Why do so many MPs lose their seats in PNG?

Colin Filer, Terence Wood and Henry Ivarature

Abstract

Multiple regressions are used to assess the relative significance of a number of political and social variables that might be associated with the likelihood of sitting MPs retaining or losing their seats in the 85 partially rural open electorates of Papua New Guinea (PNG). The tests reveal that the most significant of the variables for which we have reasonably accurate measures is the amount of ministerial power accrued by sitting members, either over the previous term of parliament or at the time when they stand for re-election. MPs who have spent more of the past parliamentary term in more powerful ministerial roles are less likely to lose their seats in the next election. Also significant, though less so, is a second political variable. This is the level of political competition in each electorate, as measured by the average number of candidates challenging the incumbents. Incumbents are more likely to lose their seats in electorates where more candidates have typically stood for election. Relationships between the rate of MP turnover and the social variables selected for inclusion in this analysis appear to be quite weak or entirely non-existent, but the evidence does indicate that the rate of turnover has little if anything to do with the level of 'development' in each electorate, and is certainly no higher in electorates with higher levels of linguistic diversity than it is in electorates with greater linguistic uniformity.

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1   Introduction

In the national election of 1977, which was the first to be held after PNG became an independent country, 60 per cent of the incumbent MPs who stood for re-election to the national parliament were defeated. This high rate of turnover may have been partly due to the changes made to electoral boundaries since the previous national election of 1972. Electoral boundaries have barely changed since 1977. The 89 open electorates that exist today have exactly the same boundaries that they had in 1977. The 20 provincial electorates that existed in 1977 retained their boundaries until 2012, when two of them were divided in two. Static electoral boundaries have therefore been one of the stable and enduring features of PNG's political system. Another persistent feature has been the rate at which the MPs representing these electorates have lost their seats when standing for re-election. On average, roughly half of them have suffered this fate in each of the eight national elections held at five-year intervals between 1982 and 2017. In 1982 the proportion was 48 per cent; in 2017 it was 51 per cent (Wood & Laveil 2019: 19).

This is not necessarily a bad thing, however much it might annoy the losing incumbents. Ancient Athenians might well take it as evidence that PNG is a virtuous democratic state. Some contemporary observers have indeed taken it as evidence that PNG is one of the most democratic countries in the world, and certainly in the world of 'developing countries', since it appears to show that power has not been, or cannot be, concentrated in the hands of a narrow political elite (Lipset 1989; Reilly 2001). However, many observers also regard it as a problem that demands some sort of explanation, not least because it seems to be associated with the failure of this democratic state to deliver public goods and services to the citizens who keep rejecting and replacing their elected representatives (Kurer 2007; May 2003; Standish 2007). In 2020, Transparency International ranked PNG at 142 out of the 180 countries listed in the Corruption Perceptions Index, and PNG fell within the lowest quintile of countries ranked in the World Bank's indicators of 'government effectiveness' and 'control of corruption' (Filer et al. 2021: 4).

This paper begins with a review of the arguments that have been used to explain election outcomes in PNG and the ways in which sitting members of the national parliament have tried to secure better outcomes for themselves. We then approach the general question of why so many MPs lose their seats by means of a more specific question, which is why some electorates have much higher rates of MP turnover than other electorates. We approach this more specific question by asking whether there are variables for which we have reasonably accurate and consistent measures that are more or less clearly associated with the variable rates of turnover in different electorates. From analysis based on multiple regressions, we find that much of this variation appears to be associated with variation in one of the personal attributes of MPs, namely their capacity to accumulate political power through their occupation of senior ministerial roles in government. But we also find some evidence that variable rates of turnover are associated with features of the electorates that MPs represent, such as the number of candidates standing in the average election or the range of altitudes at which most of the voters are living.

2   Explanations and remedies

Most observers would agree that PNG's electoral landscape has two other constant features, aside from the permanence of its boundaries and the overall rate at which MPs lose their seats. These are 'the relative unimportance of political parties in the electoral process and the essentially local character of electoral politics' (Saffu 1996: 41). But constants of this nature, which hardly vary between one election and another, or one electorate and another, cannot explain the specific outcomes of each election in each electorate. In other words, they cannot explain the difference between the roughly equal number of cases in which incumbents either lose or keep their seats, nor the reasons why patterns of electoral competition have varied so much between different electorates. The same issue arises if we seek to explain the overall rate of turnover by reference to some feature of Melanesian culture that determines the perceptions, expectations or behaviour of the voters who make these choices (Wood 2016).

What we know about the reasons behind the outcomes of successive elections in specific electorates is mainly derived from the case studies contained in books dealing with six of the seven national elections held between 1977 and 2007. The elections held in 2002, 2012 and 2017 have not received the same detailed level of coverage, so more attention has recently been paid to the comparison of trends observed in the four different regions into which PNG is conventionally divided — the Southern, Highlands, Momase and Islands regions (see Figure 1).

Figure 1: Regions and provinces of Papua New Guinea

Source: Wood 2017: 6.

The authors of the case studies have generally preferred one of two different approaches to the problem of explaining election outcomes, although the two have sometimes been combined. The first approach weighs up the personal qualities or attributes of the candidates contesting a specific election. These include the sorts of things that get recorded in a national census — age, gender, education, occupation, and so forth. They also include things such as the time that candidates have lived in the electorate, their

membership of particular local communities, or their affiliation with particular organisations, including political parties. A nationwide sample survey was undertaken in advance of the 1987 election to discover the values that voters assign to such characteristics (Saffu 1989). The results showed that many personal qualities were thought to be more important than party membership, or membership of any other type of organisation, but the small size of the sample meant that it was not possible to establish any clear pattern of variation in such opinions between different parts of the country. Surveys of this kind have not been repeated in the context of subsequent elections, nor has it been possible to assemble a nationwide database that reveals the personal attributes of the individuals who have contested each of the seats in any election. This means that evidence for the relative significance of different personal qualities in the determination of election outcomes is almost entirely based on qualitative studies of specific elections in specific electorates, so cannot provide a systematic explanation of the variation in outcomes.

The second approach to the problem of explaining election outcomes considers the strategies adopted by those candidates who are seriously intent on collecting as many votes as possible from their electorates and therefore winning the seat for which they stand. Three strategies had been fairly clearly identified by the time of the 1992 election. These are:

- the parochial strategy, in which success depends on the capacity to maximise the number of votes collected in the one part of the electorate where the candidate's own community is located;
- the material strategy, in which success depends on the capacity to persuade voters that they are either better off or will be better off as a result of the candidate's distribution of money, goods and services; and
- the moral strategy, in which success depends on the candidate's capacity to demonstrate the possession of specific qualities of leadership, authority or virtue that command respect across the whole of the electorate (Filer 1996).

At that juncture, Bill Standish was already pointing to the emergence of a fourth strategy, which he called 'gunpoint democracy', in parts of the Highlands Region (Standish 1996). This might better be called the criminal strategy, as it has since come to embrace a wide range of illegal activities that constitute 'electoral malfeasance', whether or not they involve the use or the threat of violence against other candidates and their supporters (Wood & Laveil 2019).

These four strategies are not mutually exclusive, nor are they unrelated to the personal qualities of the candidates who adopt them. However, there seems to be widespread agreement that they have not been equally prevalent in all four regions of the country since they were first identified in the 1992 election. The Highlands Region has been consistently portrayed as a region in which some combination of parochialism and materialism have dominated the thinking and behaviour of candidates and voters, even when illegal activities have not interfered with election outcomes (Brown 1989; Burton 1989; Dorney 2002; Gibbs 2013; Ketan 1996, 2004; Orlegge 2002; Standish 1989). While Standish (1996) identified Chimbu Province as the source of the criminal strategy, it seems to have found another home in Southern Highlands Province in the 1997 election (Haley 2002), and then spread more widely through the Highlands Region in the rather chaotic election of 2002 (Chin 2003; Gelu 2003; Gibbs et al. 2004; May 2003). In what is now Hela Province, the adoption of this strategy might be regarded as a manifestation of the 'resource curse' associated with the development of oil and gas resources (Haley & May 2007). On the other hand, this does not suffice as an explanation for the spread of criminal strategies in what Matbob (2013) has described as the 'Highlandization' of lowland electoral politics. Observers of the 2017 election have reported a continuation of this process — or at least the spread of a belief that moral campaign strategies are no longer likely to succeed in a number of lowland electorates (Haley & Zubrinich 2018; Transparency International Papua New Guinea [TIPNG] 2017).

Since 1992, PNG's members of parliament have supported the adoption of two measures that should ideally have discouraged candidates from adopting criminal campaign strategies, and might in some ways have reduced the risk that incumbents would lose their seats at the next election. The first measure was the one most clearly designed to

achieve the second of these objectives, and has therefore received the most solid and enduring level of support from sitting members. This was the introduction and subsequent enlargement of what are commonly called 'slush funds', but more politely known in academic circles as 'politician-allocated expenditures' (Fraenkel 2011). These have gone by different official names, with some fluctuation in the amounts being allocated, and a succession of institutional arrangements for their disbursement (Duncan et al. 2017; Ketan 2007; Reilly et al. 2015). But the basic idea is simple enough. If MPs have more control over the distribution of public spending in their electorates, incumbency should give them an advantage in any contest fought with material strategies, and might conceivably reduce the attraction of criminal strategies — at least for incumbents, if not for their challengers.

The second measure was the adoption of a limited preferential voting system that came into effect in the 2007 election, replacing the 'first-past-the-post' system that had been used in previous elections. Instead of voting for a single candidate, voters were now required to indicate their first, second and third preferences on the ballot paper. If no candidate has an absolute majority when the first-preference votes are counted, then candidates with the lowest numbers of first-preference votes are progressively eliminated, and the second or third preferences of their supporters are redistributed until one candidate does gain an absolute majority. This measure was primarily intended to enhance the legitimacy of the outcome by ensuring that the winner would have support from a reasonably large proportion of the electorate, even if a seat was being contested by a large number of candidates, and even if the preferences of some voters were exhausted or discounted before the final count. But it was also intended to encourage collaboration between competing candidates, through the exchange of preferences, and hence to discourage the adoption of purely parochial strategies, as well as the incidence of violence and intimidation witnessed at previous elections (May et al. 2013; Reilly 2006; Standish 2006).

Supporters of the first measure might claim that its value was illustrated by the outcome of the 2002 election, when 74 per cent of incumbent MPs lost their seats (Wood & Laveil 2019). This election was conducted after substantial cuts had been made to MPs' slush

funds by the government of Mekere Morauta. This was also an election in which the incidence of violence and intimidation reached a new peak in several Highland electorates (May 2003; Gibbs et al. 2004). However, it is not possible to establish a clear causal connection between these three variables or to ignore a number of other factors that may have affected the high level of turnover (May & Anere 2013; Laveil 2021). It is likewise difficult to tell whether the restoration of a 'normal' level of MP turnover in subsequent elections had more to do with the restoration and expansion of 'politician-allocated expenditures' than it had to do with the introduction of limited preferential voting (May et al. 2013; Wood 2017). To judge by reports of what transpired at the 2017 election, neither of the two measures appears to have had any long-term deterrent effect on the adoption of criminal campaign strategies (Haley & Zubrinich 2018; TIPNG 2017; Wood & Laveil 2019).

There are no electorates for which we have detailed case studies that would enable us to assess the reasons why incumbents either retained or lost their seats in each successive national election since 1982. Nor is there a body of statistical evidence that would enable us to assess the relative significance of most of the personal attributes of candidates, let alone their vote-winning strategies, in making a difference to these outcomes. In order to assess the possible significance of such factors, we must therefore begin with a consideration of those variables for which we do have reasonably accurate measures and make some assessment of the ways in which these variables are related to the rate of incumbent turnover. If this assessment finds no clear relationships, we can conclude that variable levels of turnover are either a product of chance or are due to factors that have not been measured or cannot be measured.

3   Framing a fresh statistical analysis

The tests to be applied in this paper exclude consideration of the 20 or 22 provincial electorates, as well as the four open electorates (in Port Moresby and Lae) that are entirely urban. We focus attention on the 85 partially rural open electorates (or districts) because recent studies of the constituents of human well-being in these 85 districts have established a range of variables that merit consideration as features of electorates that

might affect election outcomes (Filer & Wood 2021; Filer et al. 2021). But before we embark on a consideration of such factors, we must first explain the manner in which we have arrived at a single measure of our dependent variable.

3.1   Measuring turnover

A total of 680 elections took place in the 85 partially rural open electorates at the standard five-year intervals between 1982 and 2017. These events are recorded in the PNG Election Results Database (Wood 2017). The results of by-elections are not recorded in this database, so cannot be included in measures of turnover based on this source. We are only able to identify the number of cases in which a seat has been occupied by more than one MP in any particular term of parliament.

Measuring the rate of MP turnover might seem like a simple matter of counting the proportion of cases in which the incumbent either won or lost one of these 680 elections. However, the matter is not quite so simple since there are 72 cases (more than 10 per cent of the total) in which the outcome was not so clear and which must therefore be excluded from our analysis. Most of these are cases in which we know that incumbents did not stand for re-election, so we cannot know whether or not they would have won or lost if they had done so. The remaining cases fall into three categories:

- a few cases (mostly from the 2007 election) in which we do not know if the incumbent stood for re-election when a new MP was elected because the database does not include a list of the candidates who contested the seat at that election;
- a somewhat larger number of cases in which the initial result was invalidated by a subsequent decision (normally a court ruling) that enabled a losing incumbent to regain the seat or meant that a winning incumbent lost it after all; and
- a total of five cases (all in Southern Highlands Province in 2002) in which the election was deemed to have failed because of civil disorder and no result was declared until a subsequent by-election was held.

If a winning incumbent subsequently resigned or was dismissed from parliament for some kind of misbehaviour, we have still counted this as a clear victory at the previous election.

Figure 2 shows the proportions of the three outcomes that eventuated from each of the eight elections. Here we can see that the proportion of unclear outcomes from the 2002 election was not unusually high, despite the problems that arose in Southern Highlands Province. It was twice as high in the subsequent 2007 election because the Electoral Commission had trouble with the management of a new website that was meant to record the progressive counting of votes under the new preferential voting regime, and subsequent efforts to retrieve a full set of results were unsuccessful (May et al. 2013). However, we still have clear outcomes from 69 of the 85 elections held in that year, which is sufficient to sustain the integrity of our statistical analysis.

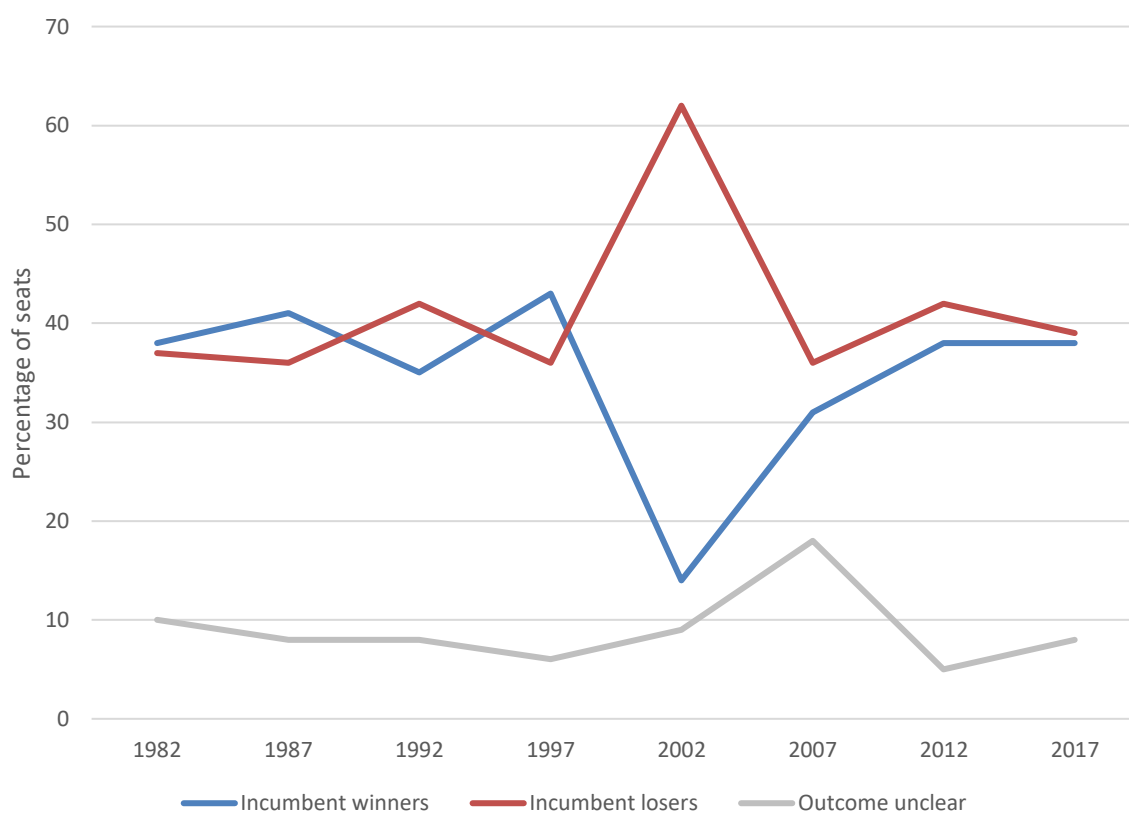**Figure 2: Outcomes of eight elections in 85 partially rural open electorates**

Figure 2 reflects the point previously made about the unusually high rate of turnover in the 2002 election, even when the troublesome elections in Southern Highlands Province are not included in the equation. In these 85 electorates, 73 per cent of incumbents are known to have stood for election and clearly lost their seats in 2002, while the proportion who did so in the other seven elections varied between 42 and 50 per cent. The average across all eight elections was 48.5 per cent — 330 cases out of a total of 680. In order to make sure that our findings are not being distorted by the anomalous results of the 2002 election, we have included election-year fixed effects in one of our regression models as a robustness test.

Figure 3 shows another way of calculating the rate of MP turnover. The 456 MPs who have represented these 85 electorates at some time between 1977 and 2017 are classified by the length of time that they have spent in parliament. Almost half of them have served exactly one term. About 30 per cent have served more than one term, but not more than two, while 11 per cent have served more than two terms but not more than three. The number of MPs who have served less than one term is more than three times greater than the number who have served more than three terms.

Figure 3: Parliamentary terms served by 456 open seat members, 1977–2017
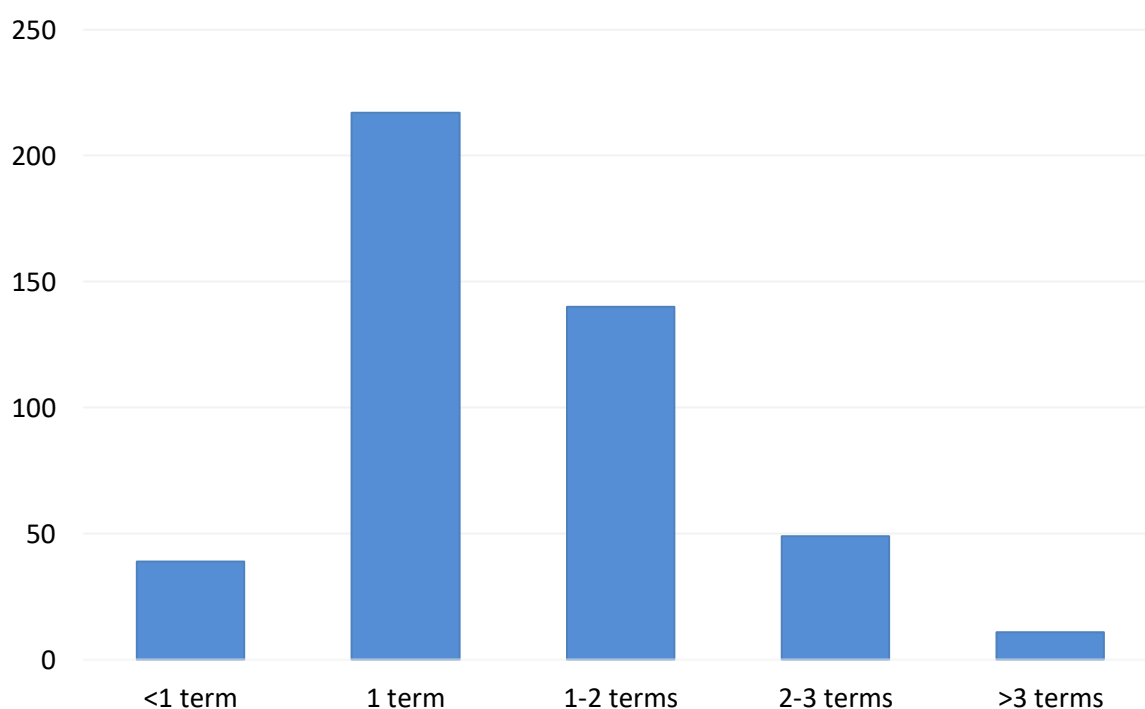
These calculations include a substantial number of cases in which MPs for various reasons have failed to complete an entire term of parliament, including those cases in which they entered parliament on the basis of an election victory that was later invalidated. There are six cases in which MPs lost their seats, for one reason or another, during one term of parliament but won them back at a subsequent election, and another 16 cases in which MPs clearly lost their seats at one election and then regained them at a later one. Comebacks of this sort are not recognised in estimates of turnover based only on the outcomes of each separate election, as shown in Figure 2. Nor does either method of estimation take account of those cases in which an MP representing an open electorate has later been elected to represent a provincial electorate, or vice versa. On the other hand, the method represented in Figure 3 tends to overestimate the rate of turnover because it takes no account of cases in which MPs were already in parliament before 1977, nor the probability that roughly half the current incumbents will win back their seats at the next election.

Since our interest is in the question of why some electorates have higher rates of turnover than other electorates, we have simplified our measurement of the dependent variable by treating the 72 cases in which a regular election had an unclear outcome as missing data, and treating comebacks as if they were victories by newcomers. Each of the 608 definitive results is therefore simply coded as a win or a loss for the incumbent who contests an election. There are three electorates where only one of the eight elections has been clearly lost by an incumbent, and in all three cases, the loss occurred in 2002. Two of these electorates (Rabaul and Pomio) are in East New Britain Province, while the third (Hagen) is in Western Highlands Province. At the other end of the scale, there are nine electorates where only one of the eight elections has been clearly won by an incumbent, and none of these victories occurred in 2002. Seven of these most volatile electorates are in the Highlands Region.

This might lead us to wonder whether the rate of MP turnover is significantly higher in the Highlands Region, and significantly lower in the Islands Region, than it is in the country as a whole. Figure 4 does show a regional difference along these lines. However, Figure 5 shows that incumbent survival rates vary as much, if not more, within regions

as they do between them. This means that we cannot explain very much of the variation between the 85 electorates by appeal to some notional differences between the way in which the electoral system has (or has not) worked in each of the four regions. Furthermore, as we show in subsequent regression results, controlling for differences between regions does not affect most of our other findings. These findings exist independently of regional differences.

Figure 4: Proportion of incumbents losing their seats in eight elections, by region
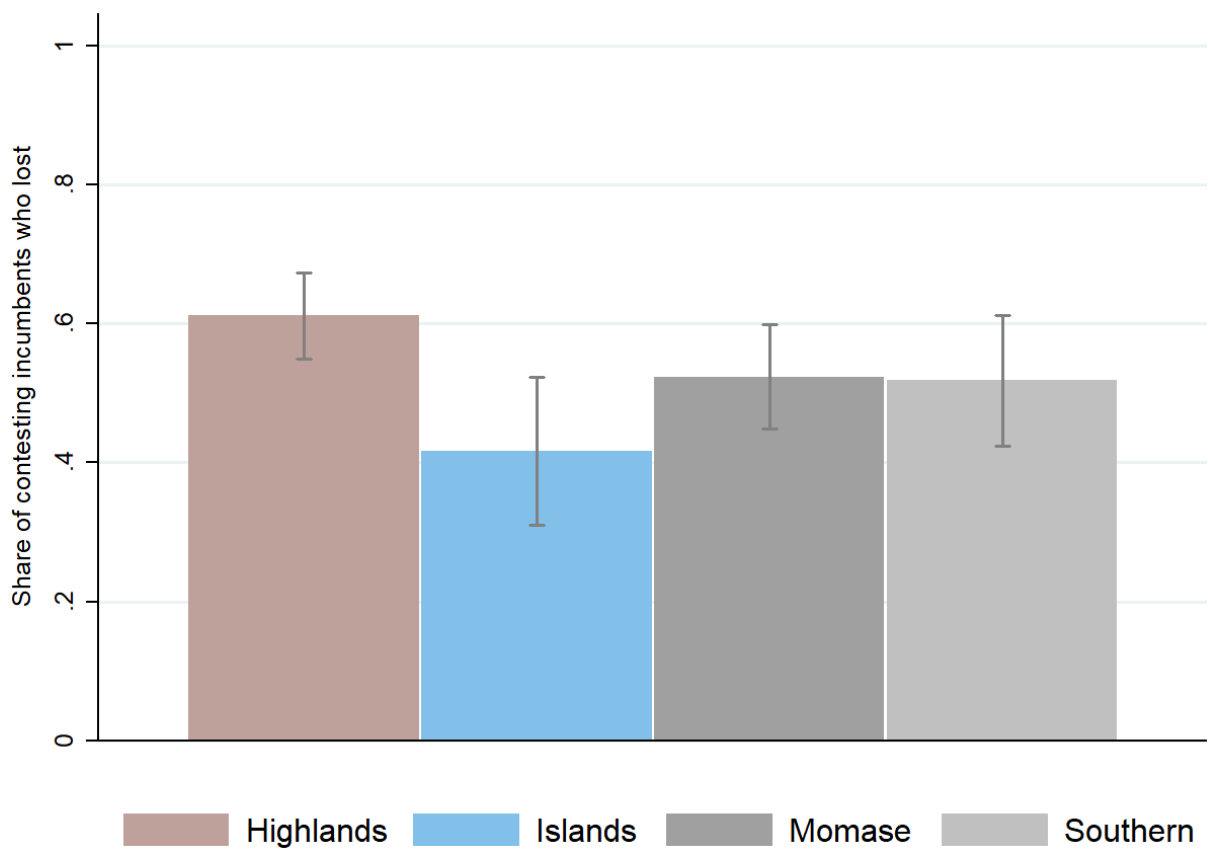
Figure 5: Proportion of incumbents losing their seats by region and district
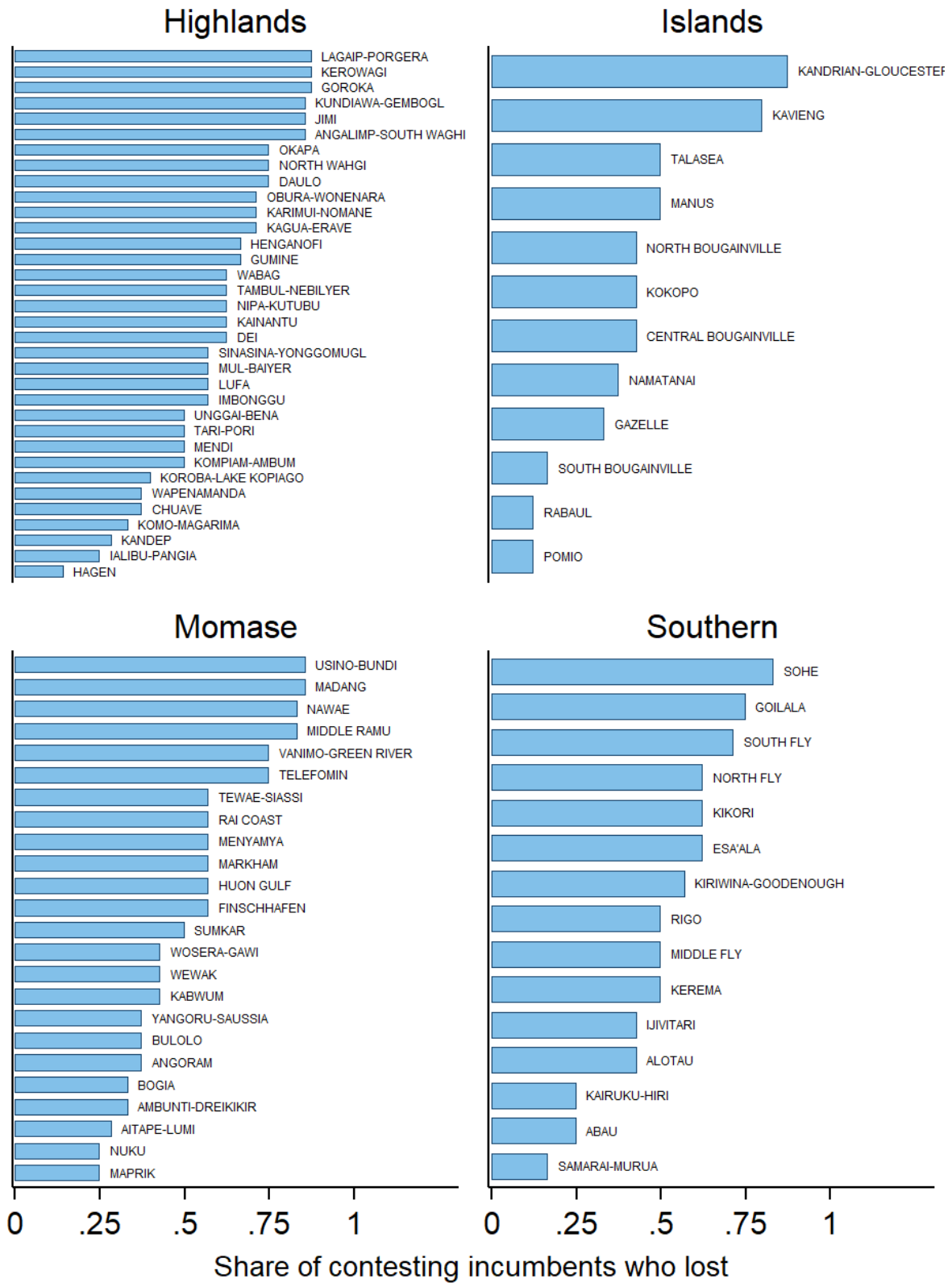
3.2   Social variables

Previous studies have assessed the degree to which 12 geographical variables and three institutional variables are associated with two measures of human well-being in the 85 partially rural districts of PNG (Filer & Wood 2021; Filer et al. 2021). We may now think of this as a collection of 17 'social' variables that are external to PNG's political system but might conceivably have some association with the rate at which incumbent MPs retain or lose their seats in different electorates. The statistical techniques used to assess this possibility are the same as those used in the previous studies. When the sample size is relatively small, there has to be some limit on the number of variables included in regression models if they are to generate meaningful results. Since the models applied to the problem addressed in the current paper have been designed to include a mixture of social and political variables, or variables that are external and internal to the political system, we have selected just four of the 17 social variables for inclusion in the models.

The first of the four variables included here is the under-five (child) mortality rate, or, to be more precise, the average of the child mortality rates estimated for each district over the five-year period from 1995 to 1999 on the basis of data collected in the 2000 national census (Tran et al. 2011). This is one of our two measures of human well-being (the other being the gross school attendance rate), and appears to be the best available proxy for 'development' (or the lack of it) at the district level, given that no reliable census data have been collected since the turn of the millennium. One reason to anticipate a correlation between the child mortality rate and the rate of MP turnover would be the supposition that voters in electorates with a higher mortality rate would be more dissatisfied with their current circumstances and more likely to blame their current MP for failing to improve their lives. Another would be the presumption that electorates with lower human development indicators may be home to more intense political competition as people vie for the spoils of political office and the material benefits that supposedly accrue to MPs and their supporters.

We have included two of the 12 geographical variables for which we have reasonably accurate measures at a district level on the basis of a preliminary assessment of the degree to which these variables are actually correlated with variation in the rate of MP turnover. Like the child mortality rate, both variables are measured on the basis of data collected in the 2000 national census. The two variables are:

- the gross population density, calculated as the average number of resident citizens per square kilometre of a district's total surface area in 2000; and
- the range of altitudes (at intervals of 100m) occupied by more than 90 per cent of the rural citizen population in 2000.

We might expect the first of these variables to facilitate communication between the candidates and voters participating in an election, while we might expect the second to have the opposite effect.

Finally, we have included one institutional variable that was shown to have a significant relationship to child mortality rates in a previous study (Filer et al. 2021). This is the extent of 'ethno-linguistic fragmentation' in each district, as measured by the number of vernacular languages and language families, and the numbers of people who spoke different languages, around the time of PNG's Independence in 1975.[1] This variable has been included in the present study because of suggestions in the international literature that the extent of linguistic (or ethnolinguistic) diversity may have some independent effect on political behaviour and election outcomes (Reilly 2006; Singer 2012).

3.3 Political variables

We have selected three independent political variables for inclusion in our regression models, but one of these political variables is measured in two different ways. The first political variable is the level of absolute turnout, as measured by the total number of valid votes cast in each of the 608 cases where an incumbent clearly won or lost their seat. The

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[1] This is actually the mean of three different measures of linguistic fragmentation at different levels of linguistic differentiation, as explained in the previous study (Filer et al. 2021: 6–11).

second variable is the overall level of political competition in each electorate, as measured by the average number of candidates known to have stood in each election, aside from the election under consideration. The third variable is the ministerial experience of the incumbent standing for re-election.

3.3.1 Turnout and competition

The number of votes cast and counted in each election needs to be distinguished from two other variables to which it ought to be related, namely the number of names on the electoral roll and estimates of the size of the voting-age population based on the national census. Previous studies suggest that the relationship between these three variables tends to vary between the four regions of the country. The vote count has commonly exceeded the estimated size of the voting-age population across the Highlands Region in all elections held since 1997, or even 1992 (Wood 2017; Wood & Laveil 2019). In some parts of Southern Highlands Province, population figures seem to have been artificially inflated in the 2000 national census, which would mean that the discrepancy between the vote count and the actual size of the voting-age population would be even greater (Allen 2007: 37). In the 2002 election, implausibly large vote counts were also recorded in a number of electorates outside the Highlands Region, which indicates the widespread incidence of electoral fraud in that election (Wood 2017). In the 2017 election, the number of names on the electoral roll exceeded estimates of the voting-age population in at least 20 per cent of electorates, and was especially prevalent in Highland electorates where the incumbents were members of the prime minister's political party (Wood & Laveil 2019). At the same time, many voters were unable to vote because their names were not on the roll. That election was also remarkable for the low level of voter turnout in the Islands Region, where the number of votes cast was only 57 per cent of the estimated voting-age population, but this does not appear to have improved the chances of incumbents retaining their seats (Wood & Laveil 2019).

Our measure of the level of political competition should likewise be distinguished from another measure that has previously been canvassed. The suggestion that incumbents were more likely to retain their seats when faced with a smaller number of challengers

was first made at the time of the 1982 election (Hegarty 1982), and statistical analysis of election results since that time confirm that this is the case (Wood & Laveil 2019). The rule seems to apply despite a steady increase in the median number of candidates standing for election in open electorates, from 10 in 1982 to almost 30 in 2012 and 2017 (Wood 2017; Wood & Laveil 2019). In this case also, there is evidence of some broad differences between the four regions, but only in the Islands Region, where candidate numbers have generally been lower, does there seem to be a correlation between these numbers and the size of the voting-age population in different electorates (Wood 2017). Within each region there is a wide variation in the number of candidates contesting different seats in different elections, but no attempt has so far been made to calculate the relative significance of the level of competition when compared with other variables that might affect the chance of incumbents winning or losing their seats.

Our measure of the level of political competition differs from the previous measure proposed by Hegarty (1982) because we have excluded the number of candidates standing in the election under consideration from the average number of candidates standing in each election held between 1982 and 2017. Our reason for this choice is that the number of candidates standing in any specific election may well reflect the perceived power of the incumbent as much as it affects the probability of the incumbent being re-elected. That is because additional challengers may contest an election when they think the incumbent is weak or vulnerable. Since our new measure is an average over time, and since the average excludes the specific election being tested, this measure should better reflect the general state of political competition or division in each electorate.

3.3.2 Ministerial experience

Information about the ministerial experience of MPs representing the 85 partially rural open electorates has been obtained from copies of the National Gazette in which ministerial appointments are officially advertised. The question addressed in this paper is whether the relative value or weight of different ministerial portfolios is related to the chances of incumbents retaining or losing their seats. Since PNG's political system does

not incorporate an official ranking of ministries, we have opted to assign the following values:
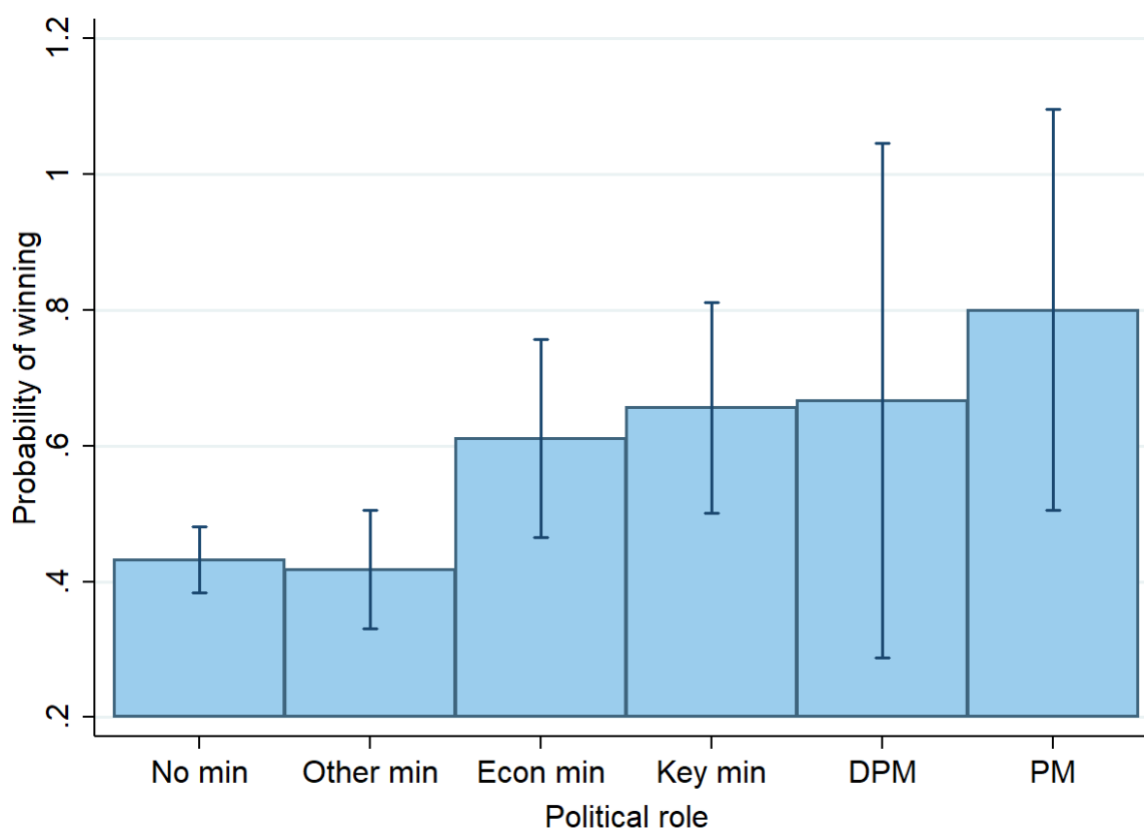
- 7 for prime ministers;
- 4 for deputy prime ministers (regardless of other portfolios that they hold);
- 3 for foreign ministers and ministers responsible for 'central agencies';
- 2 for other ministers holding key economic portfolios; and
- 1 for all other ministers.

The six 'central agencies' were officially designated with the establishment of a body known as the Central Agencies Coordinating Committee by the government of Mekere Morauta between 1999 and 2002. The relevant portfolios are Treasury, Finance, National Planning, Justice, Public Service, and Provincial Affairs. The names of the agencies and portfolios have been subject to occasional changes over the period since Independence, but they are easily identified at any given point in time. Foreign Affairs has not been officially designated as a central agency, but the portfolio is clearly one of the most senior in government.

We have identified the key economic portfolios as Lands, Mining, Petroleum, Agriculture, Forests, Fisheries, Trade and Industry, and Public Enterprise or Privatisation. These portfolios are especially attractive to MPs because of the rent-seeking opportunities that are thought to be associated with their possession. Prime ministers, deputy prime ministers, foreign ministers, central agency ministers and key economic ministers are collectively designated as senior ministers, while all other ministers are designated as junior ministers.

An initial test of the value of different portfolios to incumbents holding them at the time when they have stood for re-election shows that senior ministers had a greater chance of being re-elected than other MPs, but junior ministers were no more likely to be re-elected than government backbenchers or members of the opposition. The results shown in Figure 6 are average probabilities from a bivariate logistic regression in which election outcome is the dependent variable and ministerial role at the time of election is the independent variable (and is treated as a categorical variable).

Figure 6: Effect of ministerial portfolios on chances of incumbents retaining their seats

Abbreviations: PM = Prime Minister; DPM = Deputy Prime Minister; Key min = minister of central agency as described above; Econ min = other minister holding key economic portfolio; Other min = other (junior) minister; No min = backbencher or member of opposition.

Given the frequency with which ministerial portfolios have been redistributed during each term of parliament, it has been possible to assign a more detailed measure of ministerial experience to individual MPs by counting the number of complete months for which an individual has held a particular portfolio and multiplying this by the value assigned to that portfolio on the scale that we have adopted. By way of example, Rabbie Namaliu, MP for Kokopo, was the foreign affairs minister between 13 August 2002 and 10 August 2006, then the treasury minister between 10 August 2006 and 6 August 2007. He therefore gets a score of 47 x 3 for his spell in the first ministry and 11 x 3 for his spell in the second ministry, making a total of 174 at the time of the 2007 election.[2]

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[2] The irony of this particular example is that Sir Rabbie won a majority of first preferences at the 2007 election but turned out to have lost his seat when second and third preferences had been distributed (May et al. 2013: 199).

At the 1992 election, when he had been prime minister for 48 whole months, he had a score of 336 (48 x 7).

In adding up such cumulative scores, we have not made any distinction between the scores of MPs who were ministers at the time of any given election and those who had been ministers for some time during the previous term of parliament but were no longer ministers at the time of the election. For example, Ben Semri, MP for Middle Ramu, held a key economic ministry (fisheries) in the government of Michael Somare between August 2007 and August 2011, and we have still given him a score of 94 at the time of the 2012 election despite the fact that he ceased to be a minister when Peter O'Neill displaced Michael Somare in 2011.

4   Analysis of results

Table 1 shows the results of a number of multiple regressions in which the dependent variable is whether an incumbent MP standing for re-election loses their seat or retains it. Several points need to be borne in mind when interpreting the results.

First, the regressions are multiple regressions. This means that estimates of the relationship between any individual variable in the regression model and election outcomes take account of the effects of the other independent variables included in the model. Second, because the dependent variable is a binary variable (a win or a loss), logistic regressions are used. Third, the units of analysis in the regressions are individual elections in each of the electorates. As a result, the potential number of observations is 680 rather than 85.

A number of different models are shown separately in each of the columns in the table:

- In the first model, only the four social variables are included.
- The second model adds our cumulative measure of ministerial experience.
- The third model adds our measures of the other two political variables (absolute turnout and level of competition).
- The fourth model adds regional fixed effects as a robustness test to ensure that findings are not simply driven by the differences between the four regions.

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- The fifth and final model adds election-year fixed effects to ensure that findings are not being distorted by unusual election years such as 2002.

The number of observations in the first two models is 608, rather than 680, because 72 elections had unclear outcomes in particular electorates. The number of observations in the remaining models is 586 because this is the number of elections that not only had decisive outcomes, but for which we also have reliable measures of the number of candidates standing and the number of valid votes cast.

Table 1: Regression results

| | (1) | (2) | (3) | (4) | (5) |
	Social	Ministers	Political	Region FE	Region & Year FE
Child mortality rate	-0.00	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Range of altitudes	0.05***	0.05***	0.02	0.01	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Gross population density	-0.14	-0.13	-0.16*	-0.24*	-0.26*
	(0.11)	(0.11)	(0.09)	(0.13)	(0.14)
Ethno-linguistic diversity	-0.01*	-0.01*	-0.01	-0.01	-0.01
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Cumulative ministerial power		-0.51**	-0.43**	-0.40*	-0.42*
		(0.20)	(0.21)	(0.21)	(0.24)
Total votes counted			0.01***	0.01***	0.01
			(0.00)	(0.00)	(0.01)
Mean number of candidates			0.04***	0.05***	0.05***
			(0.01)	(0.01)	(0.01)
Constant	0.74	0.90*	-0.44	-0.10	0.00
	(0.52)	(0.52)	(0.59)	(0.74)	(0.81)
Region FE	No	No	No	Yes	Yes
Year FE	No	No	No	No	Yes
Observations	608	608	586	586	586

Robust standard errors, clustered at the electorate level, are in parentheses.
* p < 0.1, ** p < 0.05, *** p < 0.01

The first point to note is the absence of any observed relationship between child mortality rates and incumbent turnover rates. If this measure of human well-being is a good proxy for the level of development in each district or open electorate, then the rate of incumbent turnover has nothing to do with the level of development. In additional regressions not

shown here, we substituted the gross school enrolment rate for the child mortality rate as our measure of human well-being, and still found no evidence of a relationship with the rate of turnover.

The ministerial power variable is statistically significant (at least at $p<0.1$) in all of the regression models. The sign on the coefficient shows a negative relationship. MPs who have spent more of the past parliamentary term in more powerful roles are clearly less likely to lose their seats in the next election. This is true even when allowance is made for a suite of attributes associated with their electorates. This finding supports the notion that one of the personal attributes of MPs, namely their ability to accrue ministerial power, is associated with their prospects of re-election.

However, this is not the whole story. One of the other political variables, namely the overall level of political competition in the electorate, is also clearly associated with election outcomes. On average, MPs are more likely to lose their seats in electorates where average candidate numbers are higher, even when one discounts the candidate numbers in the specific election in which they are contesting. One possible explanation for this would be that electorates with higher average candidate numbers are also, on average, electorates with a wider range of social divisions or greater level of social fragmentation, and that makes it harder for MPs to get re-elected. However, there is no reason to assume that such social divisions are 'ethnic' divisions; they could stem from a range of personal rivalries, historical rifts or geographical constraints. The last of these possibilities is suggested by the appearance of a relationship between the range of populated altitudes in a district and a higher rate of MP turnover in the first two models, which then disappears when allowance is made for the level of political competition.

There is also an apparent relationship between the rate of MP turnover and the size of the turnout. Incumbents are more likely to lose their seats when more votes are cast. However, this relationship disappears when election-year fixed effects are included in the final model. Further investigation suggests the relationship is largely driven by the anomalous election of 2002, where the very high rate of turnover was associated with an

apparent level of turnout that was also especially high because of the incidence of electoral fraud.

Once the political variables are included, in the third model, there is a weak but consistent negative relationship between gross population density and the rate of incumbent turnover. In other words, the rate of turnover tends to be lower when population density is higher. The significance of this finding is unclear.

One final finding is worth noting. Once the level of political competition is included in regression models, the rate of MP turnover is slightly lower in electorates with higher levels of linguistic diversity or fragmentation. This finding is also hard to interpret, since we might have expected the reverse. If it has not arisen by chance, then it might suggest that linguistic differences do not count as the type of social division that tends to increase the number of candidates standing for election and the chance of incumbents losing their seats.

5   Conclusion

This study is the first that we know of that makes systematic use of a range of district-level variables to explain different rates of MP turnover in different parts of PNG. Our clearest finding is the correlation between ministerial experience and re-election rates. This finding fits well with the school of thought that stresses the attributes of individual MPs as contributors to their chances of re-election. While our assessment of the relative value of different ministerial portfolios is somewhat arbitrary, it is unlikely that an alternative assessment would yield a significantly different result.

There is also a strategic dimension to this finding. It could be that possession of a senior ministerial portfolio gives MPs material or moral advantages that ease their pathway to re-election, or it could be that the strategic skills required for a successful local political career also translate well to the national political arena where MPs jostle for high-ranking ministerial roles. It could be a mix of both these factors, but one or both of them would seem to have limited the effectiveness of slush funds as a means to give all MPs a roughly equal chance of getting themselves re-elected if they adopt a material campaign strategy.

However, this is not the only story to emerge from our results. Findings associated with average candidate numbers, range of altitudes and population density suggest that electorates have their own attributes, aside from the personal attributes of candidates, that can affect the rate of MP turnover. We cannot claim to have exhausted the suite of contextual variables that might be tested, but the conventional measures of development that we tested proved to be unrelated to the rate of turnover, which suggests that this particular attribute is not especially significant.

There could also be a strategic dimension to the significance of average candidate numbers, or the level of political competition, since parochial strategies could be more attractive to MPs and their challengers when average candidate numbers are higher and electorates have deeper internal divisions, even if these divisions are unrelated to conventional measures of linguistic diversity or ethnic fragmentation. In some electorates, these divisions could also encourage the adoption of criminal strategies, at the same time as they limit the plausibility of moral strategies as a means to establish a broad level of electoral support. There is considerable scope for further research in this area.

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