

Moral Hazard in Electoral Teams: List Rank and Campaign Effort*

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Abstract

How do parties motivate candidates to exert effort in closed-list elections, where seat outcomes are uncertain only for candidates in marginal list positions? We argue that parties can solve this moral hazard problem by committing ex ante to allocate higher offices in government, such as cabinet portfolios, monotonically with list rank. Under this schedule of compensation, parties have incentives to rank candidates in order of quality (under some conditions) and candidates have incentives to increase the volume and geo-diversity of their campaign efforts as their rank improves. Using detailed data on Norwegian candidates and their use of mass and social media in recent elections, we confirm that (1) candidate quality increases with list rank, and (2) candidates in safer ranks shift from intra-district to extra-district and national media exposure—a composition of effort that can increase their party’s chance of entering government, and thus their own potential share of the spoils.

Keywords: party lists; cabinet promotion; Gamson’s law; proportional representation; campaign effort; campaign media.

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1. Introduction

Scholars have long recognized that parties in closed-list proportional representation (PR) systems may have trouble motivating candidates to exert effort during election campaigns. The intuition is straightforward: under closed-list PR, list placement—not individual campaign effort—is the most important factor determining election outcomes for individual candidates.¹ If each candidate’s primary motivation is to win a seat for themselves, then those nominated in either “safe” or “hopeless” list positions will have little incentive to work hard during the campaign. Only candidates in the “hot spots,” the list positions on the cusp between winning and losing, should be motivated to exert effort. Yet, such a situation will obviously be suboptimal from a seat-maximizing party’s perspective.²

Eliciting campaign effort from candidates on closed lists is an example of a more general problem that Holmström (1982) calls moral hazard in team production. A team, as defined by Holmström (1982, pp. 324-325), is any group whose members’ individual inputs combine to produce a collective output that they can then share. Moral hazard within teams refers to the problem of getting team members to supply productive inputs, given that team leaders may be unable to observe or contract for these inputs directly, and only the payoff (overall success or failure) may be observable. As in many principal-agent relationships, the principal’s challenge in these situations is to specify a schedule of compensation that will best motivate agents to serve the principal’s interests.³

Political parties can be conceptualized as “teams of [candidates] seeking to control the governing apparatus by gaining office in a duly constituted election” (Downs, 1957, p. 25), and in closed-list PR elections, the collective output that parties seek is to gain

¹In closed-list PR, votes are cast for parties rather than candidates, and candidates are elected in the order in which they appear on the ballot. In open-list PR, by contrast, preference votes decide the order in which candidates are elected. Semi-closed/open (or “flexible”) list systems place constraints on the extent to which preference votes can alter rankings.

²We set aside, for simplicity, that parties may not be entirely seat-maximizing (e.g., Strøm, 1990).

³Explicit tournaments for rewards are only possible when individual outputs are fully observable and measurable (e.g., Lazear and Rosen, 1981). An alternative solution is peer pressure (e.g., Kandel and Lazear, 1992), but this becomes harder in large teams, like parties. In addition, although parties often require candidates to sign a pledge of loyalty in order to secure a nomination, fulfillment of a similar pledge to exert campaign effort may be difficult to observe and enforce.

enough votes and seats to control government. The challenge is therefore how to motivate all candidates to contribute to this goal, including those in safe positions whose election is essentially guaranteed. We argue that parties can reduce shirking in this environment by committing *ex ante* to allocate cabinet portfolios and other high offices to elected members of parliament (MPs) monotonically with their list rank. High offices come with various political and pecuniary perks that make them valuable to MPs.⁴ Since candidates can attain these high offices only if their parties enter government, this contract induces those in safe list positions to campaign hard in order to ensure their party's participation.⁵

We explain how, after a rank-based compensation schedule is established, (1) parties have an incentive to allocate list spots to candidates in order of their quality (to optimize both electoral and governing performance); and (2) candidates have an incentive to increase the volume and geographical diversity of their campaign efforts as their list ranks improve (to increase the chances that their party enters government). The first of these hypotheses can also be derived by highlighting each party's complementary desire to optimize its legislative performance (Buisseret et al., 2021). The second hypothesis is entirely novel, and pertains to the behavioral incentives that apply *after* candidates' ranks are determined.

We provide comparative evidence from Norway, Portugal, and Italy that candidates' expected share of high offices increases with list rank (for governing parties), and then use individual-level administrative data from Norway to show that list rank corresponds to candidate quality, complementing existing findings from Sweden (Buisseret et al., 2021). The bulk of our empirical work focuses on our new prediction about candidates' campaign efforts, which we test by exploiting unusually detailed information on Norwegian candidates' use of mass and social media during recent parliamentary elections. We show

⁴Cabinet ministers, for example, often enjoy the ability to influence policy, a higher status and salary, personal staff support, enhanced pensions, and advantages in renomination and re-election.

⁵Implicitly, our argument applies to the would-be prime minister (often a list leader) as well as those he or she appoints to higher offices. Leaders of coalition partners may constrain the choices of the prime minister, but should follow a similar intraparty compensation schedule. We assume that leaders can credibly commit to a rank-based allocation because violations would trigger a reduction in the rank-and-file's effort levels, or (in the extreme) defections from the party by disgruntled individuals or factions (cf. Cox, 2021). See also Hollyer, Klašnja and Titunik (2021) and Cirone, Cox and Fiva (2021).

that candidates' overall media activity increases with list rank, and that it systematically shifts from intra-district to extra-district (and national) exposure. Extra-district media exposure does little to help candidates win their own seats, but can improve their party's chance of participating in government and hence their own opportunity to share in the spoils. The intuition is similar to the motivation behind party leader visits across districts during election campaigns (e.g., Bélanger, Carty and Eagles, 2003), but applies more generally to other rank-and-file candidates who may be in line for promotion to higher office if their party gets into government.

Our work relates to several important strands of research on party organization and elite electoral behavior. First, we contribute to a growing literature on how parties allocate nominations and valuable internal posts among their members (e.g., Folke, Persson and Rickne, 2016; Meriläinen and Tukiainen, 2018; Buisseret et al., 2021).⁶ Much of this literature focuses on electoral cues—such as primary election results or preference votes—that can help parties decide how to distribute posts and promotions. Here, we examine closed-list PR systems in which such cues are wholly or largely absent. How can parties allocate internal promotions without direct observation of candidates' electoral performance? We flip the script to argue that, by pre-committing to a rank-based schedule for promotions, parties can still optimize their candidates' efforts in election campaigns. Just as ambition for higher office might counteract free-riding problems among MPs *in the legislative arena* (e.g., Benedetto and Hix, 2007; Martin, 2016), so too can it ameliorate moral hazard problems among candidates *in the electoral arena*.

Second, we contribute to a growing stream of work on Gamson's Law (Gamson, 1961). This law has most often been applied to parties seeking to form coalition governments—in which case it states that cabinet portfolios will be allocated in proportion to each party's contribution of seats to the coalition—and the empirical evidence for this relationship is abundant (e.g., Browne and Franklin, 1973; Warwick and Druckman, 2001; Verzichelli,

⁶See also a related literature on rank-based decision-making for other outcomes and behavior (e.g., Anagol and Fujiwara, 2016; Pons and Tricaud, 2018; Fujiwara and Sanz, 2020). A separate literature, mainly in political science, focuses on the biographical characteristics that correlate with cabinet selection (e.g., Dowding and Dumont, 2009, 2015; Smith and Martin, 2017).

2008). However, Gamsonian allocations have also been documented across parties within pre-electoral coalitions (Carroll and Cox, 2007), across factions within parties (Mershon, 2001; Ono, 2012; Ceron, 2014), and across regional branches within parties (Ennsner-Jedenastik, 2013).

Building on this literature from the perspective of mitigating moral hazard in electoral teams, we argue that a would-be governing coalition should commit to allocating high offices in proportion to electoral contributions at all levels of aggregation. The coalition's component parties should be promised proportional rewards. But then, for the same reason (to encourage optimal effort), the parties should award portfolios to their component factions and individuals in proportion to their electoral contributions. Thus, Gamson's Law should apply at the party, faction, and individual levels. We consider a rationale for why parties in closed-list PR systems allocate higher-level posts to their MPs in proportion to their list ranks, which in equilibrium correspond to their expected contributions to the party's overall electoral success.

Finally, our analysis provides new insight into an enduring puzzle in the literature on list type and turnout. Many scholars argue that allocating seats in order of preference votes, as under open-list PR, will improve incentives to mobilize voters, relative to closed-list PR, since each candidate's fate will hinge directly on their own efforts (e.g., Carey and Shugart, 1995; Karvonen, 2004; Hangartner, Ruiz and Tukiainen, 2019). However, the empirical evidence for this proposition is mixed (e.g., Tavits, 2009; Robbins, 2010; Söderlund, 2017).⁷ The Gamsonian promotion rule we posit, and our empirical evidence on intra-district and extra-district campaigning behavior, suggest a possible explanation for why turnout tends to be high in closed-list PR systems: candidates who are likely to benefit from the spoils of office if their party enters government will work hard on behalf of the party across districts, while marginal candidates will work hard to mobilize local votes within their own districts.

⁷Crutzen, Flamand and Sahuguet (2020) consider an "egalitarian rule" (under which every candidate has an equal chance of winning one of the list's seats), analyzing when such a rule improves the overall performance of the list relative to when seats are allocated according to a pre-determined rank order.

2. Candidate Effort and Party Rewards

As of 2020, 74 democracies used PR electoral rules with closed (or semi-closed) lists to elect at least a portion of the national legislature (Cruz, Keefer and Scartascini, 2021). These include several Western European democracies, such as Norway, Portugal, and Italy.⁸

The incentives of candidates on closed lists are similar to those in team production models (Holmström, 1982). The seats won by any particular party will depend on the campaigning efforts of all its candidates on the list. Yet, if they care only about winning seats for themselves, then candidates listed in either safe or hopeless spots will have little incentive to exert effort—as recognized by, for example, Persson, Tabellini and Trebbi (2003), André, Depauw and Martin (2015), and Crutzen, Flamand and Sahuguet (2020).⁹

In this section, we describe a team production theory of campaigning in which candidates care about both legislative seats and the higher offices that become available to them when their party gets into government; and parties exogenously pre-commit to allocating higher offices monotonically with list rank. Effectively, we assume that parties award both list positions and higher offices by seniority (Cirone, Cox and Fiva, 2021) and examine how candidates react to such an incentive structure.

2.1 *Candidates choosing efforts*

We begin by describing a basic intuition for how candidates decide to allocate campaign effort. We assume that each candidate has a known level of “quality,” reflecting a combination of campaigning ability, governing ability (e.g., the qualifications needed to be a competent minister), and other valence characteristics (e.g., Besley et al., 2017; Dal Bó

⁸Most categorization schemes group closed and semi-closed variants together. As with semi-open (flexible) variants of list PR (cf. Folke, Persson and Rickne, 2016; Buisseret et al., 2021), the basic question we consider might be more complicated in a semi-closed list system compared to a “pure” closed-list system.

⁹Other theoretical arguments to this effect focus on expected differences in quality and effort across alternative electoral systems (e.g., Mattozzi and Merlo, 2015; Galasso and Nannicini, 2017), but ignore effects of candidate list rank.

et al., 2017). Each candidate’s rank on the party list is also known, as well as how electorally secure it is expected to be—based on, for example, public opinion polling or past election results for the party.

Each candidate is faced with a choice about how much to campaign and for which target audience to stage events or media appearances.¹⁰ For example, a candidate can choose to stage an event or appearance targeted at a national audience, or a local event targeted at voters within a given district. Effort exerted in the candidate’s home district (where he or she appears on a list) can be considered local or “intra-district” effort. All other district-specific effort, as well as national effort, can be considered “extra-district.” For convenience, we will ignore events that affect (parts of) several districts but fall short of affecting the whole nation. We assume that district-specific events all cost the same amount to stage, regardless of the district in which they are staged; national events produce a uniform swing in all districts and entail a cost equal to a district-specific event times the total number of districts.

Given their quality and rank, candidates will choose a composition of effort that maximizes their expected office benefits, net of costs. Winning a seat confers both a consumption value (due to occupying the seat) and an instrumental value (due to the chance of securing a cabinet post or other high office). We assume that all winning candidates have a positive chance of securing high office if their party enters government, but impose the following **Monotonicity Assumption**: each candidate’s share of the pie of higher offices increases in expectation with list rank.¹¹ In essence, this assumption captures the idea that party leaders pre-commit to allocate higher offices monotonically with list rank, either explicitly or implicitly through established precedent.

To provide some evidence on this premise, Figure 1 uses data from three countries

¹⁰We classify campaign effort by its target audience, rather than its style, technology used, etc. We do not rule out the possibility that some effort is observable, and hence contractible. For example, a party’s (sitting or shadow) Minister of Agriculture might be expected to appear on national TV to defend the party’s agricultural policies. We assume that, aside from some directly contractible aspects, candidate effort is not fully observable to party leaders, so that a significant moral hazard problem remains.

¹¹The pie consists of offices of heterogeneous value—e.g., cabinet posts will be more valuable than committee chairs—all expressed in a common unit of value.

(Norway, Portugal, and Italy) employing closed-list PR, and plots the share of governing party candidates at each rank who received a cabinet portfolio.¹² In line with our assumption, receipt of cabinet portfolios is generally monotonic in list rank. The relationship is somewhat noisy in Portugal, where we have fewer observations, and where a portion of appointments to cabinet often goes to non-MPs (Costa Pinto and Tavares de Almeida, 2009).¹³

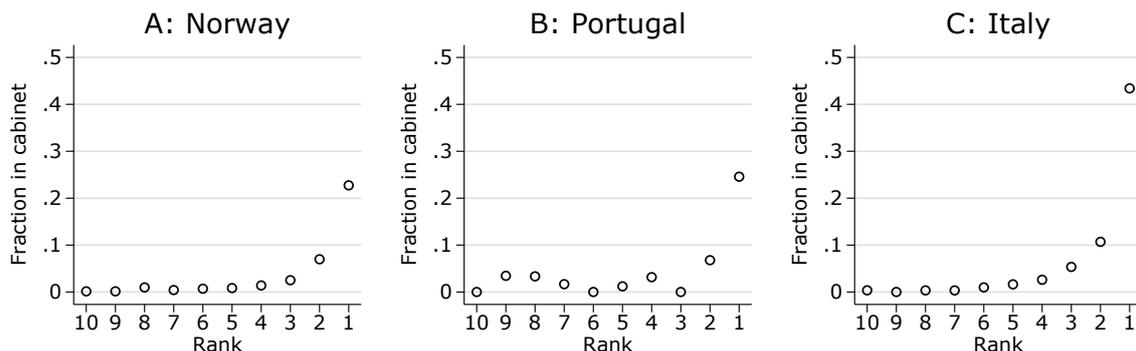


Figure 1: Promotion to cabinet by list rank

Note: Includes cases where a cabinet appointment occurs after the election as well as when it continues over from the previous term (i.e., reappointment). Norwegian data cover the 1957-2013 period; Portuguese data cover the 2005-2015 period; Italian data cover the 2006-2013 period. All samples are limited to candidates running for parties that are part of any cabinet following the election.

In the following three subsections, we provide some intuitive conjectures about how candidates—facing the opportunity for higher office and costs just described—would behave if placed in safe, hot, or hopeless spots on the party list. We offer a more formal sketch of how to justify the conjectures in Appendix A.

2.1.1 Safe spots

Election is virtually assured for candidates ranked high enough on the list, meaning that their goal reduces approximately to maximizing their expected share of high offices, net of costs. We assume that vote shares translate smoothly into seat shares in districts,

¹²Data for each case come from the national parliament’s data archives.

¹³Similar evidence has been documented for the case of Israel, where list composition in many parties is determined in internal primaries and list rank serves as a strong predictor of ministerial nomination for parties that enter government (Kenig and Barnea, 2009).

that effort translates into vote shares with diminishing returns, and that home-district events benefit from “friends-and-neighbors” voting (e.g., Fiva, Halse and Smith, 2021). Given these assumptions, we argue in Appendix A that any candidate will begin to exert intra-district effort before they begin to exert extra-district effort—because local effort is more effective and the cost of staging an event reflects the markets reached. Since the marginal benefit of intra-district effort declines as more such effort is exerted, there will eventually come a point at which extra-district effort becomes more productive than further local effort.

We also assume that the vote payoff to a candidate’s campaign events increases with his or her quality (and is zero for zero-quality candidates). Given this assumption, we can posit the following **Effort Composition Hypothesis**: for any given rank, the composition of candidates’ effort will shift according to the quality stratum into which they fall. Candidates in the lowest quality stratum will exert no effort. In the middle stratum of quality, candidates will exert intra-district effort and some may also exert extra-district effort.¹⁴ Those in the highest stratum will exert both intra-district and extra-district effort.

2.1.2 Hot spots

Candidates in hot spots have two motivations to exert effort: (1) to improve their own chance of winning a seat, and (2) to improve their party’s chance of entering government. The latter motivation will be weaker than it is for higher-ranked candidates (since the expected share of the pie upon entering government increases with higher ranks). Hot-spot candidates should thus, relative to safe candidates, concentrate more of their efforts within the district.

Hot-spot candidates should also obey the effort composition hypothesis articulated in the preceding section for safe candidates. That is, low-quality candidates will exert no

¹⁴Whether extra-district effort is worthwhile depends on how much intra-district effort has been exerted. If local effort is small, then its marginal product still exceeds that of extra-district effort and the latter remains nil. But if local effort is large enough, then its marginal product falls short of the marginal product of extra-district effort (at zero extra-district effort) and thus both kinds of effort are exerted.

effort. As their quality improves, hot-spot candidates will first exert intra-district effort, then extra-district effort.

2.1.3 Hopeless spots

Candidates in hopeless spots have little incentive to exert effort of any kind, since they are virtually sure to lose regardless of their effort—hence, they will miss out on both a seat in the legislature and the chance to be appointed to a higher office. We thus expect that candidates motivated only by the prospect of winning seats or high offices will exert low levels of effort.

There are some caveats, however. First, in some countries, such as Norway, elected MPs appointed to cabinet must resign their seats and are then replaced by the non-winning candidates (deputies) next in line on the party’s list. This can mean that some hot-spot candidates are in fact safe, and some hopeless candidates are in fact in hot spots. For example, if a party list is likely to win one seat in a district and the winner of that seat is likely to enter cabinet, then the candidate listed second is likely to get a seat (eventually), so they are safe rather than being in a hot spot.

Second, parties can motivate hopeless candidates by promising a higher list placement in future elections, conditional on good effort in the current election¹⁵; or by leveraging electoral synergies across levels of government. An example of the latter would be local town mayors in hopeless spots on national parliamentary lists. By campaigning for parliament locally, mayors can improve their chances of re-election as mayor.

We assume that promises of future promotions and electoral synergies primarily motivate local effort. Thus, hopeless candidates, too, should obey the effort composition hypothesis.

¹⁵André et al. (2017) provide evidence that parties in Belgium, the Czech Republic, and Slovakia pursue this strategy, and similar evidence has been documented for parties in Norway (Fiva and Røhr, 2018), Finland (Meriläinen and Tukiainen, 2018), and Sweden and Brazil (Folke, Persson and Rickne, 2016). Other hopeless candidates might be intrinsically motivated to exert effort based on their loyalty to parties or group interests represented by their parties.

2.2 *Parties allocating list positions*

Given the incentives we have just described for candidates of different quality and list rank, we can also consider the nomination strategy that will best serve a party's collective goal of optimizing candidate effort and vote shares.

If candidates care solely about winning higher offices, then parties will place their highest-quality candidate at the top of the list, their second highest-quality candidate in the second spot, and so forth. Could a party profit by, say, switching the first and second-listed candidates, putting the second-highest quality candidate in the top spot and highest-quality candidate in the second spot? What prevents this being profitable is that the expected share of high offices increases strictly with rank. Each candidate's incentive to work is an interactive function of their expected share of high offices and their quality, so the party wants to match these complements in order to elicit the highest possible effort.

If instead candidates care solely about winning a legislative seat, then parties will place their highest-quality candidate in the hottest spot on the list, their second highest-quality candidate in the second-hottest spot, and so forth (cf. Buisseret et al., 2021). The party thereby matches candidate quality and candidate incentive, producing the largest overall effort.

Parties may value lists that are balanced in terms of geographic ties, gender, age, and occupation, leading them to deviate from the quality ranking of candidates. In the 1970s, for example, most Norwegian parties introduced gender quotas requiring alternating men and women in list ranks. However, this requirement would not necessarily force tradeoffs in candidate quality, as quotas have been shown (at least for the similar case of Sweden) to actually induce the replacement of lower-quality men (Besley et al., 2017).

The evidence we have already provided in Figure 1 shows that the data are much closer to conforming with the assumption that candidates are primarily motivated by higher offices. Here, we shall simply assume this, which implies the following **Rank**

Order Hypothesis: parties will allocate list positions to their candidates according to their quality ranks.¹⁶

2.3 Discussion

Combining the rank order hypothesis with the effort composition hypothesis, we get an empirically testable set of predictions. First, parties will rank candidates in order of their quality. Second, low-ranked candidates should exert negligible effort on average. Third, as a candidate’s rank increases, one should first see local effort increase, followed by external effort. As we describe in the next section, we use coverage of Norwegian candidates by media outlets with varying levels of geographic coverage (district-specific or national) to provide a noisy measure of targeted campaign efforts (intra-district, extra-district, and national). As our model implies that the promise of high office will not motivate campaign effort on the part of those who have already decided to retire, we can also use comparisons between continuing politicians and “lame ducks” to further test our theory.¹⁷

3. Data and Case Setting

We use several types of data on Norwegian parliamentary candidates to explore the empirical evidence in support of our theoretical predictions. First, to test the rank order hypothesis, we estimate candidate quality using detailed data on candidates’ personal attributes, prior experience, and income. These data are available from 1997 to 2017. Second, to test the effort composition hypothesis, we use newly collected data on candidates’ use of various forms of traditional and social media in the most recent elections,

¹⁶Buisseret et al. (2021) derive a similar rank order hypothesis, explaining why higher-quality candidates get higher ranks in terms of the parties’ incentives to optimize legislative performance. In our model, given the Monotonicity Assumption, parties would wish to put their highest-quality candidates in the highest spots in order to assemble the most competent cabinet possible (assuming that candidate quality is a general characteristic and not specific to campaigning). A complementary rationale supporting the rank order hypothesis is that the highest-quality candidates may be reluctant to accept nominations to precarious hot spots, particularly in the presence of the Monotonicity Assumption and its rank-based schedule of compensation.

¹⁷Many previous studies have used term limits or planned retirements to document the effect of elections on shirking and other behaviors (e.g., Ferraz and Finan, 2011; Lopes de Fonseca, 2019).

as well as data on travel reimbursements for incumbents, to measure the quantity and geo-diversity of campaign effort.

3.1 *The Norwegian case*

Norway is a classic example of a closed-list PR system with strong parties.¹⁸ Parliamentary (*Storting*) seats are allocated in two rounds. First, 150 seats are allocated at the district level using the Modified Sainte-Laguë method. Second, 19 adjustment seats (one in each district) are given to parties that are underrepresented nationally after the first-tier seats have been allocated, provided that those parties exceed an exclusion threshold of 4% of the national popular vote (Fiva and Smith, 2017). District magnitude (prior to adjustment seats) ranges from 3 to 18 seats, with a median of 7 seats. MPs serve for a fixed four-year term (i.e., no early dissolution).

The main political divide is between the left-leaning socialist and the right-leaning conservative blocs. Recent cabinets have consisted of coalitions composed of multiple parties from one of these blocs, anchored by either the Labor Party (1997–2001; 2005–2013) or the Conservative Party (2001–2005; 2013–2021). Because of the prevalence of coalitions, all of the nine main parties have a non-zero chance of entering government, which is an important consideration when translating our theory into the empirical investigation.¹⁹ We focus much of our analysis on candidates’ campaign effort in the most recent 2017 elections, which resulted in a continuation of Prime Minister Erna Solberg’s Conservative Party-led coalition government.²⁰

Most Norwegian candidates have close ties to the districts in which they run. Historically, a residency requirement ensured that only candidates living in an electoral district could run for office in the district. The residency requirement was abolished in 1952, but

¹⁸Technically, voters may indicate desired changes to party lists, but the threshold for changing the rank order is so high that this has never happened.

¹⁹The nine parties, ordered ideologically from “left” to “right,” are the Red Party (R), Socialist Left Party (SV), Labor Party (A), Center Party (SP), Green Party (MDG), Christian Democratic Party (KRF), Liberal Party (V), Conservative Party (H), and Progress Party (FRP).

²⁰The coalition initially included only the right-wing Progress Party in 2013. The Liberal Party and Christian Democratic Party later joined (in 2018 and 2019, respectively). In 2020, after a series of conflicts among the coalition partners, the Progress Party withdrew from the cabinet.

still more than 95 percent of elected candidates run in the district where they live (Fiva, Halse and Smith, 2021). Nominations and list rank are formally determined in local (regional) nominating conventions.²¹ This aspect of the Norwegian case might somewhat temper the expected effort composition patterns for candidates—for example, some safe candidates who do not expect to win a cabinet post, for whatever reason, might concentrate relatively more effort within their districts in order to build support with the local party organization for future nomination decisions.

3.2 *Measuring seat rank security*

We define each candidate’s *seat rank security* as the number of seats the candidate’s party won in his or her district in the prior election, minus the candidate’s list rank in the current election. For example, the top-listed candidate of a party that won 5 seats in the last election would have a seat rank security of 4, indicating that they were 4 spots above the “hot spot” in the current election. A seat rank security of zero indicates the last seat won by the party in the previous election, while negative seat rank security values indicate list positions that failed to win in the last election.²²

Candidates’ seat rank security strongly predicts electoral outcomes. In the 2017 data, for example, not one of the 2,168 candidates we classify as *hopeless* (seat rank security < -1) was elected. Among the 261 candidates we classify as *semi-hot* (seat rank security of -1) or *hot* (seat rank security of 0), 91 were elected. Finally, among the 79 candidates we classify as *safe* (seat rank security > 0), all but one were elected.²³

²¹This feature is rooted in legislation going back to the 1920s, which granted public reimbursement for party members’ travel expenses for attending the nomination meetings. Local and regional party organizations therefore historically played a key role in the nomination process, and have continued to do so even after this regulatory framework was abolished in 2002 (Strøm and Narud, 2003, pp. 529-530).

²²Appendix Figure B.1 provide histograms for rank and seat rank security for our main empirical case. Party lists may include more candidates than the number of seats to account for deputies.

²³Candidates next in line to be elected on seat-winning lists are designated as deputy MPs. The number of deputies equals the number of seats won plus three. As a consequence, many high-ranking hopeless candidates receive deputy status, and may serve in parliament if regular MPs are indisposed or promoted to cabinet. In the 2013–2017 Storting, for example, fourteen deputy MPs sat in permanent place of elected MPs. Appendix Figure B.2 plots the fraction of candidates elected and the fraction of candidates with deputy status by seat rank security. Figure B.3 plots the fraction of candidates elected by seat rank security for each of the nine main parties.

3.3 *Measuring quality*

Prior research has relied on various measures for the quality of candidates, each of which comes with its own merits and limitations (e.g., Besley et al., 2017; Dal Bó et al., 2017; Galasso and Nannicini, 2017; Buisseret et al., 2021). For example, measures of income, education, and prior political experience are convenient proxies for quality, but may be correlated with social class, generational cohort, and other factors in ways that mask the true competence of individuals. Income and prior experience may also reflect the financial returns to office and norms of renomination.

Recognizing these limitations, we explore each of these measures of quality in our empirical analysis of the rank order hypothesis. In addition, following the procedures used by Besley et al. (2017), Dal Bó et al. (2017), and Buisseret et al. (2021), we identify the portion of each candidate’s income that might be attributed to their personal quality, after flexibly allowing for different age-earnings profiles across demographic groups. This procedure involves estimating “earnings scores” using individual-level data for the entire Norwegian population (aged 18 and above), taken from the registers of Statistics Norway.²⁴

The Mincer model specification includes variables capturing individuals’ age (in 5-year intervals), gender, highest level of education (six categories²⁵), and municipality of residence. We enter a complete set of age-gender-education interactions to the regression model, and include immigrant background defined by six categories.²⁶ We allow for geographic variations by including municipality fixed effects, and define separate categories for a limited number of individuals with missing observations on income, education level

²⁴Appendix Table B.1 displays summary statistics for the candidates’ earnings scores, as well as match rates of candidates to individuals in the administrative registers. We lack additional measures (for men) of leadership and cognitive ability from military enlistment exams, as used by Buisseret et al. (2021) for the Swedish case. Note that Sweden is technically a semi-closed (or semi-open) list system.

²⁵“Lower secondary education,” “upper secondary education,” “tertiary vocational education,” “short-term higher education,” “long-term higher education,” and “unknown or no completed education.”

²⁶Immigrant backgrounds are defined by the following classification: persons born in Norway with two parents born in Norway; first-generation immigrants without Norwegian background; persons born in Norway with immigrant parents; persons born abroad with one Norwegian-born parent; persons born in Norway with one parent born abroad; persons born abroad with two Norwegian-born parents.

and residential municipality. Like previous studies, we standardize residuals to have zero mean and standard deviation one in each income year, and use them to measure candidate quality.

We separately estimate the earnings scores for candidates of the nine main parties in each election from 1997 to 2017. We use income data from the year before the election takes place to avoid conflating returns to office with candidates' quality. For example, we use the average earnings score from the 1996 Mincer regressions to measure the quality of candidates running for office in 1997. In cases where candidates were previously elected (either as regular members or deputies), we rely on Mincer scores from the year before they entered parliament (either as regular MPs or deputies).

3.4 *Measuring campaign effort*

As our main operational measure of targeted candidate effort, we use different kinds of media counts. In particular, we assume the number of mentions that a candidate receives in mass media with a national reach (e.g., national newspapers and TV stations), plus the mentions that he or she receives in non-national media with coverage outside of their home district, is a noisy measure of extra-district effort. Similarly, we use the mentions that a candidate receives in home-district-specific media as a noisy measure of local, intra-district campaign effort.

Parties are required to have their candidate lists compiled by March 31 of the election year. Lists include information on candidates' rank, name, and place of residence. Together with the media consultancy firm *Retriever*, we generated a dataset on individual candidates' activity on traditional and social media platforms surrounding the 2017 election.²⁷ Because lists are finalized well before the start of our sample period, candidates' seat rank security can be considered predetermined in our analyses of campaign effort.

We complement these measures of traditional and social media activity with data

²⁷The election was held on September 11, 2017. The traditional media data cover the eighteen-week period from Sunday, May 28, to Saturday, September 30. The social media data cover the nine-week period from Sunday, July 30, to Saturday, September 30. We provide a detailed explanation of the data and how we code media exposure in Appendix C.

from the Storting on reported travel reimbursements. Incumbent MPs can be reimbursed for events held under the auspices of a party organization if the event is relevant to their position as an MP. In the weeks leading up to the 2017 election, more than one-third of the reimbursement claims mention the words “election,” “door-knocking,” or “campaign booth” as justifications for reimbursement. Outside the campaigning period, most reimbursement claims are for commuter travel to the Storting.²⁸ Unfortunately, similar data for non-incumbents are unavailable, so the number of candidates (incumbent MPs) in semi-hot and hopeless ranks we can use for our analysis is limited.

Finally, we make use of self-reported effort by candidates in the Comparative Candidates Survey (Wave II) dataset, which includes a sample of Norwegian candidates in the 2013 election.²⁹ The survey includes each candidate’s self-reported seat rank security, and asks about the usage and perceived importance of several varieties of campaign effort. An advantage of these data is that self-reported activity can help to address concerns that our main measure of effort (media mentions) in part reflects rank-driven media attention rather than the explicit efforts of individual candidates. A disadvantage is that the data do not distinguish between intra-district and extra-district effort, so can be used to illustrate how the volume of effort varies across seat rank security, but cannot speak to its geo-diversity.

These various measures do not perfectly capture all forms of campaign effort, of course. Indeed, the problem of moral hazard in electoral teams arises precisely because much of the effort exerted in campaigns will be unobservable, and hence difficult to contract for directly. As noted, some mass media attention will be driven by the outlets themselves, rather than the candidates’ explicit efforts; and some self-reported behavior might include a degree of social desirability bias, and selection bias arising from incomplete response rates. These conditions limit our ability to cleanly identify the effects of list rank on effort. Nevertheless, the diverse set of variables we have at our disposal allows us to

²⁸See Appendix Figure B.4.

²⁹The CCS dataset (CCS, 2020) is described online at www.comparativecandidates.org and is available through the Swiss Centre of Expertise in the Social Sciences (FORS).

explore broad patterns of correlations across list rank and effort, which can provide some empirical evidence that bears on our team production theory of campaigning with rank-based rewards.

4. Evidence for the Rank Order Hypothesis

We first present evidence relating to the rank order hypothesis, complementing the existing evidence for the case of Sweden that has already been documented by Buisseret et al. (2021).

Before presenting the results for the earnings score, we show the relation of unadjusted earnings the year before the election ($t - 1$) to candidates' seat rank security in Panel A of Figure 2. Earnings are standardized to have zero mean and standard deviation one in the population. Average earnings are positive across all seat ranks, implying that candidates running for office are positively selected, as in the other Scandinavian countries (Dal Bó et al., 2017; Dahlggaard and Pedersen, 2020).³⁰

In Panel B, we provide the results for the earnings score, our preferred measure of candidate quality. In line with the rank order hypothesis, we observe that the earnings score is moderate, and only weakly increasing, for candidates nominated to hopeless positions, but then increases substantially in hot spots (rank security of -1 and 0) and safe spots (positive rank security). Candidates in safe spots have an earnings score that is about one population standard deviation higher than the general population.³¹

Panels C and D of Figure 2 show two alternative measures of candidate quality plotted against candidates' seat rank security. In Panel C, we plot the fraction of candidates with prior parliamentary experience at each seat rank security. Panel D plots the fraction of candidates at each seat rank security level with more than a high school education. All

³⁰Gulzar (2021) synthesizes recent evidence from studies using micro-census data to study selection into political office.

³¹In the unadjusted earnings measure (Panel A), the differences between safe candidates and the general population is about two standard deviations. The discrepancies between Panel A and B reflect the fact that safe candidates tend to be incumbents who have received a substantial income boost from winning office (Cirone, Cox and Fiva, 2021).

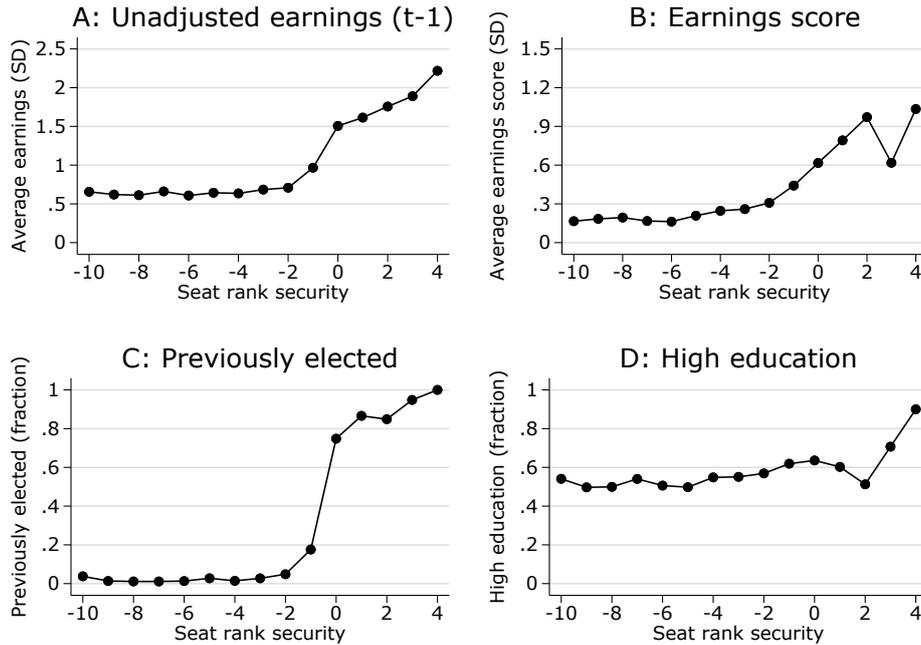


Figure 2: Candidates’ quality increases with seat rank security

Note: Panel A plots average unadjusted earnings against candidates’ seat rank security. Panel B plots the average earnings scores against candidates’ seat rank security. For previously unelected candidates, we use data from the year before the relevant election. For previously elected candidates (including candidates elected as the first deputy MP) we use data from the year before their first successful election. Panel C plots the fraction of candidates previously elected as MP or deputy MP at each seat rank security. Panel D plots the fraction of candidates with higher education against candidates’ seat rank security. The sample is limited to candidates running for one of the nine main parties in the 1997-2017 period. A candidate’s seat rank security is defined as the number of seats won by his or her party in the last election (in a given district), minus the candidate’s rank on the list in the current election. Seat rank securities of less than -10 and more than 4 are grouped with -10 and 4, respectively.

measures indicates that the best candidates are nominated at the top of the lists. Overall, the data suggest clear support for the rank order hypothesis, complementing the existing empirical evidence from list nomination patterns in Sweden (Buisseret et al., 2021).

Elite surveys of local party leaders conducted in 1957 and 1985 provide additional insight into the rank order hypothesis (Valen, Narud and Skare, 2002). When asked to evaluate the personal qualities of ideal candidates for nomination, the most important criteria emphasized were political and professional competence; ethical qualities like honesty and fair-mindedness; party loyalty; and “platform abilities” like eloquence, com-

munication skills, and the ability to perform well for the mass media and in election campaigning. Moreover, these traits were considered especially important for top-ranked candidates, whereas the relatively more desirable traits among lower-ranked candidates included being active in party work and representing group interests.

The importance of platform abilities means that some of the media coverage we use as a proxy measure of effort may reflect a selection-driven process. That is, high-quality candidates may attract media coverage beyond their districts simply because of their exceptional personal traits (indeed, parties may have nominated them to top ranks precisely with this effect in mind!), and not because of any specially targeted exertion of effort due to their motivations to obtain higher office. As we explore the evidence for the effort composition hypothesis in the next section, we will also consider ways to parse this complementary explanation from the overall patterns we document.

5. Evidence for the Effort Composition Hypothesis

In this section, we present evidence that bears on the effort composition hypothesis, relying primarily on a dataset on individual candidates' activity in traditional and social media surrounding the most recent 2017 elections. For traditional media activity, we also have data from the 2013 elections, which allows us to explore variation for the same individual moving across seat rank securities over time, in a fixed-effects regression framework. This approach helps to address possible concerns that extra-district media coverage is entirely driven by the exceptional traits of individual candidates in safe spots.

5.1 *Composition of media exposure across seat rank security*

Panel A and B of Figure 3 display the median number of mentions in traditional mass media received by candidates at each predetermined seat rank security, along with the 25th and 75th percentiles at each rank (dashed lines). Panel A tracks intra-district mentions in the mass media, while Panel B tracks extra-district mentions. For presentational

simplicity, we group national mass media mentions with extra-district mentions, but the patterns are similar for extra-district mentions alone.³²

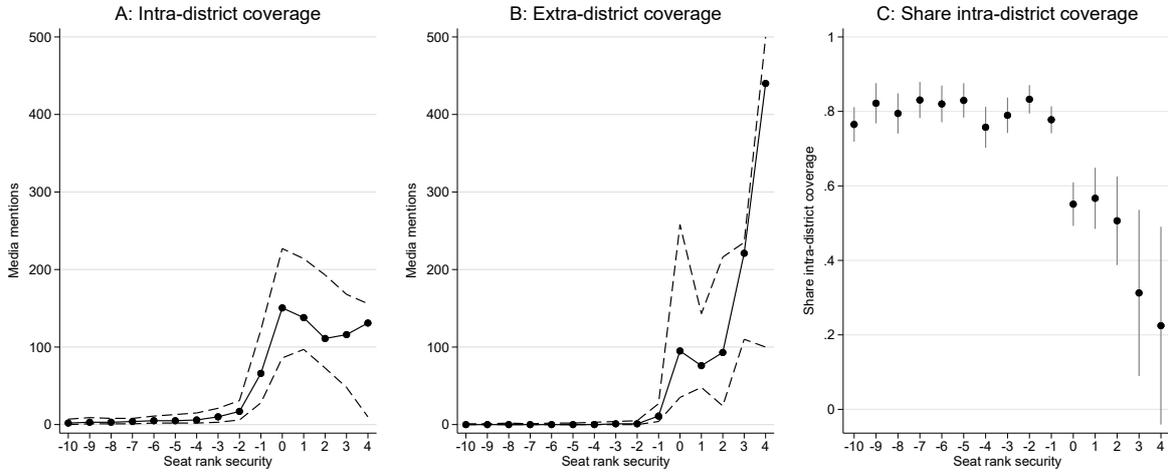


Figure 3: Intra-district and extra-district mass media attention by seat rank security

Note: Sample restricted to the hundred days leading up to election day. Panel A and B display the first quartile (bottom dashed line), second quartile (solid line), and third quartile (top dashed line) of intra- and extra-district media coverage, by candidates' seat rank security. Panel C displays the mean share of mass media coverage that is within-district along with 95% confidence intervals. Standard errors are clustered at the party-district level. A candidate's seat rank security is defined as the number of seats won by his or her party in the last election (in a given district), minus the candidate's rank on the list in the current election. The x-axes are censored at -10 and $+4$.

Even candidates listed 10 spots or more below the expected last winning spot for their party receive some local media attention, but the median level of attention remains negligible until about three spots below the expected last winning spot (i.e., rank security of -3), at which point it begins trending upward. In contrast, the median extra-district exposure of candidates is negligible until they reach one spot below the expected last winning spot, at which point the trend turns upward. The later onset of external relative to local coverage is consistent with the effort composition hypothesis.

Another way to show how the composition of effort changes with rank is to plot the mean share of all coverage that is local (on the vertical axis) against list rank (on the horizontal axis). We do this in Panel C of Figure 3, which shows that the mean share of

³²See Appendix Figure B.5.

coverage that is local shows no trend until an adjusted rank of -1 , when it begins to trend sharply downward. Only very safe candidates (with adjusted ranks of $+3$ or higher) have a portfolio of media exposure that falls mostly outside their own districts.³³

Table 1 analyzes the effort composition hypothesis in a regression framework. In specification (1) we reproduce the results from Panel C of Figure 3. In specification (2) we include party-district fixed effects. The results are basically unaltered. In specification (3) we control for whether the candidate is a local incumbent (elected in 2015), national incumbent (elected in 2013), or party leader. This last identity is perhaps most important, as mass media may supply general coverage about party leaders in campaigns, and they tend to be ranked at the top of one of the district lists. We find that local incumbents receive relatively more intra-district coverage, while national incumbents and party leaders indeed receive relatively more extra-district coverage. The estimated effects for positive seat rank securities fall relative to specification (1)-(2), but they are still significantly different from the estimated effects for candidates with negative seat rank securities. When interpreting these results, it is important to keep in mind that the additional controls in (3) are likely to subsume some of the overall effects of interest. In a seniority system, incumbent candidates are primarily the ones who aspire to cabinet promotion.

Specification (4) of Table 1 brings in data from one additional election year (2013). By including individual fixed effects, this model exploits over-time variation in seat rank securities for the same individual. The advantage of such a specification is that all time-invariant individual characteristics (e.g., candidate quality) are netted out. The disadvantage is that the problems associated with measurement error are magnified in the fixed-effects context, leading to attenuation bias (Angrist and Pischke, 2009, p. 225). Specification (4) shows that candidates in safer positions receive more extra-district coverage, but the magnitudes of the effects are smaller than in the models that rely on

³³Appendix Figure B.6 shows that the pattern is basically unaltered if we use only the two parties that won enough seats so that they had candidates with adjusted ranks of at least $+4$. Figure B.7 shows the average within-district media coverage by list rank separately for each party. Similarly, Figure B.8 shows the average within-district media coverage by list rank separately for each district.

Table 1: Regression analyses of intra-district mass media attention by seat rank security

	(1)	(2)	(3)	(4)
Seat rank security -4	-0.026 (0.029)	-0.070** (0.033)	-0.075** (0.033)	0.007 (0.047)
Seat rank security -3	0.008 (0.026)	-0.037 (0.030)	-0.039 (0.029)	-0.052 (0.069)
Seat rank security -2	0.043* (0.022)	-0.001 (0.026)	-0.003 (0.026)	-0.002 (0.051)
Seat rank security -1	-0.003 (0.023)	-0.045* (0.026)	-0.042 (0.027)	-0.017 (0.037)
Seat rank security 0	-0.229*** (0.031)	-0.262*** (0.033)	-0.134*** (0.039)	-0.094* (0.050)
Seat rank security +1	-0.219*** (0.038)	-0.243*** (0.038)	-0.095* (0.053)	-0.100* (0.056)
Seat rank security +2	-0.280*** (0.056)	-0.286*** (0.061)	-0.134** (0.052)	-0.130** (0.059)
Seat rank security +3	-0.474*** (0.088)	-0.407*** (0.088)	-0.205** (0.097)	-0.162** (0.068)
Seat rank security +4	-0.561*** (0.085)	-0.375*** (0.048)	-0.126* (0.067)	-0.191*** (0.070)
Local incumbent			0.056*** (0.016)	
National incumbent			-0.164*** (0.042)	
Party leader			-0.251*** (0.075)	
Mean of outcome variable	0.775	0.775	0.775	0.768
R-squared	0.09	0.32	0.34	0.03
Number of observations	1704	1704	1704	2389
Number of party-districts	133	133	133	139
Party-District FE	No	Yes	Yes	No
Year FE	No	No	No	Yes
Candidate FE	No	No	No	Yes

Notes: The dependent variable is the share of mass media coverage that is intra-district. Specification (1) reproduces the results from Panel C of Figure 3. The reference category is seat rank security < -10 , and we suppress presentation of seat rank securities below -4 for brevity. Specification (2) and (3) includes party-district fixed effects. Specification (4) adds data from 2013 for candidates running in both election years. The sample is restricted to the hundred days leading up to election day. Standard errors clustered at the party-district level in parentheses.

cross-sectional variation in the data.

5.2 *Media preferences or candidate effort?*

We can explore four further sets of evidence to address the possibility that the patterns documented in Figure 3 and Table 1 are due entirely to media preferences or incentives rather than candidate effort. First, we can examine the behavior of incumbent MPs who did not seek re-election in 2017. There are 50 such MPs, who had served about 12 years or 3 election periods on average before deciding not to seek re-election. Ninety percent of these incumbents had seat rank securities that put them in safe or hot spots. Thus, had they sought re-election in 2017, we would have expected them to behave similarly to other candidates in those categories. Instead, however, Panels A and B of Figure 4 show that the profiles of mass media coverage across the campaign for “lame duck” incumbents (those not running again in 2017) are much closer to candidates with weak electoral incentives (i.e., those in hopeless or semi-hot list positions) in line with our theory.³⁴

The patterns for the lame ducks are suggestive of effort-based incentives, but could still partially reflect media preferences if newspapers and TV stations choose not to give coverage to the opinions or activities of those who are not running again. A second type of evidence that overcomes this concern is social media posts, which candidates (or their staffs) decide unilaterally. Panels C and D of Figure 4 show how candidates’ social media activity evolves over the campaign period. Since Facebook and Twitter posts are entirely at individual candidates’ discretion, they provide a pure measure of their demand for exposure.³⁵ The figure shows that social media posts increase during the campaign period and then tail off rapidly once the election ends—regardless of list rank. This is consistent with candidates’ incentives: they want more attention as election day nears.³⁶

³⁴The decision not to seek re-election is not a perfect proxy for deciding to retire. Four of the non-running incumbent MPs went on to serve in cabinet again. To the extent that they anticipated the continuation of their cabinet careers, they should have behaved more like those seeking re-election.

³⁵The social media data was not successfully collected for all days leading up to the campaign (see Appendix C). For these cases we interpolate the data.

³⁶Appendix Figure B.9 shows that safer candidates are more likely to have an open Facebook or Twitter account. Figure B.10 shows that safe candidates also receive more mentions (by other Facebook users) than other candidates.

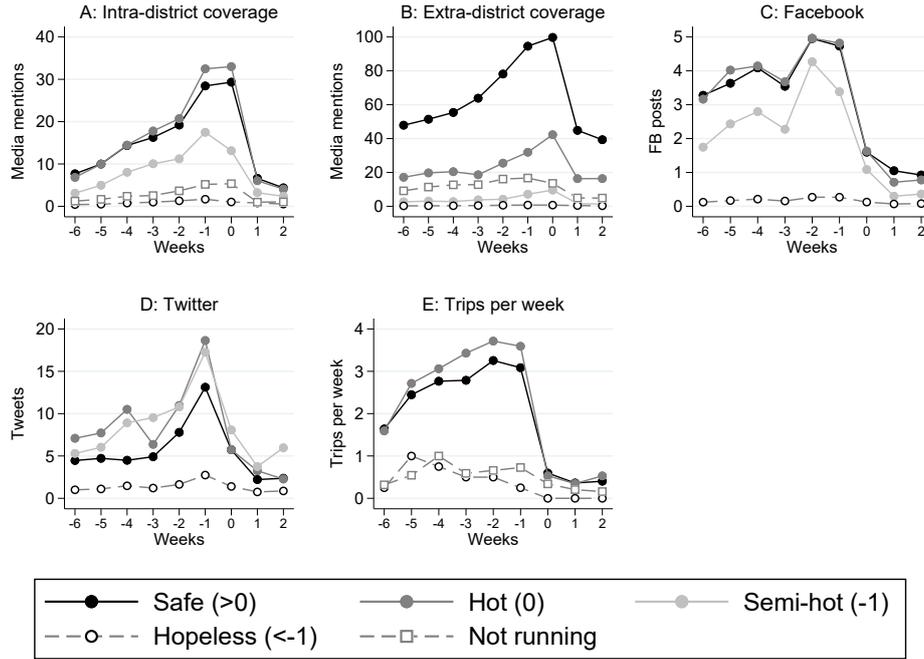


Figure 4: Mass media coverage, social media activity, and travel behavior over the campaign period, by candidates' electoral viability

Note: This figure displays mass media coverage (Panels A and B), social media activity (Panels C and D), travel behavior (Panel E) over the campaign period using five categories: safe (seat rank security > 0); Hot (seat rank security 0); semi-hot (seat rank security of -1); hopeless (seat rank security < -1); and incumbents not running for re-election. The reimbursement data only includes information for incumbents. For the travel behavior data, we collapse semi-hot and hopeless incumbent candidates into one category. We lack social media data for incumbents not running again. Data from July 30 to September 30, 2017. Election day is in week 0.

Travel during the campaign constitutes a third type of effort that potentially attracts media attention, and over which MPs can exert some discretion.³⁷ To track candidates' campaign-period travel, we use the data on reimbursement claims made to the Storting. Panel E of Figure 4 plots the number of claims made by four types of MPs during the 2017 election cycle. As with the other analyses, we distinguish between candidates running in safe ($N=47$) and hot spots ($N=49$), but since few incumbents run in low-ranked positions, we collapse semi-hot and hopeless incumbent candidates into one category ($N=4$). The

³⁷Party organizations coordinate and support many campaigning activities, so travel cannot be considered entirely discretionary. Still, travel directed by parties might produce varying effects (such as media mentions), depending on the intensity of effort exerted by individual candidates on those trips.

fourth category comprises incumbents not running for re-election (N=44).³⁸ Panel E displays a familiar pattern for incumbents running in viable positions: trips per week increase up until the week before election day, but then taper off.³⁹ This travel behavior stands in striking contrast to that of lame ducks.

Do visits by an incumbent to a given district lead to more mentions of that incumbent in the media located within the district? The fine-grained media and travel data, both varying at the daily level, allow us to investigate this question. We estimate a model using candidate-district fixed effects and provide the results in Appendix Figure B.11. The coefficient plot suggests that visits by candidates indeed stimulate media attention. Candidates receive more media coverage after (but not before) they make a visit to the district. There is some evidence that the effect begins to kick in the day prior to the visit. Such effects could materialize if candidates reach out to media before arriving in the district. In some cases, MPs might also write to the newspapers themselves to stimulate interest prior to a visit.⁴⁰

Finally, we can examine the campaign efforts that candidates themselves reported in the 2013 Comparative Candidates Survey (N=932). Exact list ranks are not recorded in the survey, but each candidate was asked, “In the beginning of the campaign, how did you evaluate your chances to win the mandate?,” with responses ranging from “I thought I could not win” to “I thought I could not lose.” We group these responses into our broad categories of seat rank securities, as in Figure 4.⁴¹ Candidates were also asked, “Were any of the following activities part of your campaign? And if yes, how important were they?”

³⁸Numbers in each group do not sum to 169 (the number of MPs) because cabinet ministers and their deputies are excluded.

³⁹The drop after election day does not follow mechanically. The 2017–2021 parliament was not constituted until about four weeks after election day.

⁴⁰For example, one MP wrote a feature article in the newspaper *Budstikka*, located in *Akershus* district, on September 2, 2017. The next day, he was knocking on doors in *Akershus*, according to his reimbursement claims.

⁴¹Specific response categories include: “I thought I could not win” (hopeless; N=682, 73% of observations); “I thought I could hardly win” (semi-hot; N=111, 12%); “I thought it was an open race” (hot; N=54, 6%); “I thought I could hardly lose” and “I thought I could not lose” (safe; N=85, 9%). We combine the latter two responses (N=49 and N=36) to match our grouping scheme. The general pattern is consistent across effort types if these are disaggregated. The survey appears to oversample viable candidates: in 2017, for comparison, 86% of candidates were hopeless, 7% semi-hot, 4% hot, and 3% safe.

Activities included mass media activity (interviews, press releases, writing blogs) and social media activity (Facebook, Twitter), as well as others that unambiguously reflect effort on the part of candidates, such as door-knocking/canvassing, visiting businesses and social organizations, and staging public speeches and rallies. Candidates ranked these campaign activities on a scale from 0 (not used) to 4 (most important).

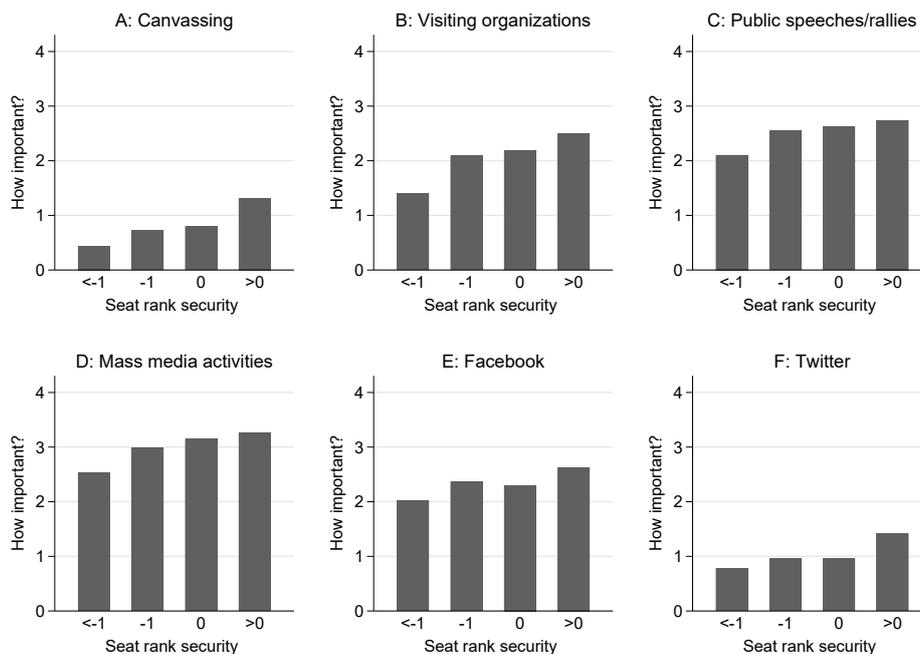


Figure 5: Self-reported campaign effort by candidates at different seat rank securities
Note: This figure uses data from Wave II of the Comparative Candidates Survey (CCS) dataset, made available by the Swiss Centre of Expertise in the Social Sciences (FORS). It shows the self-reported importance of different campaign activities among Norwegian candidates surveyed in the 2013 election. Canvassing (Panel A), visiting organizations (Panel B), public speeches/rallies (Panel C), mass media activity (Panel D), and social media activity on Facebook and Twitter (Panels E and F) all increase in importance across four categories: hopeless (seat rank security < -1); semi-hot (seat rank security of -1); hot (seat rank security 0); and safe (seat rank security > 0).

Figure 5 plots the average self-reported ratings for six prominent types of campaign activity. Across all six, the usage and perceived importance of the activity increases with seat rank security, consistent with our theoretical prediction that the volume of candidate effort increases with list rank, although the question wordings do not allow us to explore the geo-diversity of this effort (we cannot parse, for example, the share of public speeches

that occurred within the candidate’s home district versus outside of the district).

All told, we have provided evidence that several types of effort which are wholly or partially at the candidates’ discretion—tweets, Facebook posts, and campaign travel—evolve over the campaign period as we would expect. For the last kind of effort (travel), moreover, we show that the behavior of viable candidates stands in sharp contrast to the behavior of lame ducks (as with traditional mass media coverage), and that visits to a district stimulate media attention. The self-reported differences in effort of various kinds further reinforce the idea that candidates’ actions contribute to the observed differences in media exposure. Cumulatively, this evidence bolsters our confidence that the patterns in media coverage that we have documented are driven to an important extent by the candidates’ own demand for coverage, rather than being driven entirely by the media’s incentives. Although the evidence of candidate effort across list ranks we have presented is inevitably imperfect, it is nevertheless consistent with a team production theory of campaigning under a rank-based schedule of compensation.

5.3 *Additional empirical implications*

We posit that the main reason for highly-ranked candidates to exert campaign effort is their desire to ensure that their party participates in government, so that they can obtain ministerial portfolios or other high offices. If this is correct, then the level of bloc competition to get into government should affect how much effort safe candidates exert. On the one hand, if one bloc will surely win a majority and form the government, then safe candidates in all parties will have relatively low incentives to campaign (either inside or outside their districts). On the other hand, if the two blocs compete closely for a majority (as was the case in Norway in 2017), then safe candidates in all parties will have relatively large incentives to campaign (focusing their efforts on wherever the vote return is highest). At present, we lack the data needed to pursue this sort of investigation. However, such a study would address a core claim of our theory and is worth keeping in

mind for future research.⁴²

Our theory also suggests that electoral rules should affect candidates' incentives to campaign. As noted in the introduction, many scholars argue that open lists motivate greater candidate effort during campaigns (e.g., Carey and Shugart, 1995; Karvonen, 2004; Hangartner, Ruiz and Tukiainen, 2019). However, these analysts typically view candidates as single-mindedly seeking to win *seats*. If candidates care about *higher offices* too, then closed lists may generate stronger party-wide mobilizational efforts than open lists. To illustrate, compare a candidate listed first on a closed list to a candidate expected to win the most votes on an open list. Suppose that in both cases the relevant parties are sure to win one seat, and the seat-holder will then receive a cabinet portfolio if the party gets into government. The closed-list candidate is certain to win a seat and thus is certain to receive a portfolio if their party gets into government. The open-list candidate has some probability $p < 1$ of winning a seat and thus has the same probability of receiving a portfolio if their party enters government. The incentive to maximize the party's overall seat share is thus weaker for the open-list than for the closed-list candidate; and can be considerably weaker if there is substantial intraparty competition.⁴³

A final empirical implication relates to competition within parties for portfolios. Even if parties announce a rank-based schedule of compensation for promotion, entering government will result in a finite number of cabinet portfolios to distribute (particularly in coalition scenarios). For candidates at the same seat rank security, a Gamsonian logic might imply that the probability of receiving a portfolio should increase with the relative share of extra-district versus intra-district coverage (to the extent that this can be observed), with the candidates missing out on appointment having only the opportunity to ascend to other posts of secondary value (committee chairmanships, etc.). With just

⁴²Similarly, we could explore if there are differences between the main government-seeking parties and smaller parties with low chances of participating in government. For example, the probability that the far-left party (Socialist Left Party, founded in 1961) and the far-right party (the Progress Party, founded in 1973) would enter government following an election used to be negligible. However, both parties have recently been part of a cabinet (Socialist Left 2005–2013; Progress Party 2013–2020). In the 2017 election, all parties winning more than one seat in parliament had a reasonable chance to enter cabinet.

⁴³It is possible that extra-district campaigning might also contribute to the low variance in turnout observed across districts under closed-list PR, as documented by Cox, Fiva and Smith (2016).

a few elections featuring many cabinet reappointments, we lack the data to test this implication, but it is worth considering in future research.

6. Conclusion

Gamson's Law can be viewed as a solution to the free riding and moral hazard problems that beset teams of politicians seeking to get into government. Consistent with this perspective, previous literature has shown that Gamson's Law is closely followed when multiple units have agreed to cooperate during an election campaign and to govern together, should they win enough seats. In some cases, the cooperating units are parties and the agreements are pre-electoral pacts (Carroll and Cox, 2007). In other cases, the units are intra-party factions and the agreements take the form of party norms regulating the allocation of portfolios (Mershon, 2001; Ono, 2012; Ceron, 2014). In still other cases, the units are regional branches of a given party and the agreements again take the form of party allocative norms (Ennsner-Jedenastik, 2013).

The counterfactual in each of these cases is that, had the units not entered into an agreement, they would have been less likely to allocate the spoils of governance among themselves in proportion to their seat contributions to the overall coalition. There is observational evidence consistent with this expectation in the case of governing coalitions: coalitions that did not conclude pre-electoral pacts depart substantially from Gamson's Law when allocating portfolios (Carroll and Cox, 2007).⁴⁴

Our theoretical approach in this study has been to take the individual candidates in a given party as the potentially cooperating units in the context of closed-list PR elections, where scholars have long recognized a potential for moral hazard in team production to arise. When candidate quality is observable, we argue that the moral hazard problem

⁴⁴Were a particular faction to exit a party and begin competing against the remaining portion of the party in elections, one would expect that Gamson's Law would be followed more closely before the break-up than after. Thus far, however, no studies of this particular kind have been undertaken. Consistent with our general logic, there is some observational evidence that turnout is higher in the presence of pre-electoral pacts (Tillman, 2015), although it is uncertain whether this is due to less uncertainty on the part of voters or on the part of candidates exerting effort.

confronting parties, as teams, in exerting effort in elections can be solved through a Gamsonian agreement approximated by the following two simple rules: allocate list spots in order of candidate quality, and allocate larger expected shares of high offices to higher list ranks. We have provided novel empirical evidence from Norway, with additional comparative evidence from Portugal and Italy, suggesting that parties follow these rules.

If such Gamsonian promotion rules are in place, we argue that candidates' campaign efforts will increase in volume and geo-diversity as their list rank improves. Exploiting detailed data on the volume and location of media coverage of Norwegian candidates in the 2017 parliamentary elections, together with complementary data on social media posts, travel, and self-reported campaign behavior, we have shown that these patterns hold empirically. Thus, we have documented another instance in which units that have committed to governing together also commit to allocating high offices in proportion to each unit's contribution of resources to the encompassing coalition.

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Appendix A: Formal description of theory

This appendix provides a simple formal description of the main theoretical intuitions described in the main text. We assume that each candidate j has a known “quality,” q_j , reflecting a combination of campaigning ability, governing ability (e.g., the qualifications needed to be a competent minister), and other valence characteristics. Let r_j denote the list rank that candidate j receives, where $r_j = 1$ means that j is ranked first (highest) on the list, and so forth.

We classify campaign effort by its target audience, rather than style or technology used. Let e_{j0} represent j ’s nationally-targeted effort. One interpretation is that e_{j0} denotes the number of national campaign events (of unit size) that candidate j stages. Let e_{jd} represent j ’s efforts (or unit events) in district d , for $d = 1, \dots, D$. We let $d(j)$ denote j ’s home district, and call effort exerted in this district “local” or “intra-district” effort. All other district-specific effort, as well as national effort, is “extra-district.” For convenience, we ignore events that affect (parts of) several districts but fall short of affecting the whole nation.

Given quality q_j and rank r_j , candidate j will choose $\mathbf{e}_j = (e_{j0}, e_{j1}, \dots, e_{jD})$ in order to maximize expected office benefits, net of costs:

$$U_j(\mathbf{e}_j, \mathbf{e}_{-j}) \equiv S_j(\mathbf{e}_j, \mathbf{e}_{-j})[b + P_{gov}(S_{\bullet}(\mathbf{e}_j, \mathbf{e}_{-j}))b_{j,gov}(r_j)\pi] - c(\mathbf{e}_j) \quad (\text{A.1})$$

Here, $S_j(\mathbf{e}_j, \mathbf{e}_{-j})$ is the probability that j wins a seat, given both j ’s effort (\mathbf{e}_j) and the effort exerted by all other candidates, including those from other parties (\mathbf{e}_{-j}). A candidate’s chance of winning a seat depends on other factors, notably list rank, but we simplify our notation by leaving this dependence implicit. The value of winning a seat, given in the square brackets, consists of a consumption value (b), plus j ’s expected share of high offices. The probability that j ’s party enters government ($P_{gov}(S_{\bullet}(\mathbf{e}_j, \mathbf{e}_{-j}))$) increases as the party’s expected number of seats, $S_{\bullet}(\mathbf{e}_j, \mathbf{e}_{-j})$, increases. We use bullets

to indicate summation over the subscript: $S_{\bullet}(\mathbf{e}_j, \mathbf{e}_{-j}) = \sum_{i \in P(j)} S_i(\mathbf{e}_i, \mathbf{e}_{-i})$ where $P(j)$ is the set of candidates in j 's party. (Note that we do not consider parties whose probability of entering government would improve were they to lose votes.) π represents the expected value of the pie of high offices that becomes available to j 's party when it enters government, while $b_{j,gov}(r_j)$ represents j 's expected share of that pie as a function of his or her list rank (r_j). Finally, $c(\mathbf{e}_j)$ represents j 's cost of effort.

On the one hand, if $P_{gov} = 0$ (j 's party has no chance of entering government) or $\pi = 0$ (j does not value portfolios), then candidate j 's motivation reduces to maximizing the probability of winning a seat. On the other hand, as b approaches zero, seats become worthless relative to portfolios and candidate j is motivated solely by the prospect of gaining high offices.

We assume that $b_{j,gov}(r_j) > 0$ for winning candidates; and impose the following **Monotonicity Assumption**: If $r < r'$, then $b_{j,gov}(r) > b_{j,gov}(r')$. In other words, each candidate's share of the pie of higher offices increases in expectation with list rank.

We also adopt the following **Cost Assumption**: $c(\mathbf{e}_j) = p_{nat}e_{j0} + p_{district}[e_{j1} + \dots + e_{jD}]$, with $p_{nat} = Dp_{district}$. The notion here is that district-specific events all cost the same price p to stage, regardless of the district in which they are staged; while national events produce a uniform swing in all districts and cost D times what a district-specific event costs.

Election is virtually assured for candidates ranked high enough on the list, meaning that their goal reduces approximately to maximizing their expected share of high offices, net of costs:

$$\max_{\mathbf{e}_j} U_j(\mathbf{e}_j, \mathbf{e}_{-j}) \approx P_{gov}(S_{\bullet}(\mathbf{e}_j, \mathbf{e}_{-j}))b_{j,gov}(r_j)\pi - c(\mathbf{e}_j) \quad (\text{A.2})$$

Note that $S_{\bullet}(\mathbf{e}_j, \mathbf{e}_{-j}) = S_1(\mathbf{e}_j, \mathbf{e}_{-j}) + \dots + S_D(\mathbf{e}_j, \mathbf{e}_{-j})$, where $S_d(\mathbf{e}_j, \mathbf{e}_{-j})$ denotes seats won in district d . Assuming vote shares translate smoothly into seat shares in PR districts, we can simplify by substituting the party's vote share in each district for its seat share. (We thus ignore different levels of competition across PR districts, in

order to isolate how the desire to get into high office affects candidate behavior.) Letting $V_{\bullet}(e_j, e_{-j}) = V_1(e_j, e_{-j}) + \dots + V_D(e_j, e_{-j})$, we can substitute this for $S_{\bullet}(e_j, e_{-j})$ in Equation (A.2).

We assume that effort translates log-linearly into vote shares in each district. In particular, for the home district $d(j)$, we assume:

$$V_{d(j)}(e_j, e_{-j}) = V_{d(j)}(0, e_{-j}) + (\ln(1 + e_{j0}) + \beta_{loc}\ln(1 + e_{jd(j)}))q_j \quad (\text{A.3})$$

For districts d not equal to $d(j)$, we assume:

$$V_d(e_j, e_{-j}) = V_d(0, e_{-j}) + (\ln(1 + e_{j0}) + \ln(1 + e_{j,nonloc}))q_j \quad (\text{A.4})$$

The notion behind Equations (A.3) and (A.4) is that events at any level have diminishing marginal returns, the impact of home events depends on a home-district bonus ($\beta_{loc} > 1$) reflecting “friends and neighbors” voting, and the impact of all events depends on the quality of the candidate (q_j).

Given these assumptions, any candidate will begin to exert intra-district effort before they begin to exert extra-district effort—because local effort is more effective ($\beta_{loc} > 1$) and prices reflect the markets reached. Since the marginal benefit of intra-district effort declines as more such effort is exerted, there will eventually come a point at which extra-district efforts become more productive than further local effort. We let $e_{j,loc}^*(q_j, r_j)$ denote candidate j 's optimal local effort, given quality q_j and rank r_j ; and let $e_{j,extra}^*(q_j, r_j)$ denote the optimal number of extra-district events staged by candidate j .

Given this notation, we can state the following **Effort Composition Hypothesis**: For any given safe rank r_j , there exist thresholds $Q_{loc}(r_j)$ and $Q_{extra}(r_j)$ such that:

$$q_j \leq Q_{loc}(r_j) \rightarrow e_{j,loc}^*(q_j, r_j) = e_{j,extra}^*(q_j, r_j) = 0 \quad (\text{A.5})$$

$$Q_{loc}(r_j) < q_j \leq Q_{extra}(r_j) \rightarrow e_{j,loc}^*(q_j, r_j) > 0 \& \begin{cases} e_{j,extra}^*(q_j, r_j) = 0, \text{ if } e_{j,loc}^* \leq \beta_{loc} - 1 \\ e_{j,extra}^*(q_j, r_j) > 0, \text{ if } e_{j,loc}^* > \beta_{loc} - 1 \end{cases} \quad (\text{A.6})$$

$$Q_{extra}(r_j) < q_j \rightarrow e_{j,loc}^*(q_j, r_j) > 0 \& e_{j,extra}^*(q_j, r_j) > 0 \quad (\text{A.7})$$

In other words, for any given rank, the composition of candidates' effort will shift according to the quality stratum in which they fall. Candidates in the lowest quality stratum will exert no effort (Equation A.5). In the middle stratum, whether extra-district effort is worthwhile depends on how much local effort has been exerted (Equation A.6). If local effort is small, then its marginal product still exceeds that of extra-district effort and the latter remains nil. But if local effort is large enough, then its marginal product falls short of the marginal product of extra-district effort (at zero extra-district effort) and thus both kinds of effort are exerted. Those in the highest stratum will exert both intra-district and extra-district effort (Equation A.7).

Since $P_{gov}(V_\bullet(\mathbf{e}_j, \mathbf{e}_{-j}))$ is limited to the $[0,1]$ interval, it must (under fairly general conditions) become a concave function of j 's effort over some range. We assume that it is concave for any levels of effort. This would make sense, for example, if the focal party were in a dead heat with another party for being the largest party nationwide, and constitutional norms gave the largest party the opportunity to lead negotiations to form a government. More generally, all that we require is that when effort is locally non-profitable at zero, it is globally non-profitable.

Given our assumptions, there will exist quality thresholds at which any given candidate first begins to exert each type of effort—intra-district and extra-district. To identify the threshold for local effort, consider the net marginal benefit of exerting local effort. Differentiating U_j with respect to $e_{j,loc}$, and evaluating at $\mathbf{e}_j = (0, 0, 0)$, we get

$$\frac{\partial U_j(0, 0, 0, \mathbf{e}_{-j})}{\partial e_{j,loc}} = P'_{gov} \beta_{loc} q_j b_{j,gov}(r_j) \pi - p_{district} \quad (\text{A.8})$$

This payoff will be non-positive whenever q_j is at or below a threshold $Q_{loc}(r_j)$. Specifically, if $q_j \leq Q_{loc}(r_j) \equiv \frac{p_{district}}{P'_{gov}\beta_{loc}b_{j,gov}(r_j)\pi}$, then j 's optimal effort will be nil: $e_{j,loc}^* = 0$.

Proceeding similarly with respect to effort in some district $d \neq d(j)$, we find that

$$\frac{\partial U_j(0, 0, 0, \mathbf{e}_{-j})}{\partial e_{jd}} = P'_{gov}q_j b_{j,gov}(r_j)\pi - p_{district} \quad (\text{A.9})$$

and thus the threshold for districts other than the home district is $Q_{nonloc}(r_j) \equiv \frac{p_{district}}{P'_{gov}b_{j,gov}(r_j)\pi} > Q_{loc}(r_j)$. In other words, any candidate will begin to exert effort in their home district before they begin to exert effort in other districts—because local effort is more effective ($\beta_{loc} > 1$) and identically priced.

Finally,

$$\frac{\partial U_j(0, 0, 0, \mathbf{e}_{-j})}{\partial e_{j0}} = P'_{gov}Dq_j b_{j,gov}(r_j)\pi - p_{nat} \quad (\text{A.10})$$

and thus the national threshold $Q_{nat}(r_j) \equiv \frac{p_{nat}}{P'_{gov}Db_{j,gov}(r_j)\pi}$. Since $p_{nat} = Dp_{district}$, it follows that $Q_{nat}(r_j) = Q_{nonloc}(r_j)$.

Any candidate will begin to exert local effort before they begin to exert national effort—because local effort is more effective ($\beta_{loc} > 1$) and prices reflect the markets reached ($\frac{p_{nat}}{p_{district}} = D$). Since the marginal benefit of local effort declines as more such effort is exerted, there will eventually come a point at which national and non-local efforts become more productive than further local effort. Since national and nonlocal events have the same threshold, we combine them into a single category of “extra-district” events.

In the main text, we note that “as a candidate’s rank increases, one should first see local effort increase, followed by external effort.” To see this, consider a set of J candidates, with fixed qualities, listed in a single PR district. Given our assumptions, if $q_1 > \dots > q_J$, then $r_1 < \dots < r_J$. Holding fixed all other candidates’ characteristics, suppose that candidate j 's rank increases. Under the model, this can only occur if j 's quality improves relative to the fixed qualities of the other candidates. Given the Monotonicity Assumption that each candidate’s share of the pie of higher offices increases in expectation with list rank, higher quality for j implies that the thresholds $Q_{loc}(r_j)$ and $Q_{nonloc}(r_j)$ decrease.

Now suppose that j 's rank is so low that they exert no effort. As j 's rank improves, the Effort Composition Hypothesis implies that one of the following is true: (i) j continues to exert no effort for all ranks; (ii) j begins to exert local effort, but no extra-district effort, at some threshold rank and then continues to exert only local effort thereafter; (iii) j begins to exert local effort, but no extra-district effort, at some threshold rank; and then exerts both intra-district and extra-district effort at all ranks above a second, higher threshold.

Finally, in the main text, we assume the following **Rank Order Hypothesis**: If winning a marginal seat substantially affects a party's chance of getting into government, then in the limit as b approaches zero, parties will allocate list positions to their candidates according to their quality ranks. In other words, if candidate j has the k th highest quality in the district, then he or she will receive the k th position on the district list. This is because for any given list spot, r_j , effort weakly increases with quality. That is, if $q_{hi} > q_{lo}$, then $e_{j,nat}^*(q_{hi}, r_j) \geq e_{j,nat}^*(q_{lo}, r_j)$, $e_{j,nonloc}^*(q_{hi}, r_j) \geq e_{j,nonloc}^*(q_{lo}, r_j)$, and $e_{j,loc}^*(q_{hi}, r_j) \geq e_{j,loc}^*(q_{lo}, r_j)$. This means that the party gets the biggest vote contribution from any given slot by allocating it to the highest-quality candidate still available.

Appendix B: Supplementary information

Table B.1: Summary statistics on earnings score for candidates

Election year	Mean	Standard deviation	Candidates (N)	Population (N)	Match rate w/ Statistics Norway
1997	0.212	0.869	1,464	3,340,844	70%
2001	0.233	0.871	1,572	3,403,416	78%
2005	0.212	0.659	1,814	3,481,427	88%
2009	0.290	1.009	2,153	3,626,318	100%
2013	0.295	1.068	2,175	3,838,685	100%
2017	0.276	1.007	2,458	4,086,932	100%

Note: The table displays summary statistics for the earnings scores. The scores derive from annual Mincer regressions on personal income levels (wage incomes plus net firm revenues) estimated on the entire population (aged 18 and above). The earnings scores are measured as standardized residuals with a population-wide mean of 0 and a standard deviation of 1. Candidates are individuals who were running for one of the nine main parties in the relevant parliamentary election. For previously unelected candidates, we use data from the year before the relevant election. For previously elected candidates (including candidates elected as the first deputy MP) we use data from the year before their first successful election. Earnings scores for candidates are defined by the average scores in years before candidates were elected to parliament. The match rate indicates the percentage of candidates identified with earnings scores in the register data.

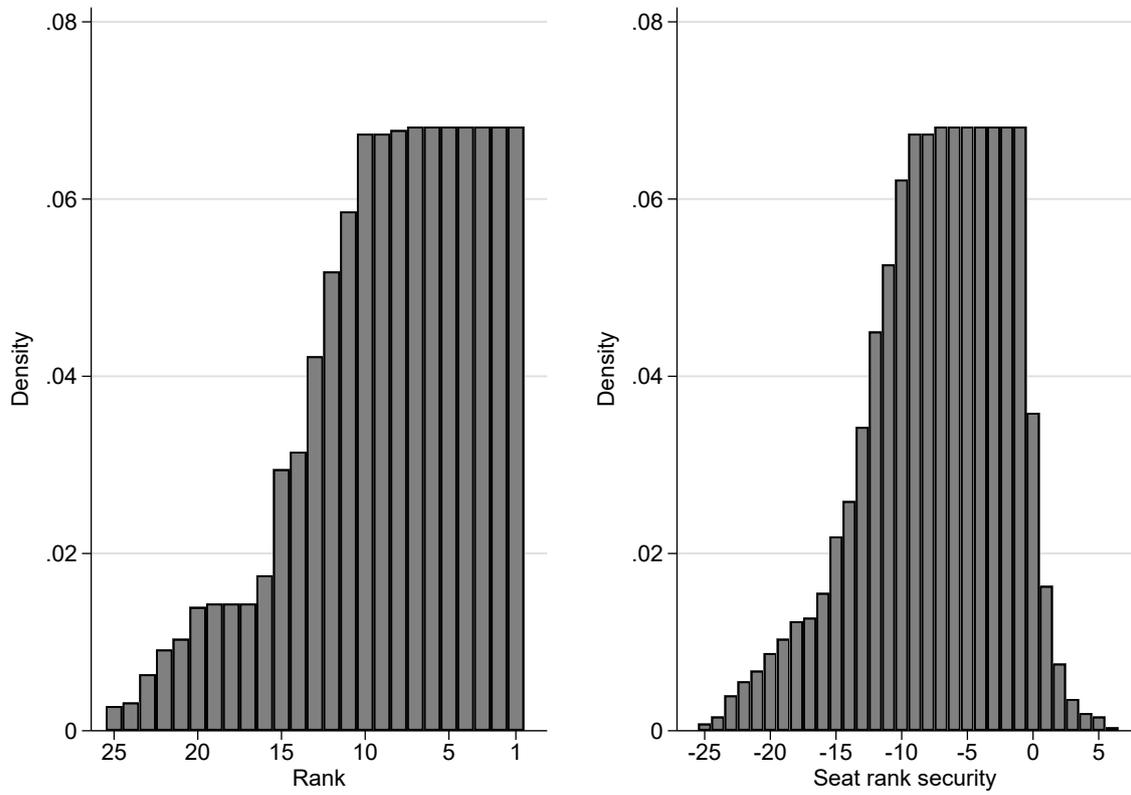


Figure B.1: Histograms for rank and seat rank security

Note: The sample is limited to the nine main parties participating in the 2017 Norwegian Parliamentary election ($N=2,487$). A candidate's seat rank security is defined as the number of seats won by his or her party in the last election (in a given district), minus the candidate's rank on the list in the current election.

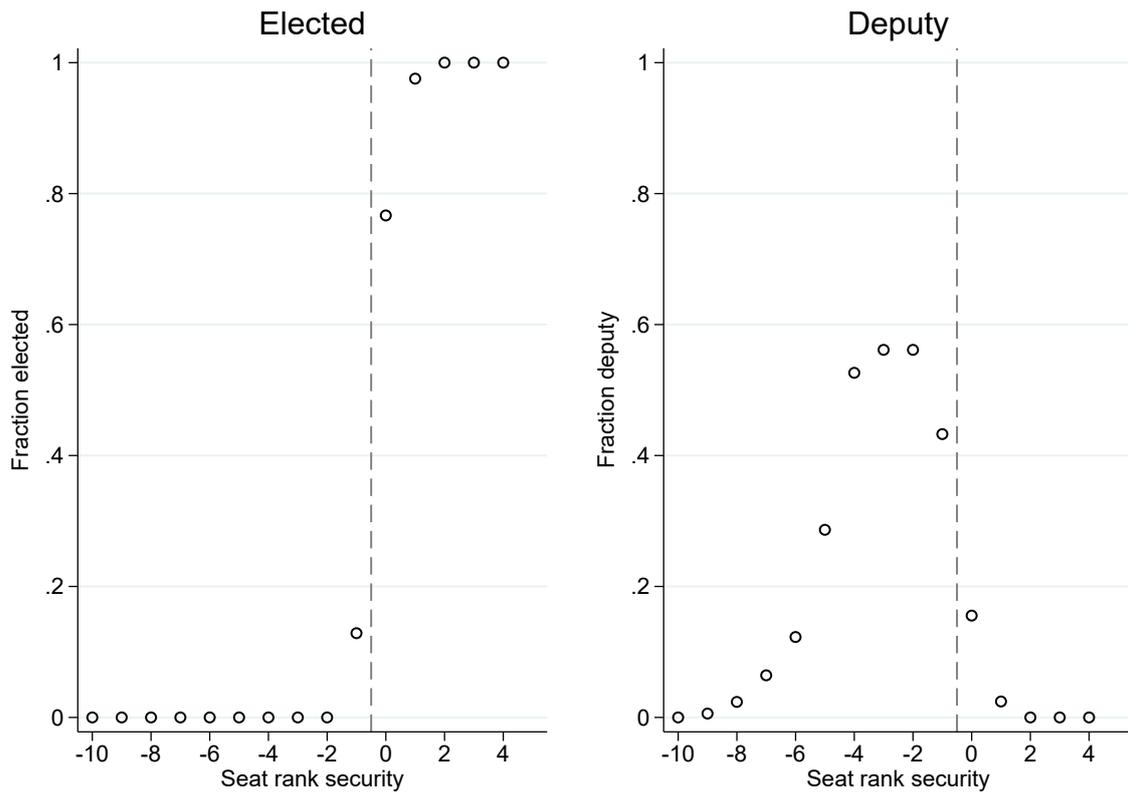


Figure B.2: Election outcomes by seat rank security

Note: The left-hand panel (right-hand panel) displays the fraction of candidates elected (elected as deputy) by candidate's seat rank security. A candidate's seat rank security is defined as the number of seats won by his or her party in the last election (in a given district), minus the candidate's rank on the list in the current election. The x-axes are censored at -10 and $+4$.

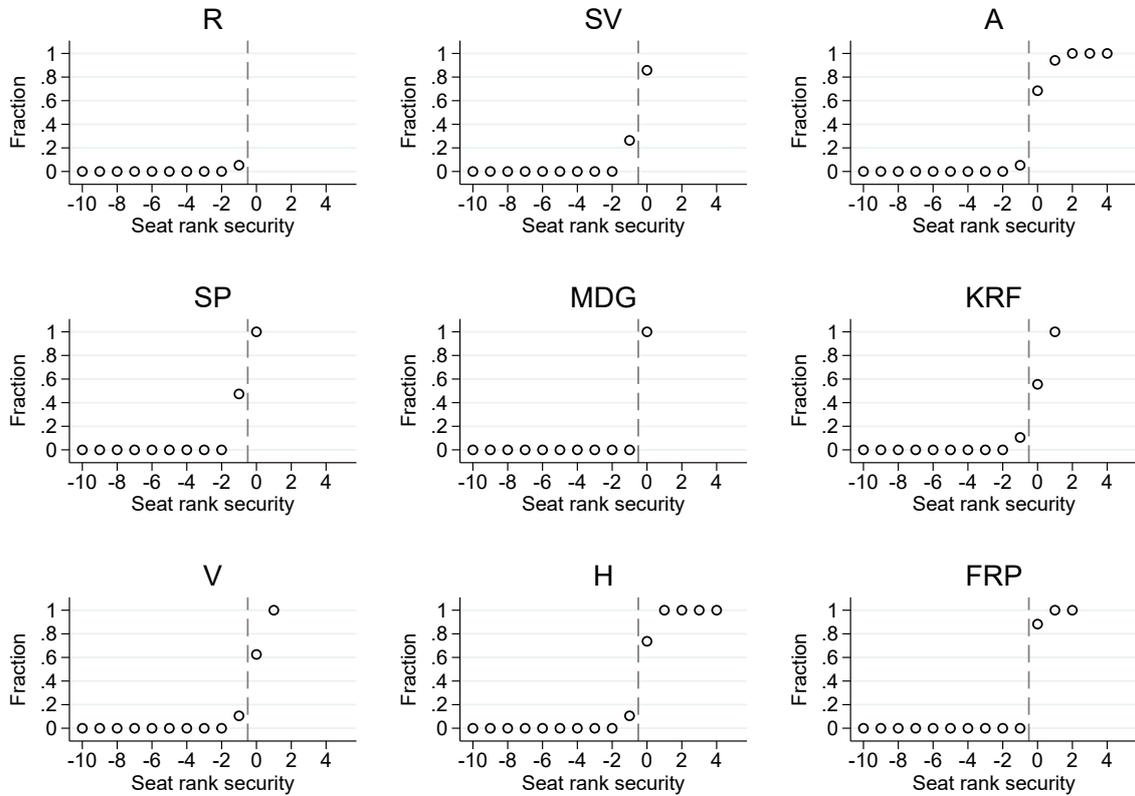


Figure B.3: Fraction of candidates elected by seat rank security and party

Note: For each of the nine main parties, this figure plots the fraction of candidates elected by seat rank security ($N=2,487$). A candidate's seat rank security is defined as the number of seats won by his or her party in the last election (in a given district), minus the candidate's rank on the list in the current election. The nine main parties are the Red Party (R), Socialist Left Party (SV), Labor Party (A), Center Party (SP), Green Party (MDG), Christian Democratic Party (KRF), Liberal Party (V), Conservative Party (H), and Progress Party (FRP). The x-axes are censored at -10 and $+4$.

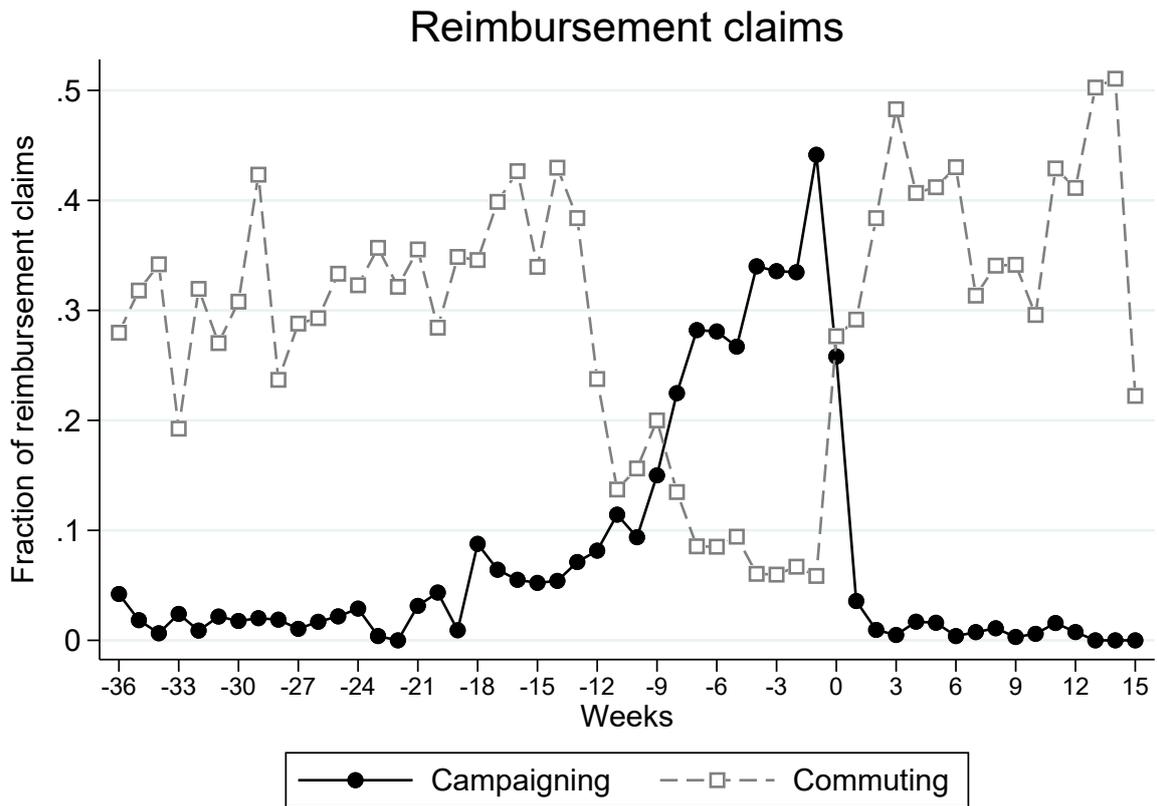


Figure B.4: Reasons for reimbursement claims over time

Note: This figure displays the fraction of reimbursement claims made for campaigning and commuting, respectively, over time. The sample covers all reimbursement claims made in the 2017 calendar year. Election day is in week 0. We classify a reimbursement claim as campaigning if the reason given includes “election” (“valg”), “booth” (“stand”), or “door” (“dør”). We classify a reimbursement claim as commuting if the reason given includes “commute” (“pendle”) or “Starting.”

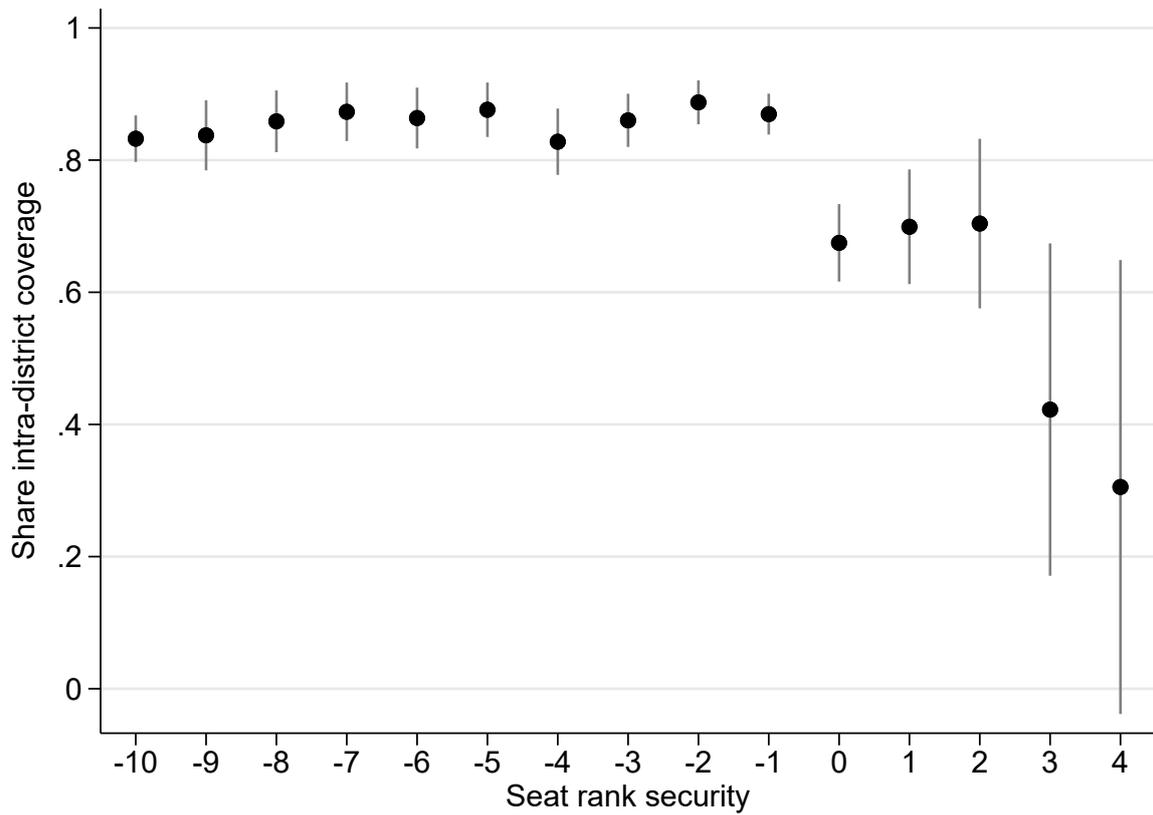


Figure B.5: Mean share of mass media coverage that is within-district, by list rank, excluding national media

Note: Sample restricted to the hundred days leading up to the election day. National media outlets are excluded. A candidate's seat rank security is defined as the number of seats won by his or her party in the last election (in a given district), minus the candidate's rank on the list in the current election. The x-axis are censored at -10 and +4.

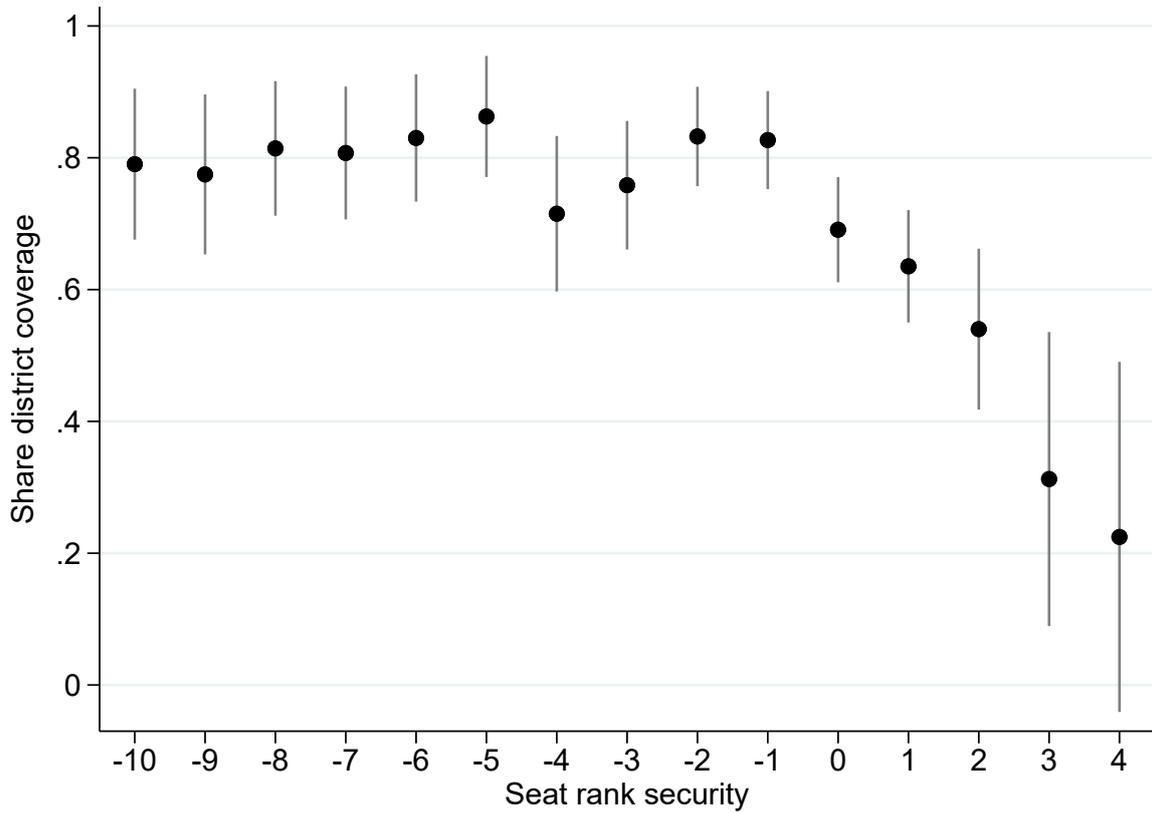


Figure B.6: Mean share of mass media coverage that is within-district, by list rank, for the two largest parties

Note: Sample restricted to the hundred days before election day and to candidates ($N=564$) running for one of the two largest parties (Labor and Conservatives). A candidate's seat rank security is defined as the number of seats won by his or her party in the last election (in a given district), minus the candidate's rank on the list in the current election. The x-axis are censored at -10 and $+4$.

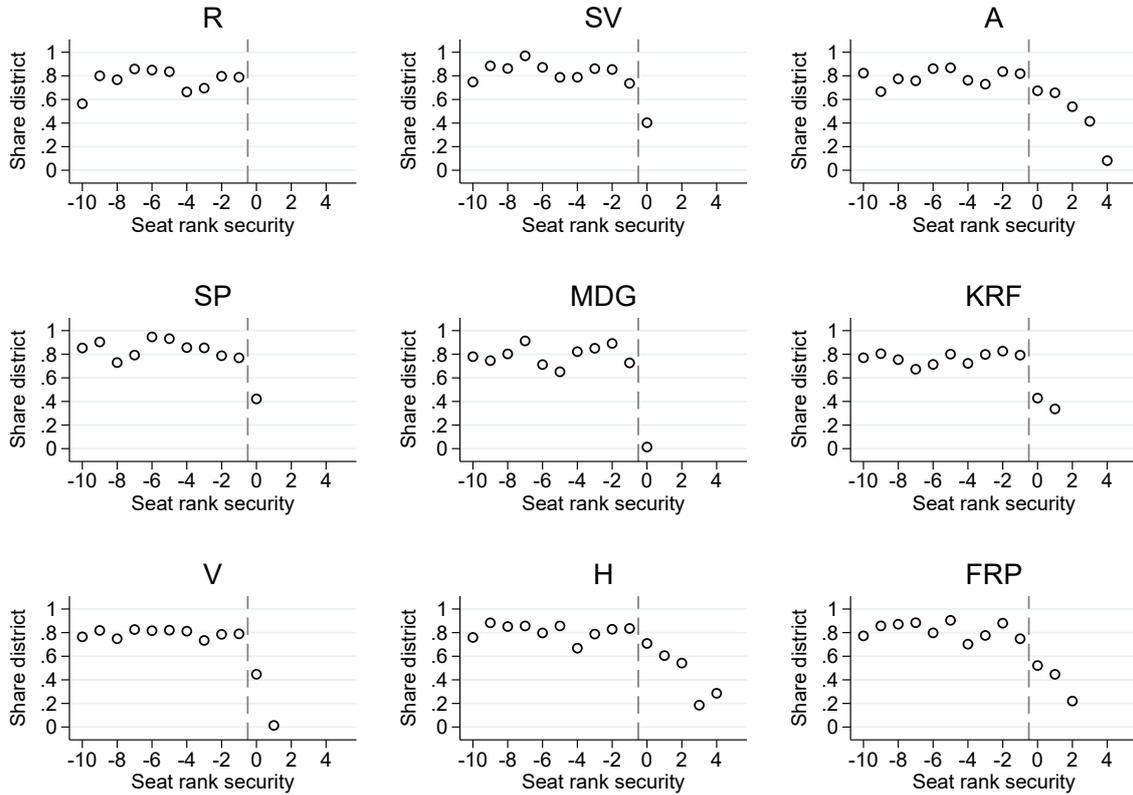


Figure B.7: Within-district media coverage by party and seat rank security

Note: For each of the nine main parties, this figure plots the mean share of mass media coverage that is within-district by seat rank security ($N=2,487$). A candidate's seat rank security is defined as the number of seats won by his or her party in the last election (in a given district), minus the candidate's rank on the list in the current election. The nine main parties, with number of hot/safe candidates in parentheses, are the Red Party (R; 0), Socialist Left Party (SV; 7), Labor Party (A; 55), Center Party (SP; 10), Green Party (MDG; 1), Christian Democratic Party (KRF; 10), Liberal Party (V; 9), Conservative Party (H; 48), and Progress Party (FRP; 29).

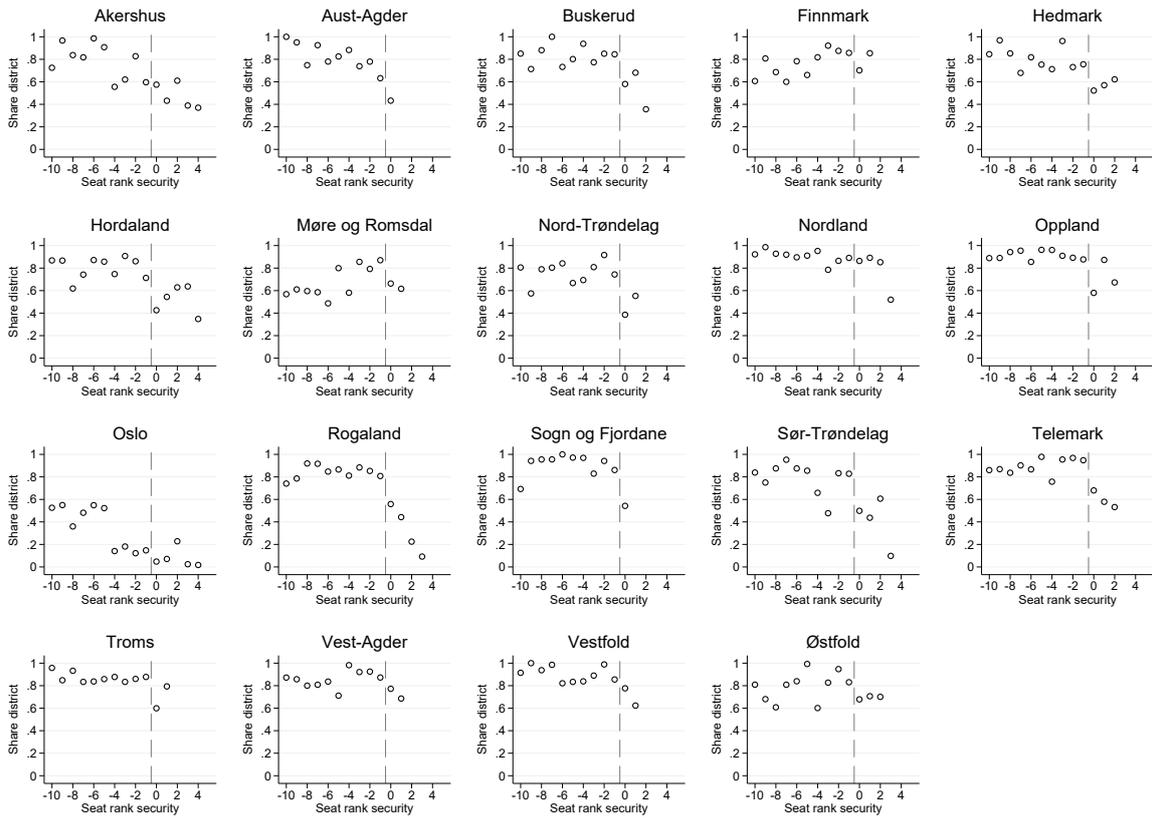


Figure B.8: Within-district media coverage by district and seat rank security

Note: For each of the nineteen districts, this figure plots the mean share of mass media coverage that is within-district by seat rank security ($N=2,487$). A candidate's seat rank security is defined as the number of seats won by his or her party in the last election (in a given district), minus the candidate's rank on the list in the current election.

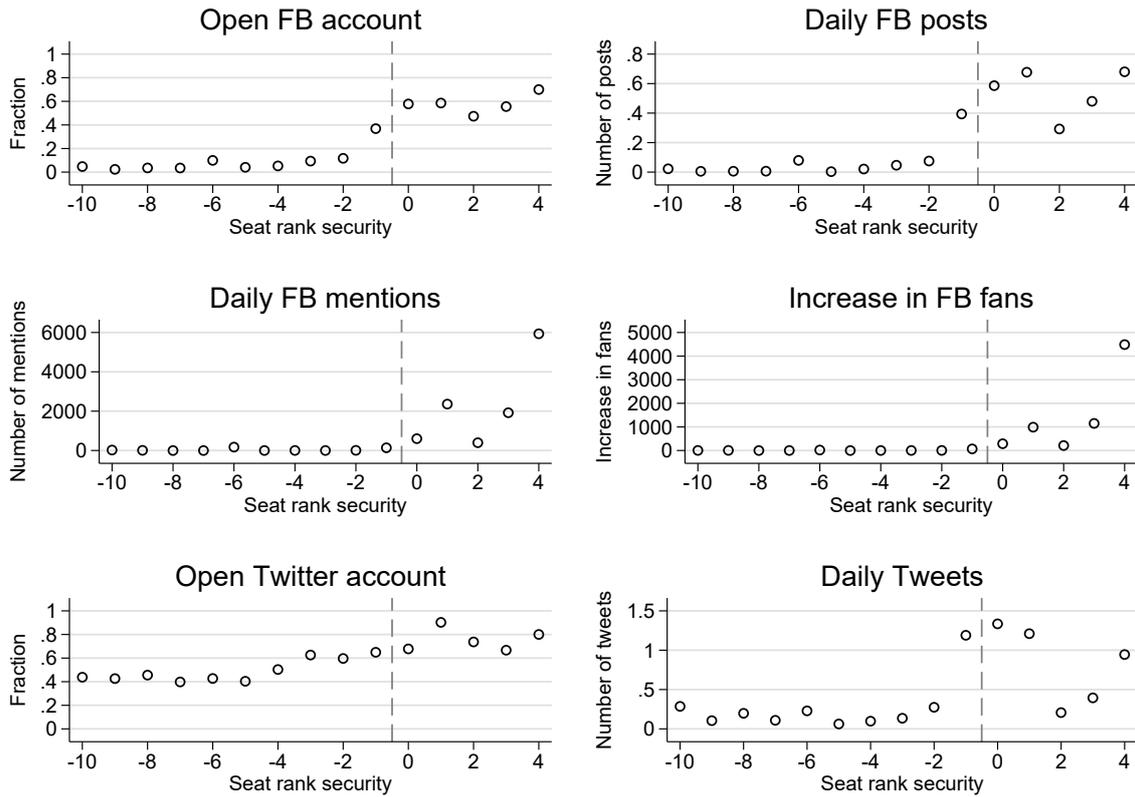


Figure B.9: Supplementary social media outcomes by candidate electoral viability
Note: Sample restricted to the hundred days before election day and to candidates ($N=2,487$) running any of the nine main parties. A candidate's seat rank security is defined as the number of seats won by his or her party in the last election (in a given district), minus the candidate's rank on the list in the current election. The x-axes are censored at -10 and $+4$.

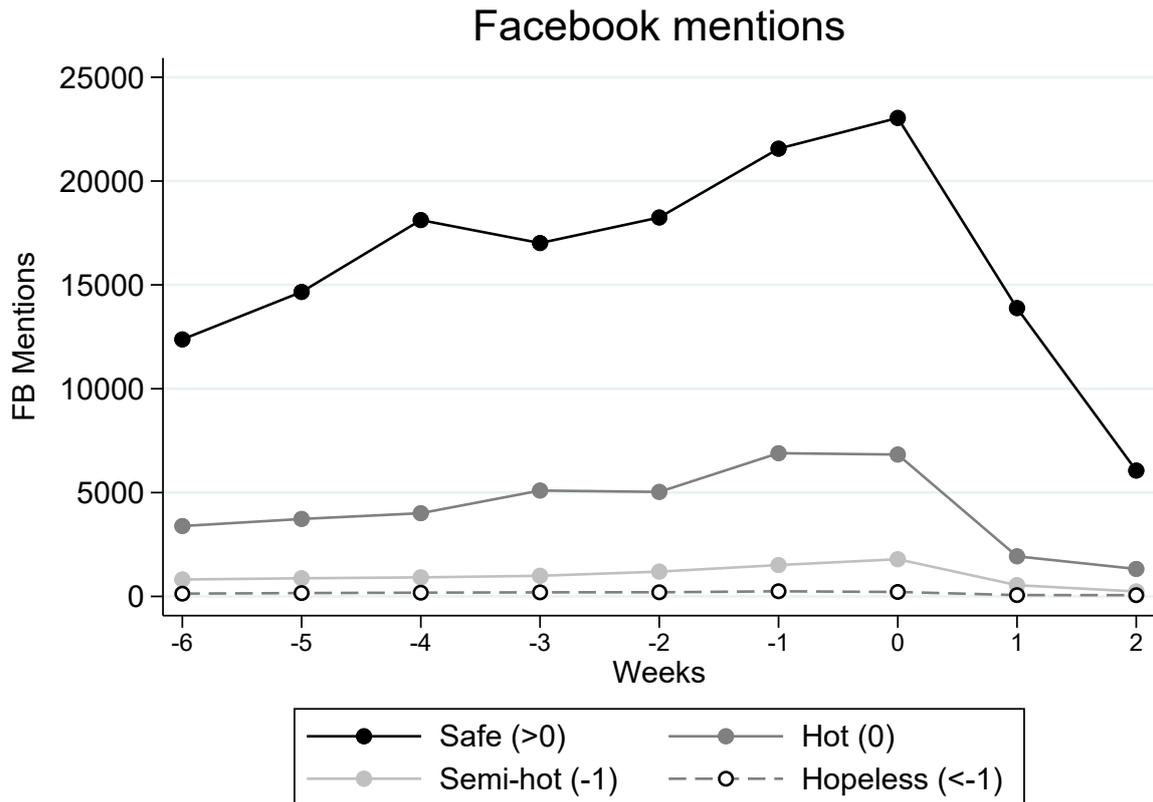


Figure B.10: Facebook mentions over time by candidate electoral viability

Note: This figure displays candidates' Facebook mentions over the campaign period by candidates' electoral viability using four categories: Safe candidates (seat rank security > 0); Hot (seat rank security 0); semi-hot (seat rank security of -1) and hopeless (seat rank security < -1). Candidates without open Facebook accounts have zero mentions.

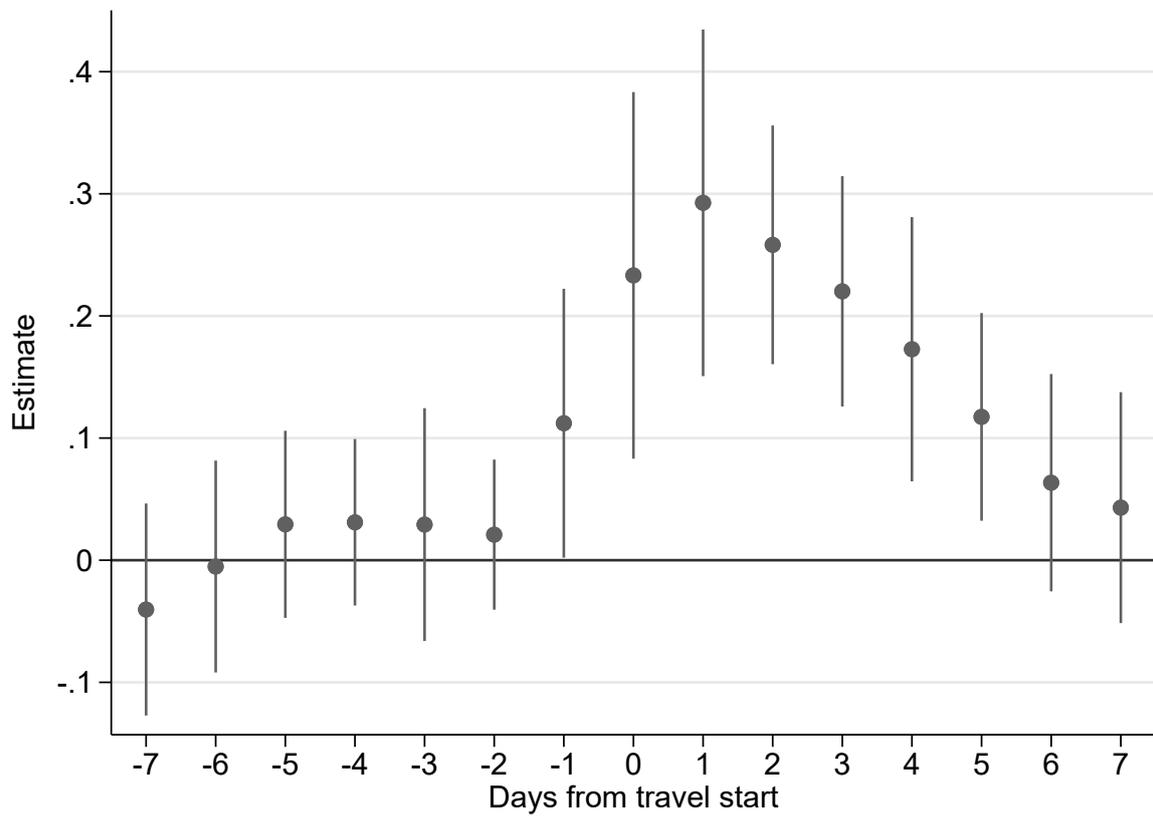


Figure B.11: Incumbents' travel behavior and media coverage

Note: This figure displays estimated coefficients and 95% error bars from a candidate-district fixed effect model. This model relates candidate trips to district d starting at day 0 to media coverage of the candidate in district d in a fifteen-day window surrounding the start of the trip ($N=100$). Candidates from Oslo, as well as trips to Oslo (where the parliament is located) are excluded. Cabinet ministers and outgoing politicians are not included.

Appendix C: Traditional and social media data

By international standards, Norway has a high newspaper penetration,⁴⁵ and local newspapers remain a key source of information on local candidates. While print subscriptions have declined, digital subscriptions have increased.⁴⁶ Survey data from 2017 show that 81% of respondents use Facebook, 50% use Snapchat or Instagram, and 30% use Twitter.⁴⁷ The 2017 National Election Surveys show that traditional media remains the main source of information during national election campaigns, and that social media only plays a small role.⁴⁸

Social media

With the help of research assistants, we identified publicly accessible Twitter and Facebook accounts for candidates running for any of the nine main parties (N=2,487).⁴⁹ Using this information, the media consultancy firm *Retriever* (<http://www.retriever.no>) established a search engine to collect the relevant activities in each social media account. The social media data cover the nine-week period from Sunday, July 30, to Saturday, September 30. The dataset includes information on whether the candidate had a publicly accessible Twitter account, the daily number of likes, followers, tweets, and retweets. Similarly, the dataset includes information on whether the candidate had a publicly accessible Facebook account, the daily number of post, likes, fans, and mentions. Due to some data issues at *Retriever*, we lack social media data for the periods August 22–25,

⁴⁵For documentation, see <https://www.nationmaster.com/country-info/stats/Media/Newspapers-and-periodicals/Circulation/Daily/Per-capita>.

⁴⁶For further information on media and digital subscriptions, see <http://www.digitalnewsreport.org/survey/2017/norway-2017/>.

⁴⁷For further information on the survey, see <https://www.statista.com/statistics/738948/social-media-usage-in-norway-by-platform/>.

⁴⁸For further documentation, see the online analysis facility at NSD – Norwegian Center for Research Data, <https://nsd.no/nsd/english/>.

⁴⁹We exclude candidates from minor lists, none of which have won any seats in parliament since 2000 (1,930 candidates). We also exclude the Liberal Party in *Vest-Agder* and *Aust-Agder*, because they run with an identical list of candidates in these districts. The nine main parties, ordered along the left-right dimension, are: *Rødt* (R), *Socialist Left Party* (SV), *Labor Party* (A), *Center Party* (SP), *Greens* (MDG), *Christian Democratic Party* (KrF), *Liberal Party* (V), *Conservative Party* (H), and *Progress Party* (FrP).

August 30–September 6, and September 8–9. For these periods, we interpolate the data.

Traditional media

Retriever has access to an (extended) version of the media archive *Atekst*. The database has comprehensive coverage of all news stories appearing in newspapers on the web and in print, as well as stories in radio and TV (advertisements are excluded).⁵⁰ Using the names and party affiliations of candidates, *Retriever* generated a dataset on daily media appearances for all candidates in each outlet. These data cover the eighteen-week periods surrounding the 2013 and 2017 elections (May 26–September 28, 2013; May 28–September 30, 2017) and include information on the headquarter locations of the various media outlets (we manually supplement the data in instances where this information is missing).

In the 2017 time window, there are 943 outlets mentioning any candidate (31% print; 62% web; 4% radio; and 3% TV). Across outlets, the average number of overall candidate mentions is 276 (standard deviation = 485). We follow *Retriever*'s classification of media outlets with a local vs. national reach, and supplement this classification wherever necessary.

⁵⁰For documentation, see <https://web.retriever-info.com/services/archive.html>.