Possible Results of Proportional-voting Systems for Seattle Port Commission Elections

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1 Overview

Our analysis of the 2017 elections to the Seattle Port Commission showed that a semi-proportional voting system could have led to an outcome that more closely reflects the ethno-racial makeup of King County. This paper looks at more elections. We also project results under explicitly proportional systems.

Going back to 2011, we find evidence of increasing slate coordination and geographic polarization under the existing, nonpartisan, top-two system. This likely has an ethno-racial dimension. Then we simulate outcomes under four potential, proportional systems: five seats county-wide, nine seats county-wide, a five-seat system with two multi-seat districts, and a nine-seat system with two multi-seat districts. In fifteen of those sixteen simulations, and assuming the same voting behavior, proportional voting would have given the slate with the most votes a majority on the Commission. Finally, we are able to simulate candidate-level outcomes for two countywide plans in 2017, and these results reflect significant ethno-racial diversity.

Data limitations stop us from comparing our simulated results to the actual slate balance of the Commission, 2011-17. Our analysis uses first-round races to get the cleanest possible measure of voter sentiment. In 2013, there was no first-round election for two of the three contested seats. That means we cannot say which Commission members would have been on what slates for two of the four elections we consider. Readers with local knowledge can consult our tables to form their own conclusions.

2 Recap of earlier findings

Our last paper found that a white, suburban/rural majority had won all three seats contested. Only two persons of color had won seats to that body in its century-long history. Focusing on ethno-racial voting patterns in 2017, we found polarization between Black and Hispanic-Latino voters and that Asians were a less cohesive block. We relied on tract-level voting-age population rates from the U.S. Census' 2012-6 American Community Survey.

The rest of the paper looked at two possible re-runs of the 2017 first-round election. One involved single-member districts. Given residential dispersion of Asians and Hispanics, we tried to draw nine districts under an expanded, nine-seat Commission. The idea was that a larger Commission would make it easier to draw at least one district for each group. That map did not help Asians nor Hispanics and left Blacks with one influence district.

Then we showed that a "three-vote" system might have led to a more representative result. In that simulation, every voter could cast three votes, with the top five vote-getters winning seats. Figure 1 reproduces the result from the key simulation in our first paper.[2]

Later in this paper, we show that a purely proportional, five-seat, countywide system might have led to three of the same winners: Ahmed Abdi, Stephanie Bowman, and Ryan Calkins. Other winners in that system might have been Bea Querido-Rico and Lisa Espinosa.

The systems we consider here treat candidates as groups or teams. Under these systems, a vote for one member of a team can help elect another member of that team. Some readers will be familiar with "multi-winner ranked-choice voting," a.k.a. the single transferable vote. Available data make us simulate party-based forms of proportional representation. Our projections are similar to what one might see under a ranked-ballot system in which voters kept their rankings within their preferred team. We cover these issues in detail in section 4.1. The next section covers the nature and extent of party-like competition in recent Port Commission races.

3 Slate coordination in voting patterns

Even though Port Commission elections are formally nonpartisan, we find that voters and candidates tend to sort into two groups. As shorthand, we term these the "rural slate" and "urban slate." We do not claim knowledge of whether candidates explicitly campaign as teams (e.g., by telling their supporters to vote only for a slate), nor whether candidates brand themselves in these ways. What is clear, however, is
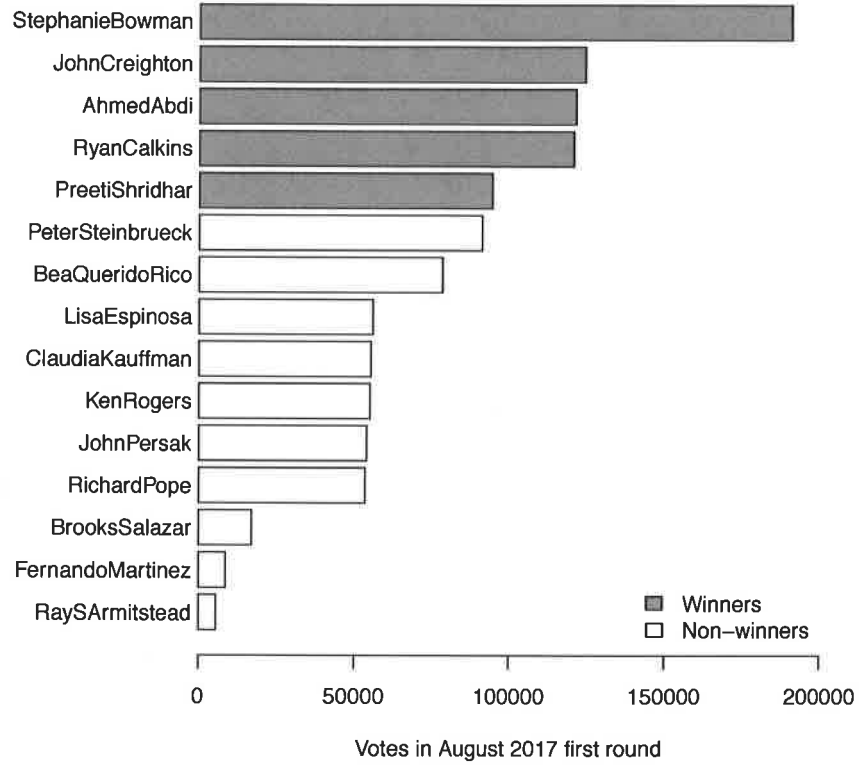
Figure 1: Hypothetical election result from a three-vote, five-seat system, using the 2017 first-round result as proxy for voters' factional preferences.

that voters and candidates tend to sort into two opposing groups. That is normal behavior in any political system. We expect it especially in a system like the current one, where a group that runs too many candidates in the first round risks not getting any into the second or "runoff."

We detect slate voting from the correlation structure of election returns, 2011 to 2017. For each election, we aggregated results from precincts to the census-tract level. We did this because precinct boundaries changed, census tracts did not, and changing precinct boundaries respected those of census tracts, except in very few cases. We rely on first-round data in order to get the clearest picture of how voters and candidates array themselves in advance of an election cycle. Votes for "blank" are omitted. For each election, we analyze the principal components (PCA) of candidates' tract-level vote shares.[1] Vote shares are calculated overall, not at the position level.[2] Table 1 shows which candidates appeared in which groups.

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[1]We use the `principal()` command in the `psych` package for R. A candidate is on the rural (urban) slate if their first-dimension factor loading is greater (lesser) than 0.5 (or -0.5). Candidates with loadings between 0.5 and -0.5 are labeled "other." The proportions of variance explained by one dimension are 0.89 (2011), 0.75 (2013), 0.51 (2015), and 0.59 (2017).

[2]This is for good reason. Say there are two posts to fill. A smart slate will field two strong candidates and ask its voters to pick those two. If all types of voters are identically distributed across precincts, all precincts should reflect identical vote-share distributions, which would be identical to the countywide distribution. The fact that voters are not distributed in that way is what lets us detect slates in aggregate voting data.

Candidate	2011	2013	2015	2017
Abdi	-	-	-	urban
Armitstead	-	-	-	rural
Bowman	-	urban	-	rural
Bryan	-	-	rural	-
Bryant	rural	-	-	-
Calkins	-	-	-	urban
Creighton	-	-	-	other
Espinosa	-	-	-	rural
Felleman	-	-	urban	-
Goodspaceguy	-	-	rural	-
Gregoire	-	-	urban	-
Hennon	-	-	rural	-
Kauffman	-	-	-	rural
Krohn	-	-	other	-
Martinez	-	-	-	other
Naubert	-	-	rural	-
Persak	-	-	-	urban
Pilloud	-	rural	-	-
Pope	rural	-	rural	rural
Reandeau	-	-	rural	-
Querido-Rico	-	-	-	rural
Rogers	-	-	rural	rural
Salazar	-	-	-	rural
Shridhar	-	-	-	urban
Sigler	-	-	other	-
Steinbrueck	-	-	-	other
Tarleton	urban	-	-	-
Willard	urban	-	-	-
Wolfe	-	rural	-	-
Yoshino	-	-	other	-

Table 1: Candidates' revealed groupings, by first-round election.

On average, both slates do their best to get candidates into runoff elections. Figure 2 gives visual evidence of that coordination. Dots represent candidates: black for the rural slate, grey for the urban slate, and empty dots for other candidates. (Note that some dots overlap.) Values along the y-axis are candidates' shares of votes, computed as proportions of all votes cast in a given first-round election. Values along the the x-axis are candidate rankings on the respective "list" of candidates, determined by their vote shares. Slates are identified by color, with black dots representing the rural slate, grey dots for the urban slate, and empty dots for other candidates. (Note that some dots overlap.) Lines represent the fits of linear regressions, one for each slate, of candidates' vote shares on their rankings.

Urban voters tend to concentrate on one or two strong candidates. This is clear from the relatively steeper slope of the urban votes-ranking relationship. The rural group also tends to be strategic, nominating two or three strong candidates. Only in 2017 did we see the rural slate hold a "laissez-faire," five-candidate competition for Position 4.
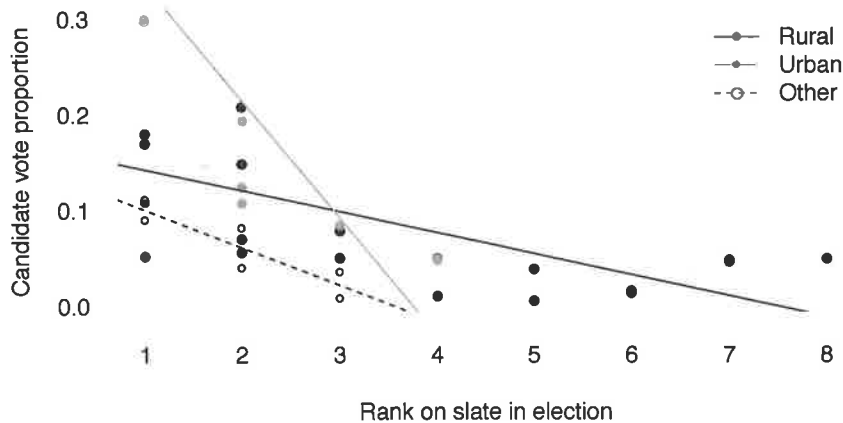

Figure 2: Slate coordination in first-round elections, 2011-17. Rank is determined by the candidate's vote share within the slate.

The dashed line for "other" shows that some candidates do not fit neatly into the rural/urban dimension of Port Commission electoral competition. They nonetheless are minor players, occasionally drawing support from the more cohesive slates. For example, in 2015, Marion Yoshino drew support from rural and urban regions of King County, edging out rural-supported Richard Pope in the primary. Yoshino went on to lose to urban-supported Fred Felleman in the runoff. In 2017, Martinez was in

this candidate cluster, with most support from southwest King County.

Ethnicity and race also appear to affect candidate support, depending the ethno-races of other candidates running. The clearest example is with Stephanie Bowman. While popular across the county, Bowman received relatively more support from urban Seattle when competing against Andrew Pilloud and Michael Wolfe in 2013. But her support shifted to a more rural base in 2017, when several non-white candidates challenged her in the first round, and when she faced Ahmed Abdi in the runoff.

We suspect an ethno-racial factor has made slate voting more pronounced. The following set of maps will illustrate. For each election, we aggregate all votes for "urban" and "rural" candidates in each census tract, then construct a "two-slate" vote. This is similar to the two-party vote, widely used in national politics.

Figure 3 gives the maps. With the increasing entry of candidates of color, a sharp distinction is emerging between the urban core and areas farther from it. For each election, tracts are shaded according to whether the rural group won 50 percent or more of votes. In the lightest tracts, the urban group wins 75 percent or more of votes. In the darkest ones, the rural group wins 75 percent or more of votes. Our results are starkest for 2017, with urban-slate majorities confined to city center, and the rural vote increasing as one moves out from it.[3]

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[3]This pattern is not present in 2011. We suspect that (a) whatever conflict now structures voting began to emerge in 2013 or (b) the 2011 election was a brief departure from it.
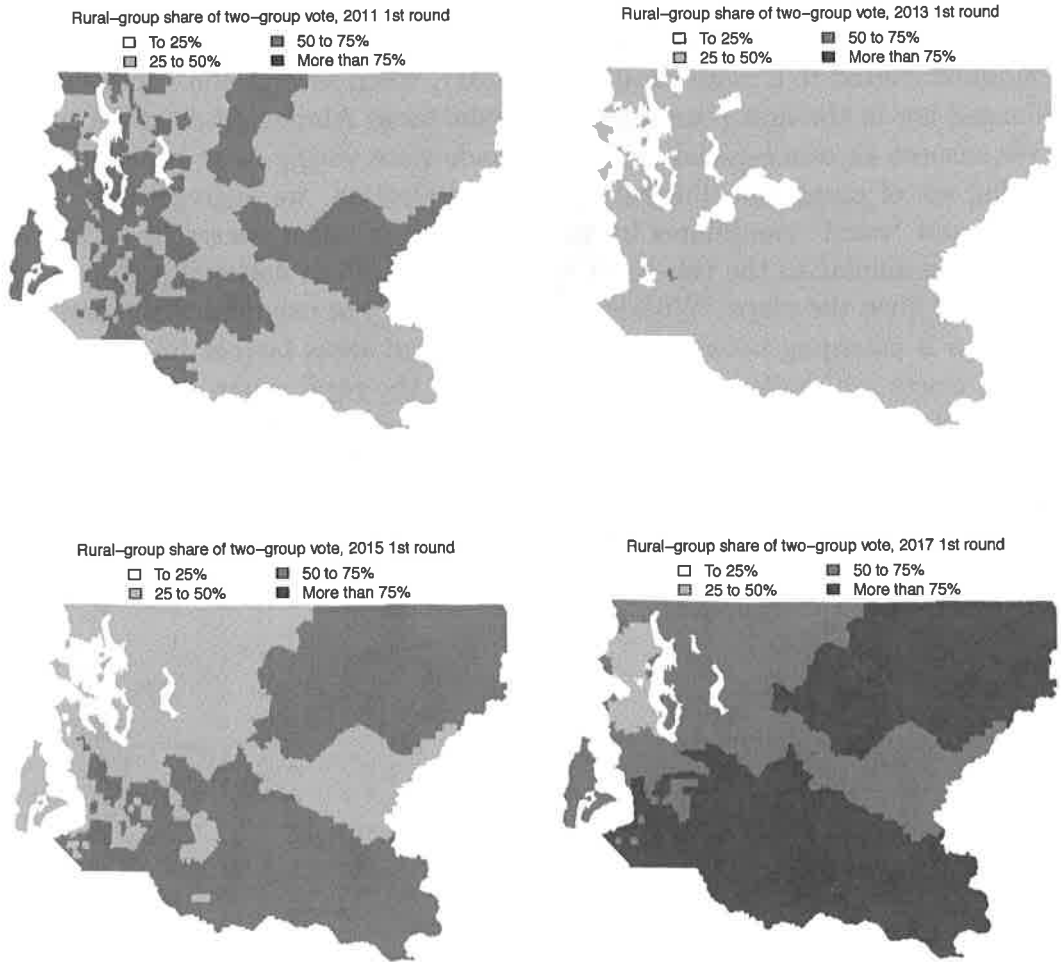
Figure 3: The two-slate, urban-rural vote from 2011-17, by census tract. White tracts reflect missing data.

4 Proportional-voting seat projections

We were asked to project outcomes under proportional representation (PR). Broadly speaking, PR methods award seat shares to groups that better reflect those groups' strength in the electorate. We simulated outcomes under four alternatives for each of the past four Port Commission elections. Of the sixteen simulations, fifteen deliver seat majorities consistent with electoral pluralities. All sixteen also deliver urban and rural seats alike. We begin the discussion by noting which slate had the most votes in each first-round election (Figure 4).
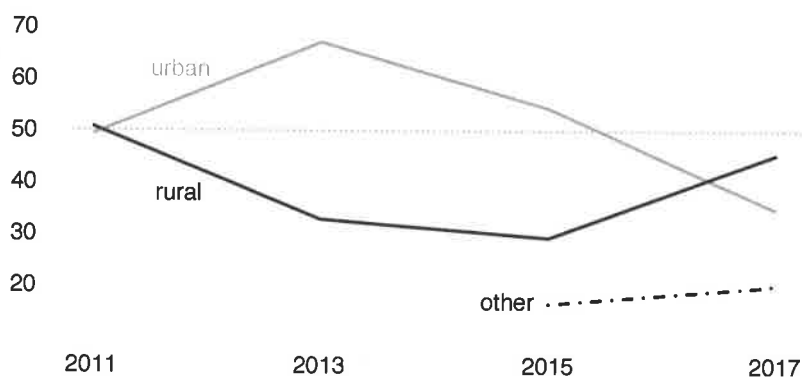

Figure 4: Groups' percentages of first-round votes, 2011-17.

4.1 PR voting options

The proportional systems we simulate are based on simple formulas. As the number of seats in a district rises, the number of votes needed to win one falls (the quota).[4] Out of necessity, we simulate an open-list-proportional (OLPR) system. This means urban and rural slates are treated as party lists.[5] For every quota of votes a slate receives, one of its candidates is elected. Candidates are elected in the order they

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[4]Technically speaking, we simulate list-based systems with a Hare quota and largest-remainder allocation.

[5]We drop the "other" grouping because it is not always cohesive. Sometimes that group wins seats in simulations that include them. We nonetheless do not want to mislead readers. Sometimes there are very few "other" candidates, and they appear to coordinate as a block. In other elections, however, "other" is an amalgam of apparently unrelated candidacies.

appear on a party list. The number of votes a candidate receives determines their list position.[6]

More common in the United States is multi-winner ranked-choice voting, also known as the single transferable vote (STV). Voters rank candidates in order of their preference. Like the system we simulate, a winning candidate in STV must achieve a quota. The main difference from list-PR is that votes in excess of a quota transfer to voters' next-ranked candidates. Reformers often note that the ranked ballot lets a voter split their ticket, e.g., first choice for a Democrat, second for a moderate Republican. In practice, however, slate coordination in STV means keeping rankings within a slate. When it works, this makes STV very much like OLPR.

We cannot directly simulate STV because we do not know whom voters would have ranked below their first choices. That said, STV results would be similar to those in OLPR, provided each slate could convince voters to keep their rankings within that slate.

Our first two simulations treat the county as a single district. One uses the current assembly size of five. This yields a quota of 20 percent of valid votes. A second simulation assumes nine seats, which is the size of the King County Council. A quota in the nine-seat body is just about 11 percent of votes (i.e., $100 \div 9$).

Our second group of simulations splits King County into two multi-seat districts. We used northern and southern districts for several reasons. First, this reflects historically different settlement patterns. It also keeps urban and rural electorates in both districts, connected to large sections of the port. Finally, this split respects increasing entry by "other" candidates in the southwest of the county.

Figure 5 displays two possible boundary configurations for a two-district system. Light shading reflects the average, urban-slate vote share. First is a five-seat body, retaining the Commission's current size. The light-green boundary represents that split, with a three-seat district in the north and a two-seat district in the south. Under this this 3/2 split, both districts include some urban- and rural-leaning tracts, as shown by the shading.

Similarly, a nine-seat Port Commission could be elected from two districts, one of four seats and one of five, shown by the dashed boundary. That would make the northern, five-seat district slightly smaller than the hypothetical three-seat district. Again, we expect both rural and urban voters to be able to compete in both districts as long as the seat-allocation formula is proportional, e.g., quota-based or along the lines of the "three-vote" system in our first report.

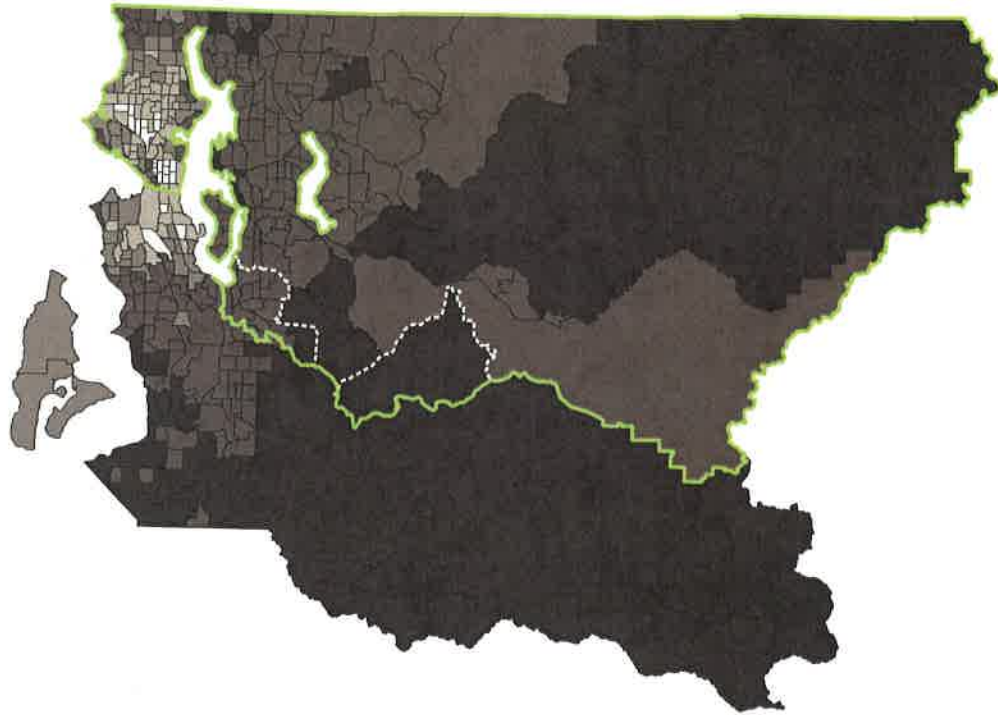[6]In a closed-list system, party leaders determine the list order.

Figure 5: Hypothetical district splits with average, urban-vote strength in light shading, based on 2011-17 candidate vote shares. The bright, green line is the district split for a five-seat council. The light, dashed line shows how that boundary changes for our nine-seat, two-district simulation. The larger district is in the north under both scenarios.

4.2 Projected PR outcomes

Using our measure of slate coordination, we project PR results for each of the four first-round elections, under each of the four districting schemes. Note that each scheme assumes a single-shot election, not the staggered system now in use.

Bar charts in Figure 6 give our slate-level results. In every scheme but that with nine seats and two districts, the slate with a plurality of votes wins a majority of seats in each election. Only in the 2011 election do we see the runner-up slate in votes receive a seat majority. Were we to include the "other" group, that group would get seats in both elections where it appears: 2015 and 2017. Again, we refrain from including "other" because only sometimes does it make sense to treat that grouping as a block.

For our countywide simulations, we also can say which candidates might have won in 2017. (There were not enough candidates in the three earlier elections to make candidate-level projections.) This is done by using each candidate's vote total to determine their position on each slate's hypothetical "party list." If a slate's vote share earns it three seats, for example, we then give those seats to the top three people on its list. These winners are:

- Five-seat system: Abdi (urban), Bowman (rural), Calkins (urban), Espinosa (rural), and Querido-Rico (rural).

- Nine-seat system: Abdi (urban), Bowman (rural), Calkins (urban), Espinosa (rural), Kauffman (rural), Persak (urban), Querido-Rico (rural), Rogers (rural), Shridhar (urban).

Under a ranked-choice form of proportional voting, Creighton and possibly Steinbrueck likely would replace the weakest vote-getter(s) in the winner pools above. Both outperformed at least one winner from a slate.

Note that both nine-seat simulations are responsive to voter sentiment. That is due to the large number of seats, which reduces the quota, and makes the seats-votes correspondence more proportional.

Introducing districts can affect responsiveness, however. In 2011, the map we drew creates an urban seat majority when most voters voted rural. Similarly, in 2017, the districted plan appears to magnify the rural vote plurality. That is because urban votes are concentrated in Seattle, as shown in the bottom-right panel of Figure 3.

We stress that there are many ways to draw multi-seat districts. One could change the number of seats in each, their boundaries, or both. One also could change the
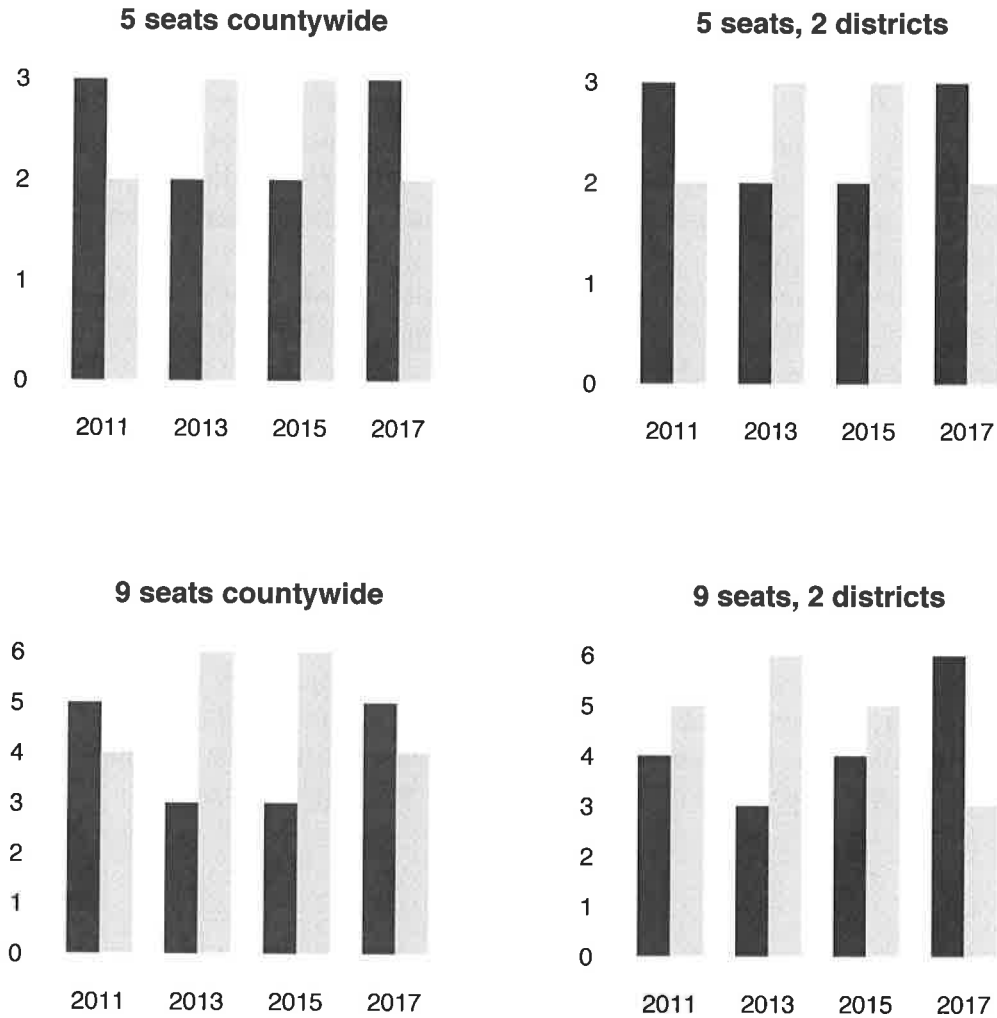
Figure 6: Projected seats for rural (dark) and urban (light) slates under four potential, proportional systems.

size of the assembly. Each of these adjustments could affect the results one gets from PR voting. So could the choice of a different PR method.

5 Conclusion

Our analysis of Port elections from 2011-2017 gives evidence of coordinated voting behavior. On average, both the rural and urban "slates" run just a few strong candidates, with a bit more fragmentation in the rural-candidate group. This is more or less in line with expectations about how electoral systems shape candidate and voter coordination.

In addition, we find increasing geographic polarization, which may have an ethno-racial dimension. This polarization is clearest for the 2017 first round, when several candidates of color ran for the first time.

We also find occasional support for alternative candidates, either those with countywide appeal, or Hispanic-preferred candidates in the southwest of the county. These "other" candidates do win seats in simulations not shown here, which might change the balance of power on the Port Commission. We qualify that observation, though, because "other" was a residual category. It does not always vote as a block.

The nature of political representation will vary with assembly size, the number of districts, the size of those districts, and how the lines are drawn. For example, in one of our scenarios, a minority of voters wins a majority of seats due to district lines. Further, a larger number of seats would allow smaller groups of voters to elect winning candidates. Candidates with countywide appeal, such as Marion Yoshino, would be most competitive under a PR system without districts.

About the authors

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[2] Jack Santucci and Michael Latner. Voting system options for the Seattle Port Commission. May 2018.