Māori may indeed register in the Roll where they expect the race to be closer. There are however few caveats that are worth noting. First, I use past election results as an predictor of closeness of the next election. Whereas the data show this is a very accurate predictor (especially for the period 2011–2014, Figure 2), there is no guarantee that voters use past results as an indicator of future results. Furthermore, as it has been argued above, even if they use them, these recollections may be noisy or inaccurate. Second, the measure of difference of closeness of elections in each Roll used may be sometimes problematic. Say, for instance, for a given meshblock this measure is 8%. This may mean that the race in the Māori district was perfectly close, whereas distance of contention was 8% in the General Roll district, but it may also mean that distance of contention was 20% in the Māori Roll district and 28% in the General Roll one. These are two substantially different scenarios. Whereas in the first one, a voter aiming to be pivotal has a very obvious choice, this is not nearly as obvious in the second one — she would not be pivotal in either scenario, making the switch needless. Results using only General Roll districts may overcome this issue, if we make the somewhat heroic assumption that strategic voters believe that the race in the Māori Roll is never close enough to merit registration.

There are other reasons that may explain the relatively small size of the effects. First, voters may not care enough about the identity or party of the local MP to be willing to switch Rolls. Second, pivotal probabilities may not be the only consideration of strategic voters. If they dislike the expected runner up enough, some voters may prefer to register in a particular Roll just to ensure a landslide victory for their preferred candidate. This could happen when sophisticated voters aim to send a message to the parties regarding their choice of local candidates.

On the whole, it seems that pivotal considerations may play a key role only for a relatively small subset of Māori. Results regarding sociodemographic characteristics of the meshblocks suggest that most Māori make their choices based on considerations other than pivotal aspects. The data uncover two major patterns. First, Māori who speak their native tongue tend to overwhelmingly enroll in the Māori Roll. This suggests that choices are driven by cultural and ethnic allegiances: given that speaking Māori is likely to be correlated with strength of Māori identity, it seems reasonable to infer that those voters who feel strongly about their cultural identity may use their registration choices to express it. This finding is consistent with previous research that used New Zealand Election Study data ([UMR, 2006](#); [Fitzgerald et al., 2007](#); [Greaves et al., 2017](#)). Note, furthermore, that this could also be a strategic choice: given that —roughly— every increase in around sixty thousand voters registered in the Māori Roll yields a new Māori electorate, citizens who aim to increase the number of Māori seats have all incentives to register in the Māori Roll.

Second, results suggest that as Māori achieve higher socioeconomic status they tend to prefer enrolling in the General Roll, whereas Māori of lower socioeconomic status prefer to register in the Māori Roll. This *could* suggest that Māori who cannot *climb up* the social ladder do not feel represented by the political

system and use enrollment in the Māori Roll as an expressive/protest statement. Similarly, these results suggest that Māori who gain certain socioeconomic status could feel a stronger sense of belonging to the system and therefore prefer to opt in the General Roll.

The fact that smoking regularly is correlated with registration in the Māori Roll is also suggestive that disadvantaged classes politically behave in a clear distinct manner. Previous research has shown a much stronger prevalence of smokers within disadvantaged groups in New Zealand, and even an increase in socioeconomic and ethnic inequalities in smoking during the nineties (Hill et al., 2017; Tobias and Cheung, 2001; Barnett et al., 2004). Whereas this conjecture should be taken with caution, these pattern may reflect some fundamental relationship between educational attainment and health/risk attitudes on one hand and political behavior on the other.

Enrollment choices could also be driven by voting costs considerations (Gibson et al., 2013; Xanthaki and O’Sullivan, 2009). Indeed, “there are considerable practical difficulties in casting a vote for those on the Māori Roll. These include the much larger geographic size of Māori electorates (requiring some Mori electors to travel far greater distances than non-Mori electors in order to cast an ordinary vote), and limited numbers of both Māori polling booths and returning officers.” (Parliamentary Library (2009), page 18). Taking the 2008 election as an example, according to official statistics results, there were 2,270 polling stations in the Māori Roll, whereas there were 3,249 stations in the General Roll.²¹ Even though technically anyone can vote in any polling station, doing so outside the own Roll or electorate involves some costly bureaucratic paperwork on the day of voting. Hence, at the margin, some Māori voters in rural areas may have chosen the General Roll out of convenience considerations. In a similar fashion, even if switching Roll is virtually a costless action, one cannot rule out the fact that some voters find ticking a box already too costly, or may intend to switch but forget to do so in time, or never manage to get reliable information on expected closeness of future races.

7 Concluding Remarks

This paper takes advantage of the fact that Māori in New Zealand have the right to choose what district to vote in to analyze to what extent agents are strategic when they make political decisions. Whereas the data suggest that some Māori voters choose to register where they expect the race to be closer, there seem to be stronger reasons driving Māori enrollment choices. Namely, cultural allegiance and socioeconomic status: Māori with a stronger sense of Māori identity tend to prefer the Māori Roll. This is possibly a strategic choice since this increases the likelihood of creating new Māori districts. Furthermore, Māori who reach a certain socioeconomic status seem to prefer to register in the General Roll. This seems to suggest that Māori identity dilutes with socioeconomic status.

These results should however be taken with a grain of salt: given the aggregate nature of the data,

²¹Detailed 2008 results taken from https://www.electionresults.govt.nz/electionresults_2008/e9/html/e9_part8.html.

they may suffer from ecological fallacy. Results presented here linking Māori commitment to their own culture and registration to Māori are consistent with previous research that uses survey data (UMR, 2006; Fitzgerald et al., 2007; Greaves et al., 2017). Nonetheless, future research using individual-level observational or survey data should confirm (or discard) the findings regarding socioeconomic status and pivotal expectations.

There are other questions that future research should shed light onto. First, uncover the relationship between Māori concentration and registration to the Māori Roll (Figure 7b): these could be explained by self-selection (Māori with a stronger sense of Māori identity choose to live in higher density Māori areas), or by network effects (when Māori move into Māori-dense areas their sense of ethnic identity changes). Second, understand the extent to which (if any) political parties strategize around the Māori Electoral Option. Third, fully account for the fact that (seemingly) lower socioeconomic status Māori are less attracted to the General Roll. These are all relevant questions not only from a research but also from a policy-making point of view.

References

- Abramson, Paul R., John H. Aldrich, André Blais, Matthew Diamond, Abraham Diskin, Indridi H. Indridason, Daniel J. Lee, and Renan Levine. "Comparing strategic voting under FPTP and PR." *Comparative Political Studies* 43, no. 1 (2010): 61-90.
- Alvarez, R. Michael, Frederick J. Boehmke, and Jonathan Nagler. "Strategic voting in British elections." *Electoral Studies* 25, no. 1 (2006): 1-19.
- Barnett, Ross, Graham Moon, and Robin Kearns. "Social inequality and ethnic differences in smoking in New Zealand." *Social Science & Medicine* 59, no. 1 (2004): 129-143.
- Blais, André, John H. Aldrich, Indridi H. Indridason, and Renan Levine. "Do voters vote for government coalitions? Testing Downs' pessimistic conclusion." *Party Politics* 12, no. 6 (2006): 691-705.
- Bouton, Laurent, and Micael Castanheira. "One person, many votes: Divided majority and information aggregation." *Econometrica* 80, no. 1 (2012): 43-87.
- Castanheira, Micael. "Victory margins and the paradox of voting." *European Journal of Political Economy* 19, no. 4 (2003): 817-841.
- Comrie, Margie, Annemarie Gillies, and Mary Day. "The Māori Electoral Option Campaign: Problems of Measuring 'Success'." *Political Science* 54, no. 2 (2002): 45-57.
- Fitzgerald, E., B. Stevenson, and J. Tapiata. "Māori electoral participation: A report produced for the Electoral Commission." Palmerston North, New Zealand: Massey University. Google Scholar (2007).
- Geddis, Andrew. "A Dual Track Democracy? The Symbolic Role of the Mori Seats in New Zealand's Electoral System." *Election Law Journal* 5, no. 4 (2006): 347-371.
- Gibson, John, Bonggeun Kim, Steven Stillman, and Geua Boe-Gibson. "Time to vote?." *Public Choice* 156, no. 3-4 (2013): 517-536.
- Greaves, Lara M., Danny Osborne, Carla A. Houkamau, and Chris G. Sibley. "Identity and demographics predict voter enrolment on the Māori electoral roll." (2017) DOI: 10.20507/MAIJournal.2017.6.1.1. Available at http://www.journal.mai.ac.nz/sites/default/files/MAIJrnl_6_1_Greaves_02_FINAL.pdf.

- Herrmann, Michael, Simon Munzert, and Peter Selb. "Determining the effect of strategic voting on election results." *Journal of the Royal Statistical Society: Series A (Statistics in Society)* 179, no. 2 (2016): 583-605. doi:10.1111/rssa.12130
- Hill, Sarah, Tony Blakely, and Philippa Howden-Chapman. *Smoking Inequalities: Policies and patterns of tobacco use in New Zealand, 1981-1996*. Department of Public Health, Wellington School of Medicine & Health Sciences, 2003. Available at <https://www.otago.ac.nz/wellington/otago022976.pdf>
- Hix, Simon, Rafael Hortala-Vallve, and Guillem Riambau. "The effects of district magnitude on voting behavior." *The Journal of Politics* 79, no. 1 (2017): 356-361.
- Lijphart, Arend. *Democracies: Patterns of majoritarian and consensus government in twenty-one countries*. Yale University Press, 1984.
- Myerson, Roger B. "Large poisson games." *Journal of Economic Theory* 94, no. 1 (2000): 7-45.
- Parliamentary Library. "The Origins of the Māori Seats", Parliamentary Library Research Paper, New Zealand, 2003 (updated 2009). Available at <https://www.parliament.nz/resource/en-NZ/00PLLawRP03141/e27e432e971eb1f60ea75b00c987a39e4b2e62ce>.
- Riambau, Guillem. "Do citizens vote for parties, policies or the expected winner in proportional representation systems? Evidence from four different countries using a multiple-type model." *Party Politics* (2016): 1354068816668669.
- Robson, Bridget, and Papaarangi Reid. "Ethnicity Matters: Review of the Measurement of Ethnicity in Official Statistics." *Statistics New Zealand*, (2001).
- Spenkuch, Jörg L. "Expressive vs. Pivotal Voters: An Empirical Assessment." (2017). Available at <https://poseidon01.ssrn.com/delivery.php>
- Tobias, Martin, and Jit Cheung. "Inhaling inequality: Tobacco's contribution to health inequality in New Zealand." Ministry of Health, 2001. Available at <http://www.moh.govt.nz/notebook/nbbooks.nsf>
- UMR Research. "Māori Electoral Engagement: a review of the existing data", available at <https://www.elections.org.nz/sites/default/files/plain-page/attachments/Maori%20Electoral%20Engagement.pdf>
- Statistics New Zealand. "Definition of Maori Descent." *Statistics New Zealand webpage* (2016), <http://www.stats.govt.nz/methods/classifications-and-standards/classification-related-stats-standards/maori-descent/definition.aspx#>. Accessed August 4, 2016.
- Statistics New Zealand. "Number of Electorates and Electoral Populations: 2013 Census - Media Release." *Statistics New Zealand webpage* (2013), http://www.stats.govt.nz/browse_for_stats/population/census_counts/NumberofElectoratesandElectoralPopulations_MR2013Census.aspx. Accessed August 12, 2016.
- Xanthaki, Alexandra, and Dominic O'Sullivan. "Indigenous participation in elective bodies: the Maori in New Zealand." *International Journal on Minority and Group Rights* 16, no. 2 (2009): 181-207.

8 Figures

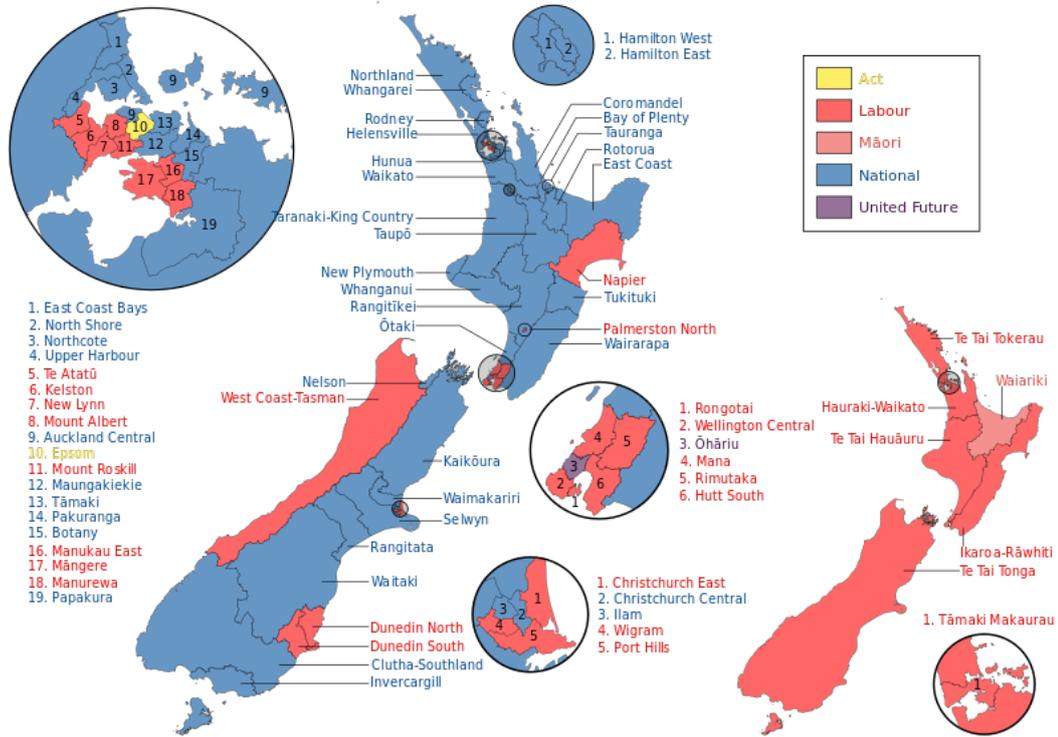
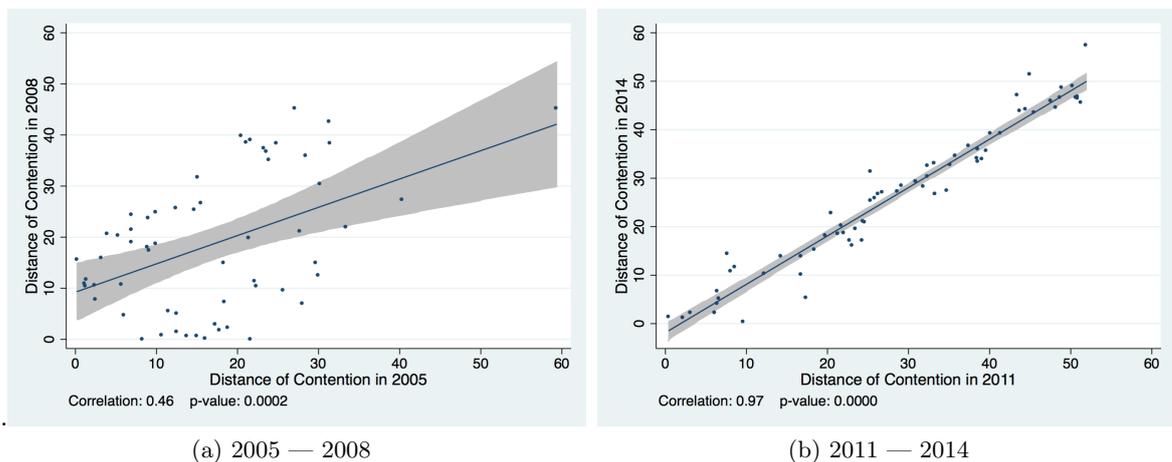


Figure 1: Electorate map of New Zealand that includes the results of the general election of 2014. Source: <https://thespinoff.co.nz/politics/24-09-2017/a-better-visual-breakdown-of-the-2017-election-results/>, accessed on June 4, 2018.

Figure 2: Correlation between election results before and after a Māori Electoral Option

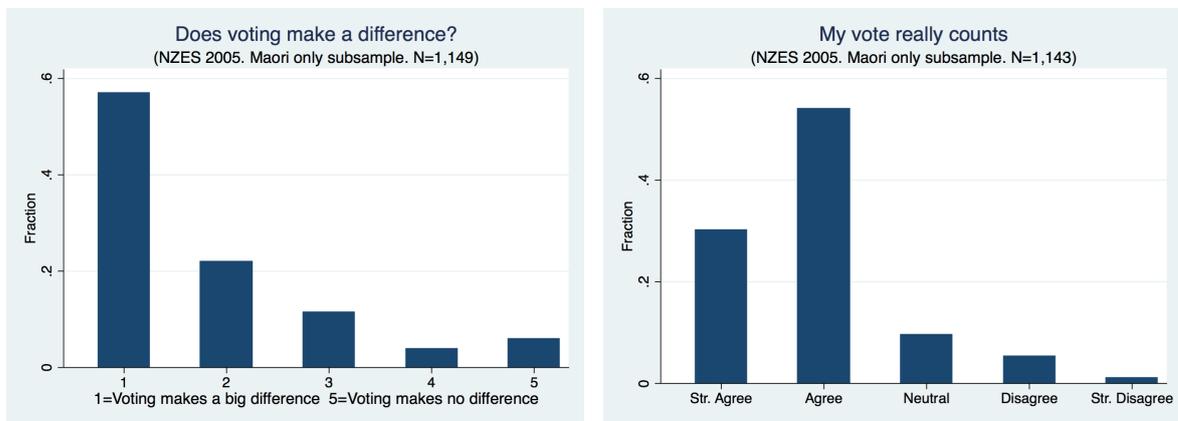


Correlation between election results right before and after Māori Electoral Options in this paper (2006 and 2013). Each dot is an electorate. Shaded areas represent 95% confidence intervals. Distance of contention: % votes winner - % votes runner-up.



Figure 3: Example of the form Māori receive at home to switch Roll. In this case, the voter is switching from the Māori to the General Roll.

Figure 4: Māori and the importance of the vote. 2005 survey data.

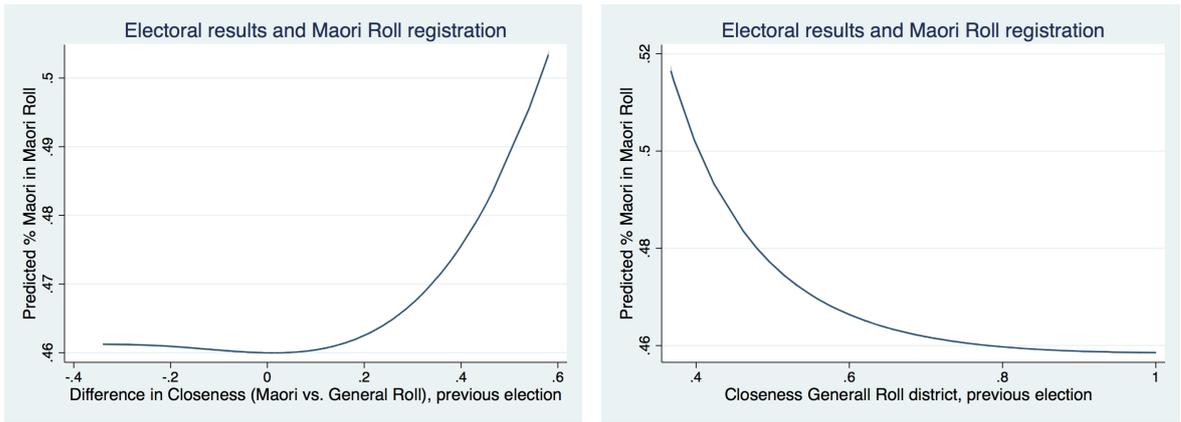


(a) "Voting makes a difference"

(b) "My vote really counts"

Data: New Zealand Election Study (2005) (<http://www.nzes.org/>)

Figure 5: Election results and predicted registration rates. Partially linear model .

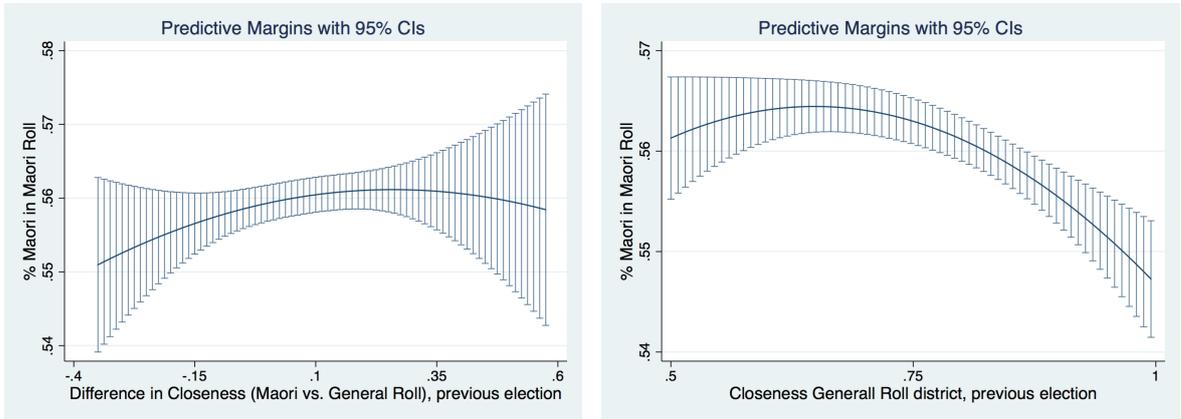


(a) Difference in closeness ('DIFF')

(b) Closeness General Roll electorate ('Close')

Predicted percentage of Māori registered at the Māori Roll resulting from the partially linear model — see expression (4): $\%MAO_i = \alpha + X_i\beta + g(\text{DIFF}_i) + \varepsilon_i$ (Panel a); $\%MAO_i = \alpha + X_i\beta + g(\text{Close}_i) + \varepsilon_i$ (Panel b). DIFF and Close are defined as in Table 2. Unweighted regression. X_i are the usual controls: % Māori descent, % Māori who speak Māori, % Regular smokers, % Female, % 65+ years old, % 15-64, Median household income, % College degree, % Home owners, % Full time employed, % Unemployed, % Work as manager.

Figure 6: Election results and predicted registration rates. OLS with squared regressors.

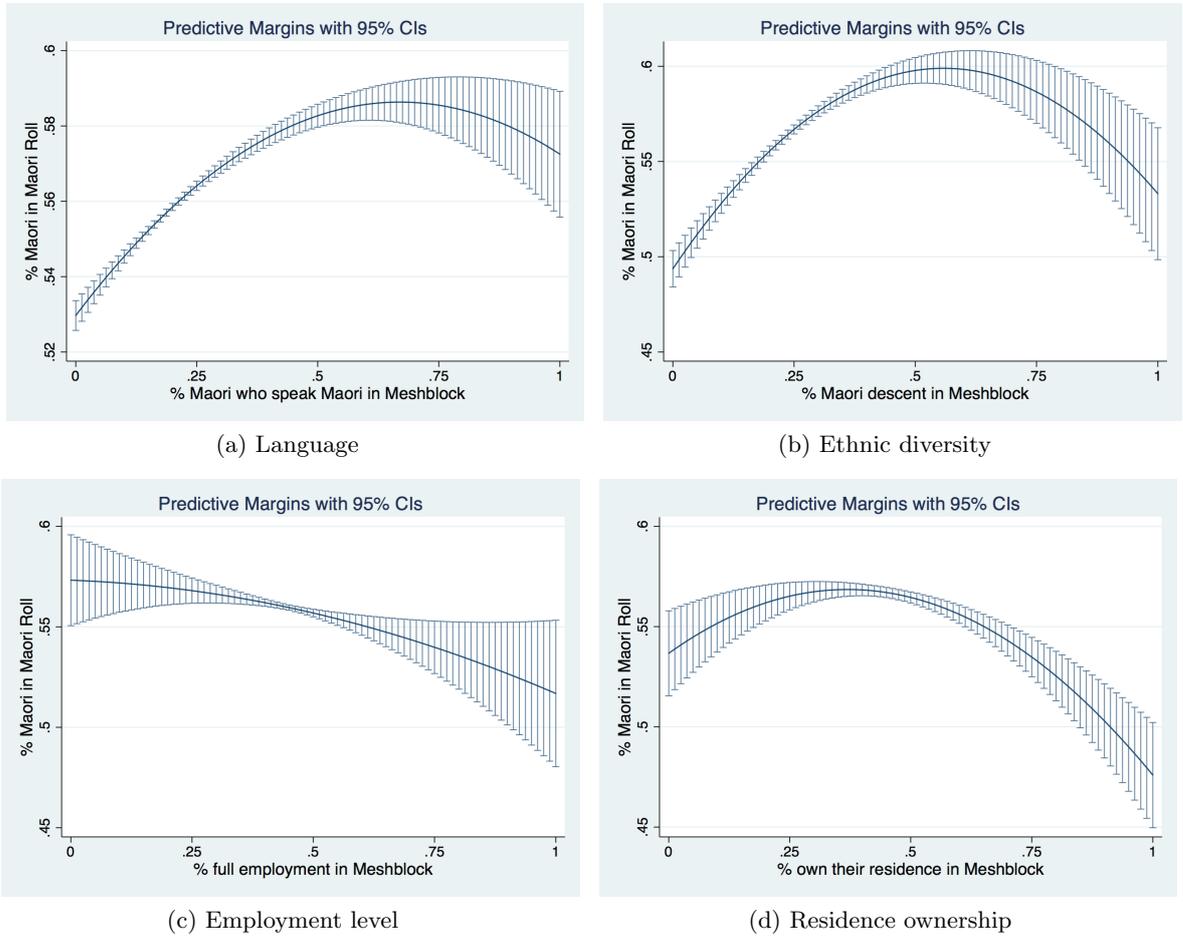


(a) Difference in closeness ('DIFF')

(b) Closeness General Roll electorate ('Close')

95% confidence intervals for the predicted values resulting from the following specification — (6): $\%MAO_i = \alpha + X_i\beta + \text{DIFF}_i\gamma_1 + \text{DIFF}_i^2\gamma_2 + \varepsilon_i$ (Panel a); $\%MAO_i = \alpha + X_i\beta + \text{Close}_i\gamma_1 + \text{Close}_i^2\gamma_2 + \varepsilon_i$ (Panel b). All control variables are held at their means. DIFF and Close are defined as in Table 2. Weights are based on total Māori population in the meshblock. Fixed effects are included. Standard errors clustered at the electorate level. X_i are the usual controls: % Māori descent, % Māori who speak Māori, % Regular smokers, % Female, % 65+ years old, % 15-64, Median household income, % College degree, % Home owners, % Full time employed, % Unemployed, % Work as manager.

Figure 7: Sociodemographic correlates of registration in Māori Roll



95% confidence intervals for the predicted values resulting from the following specification — a slightly modified version of expression (5): $\%MAO_i = \alpha + X_i\beta + W_i\delta_1 + W_i^2\delta_2 + DIFF_i\gamma + \varepsilon_i$. W_i : % Māori who speak Māori (Panel a); % Māori descent (Panel b); % Full time employed (Panel c); and % Home owners (Panel d). Weights are based on total Māori population in the meshblock. Fixed effects are included. Standard errors clustered at the electorate level. X_i are the usual controls: % Māori descent, % Māori who speak Māori, % Regular smokers, % Female, % 65+ years old, % 15-64, Median household income, % College degree, % Home owners, % Full time employed, % Unemployed, % Work as manager, DIFF. DIFF is defined as in Table 2.

9 Tables

Table 1: General election results right before the Māori Electoral Options in the data (2006 and 2013)

	% Party vote	Electorate seats		List seats	Total
		General Roll	Māori Roll		
2005 General election					
Labour	41.1%	28	3	19	50
National	39.1%	31	0	17	48
New Zealand First	5.72%	0	0	7	7
Green	5.30%	0	0	6	6
Māori	2.12%	0	4	0	4
United Future	2.67%	1	0	2	3
ACT	1.51%	1	0	2	2
Progressive	1.16%	1	0	1	1
Total	98.68%	62	7	52	121
2008 General election					
Labour	33.99%	19	2	22	43
National	44.93%	41	0	17	58
New Zealand First	4.07%	0	0	0	0
Green	6.72%	0	0	9	9
Māori	2.39%	0	5	0	5
United Future	0.87%	1	0	0	1
ACT	3.65%	1	0	4	5
Progressive	0.91%	1	0	0	1
Total	97.53%	63	7	52	122
2011 General election					
Labour	27.48%	19	3	12	34
National	47.31%	42	0	17	59
New Zealand First	6.59%	0	0	8	8
Green	11.06%	0	0	14	14
Māori	1.43%	0	3	0	3
Mana [Māori party]	1.08%	0	1	0	1
United Future	0.6%	1	0	0	1
ACT	1.07%	1	0	0	1
Conservative	2.65%	0	0	0	0
Aotearoa Legalise Cannabis	0.52%	0	0	0	0
Total	99.79%	63	7	51	121

Source: New Zealand Electoral Commission, <http://www.electionresults.govt.nz/>

Table 2: Summary Statistics by meshblock (unweighted).

	Average	St. dev.	Min	Max	Median
Panel A: 2006					
# Māori residents	11.96	12.88	0	188	8
% Māori descent	16.70	13.74	1	100	12.5
% Māori registered in Māori Roll	57.13	21.75	0	100	50
% Māori who speak Māori	20.62	23.33	0	100	16.66
% Female	51.05	4.92	6.66	85.07	51.07
% 65+ years old	11.86	9.05	0	97.75	10
% 15-64 years old	66.64	9.17	2.25	100	66.66
% College degree	10.62	8.18	0	66.66	9.09
Median household income	52.18	19.26	0	100	50.8
% Home owners	53.57	17.64	0	100	56
% Full time employed	49.87	11.10	1.11	100	50
% Unemployed	3.31	3.30	0	27.78	3.03
% Work as manager	17.77	11.48	0	100	15.79
% Regular smokers	19.78	9.93	0	66.66	18.42
Closeness General Electorate	78.43	12.80	42.36	99	77.57
DIFF Closeness	6.37	14.77	-28.49	46.53	7.29
Panel B: 2013					
# Māori residents	11.83	12.81	0	201	8
% Māori descent	16.82	13.50	3.8	100	12.82
% Māori registered in Māori Roll	54.78	21.51	0	100	57.89
% Māori who speak Māori	19.13	22.40	0	100	15.38
% Female	50.24	10.39	1.27	100	50
% 65+ years old	14.06	9.66	0	98.04	12.12
% 15-64 years old	65.51	9.27	1.96	100	65.38
% College degree	12.92	8.49	0	58.33	11.43
Median household income	63.84	25.40	0	150	61.7
% Home owners	50.40	17.56	0	100	52.63
% Full time employed	46.57	1.18	1.02	96.87	47.06
% Unemployed	4.58	3.96	0	32.14	4.16
% Work as manager	18.36	12.41	0	100	16.66
% Regular smokers	14.65	8.59	0	70	13.33
Closeness General Electorate	73.31	16.74	36.70	99.97	75.96
DIFF Closeness	11.91	20.91	-33.87	57.99	10.96
Total observations	63,279				

Census data from 2006 and 2013 — available at <http://www.stats.govt.nz/>. Statistics for ‘% Māori registered in Māori Roll’ and ‘Median household income’ are weighted. ‘Median household income’ is in thousands of New Zealand dollars. ‘% Full time employed’ is given as percentage of total population. ‘Closeness General Electorate’ = $100 - (\text{Distance in \% of votes between the two most voted parties})$. These results refer to the general electorate the meshblock belonged to in the the election immediately previous to the Census (2005 and 2011). ‘DIFF Closeness’ = ‘Closeness Māori Electorate’ - ‘Closeness General Electorate’, where ‘Closeness Māori Electorate’ is defined exactly as closeness for general electorates.

Table 3: Previous electorate results and registration in the Maori Roll

	Dependent Variable: % Māori registered in Māori Roll					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Difference in closeness between Māori and General Electorates						
Closeness Māori Electorate – Closeness General Electorate	0.009 (0.008)	0.010* (0.005)	0.009 (0.007)	0.010* (0.005)	0.009 (0.009)	0.010 (0.009)
R^2	0.016	0.024	0.016	0.024	0.016	0.024
Fixed Effects	YES	YES	YES	YES	YES	YES
Weights	NO	YES	NO	YES	NO	YES
Clustered SE	NO	NO	Robust	Robust	Electorate	Electorate
Controls	YES	YES	YES	YES	YES	YES
Observations	58,295	58,295	58,295	58,295	58,295	58,295
Panel B: Closeness General Electorate						
Closeness General Electorate	-0.027*** (0.010)	-0.031*** (0.007)	-0.027*** (0.010)	-0.031*** (0.007)	-0.027** (0.012)	-0.031*** (0.012)
R^2	0.016	0.025	0.016	0.025	0.016	0.025
Fixed Effects	YES	YES	YES	YES	YES	YES
Weights	NO	YES	NO	YES	NO	YES
Clustered SE	NO	NO	Robust	Robust	Electorate	Electorate
Controls	YES	YES	YES	YES	YES	YES
Observations	58,295	58,295	58,295	58,295	58,295	58,295

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Unit of analysis: meshblock. Fixed effects: meshblock and year. Dependent variable: % of Maori residents in the meshblock who were registered in the Maori roll. Controls: % Māori descent, % Māori who speak Māori, % Regular smokers, % Female, % 65+ years old, % 15-64, Median household income, % College degree, % Home owners, % Full time employed, % Unemployed, % Work as manager. Weights are based on total Māori population in the mesblock.

Table 4: Sociodemographic characteristics and registration in the Māori Roll

	Dependent Variable: % Māori registered in Māori Roll					
	(1)	(2)	(3)	(4)	(5)	(6)
Median income	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
% College degree	-0.020 (0.029)	-0.001 (0.023)	-0.020 (0.032)	-0.001 (0.023)	-0.020 (0.028)	-0.001 (0.021)
% Home owners	-0.033* (0.020)	-0.054*** (0.015)	-0.033 (0.022)	-0.054*** (0.015)	-0.033 (0.022)	-0.054*** (0.015)
% Full employment	-0.060*** (0.022)	-0.052*** (0.016)	-0.060** (0.024)	-0.052*** (0.016)	-0.060*** (0.022)	-0.052*** (0.016)
% Unemployed	0.050 (0.042)	0.032 (0.028)	0.050 (0.041)	0.032 (0.026)	0.050 (0.044)	0.032 (0.028)
% Managers	-0.105** (0.044)	0.007 (0.034)	-0.105** (0.050)	0.007 (0.031)	-0.105** (0.044)	0.007 (0.033)
% Māori	0.221*** (0.023)	0.138*** (0.015)	0.221*** (0.021)	0.138*** (0.014)	0.221*** (0.020)	0.138*** (0.014)
% Māori speak Maori	0.076*** (0.006)	0.082*** (0.006)	0.076*** (0.008)	0.082*** (0.006)	0.076*** (0.008)	0.082*** (0.006)
% Smokers	0.056** (0.023)	0.021 (0.016)	0.056** (0.024)	0.021 (0.016)	0.056** (0.025)	0.021 (0.014)
Year = 2013	-0.018*** (0.003)	-0.021*** (0.002)	-0.018*** (0.003)	-0.021*** (0.002)	-0.018*** (0.003)	-0.021*** (0.003)
R^2	0.016	0.024	0.016	0.024	0.016	0.024
Fixed Effects	YES	YES	YES	YES	YES	YES
Other controls	YES	YES	YES	YES	YES	YES
Weights	NO	YES	NO	YES	NO	YES
Clustered SE	NO	NO	Robust	Robust	Electorate	Electorate
Observations	58,295	58,295	58,295	58,295	58,295	58,295

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Results for sociodemographic variables (these are the same regressions as in Panel A of Table 3). Controls not shown: % Female, % 65+ y.o., % 15 - 64 y.o., DIFF (Closeness Māori Electorate – Closeness General Electorate). Unit of analysis: meshblock. Fixed effects: meshblock and year. Dependent variable: % of Māori residents in the meshblock who were registered in the Māori roll. Weights are based on total Māori population in the mesblock.