DEVELOPMENT POLICY CENTRE

Discussion Paper 117
March 2026
Series ISSN 2206-303X

Puzzles and predictions: results from the 2022 election in PNG

Terence Wood and Maholopa Laveil

Abstract

In this paper we report on analysis of newly-released election results data from Papua New Guinea. The data comes from the 2022 general election and form part of a dataset that stretches back to 1972. We use the data to assess different aspects of electoral politics. Amongst other findings, we identify concerning high voter turnout, particularly in the Highlands, whilst at the same time finding that turnout was surprisingly low in some other Highlands electorates. We put the Hegarty Rule – the relationship between candidate numbers and incumbent performance – to the test, demonstrating a robust relationship between the two variables. We also test whether the Hegarty rule could have been used in advance to predict results in the 2017 and 2022 elections. In 2017, in particular, it performed well. Finally, we look at the long-run relationship between ethnolinguistic fragmentation and candidate numbers. We find a relationship, although it only explains a small share of the overall variation in candidate numbers across the country.

Puzzles and predictions: results from the 2022 election in PNG

Terence Wood and Maholopa Laveil

Terence Wood is a researcher at the Development Policy Centre.

Maholopa Laveil is a lecturer at the University of Papua New Guinea and PhD student at the Australian National University.

Wood, T & Laveil, M 2026 "Puzzles and predictions: results from the 2022 election in PNG," *Development Policy Centre Discussion Paper 117,* Crawford School of Public Policy, The Australian National University, Canberra.

We acknowledge the hard work that the Papua New Guinea Electoral Commission puts into running elections and gathering results under challenging conditions.

The authors also acknowledge the ANU-UPNG partnership for their support for this research.

For more information on the Development Policy Centre, visit
https://devpolicy.crawford.anu.edu.au

To access the data that this report is based on visit
https://pngelections.devpolicy.org

Puzzles and predictions: the 2022 election in PNG

1 Introduction

Unlike many developing countries, Papua New Guinea has remained democratic. The 2022 general election was the tenth since Independence. While the achievement is real, since the 1990s elections have been plagued by problems, ranging from violence to vote buying. Amidst other electoral issues, obtaining electoral results data has also become increasingly difficult: we were only able to obtain 2022 results data in 2024. Despite real efforts on its behalf, the Electoral Commission itself struggled to obtain results from some provinces after the 2022 elections.

Nevertheless, 2022 results data for most of the country now exist, and, after tidying and verifying 2022 data as best possible, we have added the election's data to our existing dataset covering all general elections in Papua New Guinea since 1972. These results allow for detailed analysis of electoral trends and patterns. The full dataset can be accessed online at the Development Policy Centre's PNG Elections Database website (Wood, 2025).

In this paper we continue our ongoing practice of analysing election results in Papua New Guinea with a particular focus on the 2022 General Elections. (For previous iterations of this work see: Laveil & Wood, 2019; Wangi & Wood, 2019; Wood, 2017.) Amongst other findings, in our work on the 2022 election detailed in this paper, we identify concerning high voter turnout, particularly in parts of the Highlands. At the same time we found surprisingly low turnout in other parts of the Highlands. Using a large suite of different regression models, we also found clear evidence that the relationship between candidate numbers and incumbent performance in elections – first identified by David Hegarty in 1982 – continues to exist. Furthermore, we found that, up to a point, the Hegarty rule could have been used in advance to predict results in the 2017 and 2022 elections. In 2017, in particular, it performed well. Finally, we found a long-run relationship between ethnolinguistic fragmentation and candidate numbers across PNG, although it only explains a small share of the overall variation in candidate numbers across the country.

From here, this paper proceeds as follows. We provide a brief primer on elections in PNG, including basics such as the electoral system and logistical matters. Then we plot key trends including voter and candidate numbers, before discussing problems with voter turnout. After that, we cover incumbent re-election rates and the Hegarty Rule. Then we look at two electoral oddities present in PNG: the success of the PANGU party; and election outcomes in the

Highlands. Finally, we report on the results of our tests linking ethnolinguistic fragmentation and candidate numbers.

2 Elections in Papua New Guinea

Then a territory of a Australia, PNG held its first mass suffrage general election in 1964 (Hughes et al., 1965). It subsequently held elections in 1968 and 1972 prior to becoming an independent country in 1975 (Hegarty, 1983). These early elections were held using a preferential voting system. In its first post-independence election, held in 1977, PNG exchanged preferential voting for a single member district plurality electoral system similar to that used in the United Kingdom (Reilly, 2002). However, after the 2002 general election PNG returned to preferential voting albeit of a slightly different form to that used prior to independence. This system, which is still in use, is a Limited Preferential Voting system in which voters rank their three most preferred candidates (for a description of the system and debates about it see, Wood et al., 2021). In addition to changing electoral systems, PNG also undertook major redistricting prior to the 1977 elections, creating nine additional seats. PNG has only redistricted twice since: prior to the 2012 elections two seats were added; and prior to the 2022 elections the country went from having 111 to 118 seats.[1]

Two types of MPs are elected in PNG's elections: governors are elected to represent provinces, and oversee provincial governments; and MPs from so called Open Seats are elected to represent their districts and oversee District Development Authorities. (Districts are subsets of provinces). PNG's parliament is unicameral, meaning that both provincial governors and Open Seat MPs sit in the same chamber and have equal voting rights.[2]

Voters vote at polling stations throughout the country, although the process varies somewhat. In the Highlands and some urban areas polling takes place on a single day (in theory at least). In much of the rest of the country, polling takes place over a number of days with teams of polling officials travelling between polling stations. The logistics of polling have become more challenging over time. Figure 1 shows the number of polling stations in elections for which

[1] By redistricting we mean the formal addition of new seats. There have also been smaller, ad hoc, instances of redistricting that were not approved by the Electoral Boundaries Commission. For instance, Gama LLG was transferred from Middle Ramu to Usino-Bundi district, sometime between 1992-2002. This, we have been advised appears to be illegal (Oppermann & Haley, 2025). But in practice changes of this nature have occurred.

[2] Provincial governors' roles in parliament do differ slightly from MPs representing Open Seats in that governors have to resign from their gubernatorial role if they wish to take on a ministerial position in government (they can still stay in parliament even if they have ceased to be a governor).

polling data exist.[3] In 2022 there were nearly five times as many polling stations as there were in the last pre-independence election.

Figure 1 – Polling station numbers in general elections in PNG

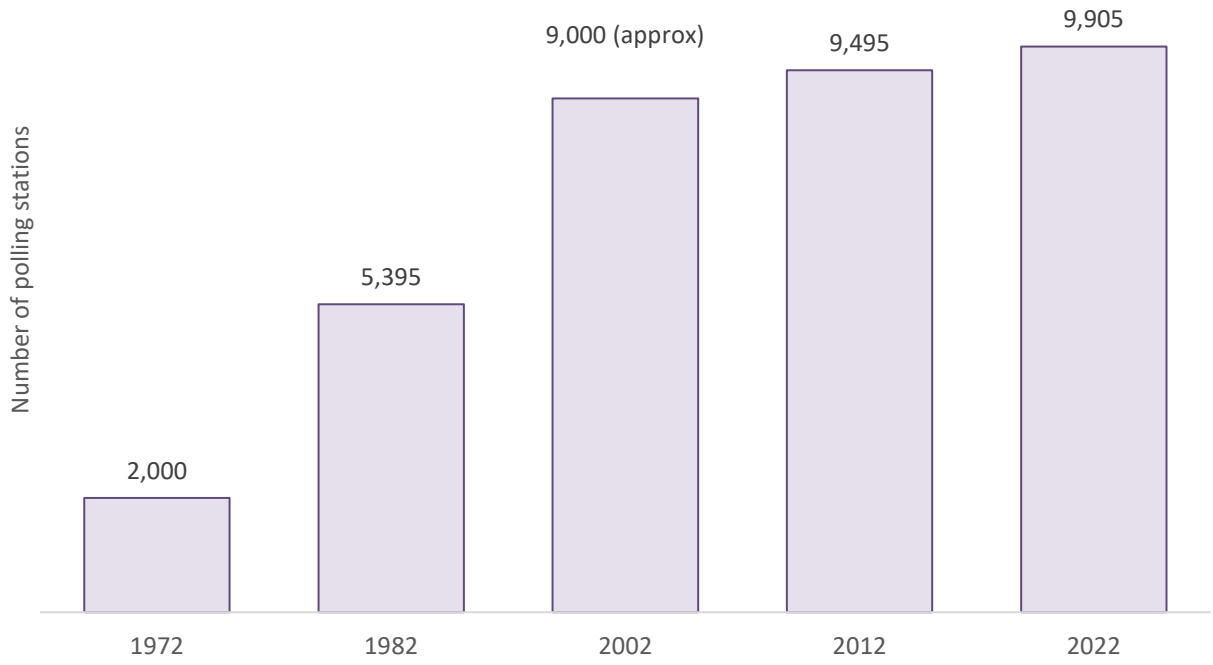


Chart notes: Data from various sources. Only available for some years. 2022 and 2012 data come from the PNGEC's polling schedule. 2002 data come from the PNGEC's post election report. 1982 data comes from: https://tinyurl.com/PNG1982. 1972 data from: https://tinyurl.com/PNG1972. Data are missing for all other elections including 1977.

Although one might imagine that polling stations would be fairly equally distributed around the country, by the time of the 2022 election they were not. Figure 2 shows the median number of polling stations by region in the 2022 election.

Given malapportionment is an issue in PNG, one obvious explanation for regional differences in polling station numbers is simply that electorates have different population sizes and that this is reflected in polling station numbers. Table 1 reports on the results of regressions in which we tested for this. The unit of analysis in the regressions is Open electorates.[4] The dependent

[4] We have limited our focus to Open electorates because provincial electorates are supersets of Open electorates and their values will just be sums of Open electorate totals. For this reason, including them offers no additional explanatory power.

variable is the natural log of polling stations (we used the natural log as the number of polling stations across electorates is heavily skewed).[5]

Figure 2 – Median number of polling stations by region

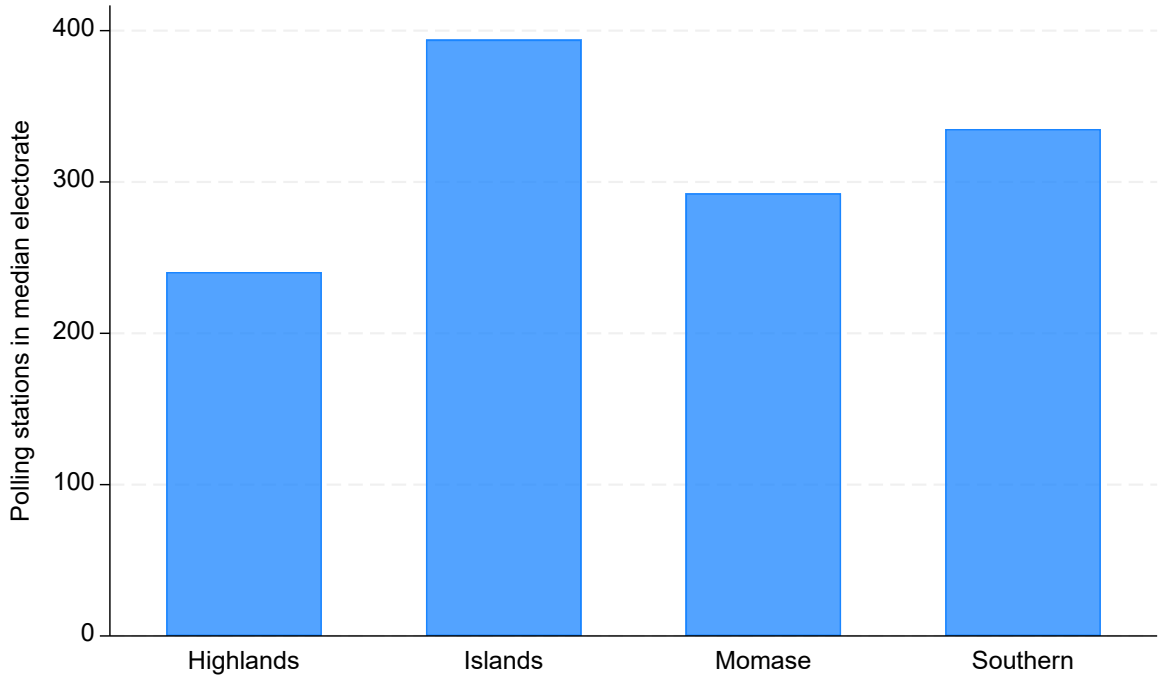


Chart notes: All data come from the PNG Election Results database. Bars show the number of polling stations in the median electorate. Data for the 2022 election. Data available for the following number of electorates in each region: Highlands=36; Islands=13; Momase=26; Southern = 21

One challenge that we faced in running these tests is that good population data are not available for PNG. As a result, for this exercise we used population figures from the 2000 census, which is widely regarded as the last reasonably accurate census.[6] This was not ideal, but as long as the relative population sizes between districts have not changed much, using old population figures might shed some light on variation in polling station numbers.

[5] Our polling station data come from electoral administration information. Polling station data was missing for a small number of electorates.
[6] Other alternatives would have been to use numbers of enrolled voters or the numbers of ballots cast. However, because of electoral issues discussed elsewhere in this paper, these data are also less than ideal. Also, votes cast and enrolled voters are likely endogenous to polling station numbers, rendering the use of such statistics very problematic.

Table 1 – Correlates of polling station variation between electorates

	Pstns (ln)	Pstns (ln)	Pstns (ln)
Population 2000 (km^2) (ln)	0.18	0.45**	0.38**
	(0.25)	(0.19)	(0.18)
Region			
Islands	0.42***	0.43***	0.44***
	(0.15)	(0.14)	(0.15)
Momase	0.17*	0.01	-0.01
	(0.09)	(0.12)	(0.11)
Southern	0.26	0.25	0.28
	(0.25)	(0.24)	(0.22)
Land area (ln)		0.15***	0.09*
		(0.05)	(0.05)
Favourable geography		-0.51*	-0.46*
		(0.26)	(0.23)
Wards in district			0.00*
			(0.00)
Constant	3.50	-0.41	0.53
	(2.69)	(2.03)	(1.92)
Observations	82	82	82
R^2	0.09	0.34	0.38

Robust standard errors in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

In addition to population, in the second and third models we also controlled for a range of geographical features using data on electorates from Filer et al. (2021). As the first regression model shows, surprisingly, when controlling for regional differences, population on its own does not seem to be associated with polling station numbers, nor does it eliminate regional differences. However, in the second and third models, once key geographical traits of electorates are included in the regression equations, population is associated with polling station numbers and the relationship is in the expected direction (more people, more polling stations). What is more, other geographical features are related to polling station numbers in ways that seem reasonable. Electorates that are larger (in terms of land area) have more polling stations, while electorates that have more favourable geography (a larger portion of the electorate that is not swamp land or steep terrain) have fewer polling stations. Once again, this makes sense: in electorates where travel is harder having more polling stations will make it easier for people to vote by sparing them the need to travel to polling stations across difficult terrain. Finally, more wards are also associated with more polling stations (although the relationship is weak). This also makes some sense: wards are the smallest political/administrative unit in PNG and will in various ways be associated with electoral and district administration. When these variables are controlled for, the difference between the Highlands and Southern, and Momase disappears. The difference with the Islands region remains, but that may well be explained by the presence of islands separated by sea.

Overall, although it is possible to find a small number of electorates with odd numbers of polling stations, it appears that the broader variation in polling station numbers between electorates present in 2022 at least in part reflected differences between the electorates of the sort that might reasonably be taken into account when planning elections. It also fits with the advice that we have been given that, although no formal rules appear to be in place, election managers tend to follow sensible heuristics such as distance and roll numbers as they make choices about polling locations.

Conduct at polling stations varies considerably between parts of the country. In some parts of the Highlands, particularly the Upper Highlands, polling can be violent and violence has halted elections at times. Elsewhere, violence associated with polling is less common but can occur. Violence aside, the conduct of polling varies a lot throughout the country. In parts of the Highlands in particular, *Haus Lains* (clans) are often large, cohesive and capable of internal coercion, which enables candidates and their supporters to monopolise entire polling stations allowing for largescale ballot fraud. In other parts of the country it is often the case that electoral support is much more fragmented and it is harder for the supporters of a single candidate to capture a polling station. As a result, scrutineers representing most major candidates are typically present at polling stations in these areas, which reduces opportunities for systematic voting fraud, although polling can still be fairly anarchic which allows for small-scale cheating (For a full discusion of electoral violence and other electoral issues see: Haley, 1997; Haley & Zubrinich, 2013, 2018; Kabuni et al., 2022; Laveil, 2020, 2021a, 2022; Laveil & Wood, 2019; Oppermann & Haley, 2025; Standish, 2003, 2007; Transparency International, 2022; Transparency International PNG, 2017; Wood, 2015; Wood et al., 2023).[7]

There are exceptions, but generally, although it takes time, and although it is occasionally interrupted by violence, thanks to the presence of most candidates' scrutineers, and owing to a reasonably transparent process, ballot counting, which occurs in central locations tends to be fairly free of large-scale fraud (Wood, 2015), as is the case with the reporting of election results.[8]

[7] One of us (Wood) was present during the 2017 elections in the city of Lae. Conduct at polling stations varied dramatically. In some polling stations electoral officials followed rules closely. In other polling stations informal community-level institutions allowed for reasonably orderly and fair voting. In other places large crowds overwhelmed polling officials, rolls were abandoned and anyone was free to vote, often several times. In at least one polling station security officials associated with one candidate "captured" the polling station, expelled other votes, and voted multiple times until ballot papers ran out.

[8] There are exceptions. In the wake of the 2022 elections in Papua New Guinea the province of Hela reported on results for its provincial electorate as well as its Open electorates so rapidly that it does not seem likely that ballots were properly counted. For powerful political figures, the rapid counting of ballots is advantageous as early election

When voters in PNG are free to chose who to vote for, very few vote on the basis of national issues. Rather, voters typically vote for candidates that they think will provide them, their families or their communities with patronage if elected (May, 2022; Saffu, 1989; Wood, 2018).[9] The nature of voter-politician linkages in PNG incentivises politicians to focus on providing patronage to their supporters and provides them with little electoral incentive to worry about national issues, which do not normally affect voters' assessments of them. Localised politics of this sort impedes the quality of governance in PNG more generally (Wood, 2018), but it is of direct importance for elections too: electoral quality is itself a national issue and politicians can safely neglect it knowing that voters will not punish them at the ballot box. Indeed, if anything, politicians, as powerful local actors, are probably more likely than other candidates to benefit from electoral issues (Wood, 2015). As a result, election preparation is under-resourced and insufficient attention is paid throughout the electoral cycle to issues such as maintaining the electoral roll. Capacity also appears to be an issue (Henderson & Boneo, 2013). More positively, the localised, fragmented nature of national politics, as well as the decentralised nature of electoral administration, has typically made it hard for politicians or political groupings to capture elections nationally, although in recent years allegations have been made of national-level electoral malfeasance (for example, Flanagan, 2017; Flanagan, 2017a).

One additional consequence of the localised clientelist nature of PNG's politics is of relevance to this paper: as they vote in search of local benefits, voters very rarely vote along party lines. Parties are national features, and their influence on voting in more affluent democracies typically stems from differing views on national issues. Because national issues are of little importance as most voters choose who to vote for in PNG, parties are largely electorally irrelevant in there. However, they still play a role in politics. Because they do not need to fear voter sanction, MPs often switch parties whenever they see it advantageous (Fraenkel, 2024). Yet parties still have some degree of cohesion at least in the short term. And, as a result, they sometimes serve as a link between powerful politicians and less powerful politicians or aspiring politicians. In particular, parties and party ties appear to enable the transfer of material assistance between well-resourced powerbrokers and candidates who lack the resources needed to contest elections (Baker, 2025; Fraenkel, 2024; Kabuni et al., 2022; May, 2003). As a

enables them to head quickly to Port Moresby and have a head start in the post-election process of forming government.

[9] Voting in this manner is sometimes talked of as a particularly Melanesian approach to politics. However, the phenomenon – referred to as clientelism by political scientists – is common throughout much of the developing world and can be found in the histories of many OECD countries too.

result, examining the fortunes of political parties does offer some sense of the electoral landscape, as well as the nature of politics in PNG. For this reason, we will return to party performance in 2022 later in the paper.

3 Electoral trends

Elections have become increasingly busy in the post-independence era in PNG. Figure 3 shows the number of registered voters as well as the estimated number of votes cast in each general election since independence. As the figure shows, both have grown rapidly: the roll is nearly 3.5 times as large now as it was in 1977. The estimated number of votes cast in 2022 was nearly 4.5 times as large as it was in 1977.

There have been many issues with PNG's electoral roll. The process of compiling the roll has been fraught: at times candidates have induced or compelled electoral officials to add additional names to the roll; deceased voters have not always been removed from the roll; and people who should be on the roll have sometimes gone to vote only to find that their names are not present.

Unfortunately, it is not possible to get a sense of how accurate the roll is by comparing the number of enrolled voters to estimates of the voting aged population. This is because PNG has not had an accurate census since 2000 – more recent censuses and attempts to estimate the country's population have been problematic. As a result, the voting aged population of PNG is unknown. The most recent comparison between the estimated voting aged population and the roll was conducted by Wood and Laveil (2019). Estimates from that paper suggested that the number of enrolled voters has been greater than the voting aged population in the Highlands since at least the late 1990s, with the difference being particularly pronounced in 2002. As the figure below shows, the roll grew rapidly through out the 1990s. The 2002 election was troubled in many ways (for a discussion see, Laveil, 2021b) and in the wake of the election concerted attempts at improving electoral quality were made. One of these was roll tidying. The associated fall in enrolled voters is clear in Figure 3.

Estimating the total number of votes cast in any given election is hard owing to the fact that, although results are available for most electorates, they are not available for all. To overcome this we have drawn on electoral reports produced by organisations such as PNG's Electoral Commission. Where official reports have not been available, we have imputed voting numbers for missing electorates using voting figures from other years. As can be seen the number of votes cast has risen rapidly, and was particularly high in 2002 before falling in 2007 and rising again since. Somewhat reassuringly, total votes cast have not exceeded the number of enrolled voters. However, as we will discuss in the section on turnout, in some parts of the country the

number of votes cast in recent elections has been higher than the number of enrolled voters. Given that the roll itself is already likely larger than the number of voting aged people, this is concerning.

Figure 3 – Registered voters and total votes cast

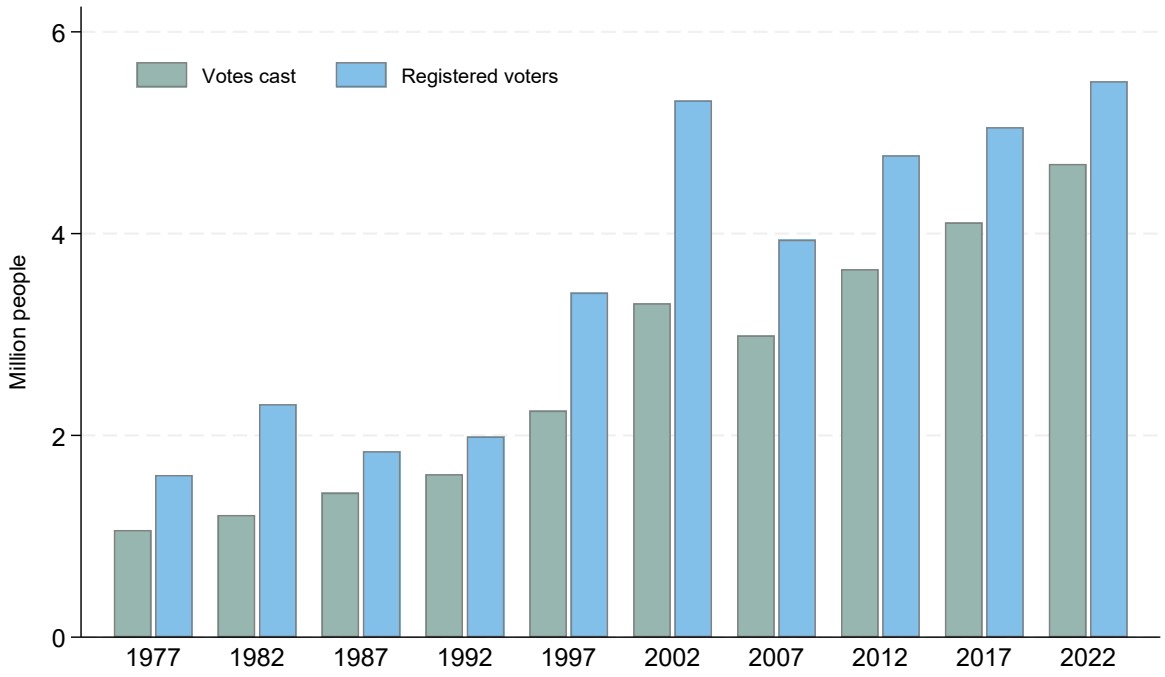


Chart notes: Roll data for early elections come from old International IDEA reports. Numbers of 1997 to 2007 come from a PNG Electoral Commission report. Numbers for more recent years come from the PNG Election Results database. Estimated votes cast for all years except 2022 come from our own calculations. 2022 numbers come from results reporting for that year. For details on the anomalous 2002 results see (Laveil 2021b)

Figure 4 also plots numbers of votes cast over time, but in this instance the figure distinguishes provincial seats from Open electorates. The shaded areas in both charts span the range between the largest and smallest seats in the category (provincial or Open) in the year in question. The line within the shaded area is the median seat for the category in question.

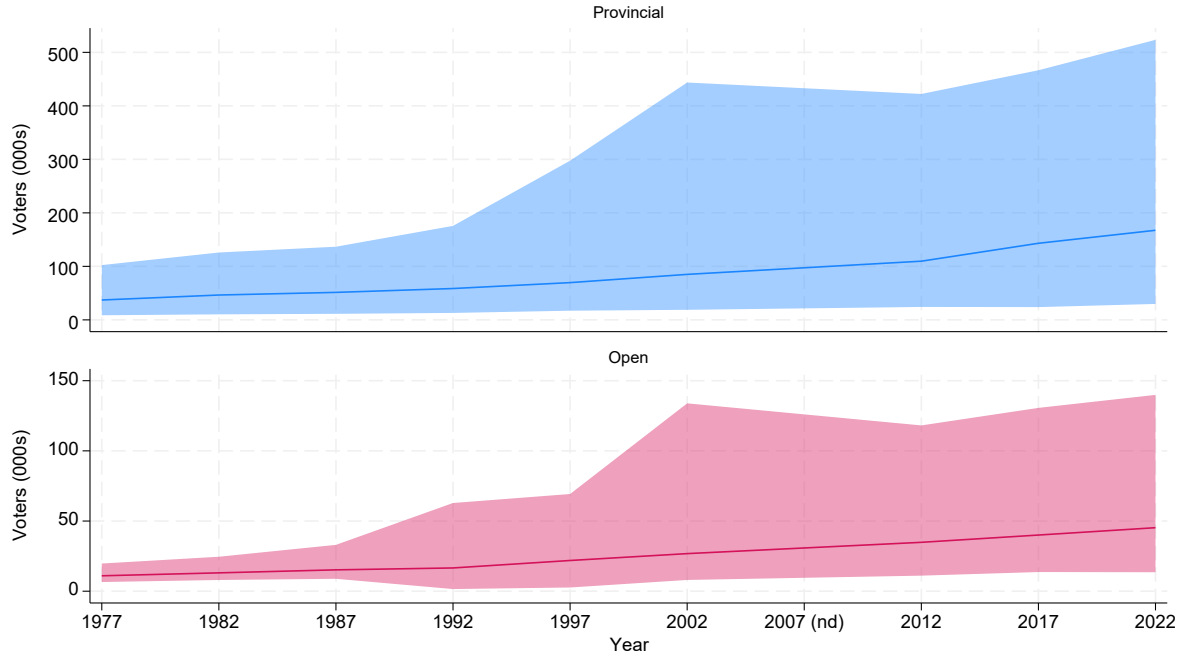
The number of voters in both provincial and Open seats has grown. Year on year changes have been most pronounced in the largest seats in both categories but growth has also been present in the median and smallest seats.

Malapportionment is a well known problem afflicting elections in PNG (for more detail see: Laveil, 2021a). Indeed the 2022 redistricting was nominally an attempt to address the problem, although in practice it failed to do this (Laveil, 2021a). Because problems of malapportionment have been covered elsewhere and we will not revisit it here except to note two features visible in Figure 4.

The first, and most striking is to do with the size of some Open electorates. Although, as might be expected, provincial seats are, on average, considerably larger than Open electorates, in 1992, 2002 and 2012 the largest Open electorate was larger than the median provincial electorate (in 1997 the largest Open electorate was almost exactly the same size as the median; data are missing for 2007). In all the years that we have data for, the largest Open seats were larger than the smallest provincial seats. Provinces are supersets of Open electorates and contain multiple electorates. Because of this, provincial seats ought to be larger than Open seats. The fact that, at times, even the median provincial seat has not been larger than the largest Open seats affords a sense of just how much PNG's electorates vary in size or, to put it another way, how serious malapportionment is.

The second feature that is of interest is the fact that, in provincial and Open seats, the differences between the smallest and largest electorates started rising in the early 1990s, took off in the lead up to the 2002 election and have remained high ever since. There was a time when malapportionment was not nearly as acute an issue as it now is in PNG.

Figure 4 – Provincial and Open seat sizes by total votes cast



Notes: The upper edge of the shaded region is the largest seat. The lower edge of the region is the smallest seat. The solid line in the middle of the region is the median seat. Data are missing for 2007. All data come from the PNG Election Results database.[10]

[10] We are grateful to a reviewer who pointed out to us that a 1992 change in electoral rules may have slowed the increase in votes cast at that point in time. Looking at the trends on the charts this effect may have been present in 1997, but dissipated by 2002.

In addition to voter numbers increasing over time, the number of candidates standing in general elections in PNG has also risen.

Figure 5 shows the growth in candidate numbers nationally. Figure 6 shows the growth by region. Candidate numbers have grown in all regions. Throughout the period covered in the charts, the greatest number of candidates have come from the Highlands region, which reflects the fact that it is the largest region in terms of population, but which also fits with the standard perception that political contestation is at its most intense in the Highlands. However, as Figure 6 shows, the relative growth in candidate numbers has actually been higher in the Momase and Southern regions.[11]

Figure 5 – Changing candidate numbers nationally

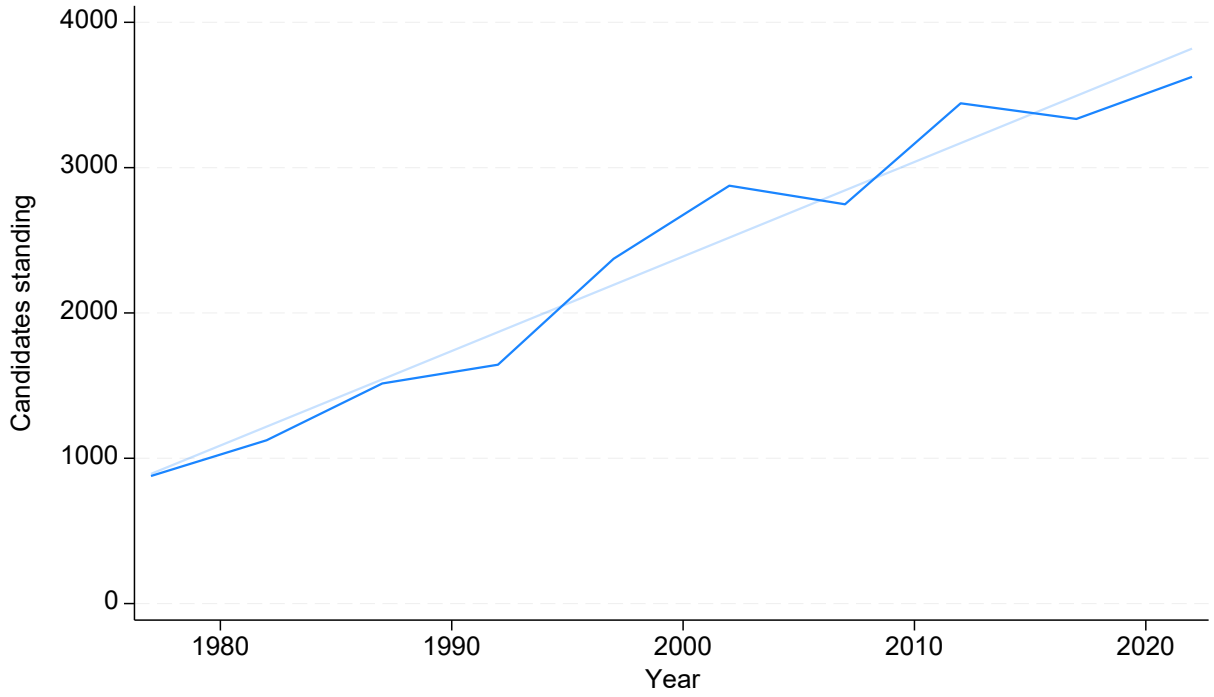


Chart notes: All data come from the PNG Election Results database. Exact candidate numbers plotted in darker blue line. Line of best fit plotted in lighter line. The average annual increase in candidate numbers has been over 60 candidates per year.

[11] If an alternative measure, the average growth in candidate numbers in each region is used Southern still has the most rapid increase (Howes et al. 2025)

Figure 6 – Changing candidate numbers by region

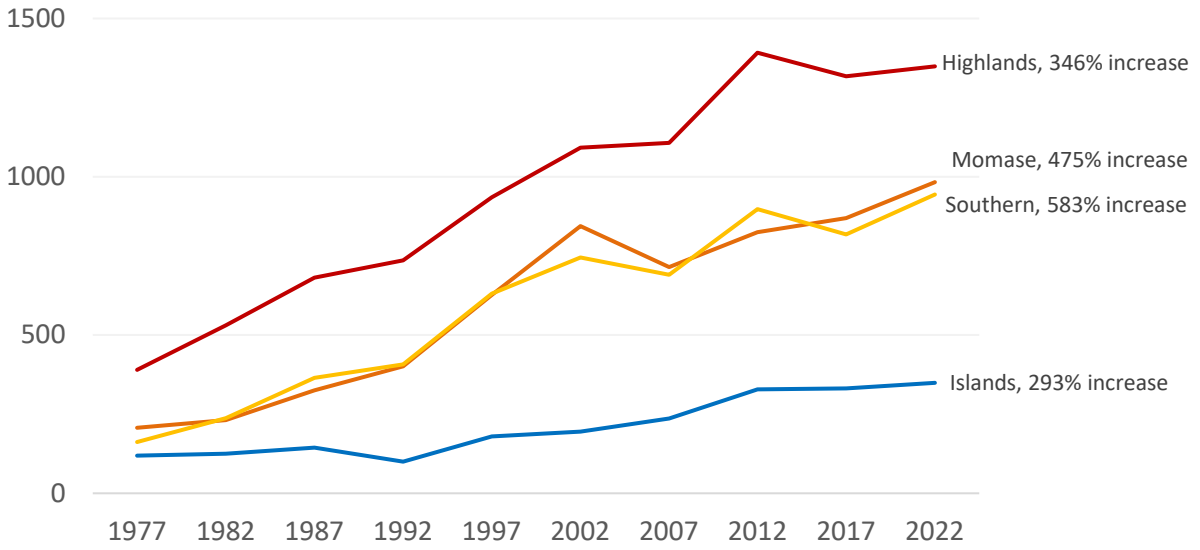


Chart notes: All data come from the PNG Election Results database.

4 Turnout

As we have already discussed, the issue of roll inflation makes the study of voter turnout problematic in PNG. However, even though there are issues with roll inflation, studying turnout as measured by votes cast over the size of the roll still reveals some worrying patterns.

Figure 7 shows four histograms plotting turnout (as calculated by total votes cast/total enrolled voters) in the most recent three general elections in PNG as well as the 1977 election. (We do not have electorate-level roll data for other elections.)

The histograms are colour coded based on turnout. Turnout below 50 percent is shaded grey, turnout between 50 percent and 90 percent is shaded pink, and turnout over 100 percent is shaded red. We have distinguished between electorates with turnouts lower and higher than 90 percent as that figure was (approximately) the turnout in the 2014 elections in Solomon Islands. Solomon Islands' 2014 elections are a useful comparator for several reasons: first, the country is a strongly clientelist polity like PNG and the contingent nature of clientelist politics gives voters a strong incentive to vote; second, Solomon Islands re-constructed its roll prior to 2014 and the new roll was regarded as broadly accurate; third, there was very little evidence of fraud in the 2014 elections. In other words, the 2014 Solomons elections serve as an example of how high we might expect turnout to be in a country with clientelist politics but largely free of electoral fraud.

Figure 7 – Turnout by election

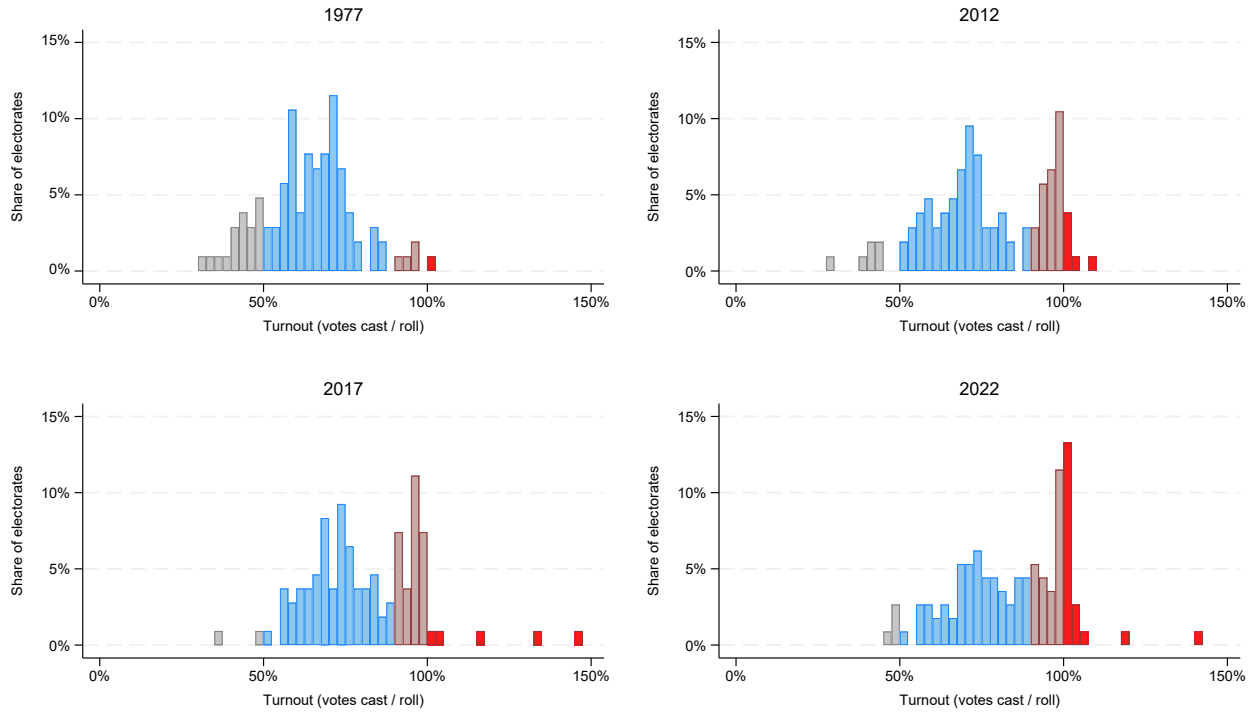


Chart notes: All data come from the PNG Election Results database.

As the 1977 panel shows, high turnout, including turnout over 100 percent is not an entirely new feature in elections in PNG. However, as the 2012 and 2017 elections show, unlikely and impossibly high turnouts have become more common in recent elections. Even compared to the two previous elections, 2022 stands out. In 2022, turnout in the modal turnout cluster was over 100 percent.

Impossibly high turnout rates of this nature can, in theory, stem from one of two issues. The first is poorly compiled rolls missing the names of legitimate voters who were ultimately able to cast ballots because polling officials decided that they were eligible to vote. The second is voters voting twice, or other types of polling fraud. While both explanations are plausible, and while it is possible for both to occur at the same time, observation reports from the 2022 election suggest that the latter issue was the main reason for the impossible turnout figures plotted in Figure 7 (Oppermann & Haley, 2025).

Figure 8 shows turnout in the 2022 election broken down by region.

Figure 8 – Turnout by region in the 2022 election

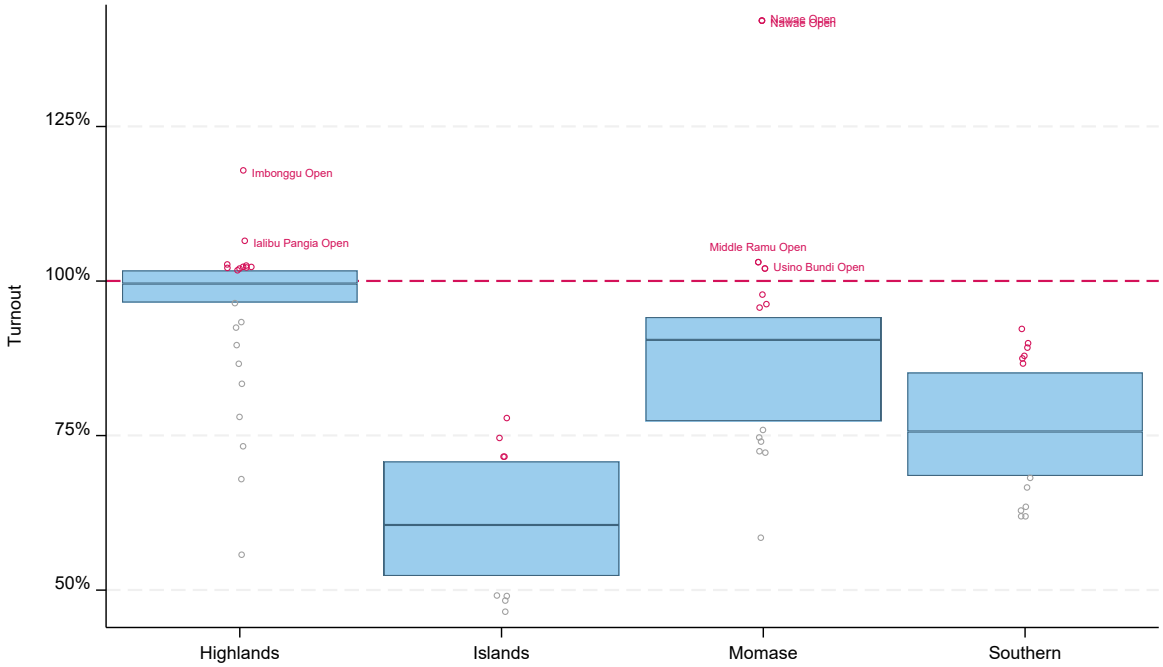


Chart notes: All data come from the PNG Election Results database. The boxes in the chart are the interquartile range. The horizontal line within each box is the turnout in the median electorate.

The boxes in the chart represent the interquartile range (the range within which 50 percent of the electorates in the region fall). The horizontal line within the box is the turnout in the median electorate in the region in question. The dots outside the boxes are electorates in which turnout was either higher or lower than the interquartile range. Electorates where turnouts are high, even by the standards of their region are labelled.

A number of features stand out. First, Nawae is a major outlier. Turnout, as per the results data given to us was nearly 100 percent in Nawae in the 2017 election so it is likely that broader issues are present there. However, turnout is so high in Nawae, and so much higher than anywhere else, that we are inclined to think the 2022 number is a product of data entry issues, possibly during roll compilation. Indeed, in the report that the PNG Electoral Commission submitted to parliament after the 2017 election turnout was stated to be only 82.5 per cent (Papua New Guinea Electoral Commission, 2017, p. 84). While it cannot be guaranteed that the figure in the report is itself accurate, the difference would seem to suggest an error in data entering at some point in the process that took place prior to the data being given to us.[12]

[12] We are grateful to a reviewer for drawing out attention to the number in the PNGEC's report.

The second standout feature is how low turnout was in the Islands region. This pattern has been observed in previous elections (Laveil & Wood, 2019). The pattern could stem from any one of a number of reasons, ranging from old and out of date inflated electoral rolls, to voter disinterest, to voters actively being prevented from voting. Of these options, estimates from the 2017 election suggest that, if anything, the roll in the Islands region is less than the voting aged population, suggesting that an inflated roll is not the source of low turnout (Laveil & Wood, 2019). Finding out whether coercion, disinterest or something else entirely is the source of low turnout in the Islands will be an important area of future work.

The third feature which leaps out from the chart is just how high turnout was in the Highlands. Turnout in the median electorate is almost 100% and there is a large cluster of electorates with turnouts in the vicinity of 105 percent. Such figures are commensurate with the problems already identified in the 2022 general elections in the Highlands (Oppermann & Haley, 2025; Wood et al., 2023) and do not come as a particular surprise. More surprising, however, is the long tail of electorates in the Highlands where turnout was much lower. Such low turnout seems at odds with the fiercely fought nature of elections in the Highlands. Possibly the issue stems from the roll; however, the there are several potential explanations for this. The first is voter repression. The second is instances in which counting has been interrupted or ballot boxes stolen, or similar electoral problems.[13] (Mean turnout was lowest in Enga and Hela. It was also low in parts of Southern Highlands. All three provinces have suffered from problems of electoral violence and similar issues which with voter repression being the most likely explanation of low turnout.)

To further study turnout issues, we compared electoral-level turnout numbers from 2017 and 2022. When we did this we found a very clear correlation between turnout in 2017 and 2022 (r=0.85). Turnout was higher in 2022 than in 2017 but by and large the change was not a total transformation of the sort that might suggest rigging at the central level: electorates that had been problematic in 2017 become somewhat more problematic on average in 2022.

5 Re-election rates and the Hegarty rule

In 1982, during the general election of that year, political scientist David Hegarty identified a correlation between candidate numbers and the likelihood that incumbent MPs would lose their seats during elections (Hegarty, 1982). In past analysis we have sought to study this

[13] We are grateful to a reviewer for raising this second factor driving low turnout.

relationship, which we have referred to as the Hegarty Rule (Laveil & Wood, 2019; Wood et al., 2023). Our findings have differed somewhat depending on the model used and the year or years covered (compare, for example, Laveil & Wood, 2019 with Wood et al., 2023). However, overall our analysis has typically confirmed the relationship identified by Hegarty.

To build on previous analysis we have now undertaken a large suite of studies based on all available years' data, including the data from 2022. We made use of various regression models, including analysis run on pooled data, analysis using electorate fixed effects and analysis using first differences. We studied both incumbent vote shares and whether incumbents were re-elected. We studied bivariate relationships as well as relationships in which a suite of electorate traits and intertemporal trends were controlled for. The results of these tests are presented in Appendix 1.

In all of the tests we ran the relationship between candidate numbers and incumbent performance was in the expected direction – increases in candidate numbers were associated with lower incumbent vote shares or with a decreased probability that the incumbent won their seat back. In total we ran 35 separate regressions. The coefficient for changes in candidate numbers was statistically significant in all models except two.

Of particular interest, the correlations between the dependent variables and changes in candidate numbers was statistically significant in all models focused solely on the 2017 election and – contrary to the findings of Wood et al. (2023) – the correlations in 2022 were also statistically significant for all regressions except one.

The top pane in Figure 9 gives a sense of how clear the relationship between incumbent vote shares as estimated by one of our regression models based on the Hegarty Rule and actual incumbent vote shares.[14] The figure comes from the model that used changes in candidate numbers and a full range of controls (the model described as Model 5 in the appendices). The model's estimate for the electorate in question in the year in question is on the x-axis and the actual result is on the y-axis. The r-squared value on the chart gives a broad sense of how well the model's estimates corresponded with what actually happened.

The bottom pane in Figure 9 shows the relationship between the estimated probability that the incumbent won their seat back and whether they actually won their seat back. Each bar

[14] In Limited Preferential Voting elections we used first preference vote shares.

represents an election in an electorate. The height of the bar estimates the estimated probability that the incumbent won their seat back. The colour of the bar indicates whether the incumbent did in fact win their seat back. The numbers in the top right corner of the chart illustrate model performance based on the heuristic that an estimated probability of an incumbent winning over 50 percent or over can be taken as an estimated win. This was then compared with whether the incumbent actually won or not to give a sense of how well the regression model's estimates matched actual results.

Figure 9 – Incumbent vote share and changes in candidate numbers, all elections

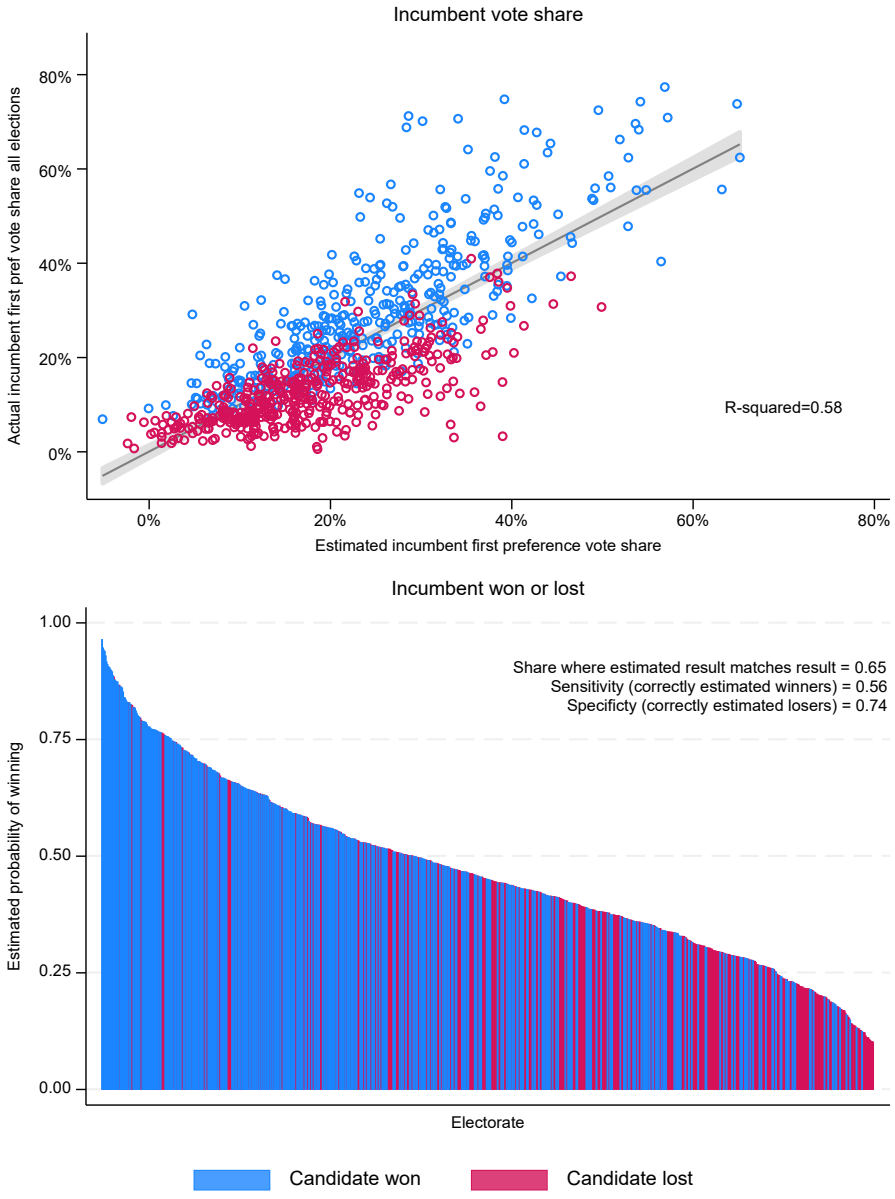


Chart notes: In the top pane the diagonal line plots the one to one relationship between estimated values and actual values. Each dot on the chart is a specific electorate in a particular election. Electorates that are on the line are electorates in which the estimate outcomes perfectly matched the actual outcome. Electorates above the line are electorates in which the estimated vote share was lower than the actual result. Electorates below the line are electorates in the estimated vote share was higher than the actual result. In the bottom pane each bar is an individual election in an individual electorate. The height of each bar reflects the estimated probability that the incumbent

would win the election. Electorates in which the incumbent actually won are shaded in blue. Electorates in which the incumbent lost are shaded in red.

The correlations between estimated vote shares and actual vote shares shown in the top pane are not perfect, but they are clear enough to be obvious in the chart. There are individual exceptions of course, but – as is indicated by an r-squared of 0.58 – the relationship is clear.

The relationship between the estimated probability of incumbent victory and whether the incumbent won or not is also reasonably good. There are more actual wins to the left of the chart, where the estimated probability of victory is higher, and similarly there are more losses to the right of the chart. As a useful guide to understanding the findings shown in the bottom pane consider that a coin toss will predict an election outcome correctly 50 percent of the time. As can be seen in the text in the bottom pane, the model estimated the correct outcome 65 percent of the time, which is far from perfect, but clearly better than a coin toss. Also worth noting is that the model was more accurate with respect to losses than with wins.

Producing models that estimate outcomes for past elections based on all available election years is one thing, and of interest to social scientists. However, some observers will likely be more interested in whether the Hegarty Rule can correctly predict the results of future elections based on the outcomes of past elections. To get a sense of this, we tested whether the rule could have correctly predicted the outcomes of the 2022 and 2017 elections based only on data from previous elections. The results for first preference vote shares in the 2022 and 2017 elections are presented in Figure 10. The results based on whether the incumbent won or not in 2022 and 2017 are shown in Figure 11.

The model used in these regressions is similar to the full model used to generate Figure 9 above. The differences are that only results from previous elections – not the elections in question or subsequent elections – were used in the predictions.[15]

[15] Also the model did not use year fixed effects (as were used in the models focused on the full dataset) but instead included a variable controlling for linear trends over time The reason for this change is that while someone trying to predict future election results would be able to identify trends over time in past elections they could not be expected to know in advance any idiosyncratic changes in the upcoming election (these are the types of changes captured when year fixed effects are used).

Figure 10 – Testing predictions of incumbent vote shares against actual vote shares

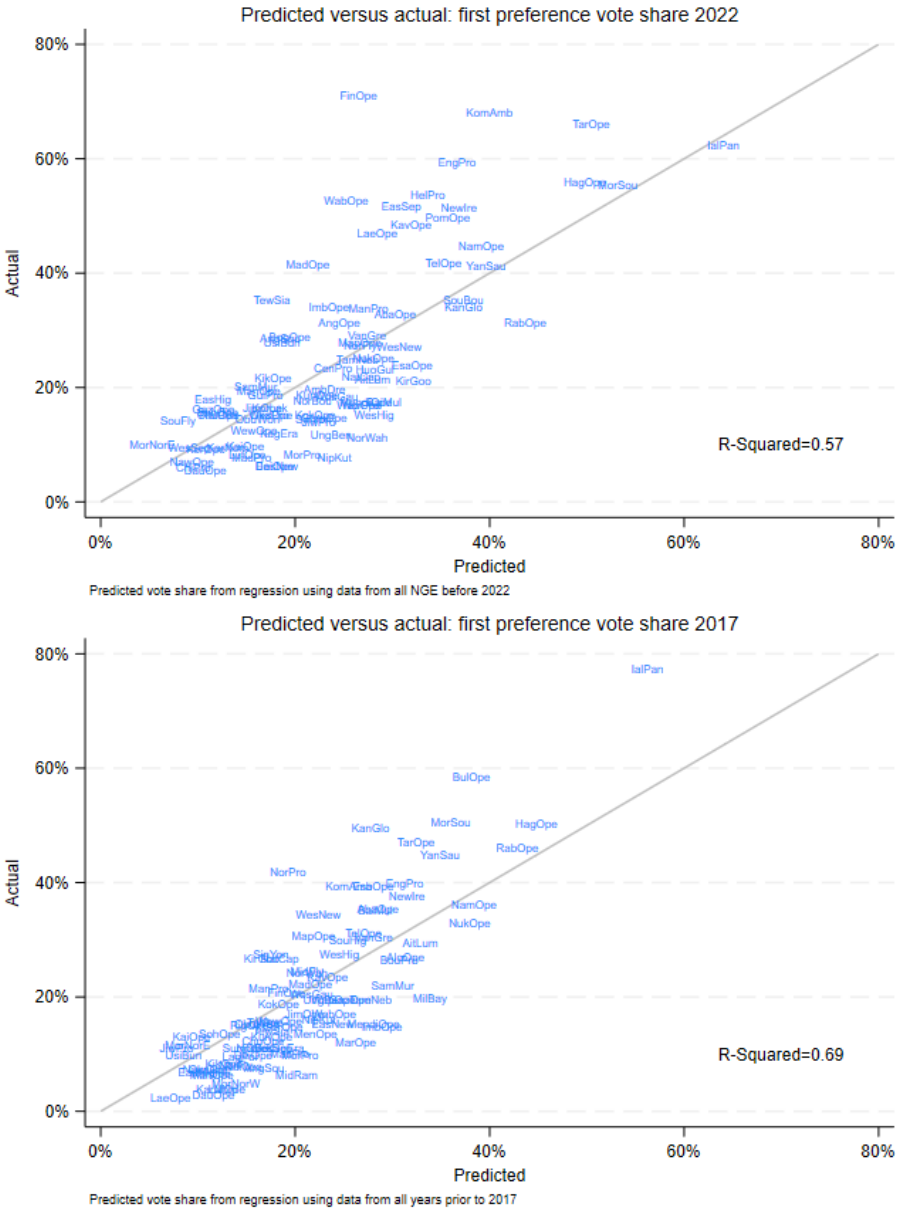


Chart notes: Individual electorates are identified using a code that is a shortened version of the electorate's name. The diagonal line plots the one to one relationship between predicted values and actual values. Electorates that are on the line are electorates in which the predicted outcomes perfectly matched the actual outcome. Electorates above the line are electorates in which the predictions were lower than the actual result. Electorates below the line are electorates in the predicted outcomes were higher than the actual result.

The predictions are not perfect for either election. However, there is a clear relationship, particularly in 2017.

Figure 11 – Testing 2022 predictions of incumbent re-election against actual results

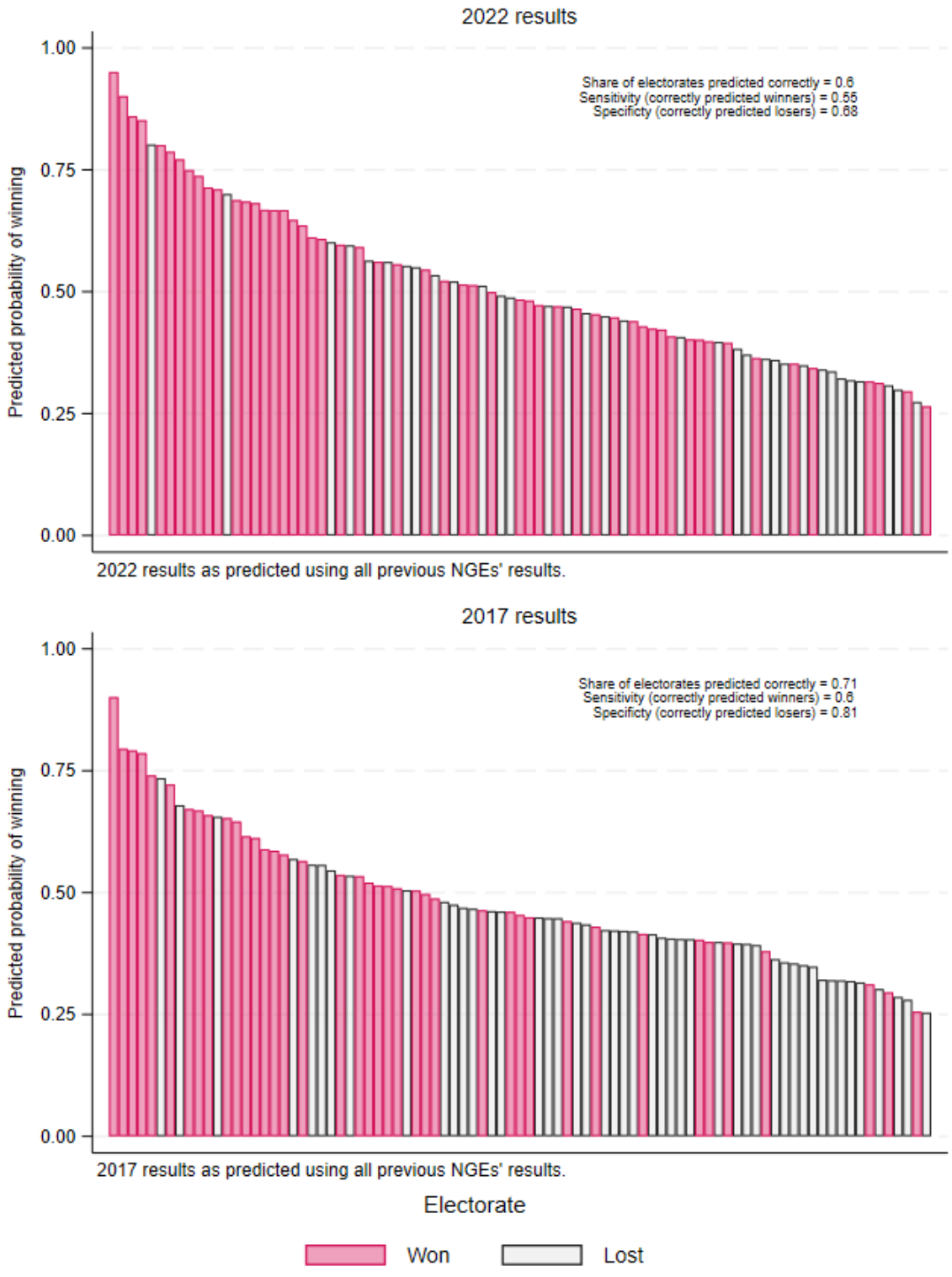


Chart notes: Each bar is an individual electorate. The height of each bar reflects the predicted probability that the incumbent would win the election. Electorates in which the incumbent actually won are shaded in red. Electorates in which the incumbent lost are shaded in grey.

In 2022, the model predicted the result accurately 60 percent of the time. This is better than a coin toss but far from perfect. The main problem in 2022 was that the model underestimated

the probability that incumbents would win: in many electorates in which the model predicted that the incumbent had less than a 50 percent chance of winning, the incumbent actually won. With the benefit of hindsight, these outcomes are not completely unexpected: in 2022 incumbents did a lot better than has been the case in previous elections. No model based on past elections alone could have predicted this.

The 2017 model also underpredicted incumbent wins, but it did better overall, making correct predictions 71 percent of the time. Not perfect, but someone using the model in advance would have generated a reasonably accurate picture of who would be in the next parliament. In particular, predictions at the ends of the distribution were very often accurate. Controlling for other variables, in electorates where candidate numbers fell a lot, the incumbents almost always won. In electorates where candidate numbers rose rapidly the incumbents usually lost.

All told, the findings in this section point to the ongoing relevance of the Hegarty Rule: in elections in PNG changes in candidate numbers are related to election outcomes. This presumably is because aspiring politicians have some insight into whether incumbents are weak and are more likely to stand if they think this is the case, or perhaps because more candidates stand when people are frustrated with the performance of the incumbent. In the absence of opinion polling or other techniques for predicting election outcomes in PNG, the insights that emerge from the Hegarty Rule are of considerable interest (for a good discussion of available tools for predicting elections in OECD countries see: Leigh & Wolfers, 2006).

However, we would caution against trying to predict individual electorate outcomes based on the rule. Not only are its predictions imperfect but, as the 2022 elections – and higher than expected incumbent re-election rates in this election – indicate, the Hegarty rule is prone to something akin to the problem of induction. Just because there is a relationship in previous elections does not mean that the relationship will, in the future, be of the same magnitude as it has been in the past.

What is more, although it is unlikely that the average political actor in PNG will read this discussion paper, the problem could potentially become worse in the future if candidates, powerbrokers, or voters themselves tried to use something akin to the Hegarty Rule when making electoral decisions.

6 The puzzling electoral performance of PANGU

In 2022, a high share of incumbents chose to stand under the banner of the PANGU party – the party headed by the Prime Minister, James Marape. In 2022, 38 percent of incumbents stood as

PANGU candidates. In 2017, when PANGU was not the Prime Minister's party, only 2 percent of incumbents had stood as PANGU candidates. In 2022, only 15 percent of incumbents stood for the next largest party, the People's National Congress (PNC). No other party was home to more than 10 percent of incumbents.[16] (For further discussion see: Wood et al. 2023.)

Voters in PNG do not, as we have noted, normally vote along party lines, yet parties are important, up to a point, as political alliances are formed in parliament. Incumbents tending to stand for the Prime Minister's party is not new in PNG. In 2017 even more candidates stood as candidates of the then prime minister's party, the PNC. (For good discussion of the propensity of MPs to flock to the Prime Minister's party in pre-2022 elections see: Kabuni & Howes, 2022). However, there was a major difference in 2022: incumbents were re-elected at a much higher rate than was the case in 2017 or, indeed, any other post-independence election. Importantly 76 percent of PANGU incumbents were re-elected in the general election. The fact that so many successful incumbents stood under the PANGU banner gave its leader, James Marape a significant head start when it came to forming the government after the election.

There are a number of possible reasons why so many incumbents stood as PANGU candidates in 2022. One possibility is that incumbents thought that PANGU was very likely to be at the centre of the new coalition government after the election and that, because of this, it would be advantageous to stand as a PANGU candidate so as to demonstrate loyalty to its leader, and presumed future prime minister, so as to obtain a ministerial portfolio. Another possibility is that incumbents were offered material electoral support if they stood as PANGU candidates.

Table 2 offers some interesting additional insight into the PANGU question. It plots the results of a Hegarty Rule test for the 2022 election. The models used are the same as the models used to produce the charts shown in Figures 10 and 11 above. The only difference is that we have added a variable that indicates whether the incumbent stood as a PANGU candidate or not.

[16] Candidates change parties frequently in PNG, including in the lead up to elections. Accordingly, there is a chance that our numbers may be slightly off. Any differences will not be major though.

Table 2 – The Hegarty Rule and PANGU performance

2022 Incumbent vote share PANGU

	(1) Vote share	(2) Vote share	(3) Vote share	(4) Vote share	(5) Vote share
PANGU	0.08***	0.06***	0.06***	0.05**	0.05**
	(0.00)	(0.01)	(0.01)	(0.04)	(0.04)
Change in ln cand nums		-0.21***	-0.22***	-0.22***	-0.23***
		(0.00)	(0.00)	(0.00)	(0.00)
Num cands in prev eln (ln)				-0.06	-0.06
				(0.12)	(0.15)
Winner v-share previous eln				-0.29**	-0.28**
				(0.03)	(0.04)
Constant	0.00	0.00	0.00	0.26*	0.25
	(0.99)	(0.76)	(0.88)	(0.09)	(0.12)
Region FE	No	No	Yes	No	Yes
Observations	87	87	87	87	87
Adjusted R-squared	0.08	0.32	0.35	0.35	0.38

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

2022 Incumbent Win/Lose PANGU

	(1) Win	(2) Win	(3) Win	(4) Win	(5) Win
PANGU	0.99**	0.91*	0.44	1.33**	0.74
	(0.04)	(0.07)	(0.42)	(0.02)	(0.21)
Change in ln cand nums		-0.89	-1.60**	-1.23	-1.78**
		(0.22)	(0.04)	(0.13)	(0.03)
Num cands in prev eln (ln)				-0.13	-0.47
				(0.85)	(0.56)
Winner v-share previous eln				6.26**	4.02
				(0.02)	(0.12)
Constant	0.11	0.13	-0.75**	-0.94	-0.11
	(0.69)	(0.63)	(0.05)	(0.73)	(0.97)
Region FE	No	No	Yes	No	Yes
Observations	87	87	87	87	87
Count R-squared	0.61	0.61	0.71	0.70	0.78

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Of particular interest in these results is the fact that in all models the coefficients are positive for PANGU incumbents. They are also statistically significant in all models focused on incumbent first preference vote shares. And they are statistically significant in three of the models focused on incumbent victory. They are not statistically significant in the two models that include regional fixed effects, although, if anything, PANGU incumbents were still more likely to be re-elected.

The significance of this finding is as follows: there is – as we have demonstrated previously – a clear relationship between changes in candidate numbers and incumbent performance. Yet even taking this into account, PANGU incumbents perform better than expected on average.

Quite why this is the case is uncertain. We have heard rumours that PANGU candidates were given additional ballots through some form of centralised vote rigging. However, given the fact that the operation of elections is, for the most part, a product of the performance of provincial, district and polling station officials, and given that ballot counting is usually a transparent, scrutinised process, we think that ballot rigging of this nature is unlikely. Another explanation is that PANGU simply attracted, or recruited, more capable or more powerful incumbents. However, this too seems doubtful, as the strength of incumbents ought to be captured by changes in candidate numbers: aspiring MPs are, as we have already discussed, less likely to challenge strong incumbents.

Another possibility is that PANGU incumbents were almost always in government, not in the opposition in the lead up to the election, and were able to benefit from being able to access more money simply by virtue of being in government. However, in Appendix 2 we include government as a control variable in our regressions. The effect of being government is sometimes statistically significant. However, its inclusion does not eliminate the PANGU effect. Similarly in Appendix 2 we test the relationship between being a PNC incumbent in the 2017 election (PNC was the main party in the government going into that election). There was no relationship between the PNC and success in Hegarty Rule regressions in 2017.

A more plausible explanation is the one that we touched on above: that PANGU incumbents were given money to campaign with, presumably as a quid pro quo for aligning themselves with PANGU. Any money that was given would have had to have been spent late in the campaign period, after the deadline for other candidates to register for the election. If material assistance were spent late in the electoral cycle, it would have affected results in a manner that would not have been predicted by challengers and reflected in candidate numbers.

Interestingly, this explanation, if true, seems to be PANGU specific, and not associated with simply being an incumbent in a large powerful party. PNC incumbents actually performed worse in 2022 than would have been anticipated on the basis of Hegarty Rule tests (see Appendix 2 for results).[17]

[17] While the 2017 election is the only one we have sufficient data to test party under/over performance it is not an ideal test case. The PNC was a particularly unpopular party at the time of the 2017 elections, and plausibly its candidates may have been punished for this, negating any other benefits that they may have received for standing under the party banner.

We cannot, obviously, prove that PANGU candidate success was definitely a result of money politics. All we have is results patterns, not more detailed evidence on actual offers and decisions amongst MPs. The possibility is, however, plausible. In our view, it fits with the results patterns. If it is correct, it should be of interest to social scientists: there is a chance that it may point to hitherto unnoticed changes in political and electoral dynamics in PNG.

7 The 2022 elections in the Highlands

One final puzzle emerged from early studies of the results of the 2022 election. This was that, although incumbent re-election rates were unusually high in most of the country, they were no higher than normal in the Highlands. This led Wood et al. (2023) to conclude that cheating on election day was unlikely to be the source of high incumbent re-election rates. If it were, the authors reasoned, re-election rates ought to have been higher, not lower, in the Highlands because electoral issues are at their most acute in that specific region.

Figure 12 shows re-election rates by region in 2022 in the left panel. The previously reported relationship can be seen in the figure: incumbent re-election rates were considerably lower in the Highlands than elsewhere.

Figure 12 also shows mean incumbent first preference vote share in the right panel of the chart. Here the relationship is quite different. Now the Highlands does not standout. Indeed the region with the lowest average first preference vote share is Southern. The difference raises the question of why so many incumbents lost in the Highlands, when their first preference vote shares tended, on average, to be comparatively high. Generally, candidates who are ahead on first preferences go on to win elections in PNG (Reilly, 2021; Wood et al., 2021). This was often not the case in the Highlands in 2022. In the Highlands 35 percent of those incumbents ahead on first preferences went on to lose. This compares with the Islands region (7%), Momase (11%) and Southern (12%). It is unclear why a comparatively high number of incumbents who were ahead on first preferences ultimately lost their seats in the Highlands. Table 3 shows the incumbents who were ahead on first preferences in the Highlands but who ultimately lost their seats. There are no clear patterns in terms of provinces or parties. Perhaps the pattern is simply a product of chance. Perhaps there is another explanation. If there is, it is not, at this point, obvious.

Figure 12 – Election results by region

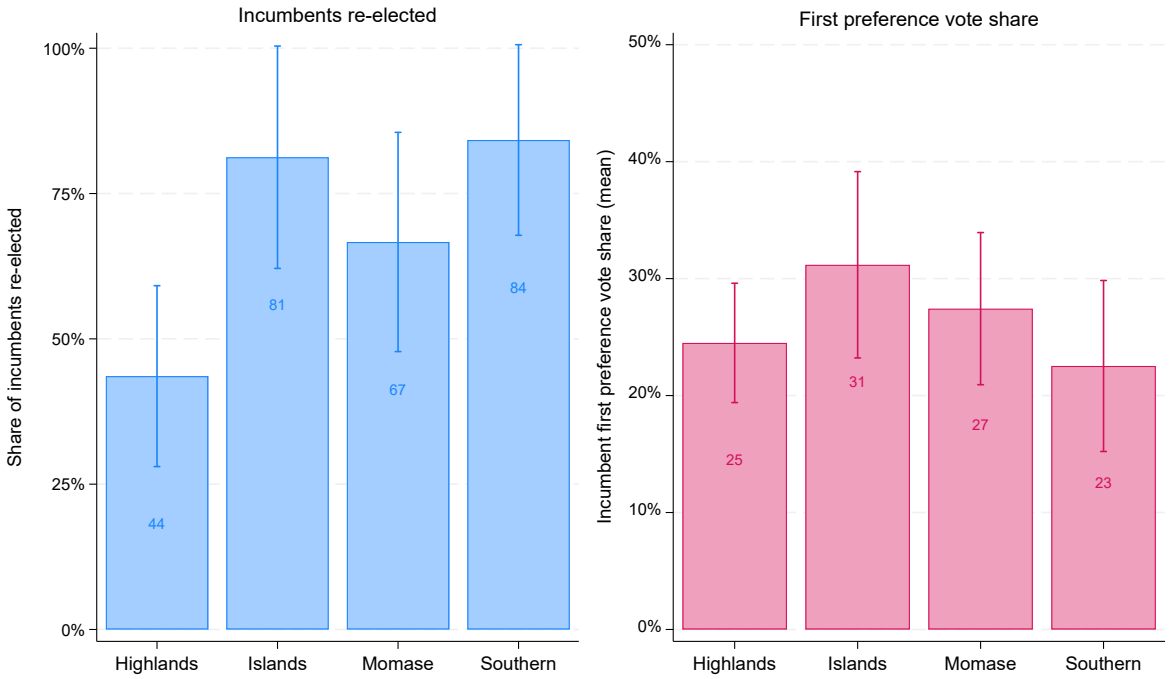


Chart notes: All data come from the PNG Election Results database.

One interesting possible explanation suggested to us by a reviewer is that, as a result of the fiercely contested electoral contests to be found in parts of the Highlands, as well as the clan based electoral competition in parts of the region, it could be the case that voters have become more strategic in their allocation of preferences than is the case elsewhere. Another very different explanation suggested to us by a different reviewer was that, in their view, the nature of the 2022 elections in the Highlands involved so much coercion and clan based voting, that changes between first and after preference results may not stem much from individual voter decisions at all. We are not in a position to mediate between these views or to offer our own explanations above and beyond those we have already discussed. Hopefully, future research including studies of anomalous seats may ultimately shed more light on what is occurring in the region.

Table 3 – Highlands incumbents ahead on first preferences who lost

Electorate	Province	Incumbent	Inc Party	Winner	Winner party	Govt?	Note
Chuave Open	Chimbu	Wera Mori	PNG Country	James Nomane	Independent	Govt	
Gumine Open	Chimbu	Nick Kuman	Advance PNG	Dawa Dekena	PNG Party	Govt	
Kerowagi Open	Chimbu	Bari Palma	PNC	Francis Siune	Advance PNG	Other	
Kundiawa Open	Chimbu	William Onglo	URP	Dilu Muguwa	Advance PNG	Govt	Re-count?
EHP	Eastern H	Peter Numu	PNG One Nat	Simon Sia	PNC	Govt	
Kainantu Open	Eastern H	Johnson Ibo	PPP	William Haga.	Independent	Govt	
North Wahgi Open	Jiwaka	Fabian Pok	URP	Benjamin Mul	Independent	Govt	
Mendi Open	Southern H	Micheal Nali	Independent	Raphael Tonpi	ULP	Govt	
Baiyer Mul Open	Western H	Koi Trappe	PNC	Jacob Kop Maki	PANGU	Other	

8 Ethnolinguistic fragmentation and electoral fragmentation

In 2022 the Open electorate with the most candidates (Moresby North East Open) had 76 candidates standing; 12 Open electorates had 50 or more candidates standing. The Open electorate with the fewest candidates standing (Moresby South Open) had just eight candidates; seven electorates had 10 or less candidates standing. As we have discussed previously in the section on the Hegarty Rule, much of the variation in candidate numbers in any given electorate stems from factors to do with the incumbent contesting the election, such as their perceived strength and satisfaction with their performance. However, this is not the full story: if we move beyond individual MPs and individual elections and look at overall averages for electorates across post-independence elections there is considerable variation: the busiest Open seat had 38 candidates stand on average, while one electorate had an average of only eight.

In an attempt to learn more about factors that might underpin broad variation between electorates, we focused on structural factors – features that are inherent to electorates and slow changing over time.

To do this, we combined social and geographic data on Open electorates (Filer, Fraenkel, et al., 2021) with 2022 election results. One area of particular interest to us was the existence, or lack thereof, a relationship between ethnolinguistic fragmentation (as captured by linguistic fragmentation) and candidate numbers. This is an area that has been studied extensively internationally (for example, Eifert et al., 2010; Habyarimana et al., 2009; Posner, 2005) but not

yet in PNG.[18] While there are debates in the international literature, broadly it provides reason to anticipate that electorates with more where more languages are spoken will also be electorates where more candidates stand on average.

The unit of analysis in the work in this section is Open electorates. Our election results data come from the dataset used throughout this paper. Although ethnolinguistic fragmentation itself might, plausibly stem from a variety of differences it has often been operationalised in the international literature using linguistic diversity (Easterly & Levine, 1997; Eifert et al., 2010). We followed the same approach in our analysis. The language data that we have drawn on came from around the time of independence. Much of the other data for other variables in our regressions came from around the turn of the millennium.[19] Dated data are not ideal; however, many aspects of electorates change slowly (particularly their geography, but also social features such as languages). And as long as the relative status of electorates has remained generally unchanged (for example, if electorates with higher than average numbers of languages in 1978 continued to have higher than average numbers of languages in 2022), then analysis can still be usefully undertaken. A table of summary statistics for the variables used in our analysis can be found in Appendix 4.

In the first tests we ran OLS regressions using the natural log of the number of candidates in each electorate in the 2022 elections as the dependent variable, and the natural log of languages as the key independent variable of interest. The second set of tests was the same as the first set except that the dependent variable was the number of candidates in each election averaged across all post 1977 elections.[20] In Appendix 3 we report on results from a third set of tests in which fragmentation indices were used instead of counts (the indices are fully explained in the appendix.) The results for these alternate series of tests are very similar to those presented below based on language counts.

Figure 13 focuses on the basic bivariate relationship between candidate numbers in the 2022 election and language numbers. Because both variables are skewed we have used their natural logs in the figure. As can be seen, there is a bivariate relationship between language numbers

[18] Although the electoral relationship has not been studied in PNG. Work has looked at the relationship between fragmentation and other aspects of governance (see: Reilly & Phillpot, 2002).

[19] The age of the electorate data meant that we had to exclude electorates that were re-districted in 2022 from our analysis.

[20] Post 1977 elections were used instead of all post independence elections (i.e 1977 was excluded), because major redistricting in 1977 made it impossible to track incumbency.

and candidate numbers (the p-value for the coefficient for languages in a bivariate regression is 0.054). In electorates with more language groups candidate numbers tend, on average, to be higher. There is, however, a lot of variation around the line of best fit. Language numbers and candidate numbers appear to be related, but they are clearly not the whole story.

Figure 13 – Language numbers and 2022 candidate numbers

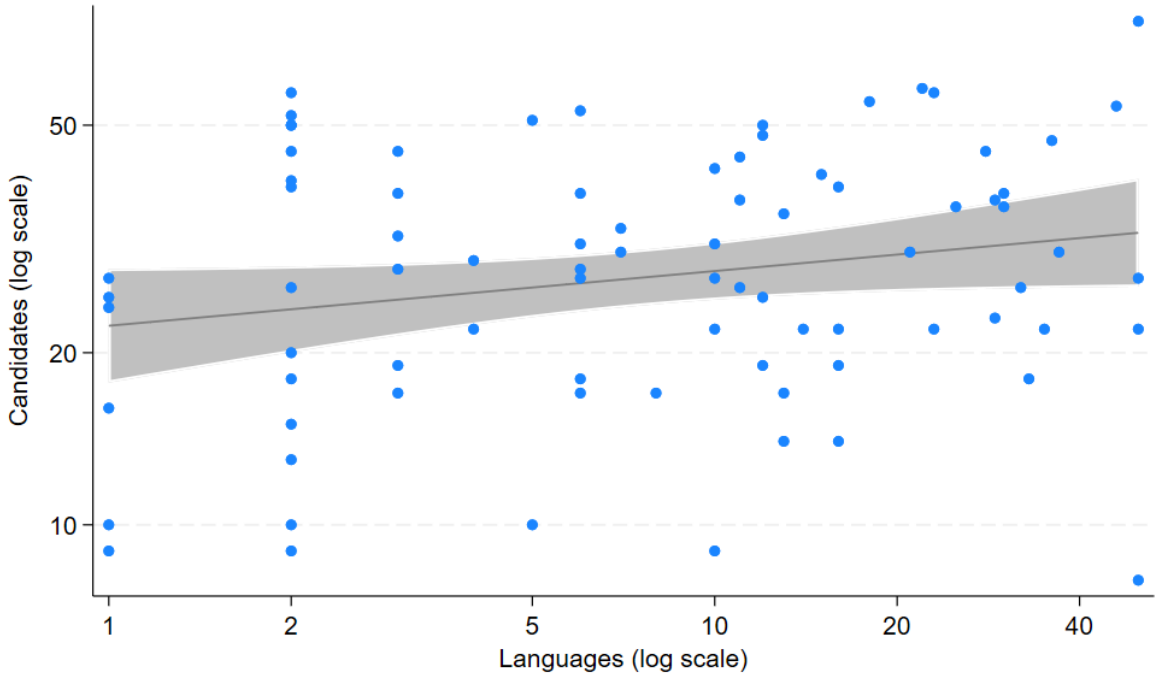


Chart notes: Candidate data from the PNG Election Results database. Language number from Filer et al. (2021).

Table 4 shows regression results in which the natural log of candidate numbers is the dependent variable and the natural log of languages spoken is the independent variable of interest. The candidate data used in all models comes from the 2022 election alone. The first model in Table 4 shows both the bivariate relationship plotted above in Figure 13. The second model adds controls for regional differences. The third model includes other district features that could plausibly affect candidate numbers (specifically: population, electorate land area, how easy it is to travel around the electorate and whether the electorate had an incumbent in 2022).

The first model shows the same relationship present in the chart above. Once regional controls are included the relationship becomes statistically significant at the 5 percent level. In the regression model with other variables included, the relationship between language numbers and candidate numbers becomes clearer still, although many of the other variables which might have been thought to affect candidate numbers do not.

Table 4 – Regression results: candidate numbers and language numbers, 2022

	Candidates (ln)	Candidates (ln)	Candidates (ln)
Languages (ln)	0.10*	0.17**	0.26**
	(0.06)	(0.08)	(0.10)
Good access			0.29
			(0.19)
Population (2000)			-0.00**
			(0.00)
Land area (km2)			0.00
			(0.00)
Incumbent?			-0.43**
			(0.18)
Region			
Islands		-0.63***	-0.73***
		(0.18)	(0.19)
Momase		-0.25	-0.34*
		(0.19)	(0.18)
Southern		-0.14	-0.33*
		(0.17)	(0.17)
Constant	3.10***	3.13***	3.68***
	(0.13)	(0.12)	(0.26)
Observations	82	82	82
R^2	0.04	0.17	0.27

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Electorate size in terms of land area is not associated with candidate numbers. More populous electorates actually have fewer candidates on average once other factors are controlled for (the magnitude of the relationship is small). There are two clear relationships, though. One is already well known: more candidates contest in electorates that do not have incumbents. The other variable, region, is more interesting. Even with other traits controlled for, as is shown by the negative coefficients for Islands, Momase and Southern, more candidates contest in Highlands electorates than do elsewhere.

Table 5 reports on regression models that are identical in form to those presented above, but which use data from all post-1977 elections. To address the impact of incumbency on candidate numbers only those electorates with incumbents in any particular election were included when calculating averages. Because major redistricting occurred prior to the 1977 election it was not possible to determine incumbency. For this reason 1977 was excluded from averages. As can be seen, the results are very similar to those that come from the 2022 elections alone, although the coefficient for the bivariate relationship is no longer statistically significant.

Table 5 – Candidate numbers and language numbers, all elections

	Candidates (ln)	Candidates (ln)	Candidates (ln)
Languages (ln)	0.02	0.10**	0.15***
	(0.04)	(0.05)	(0.05)
Good access			0.19*
			(0.11)
Population (2000)			-0.00**
			(0.00)
Land area (km2)			-0.00
			(0.00)
Region			
Islands		-0.77***	-0.79***
		(0.11)	(0.11)
Momase		-0.28**	-0.30**
		(0.13)	(0.13)
Southern		-0.12	-0.15
		(0.14)	(0.14)
Constant	3.02***	3.06***	3.13***
	(0.10)	(0.09)	(0.13)
Observations	82	82	82
R^2	0.00	0.34	0.38

Robust standard errors in parentheses. Only elections in electorates with incumbents included. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

These findings provide grounds to believe that language is associated to an extent with candidate numbers. However, it is also worth noting what the results do not show: they do not reveal blind, or even strong, loyalty. Variation in the number of languages spoken does not explain much of the variation in candidate numbers. As the differences in the r-squared values between the bivariate models and models with controls added show, much else clearly matters. What is more, there will almost certainly be other features that we could control for that are also important. All else being equal fewer candidates would presumably be likely to stand in elections where electoral violence is an issue.

Our findings also do not necessarily show that language itself is the actual factor contributing to voters' decisions. In neighbouring Solomon Islands, some research suggests that the most relevant unit of collective electoral action is the clan and that relationships between language and electoral outcomes only emerge because clans exist within language groups and not typically across language groups (Wood, 2014). The situation, as with so much in electoral politics in Melanesia, is complex. However, ethnolinguistic fragmentation, as proxied by languages, appears to be broadly correlated with electoral fragmentation.

9 Conclusion

From 1962 until 2008 almost all general elections in PNG were covered in detailed scholarly books focused on the election in question (Hegarty, 1983; Hughes et al., 1965; King, 1989; May et al., 2011; May & Anere, 2002; Oliver, 1989; Saffu, 1996). These books have provided rich, mostly qualitative, insights into electoral politics in PNG. Since 2007, a number of detailed reports based on election observations and associated surveys have also provided a range of important information, particularly electoral quality (Haley & Zubrinich, 2013, 2018; Oppermann & Haley, 2025). Quantitative work on elections that hasn't come in the form of election observation surveys has been rarer, but this body of research has grown in recent years (for example, Filer, Wood, et al., 2021; Ivarature, 2022; Laveil & Wood, 2019; Leng, 2024; Oppermann et al., 2025). Much of this quantitative work has drawn on election results data and has been used to produce systematic studies on the nature of electoral competition in PNG. These studies serve as useful complements to both qualitative and observation-based work. However, obtaining data necessary to conduct this research has not been easy. Election results have become more difficult to obtain and information on other aspects of PNG that can be analysed in conjunction with election data is sparse.

In this paper, we have reported on analysis focused on recently compiled results data on the 2022 general election in PNG. We have covered a range of areas from electoral trends to variations between electorates. We have examined whether election results can be predicted using other available data and we have highlighted some concerning anomalies in the results of the 2022 election. We have also sought to investigate the relationship between electorate traits and election results. Needless to say, we have not been able to cover everything of interest. We have put the data that our work is based on in the public domain.[21] We hope that other researchers will be able to draw on them to further contribute to the scholarly study of electoral politics in PNG.

[21] See: https://pngelections.devpolicy.org/, https://doi.org/10.6084/m9.figshare.16689562.v1, https://doi.org/10.6084/m9.figshare.14456229.v3.

Appendix 1 – Regression results for Hegarty Rule tests

To study the Hegarty Rule used six different approaches. The approaches were as follows:

1. Pooled OLS regressions in which the dependent variable was winner vote share and the independent variable of interest was change in candidate numbers.
2. Pooled logistic regressions in which the dependent variable was whether the winner won or not and the independent variable of interest was change in candidate numbers.
3. Electorate fixed effects models in which we studied how much changes in the dependent variable of interest, winner vote share, differed from the mean for each electorate, and whether this change correlated with differences in candidate numbers.
4. Electorate fixed models identical to those in 3 but using logistic regressions with a binary dependent variable focused on whether the incumbent won or not.
5. First difference models in which the dependent variable was the change in incumbent vote share and the key independent variable of interest was the change in candidate numbers between the election in question and the previous election.
6. First difference logistic regression models in which the dependent variable was whether the incumbent won or not vote and the key independent variable of interest was the change in candidate numbers between the election in question and the previous election.

In all instances, we ran basic bivariate regressions testing the relationship between change in the dependent variable of interest and changes in candidate numbers. We also ran regressions in which we controlled for the number of candidates in the previous election as well the winner's vote share in the previous election.[22] In addition we ran regressions in which year and region fixed effects were included. This was done for all regressions except the electorate fixed effects, in which we included year fixed effects, but not region fixed effects, as regions are supersets of electorates and, as such, do not add additional insights. In all models we excluded electorates in which there was no incumbent in a particular year as well as electorates in which electorate results were not complete for the year in question. We ran all these models for all years for which data were available. We also ran models 5 and 6, focused on changes in candidate numbers, for the 2017 and 2022 elections on their own. Our findings are detailed in the tables below.

[22] The only exception to this the electorate fixed effects model in which the number of candidates was the key dependent variable of interest and so this was not added as a control.

Pooled data

	(1) Vote share	(2) Vote share	(3) Win	(4) Win
Change in ln cand nums	-0.08***	-0.13***	-0.48***	-1.01***
	(0.00)	(0.00)	(0.00)	(0.00)
Number of candidates (ln)		-0.02*		0.18
		(0.07)		(0.23)
Winner v-share previous eln		0.64***		5.16***
		(0.00)		(0.00)
Constant	0.22***	0.12***	-0.01	-1.77***
	(0.00)	(0.00)	(0.83)	(0.00)
Observations	923	897	923	897
R-squared	0.05	0.51		
Count R-squared			0.56	0.64

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Electorate Fixed Effects

	(1) Vote share	(2) Vote share	(3) Win	(4) Win
Number of candidates (ln)	-0.06***	-0.15***	-0.09	-0.55**
	(0.00)	(0.00)	(0.57)	(0.02)
Winner v-share previous eln	0.24***	0.25***	2.00***	2.07***
	(0.00)	(0.00)	(0.01)	(0.01)
Constant	0.33***	0.48***		
	(0.00)	(0.00)		
Two way FE	No	Yes	No	Yes
Observations	897	897	882	882

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

First differences: first preference vote share

	(1) Vote share	(2) Vote share	(3) Vote share	(4) Vote share	(5) Vote share	(6) Vote share
Change in ln cand nums	-0.17***	-0.14***	-0.14***	-0.15***	-0.15***	-0.16***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Winner v-share previous eln		-0.30***	-0.27***	-0.32***	-0.32***	-0.45***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Num cands in prev eln (ln)				-0.01	-0.01	-0.08***
				(0.28)	(0.43)	(0.00)
Constant	-0.02***	0.05***	0.03	0.08**	0.08**	0.24***
	(0.00)	(0.00)	(0.19)	(0.01)	(0.03)	(0.00)
Region FE	No	Yes	Yes	No	Yes	Yes
Year FE	No	No	Yes	No	No	Yes
Observations	843	843	843	843	843	843
R-squared	0.29	0.39	0.42	0.39	0.39	0.45

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

First differences: incumbent wins

	(1) Win	(2) Win	(3) Win	(4) Win	(5) Win	(6) Win
Change in ln cand nums	-0.47***	-0.49***	-0.52***	-0.84***	-0.81***	-0.94***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
Num cands in prev eln (ln)				0.22	0.27*	-0.09
				(0.16)	(0.09)	(0.70)
Winner v-share previous eln				5.67***	5.56***	5.00***
				(0.00)	(0.00)	(0.00)
Constant	-0.06	-0.41***	-0.44	-2.05***	-2.34***	-1.94**
	(0.42)	(0.00)	(0.14)	(0.00)	(0.00)	(0.02)
Region FE	No	Yes	Yes	No	Yes	Yes
Year FE	No	No	Yes	No	No	Yes
Observations	844	844	844	843	843	843
Count R-squared	0.58	0.58	0.61	0.65	0.65	0.65

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

2022 First differences

	(1) Vote share	(2) Vote share	(3) Vote share	(4) Vote share	(5) Win	(6) Win	(7) Win	(8) Win
Change in ln cand nums	-0.22***	-0.24***	-0.23***	-0.25***	-1.08	-1.76**	-1.41*	-2.05**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.13)	(0.03)	(0.06)	(0.01)
Num cands in prev eln (ln)			-0.06*	-0.06			-0.19	-0.58
			(0.09)	(0.11)			(0.78)	(0.48)
Winner v-share previous eln			-0.34***	-0.34***			4.86*	3.18
			(0.01)	(0.01)			(0.05)	(0.20)
Constant	0.03**	0.02	0.31**	0.29*	0.44**	-0.66*	0.02	0.59
	(0.02)	(0.41)	(0.04)	(0.06)	(0.05)	(0.07)	(0.99)	(0.85)
Region FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	87	87	87	87	87	87	87	87
R-squared	0.28	0.30	0.33	0.35				
Count R-squared					0.55	0.71	0.66	0.78

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

2017 First differences

	(1) Vote share	(2) Vote share	(3) Vote share	(4) Vote share	(5) Win	(6) Win	(7) Win	(8) Win
Change in ln cand nums	-0.18***	-0.18***	-0.19***	-0.18***	-1.56**	-1.59**	-2.23**	-2.43***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.04)	(0.01)	(0.01)
Num cands in prev eln (ln)			-0.03	-0.02			-0.25	-0.46
			(0.20)	(0.47)			(0.76)	(0.65)
Winner v-share previous eln			-0.09	-0.06			8.77**	9.40**
			(0.40)	(0.57)			(0.01)	(0.02)
Constant	0.00	0.00	0.13	0.10	-0.22	0.10	-1.19	-0.05
	(0.65)	(0.71)	(0.20)	(0.46)	(0.33)	(0.78)	(0.71)	(0.99)
Region FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	87	87	87	87	87	87	87	87
R-squared	0.35	0.35	0.35	0.34				
Count R-squared					0.63	0.62	0.74	0.76

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Appendix 2 – the Hegarty Rule government and the PNC

2022 Incumbent vote share PANGU, Controlling for government

	(1) Vote share	(2) Vote share	(3) Vote share	(4) Vote share	(5) Vote share
PANGU	0.08***	0.05**	0.06**	0.04*	0.04*
	(0.01)	(0.03)	(0.02)	(0.08)	(0.09)
Government	0.04	0.05*	0.04*	0.04*	0.04*
	(0.21)	(0.06)	(0.09)	(0.06)	(0.09)
Change in ln cand nums		-0.21***	-0.22***	-0.23***	-0.24***
		(0.00)	(0.00)	(0.00)	(0.00)
Num cands in prev eln (ln)				-0.06*	-0.06
				(0.09)	(0.14)
Winner v-share previous eln				-0.28**	-0.28**
				(0.03)	(0.04)
Constant	-0.02	-0.03	-0.02	0.25	0.23
	(0.34)	(0.19)	(0.28)	(0.11)	(0.15)
Region FE	No	No	Yes	No	Yes
Observations	87	87	87	87	87
R-squared (adj)	0.09	0.34	0.36	0.37	0.38

Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

2022 Incumbent Win/Lose PANGU, Controlling for government

	(1) Win	(2) Win	(3) Win	(4) Win	(5) Win
PANGU	0.94*	0.86*	0.30	1.25**	0.60
	(0.06)	(0.09)	(0.61)	(0.03)	(0.32)
Government	0.27	0.31	0.75	0.67	1.09*
	(0.61)	(0.55)	(0.22)	(0.22)	(0.07)
Change in ln cand nums		-0.92	-1.69**	-1.37	-1.96**
		(0.21)	(0.03)	(0.10)	(0.02)
Num cands in prev eln (ln)				-0.22	-0.52
				(0.74)	(0.51)
Winner v-share previous eln				6.51**	4.50*
				(0.02)	(0.08)
Constant	-0.07	-0.08	-1.33**	-1.14	-0.89
	(0.87)	(0.85)	(0.02)	(0.67)	(0.77)
Region FE	No	No	Yes	No	Yes
Observations	87	87	87	87	87
Count R-squared	0.62	0.63	0.72	0.72	0.75

Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

2017 Incumbent vote share PNC

	(1) Vote share	(2) Vote share	(3) Vote share	(4) Vote share	(5) Vote share
PNC	-0.01	-0.01	-0.01	-0.00	-0.01
	(0.50)	(0.73)	(0.70)	(0.77)	(0.68)
Change in ln cand nums		-0.18***	-0.18***	-0.18***	-0.18***
		(0.00)	(0.00)	(0.00)	(0.00)
Num cands in prev eln (ln)				-0.03	-0.02
				(0.21)	(0.47)
Winner v-share previous eln				-0.08	-0.07
				(0.41)	(0.57)
Constant	0.02	0.01	0.01	0.13	0.10
	(0.26)	(0.57)	(0.56)	(0.20)	(0.44)
Region FE	No	No	Yes	No	Yes
Observations	87	87	87	87	87
R-squared	-0.01	0.35	0.34	0.35	0.33

Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

2017 Incumbent Win/Lose PNC

	(1) Win	(2) Win	(3) Win	(4) Win	(5) Win
PNC	-0.30	-0.24	-0.44	-0.34	-0.60
	(0.49)	(0.59)	(0.37)	(0.49)	(0.27)
Change in ln cand nums		-1.54**	-1.54**	-2.19**	-2.37**
		(0.03)	(0.05)	(0.01)	(0.01)
Num cands in prev eln (ln)				-0.25	-0.55
				(0.76)	(0.59)
Winner v-share previous eln				8.91**	9.35**
				(0.01)	(0.02)
Constant	0.00	-0.09	0.37	-1.04	0.64
	(1.00)	(0.79)	(0.42)	(0.75)	(0.88)
Region FE	No	No	Yes	No	Yes
Observations	87	87	87	87	87
Count R-squared	0.54	0.60	0.64	0.75	0.74

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

2022 Incumbent vote share PNC

	(1) Vote share	(2) Vote share	(3) Vote share	(4) Vote share	(5) Vote share
PNC	-0.09**	-0.08***	-0.07**	-0.08***	-0.07***
	(0.02)	(0.01)	(0.01)	(0.00)	(0.01)
Change in ln cand nums		-0.22***	-0.23***	-0.23***	-0.25***
		(0.00)	(0.00)	(0.00)	(0.00)
Num cands in prev eln (ln)				-0.07*	-0.07*
				(0.06)	(0.08)
Winner v-share previous eln				-0.33***	-0.33***
				(0.01)	(0.01)
Constant	0.04***	0.04***	0.03	0.35**	0.33**
	(0.00)	(0.00)	(0.15)	(0.02)	(0.04)
Region FE	No	No	Yes	No	Yes
Observations	87	87	87	87	87
R-squared (adj)	0.05	0.32	0.33	0.37	0.38

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

2022 Incumbent Win/Lose PNC

	(1) Win	(2) Win	(3) Win	(4) Win	(5) Win
PNC	-1.08*	-1.07*	-1.13	-1.51**	-1.66**
	(0.08)	(0.07)	(0.12)	(0.02)	(0.04)
Change in ln cand nums		-1.07	-1.71**	-1.48*	-2.05**
		(0.14)	(0.03)	(0.05)	(0.01)
Num cands in prev eln (ln)				-0.42	-0.75
				(0.57)	(0.37)
Winner v-share previous eln				4.96**	3.64
				(0.04)	(0.12)
Constant	0.61**	0.61**	-0.47	1.01	1.30
	(0.01)	(0.02)	(0.21)	(0.72)	(0.68)
Region FE	No	No	Yes	No	Yes
Observations	87	87	87	87	87
Count R-squared	0.64	0.62	0.72	0.70	0.80

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Appendix 3 – candidate number regressions using fragmentation indices

The tables below report on the findings from similar regressions that differ from those presented in the main text in one important way: in both tables presented here the measures of language and candidate fragmentation are no longer candidate numbers; they are the fragmentation indices, which take into account differences between candidates who won large shares of the vote and candidates who won very little, and between languages spoken by most of an electorate and languages spoken by very few people. In both instances the measure used to capture fragmentation this is a standard one from the study of ethnolinguistic fragmentation and the study of electoral fragmentation (ELF). The measure is the reciprocal of the Herfindahl-Hirschman Index. (Which we refer to here as the "Effective number of languages" and the "Effective number of candidates".) The first table presents results using only the 2022 election results. The second presents results from regressions run on averages across all post-1977 elections.

The depended variable in both sets of regressions is the Effective Number of Candidates.

The relationship between ethnolinguistic fragmentation and electoral fragmentation measured using fragmentation indices. 2022 data.

	(1)	(2)	(3)
ELF (ln)	0.20	0.51***	0.58***
	(0.19)	(0.17)	(0.18)
Good access			0.47**
			(0.20)
Population (2000)			-0.00**
			(0.00)
Land area (km2)			0.00
			(0.00)
Incumbent?			-0.55**
			(0.26)
Region			
Islands		-0.68***	-0.67**
		(0.25)	(0.29)
Momase		-0.53***	-0.45**
		(0.19)	(0.19)
Southern		-0.24	-0.33
		(0.18)	(0.23)
Constant	2.23***	2.67***	3.34***
	(0.10)	(0.16)	(0.42)
Observations	74	74	74
R^2	0.02	0.14	0.25

Robust standard errors in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The relationship between ethnolinguistic fragmentation and electoral fragmentation measured using fragmentation indices. Averages all post 1977 elections

	(1)	(2)	(3)
Elf (ln)	0.07	0.31***	0.35***
	(0.12)	(0.11)	(0.10)
Good access			0.20
			(0.13)
Population (2000)			-0.00*
			(0.00)
Land area (km2)			0.00
			(0.00)
Region			
Islands		-0.77***	-0.74***
		(0.14)	(0.15)
Momase		-0.36***	-0.31**
		(0.13)	(0.15)
Southern		-0.16	-0.17
		(0.15)	(0.16)
Constant	2.35***	2.71***	2.82***
	(0.07)	(0.14)	(0.22)
Observations	76	76	76
R^2	0.01	0.29	0.33

Robust standard errors in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Appendix 4 – Summary statistics, language and candidate regressions

	Mean	Std Dvn	Min	Max	N
Candidates 2022	30.80	13.76	8.00	76.00	96
Candidates (mean across elections)	22.85	8.56	8.33	40.44	82
Candidate fragmentation (ELF) 2022	10.15	5.79	1.89	29.42	92
ENC (mean across elections)	11.81	5.07	3.95	28.71	82
Languages	13.34	13.48	1.00	50.00	82
Linguistic fragmentation (ELF)	0.64	0.28	0.00	0.99	82
Good access	0.48	0.41	0.00	1.00	82
Population (2000)	56,427	19,005	27,048	124,628	82
Land area	4,526	5,755	56	31,864	82

References

Baker, K. (2025). Practising Politics in a Disorderly Democracy. *Australian Journal of Politics & History*. https://doi.org/https://doi.org/10.1111/ajph.70018

Easterly, W., & Levine, R. (1997). Africa's growth tragedy: Policies and ethnic divisions. *Quarterly Journal of Economics*, *112*(4), 1203-1250.

Eifert, B., Miguel, E., & Posner, D. N. (2010). Political Competition and Ethnic Identification in Africa. *American Journal of Political Science*, *54*(2), 494-510. https://doi.org/10.1111/j.1540-5907.2010.00443.x

Filer, C., Fraenkel, J., & Wood, T. (2021). *Papua New Guinea District Level Dataset*. Retrieved 20/10/25 from https://doi.org/10.6084/m9.figshare.14456229.v3

Filer, C., Wood, T., & Henry, I. (2021). Why Do So Many MPs Lose their Seats in PNG? *Development Policy Centre Discussion Paper*, *2021*(96), 1-31.

Flanagan, P. (2017). *Book cooking and the PNG election*. Retrieved 3/08/17 from http://www.eastasiaforum.org/2017/07/27/book-cooking-and-the-png-election/

Flanagan, P. (2017a). *PNG's Electoral Bias Indicators –PNC's near 300,000 Ghost Voters and Mathematical Impossibilities*. Retrieved 25/3/19 from http://pngeconomics.org/2017/07/pngs-electoral-bias-indicators-pncs-near-30000-ghost-voters-and-mathematical-impossibilities/

Fraenkel, J. (2024). Can Law Manufacture a Party System? The Papua New Guinea and Solomon Islands Experience with Party-Strengthening Legislation. *Australian Journal of Politics & History*, *70*(3), 513-531. https://doi.org/https://doi.org/10.1111/ajph.12931

Habyarimana, J., Humphreys, M., Posner, D. N., & Weinstein, J. M. (2009). *Coethnicity: diversity and the dilemmas of collective action*. Russell Sage Foundation.

Haley, N. (1997). Election Fraud on a Grand Scale: the Case of the Koroba-Kopiago Open Electorate. In R. May & R. Anere (Eds.), *Maintaining Democracy: The 1997 Elections in Papua New Guinea* (pp. 123-139). University of Papua New Guinea.

Haley, N., & Zubrinich, K. (2013). *2012 Papua New Guinea General Elections Domestic Observation Report*. Cardno Emerging Markets. Canberra

Haley, N., & Zubrinich, K. (2018). *2017 Papua New Guinea General Elections: election observation report*. Department of Pacific Affairs. Canberra

Hegarty, D. (1982). *Electoral Vulnerability in Papua New Guinea* Political Studies Seminar, University of Papua New Guinea.

Hegarty, D. (1983). The 1977 national elections in Papua New Guinea - an overview. In D. Hegarty (Ed.), *Electoral Politics in Papua New Guinea: Studies on the 1977 National Elections* (pp. 1-17). University of Papua New Guinea Press.

Henderson, S., & Boneo, H. (2013). *Australian Aid for Electoral Assistance in Papua New Guinea 2000-2012 - independent evaluation*. Department of Foriegn Affairs and Trade. Canberra

Howes, S., Davies, M., Fox, R., Laveil, M., Pandey, M., Samof, K., & Sum, D. (2025). *Struggle, reform, boom and bust: an economic history of Papua New Guinea since independence*. ANU Press.

Hughes, C. A., van der Veur, P. W., & Bettison, D. G. (1965). The Elections: An Overview. In D. G. Bettison, C. A. Hughes, & P. W. van der Veur (Eds.), *The Papua New Guinea Elections 1964* (pp. 388-429). The Australian National University.

Ivarature, H. (2022). A hidden dimension of political instability: Insights from ministerial duration in Papua New Guinea from 1972 to 2017. *Asia & the Pacific Policy Studies*.

Kabuni, M., & Howes, S. (2022). *Prime ministerial incumbency bias in PNG*. Retrieved 30/1/2023 from https://devpolicy.org/prime-ministerial-incumbency-bias-in-png-20220502/

Kabuni, M., Laveil, M., Milli, G., & Wood, T. (2022). Elections and politics. In S. Howes & L. N. Pillai (Eds.), *Papua New Guinea: government, economy and society* (pp. 17-56). ANU Press.

King, P. (1989). *PANGU returns to power: the 1982 elections in Papua New Guinea*. University of Papua New Guinea.

Laveil, M. (2020). *PNG: where voter turnout is too high*. Retrieved 29/10/20 from https://devpolicy.org/png-where-voter-turnout-is-too-high-20200916/

Laveil, M. (2021a). *Hasten slowly: PNG's redistricting challenge*. Retrieved 15/1/2023 from https://devpolicy.org/hasten-slowly-pngs-redistricting-challenge-20211221/

Laveil, M. (2021b). *PNG's stand-out elections of 2002*. Retrieved 3/10/2025 from https://devpolicy.org/pngs-stand-out-elections-of-2002-20210505-2/

Laveil, M. (2022). *PNG's election a violent event*. Retrieved 15/12/22 from https://www.lowyinstitute.org/the-interpreter/png-s-election-violent-event

Laveil, M., & Wood, T. (2019). The 2017 election in Papua New Guinea. *Development Policy Centre Discussion Paper*, *83*.

Leigh, A., & Wolfers, J. (2006). Competing Approaches to Forecasting Elections: Economic Models, Opinion Polling and Prediction Markets. *NBER Working Paper Series*, *2006*(12053).

Leng, A. (2024). Are government ministers more likely to be re-elected? Evidence from Papua New Guinea. *Development Policy Centre Discussion Paper*(111). https://devpolicy.org/publications/are-government-ministers-more-likely-to-be-re-elected-evidence-from-papua-new-guinea/

May, R. (2022). *State and Society in Papua New Guinea, 2001–2021*. ANU Press.

May, R. J. (2003). Disorderly democracy: political turbulence and institutional reform in Papua New Guinea. *State, Society and Governance in Melanesia Discussion Paper*, *2003*(2).

May, R. J., Anere, R., Haley, N., & Wheen, K. (2011). *Election 2007: The Shift to Limited Preferential Voting in Papua New Guinea*. National Research Institute. http://www.jstor.org/stable/j.ctt4cg5t3

May, R. J., & Anere, R. e. (2002). *Maintaining democracy: the 1997 elections in Papua New Guinea*. Australian National University.

Oliver, M. (1989). *Eleksin: the 1987 national election in Papua New Guinea*. University of Papua New Guinea.

Oppermann, T., & Haley, N. (2025). *Informalisation and Electoral Inequality: Report on the 2022 Papua New Guinea General Election*. Department of Pacific Affairs. Canberra

Oppermann, T., Haley, N., & Wiltshire, C. (2025). Voting Methods and Their Distribution in Papua New Guinea. *Department of Pacific Affairs Discussion Paper*, *2025*(1), 1-30.

Papua New Guinea Electoral Commission. (2017). *Report to the Tenth Naional Parliament on the Conduct of the 2017 National Election*. Papua New Guinea Electoral Commission. Port Moresby

Posner, D. N. (2005). *Institutions and Ethnic Politics in Africa*. Cambridge University Press.

Reilly, B. (2002). Back to the Future? The Political Consequences of Electoral Reform in Papua New Guinea. *The Journal of Pacific History*, *37*(2), 239-253.

Reilly, B. (2021). *Assessing the shift to Limited Preferential Voting in PNG* Conference Paper Presented at: Learning About Papua New Guinea and How it Works, Canberra. https://www.researchgate.net/publication/355131845_Assessing_the_shift_to_Limited_Preferential_Voting_in_PNG

Reilly, B., & Phillpot, R. (2002). "Making democracy work" in Papua New Guinea - Social capital and provincial development in an ethnically fragmented society. *Asian Survey*, *42*(6), 906-927.

Saffu, Y. (1989). Survey Evidence on Electoral Behavior in Papua New Guinea. In M. Oliver (Ed.), *Eleksin: the 1987 national election in Papua New Guinea* (pp. 15-36). University of Papua New Guinea.

Saffu, Y. (1996). Continuity and Change in PNG Electoral Politics. In Y. Saffu (Ed.), *The 1992 Papua New Guinea Election: Change and Continuity in Electoral Politics* (pp. 1-42). Department of Political and Social Change, Research School of Pacific and Asian Studies.

Standish, B. (2003). Papua New Guinea's Most Turbulent Election. *Catalyst*, *33*(2), 130-148.

Standish, B. (2007). The dynamics of Papua New Guinea's democracy: an essay. *Pacific Economic Bulletin*, *22*(1), 135-157.

Transparency International. (2022). *TIPNG Domestic Election Observation Report 2022*. Transparency International Papua New Guinea. Port Moresby

Transparency International PNG. (2017). *TIPNG Observation Report: 10th National Parliamentary Elections*. Transparency International Papua New Guinea Inc. Port Moresby

Wangi, T., & Wood, T. (2019). Using name standardisation to track candidate and MP performance over time in Papua New Guinea. *Development Policy Centre Discussion Paper*, *84*.

Wood, T. (2014). *Ties that Unbind? Ethnic Identity, Social Rules and Electoral Politics in Solomon Islands* [Ph.D thesis, Australian National University]. Canberra.

Wood, T. (2015). The Three Political Economies of Electoral Quality in Papua New Guinea and Solomon Islands. *Development Policy Centre Discussion Paper*, *43*.

Wood, T. (2017). Papua New Guinea election results: trends and patterns 1972-2012. *Development Policy Centre Discussion Paper*, *55*.

Wood, T. (2018). The clientelism trap in Solomon Islands and Papua New Guinea, and its impact on aid policy. *Asia & the Pacific Policy Studies*, *5*(3), 481-494. https://doi.org/doi:10.1002/app5.239

Wood, T. (2025). *The Papua New Guinea Election Results Database*. Retrieved 2/10/2025 from https://pngelections.devpolicy.org/

Wood, T., Laveil, M., & Kabuni, M. (2021). What has limited preferential voting changed in Papua New Guinea? *Development Policy Centre Discussion Paper*, *2022*(101), 1-36. https://devpolicy.org/should-png-abandon-lpv-20210910/

Wood, T., Laveil, M., & Kabuni, M. (2023). Troubles and Puzzles: The 2022 General Elections in Papua New Guinea. *The Journal of Pacific History*, *58*(4), 444-466. https://doi.org/10.1080/00223344.2023.2248008