

Gender Quotas and the Crisis of the Mediocre Man: Theory and Evidence from Sweden*

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Abstract

This paper presents a model of how political parties choose the composition of their lists, with regard to gender and competence, in competition with other parties under proportional representation. It then builds a unique data set with rich individual data on all political candidates, in all parties, in all Swedish municipalities, since 1988. The data show that the elected shares of women and competent men both increase with the quality of the party leadership, as our theory predicts. We investigate the effects of the “zipper” placement mandate unilaterally implemented by the Social Democratic party in 1993, and find that the quota raised (lowered) the competence of men in the municipalities relative to where the initial share of women was low (high).

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"Our party's quota policy of mandatory alternation of male and female names on all party lists was informally known as the crisis of the mediocre man ..." Inger Segelström – chair of Social Democratic Women's Federation 1995-2003.

1 Introduction

It is often said that representative democracies need both men and women of competence and integrity to operate well. But how far one should attempt to engineer changes in the composition of the political class is much debated. Nevertheless, gender representation is an area where a myriad of changes have been made. That said, the empirical literature on policy effects from greater representation of women is somewhat equivocal, despite the clear predictions from citizen-candidate models, such as Besly and Coate (1997).¹ When it comes to the impact of the engineering tools themselves on other outcomes, such as the competence of politicians, we know even less. In this paper, we aim to bridge that knowledge gap from a theoretical as well as an empirical perspective.

In models of political selection, such as Banks and Sundaram (1998), it is commonly assumed that politician competence matters and can be treated as a valence issue. This assumption is echoed in a survey of Swedish voters, who in the year 2000 were asked about their reasons for choosing a party. The most important one was indeed competence, with 71 percent of those surveyed affirming the suggestion that the party should have "competent politicians that can handle the country's affairs".² However, exactly how voters interpreted this statement, or indeed how political competence can and should be measured, is not directly evident.³ A unique feature of this paper is a data set that allows us to define a new measure of competence, which persuasively gauges the competence of each individual candidate.

When it comes to the engineering of equal gender representation, quotas

¹Recent studies which all find effects include Chattopadhyaya and Duflo (2004) for Indian villages, Rehavi (2008) for U.S. states, and Svaleryd (2009) for Swedish municipalities, while no effects are found by Ferreira and Gyorko (2011) for U.S. cities and Campa (2011) for Spanish municipalities.

²See Appendix Table 2 for details.

³Competence and its importance is sometimes measured in an indirect way – e.g., Galasso and Nannicini (2011) find that parties place the most educated candidates in the most contested electoral districts in Italy.

are commonly used, but their merits are often contested. More than 100 countries use some form of gender quotas in their election systems, and measures are also discussed e.g., for company boards. Quota proponents often refer to equal representation and opponents refer to violations of meritocracy. But, to date, little theory and evidence speak on this issue. There is a considerable body of research on effects of gender quotas.⁴ The existing literature, however, has not investigated the equilibrium effects of quotas, including their possible impact on other dimensions of candidate selection such as competence.⁵ Similarly, the effect of one party's quota on the behavior of parties not subject to a quota is a neglected issue.

In the paper, we build the first explicit model to analyze how two parties select the gender and competence composition of their lists in political competition under proportional representation. The model highlights a tension between preferences for list composition of the (male) party leadership and the electorate at large. It also underscores the leadership's trade-off between its own survival and electoral success.⁶

Our framework shows how under-representation of both women and competent (male) politicians may result from a combination of mediocre leaders, who fear for their own political careers, and weak electoral competition. Most importantly for this paper, this framework can also be used to derive testable predictions about the consequences of imposing a gender quota. We predict that such a quota can force mediocre leaders to re-prioritize voter preferences above their own preference for re-election, leading to a simultaneous boost of both gender diversity and male competence.

We provide evidence by building a unique data set with detailed panel data for all candidates, on all party lists, in all Swedish municipalities, in all elections since 1988. We trivially code the gender of all politicians, but also

⁴The spread of reforms and their numeric impact on representation is discussed in Dahlerup 2006 and Krook (2009). Case studies of substantive and symbolic representation are discussed in Franceschet, Krook and Piscopo (2012). Effects on electoral outcomes for parties suggest that a strict quota may benefit parties with previous male dominance (see Cases-Arce and Saiz 2011).

⁵Baltrunaite et al (2012) study Italy and show that the education of male and female politicians goes up with a quota. Julio and Tavares (2011) discuss theoretically how the supply of politicians relate to gender discrimination, and how it responds to a quota.

⁶At a general level, our paper shares its focus on the interaction between internal survival and external success with Caillaud and Tirole (2002). But these authors study the choice of platform quality under plurality rule, rather than selection of list composition under proportional representation.

the competence of candidates, as well as party leaders, in alternative ways. With these data, we study the determinants of (pre-quota) list composition in 1991, showing that the shares of women and competent men both go up with leadership competence and levels of electoral competition, basically as theory predicts. Then, we study the effects of the 1993 "zipper quota" implemented by the Social Democratic party. We show that the quota raised (lowered) the competence of men in the municipalities relative to where the initial share of women was low (high), which is also in line with theory, but find no robust evidence of spillover effects on other parties.

Recent work on quotas and the composition of party ballots has downplayed the role of candidate supply, focusing instead on party demand. Contributions, such as Bagues and Esteve-Volart (2012), have suggested that a lack of political competition leaves room for party organizations to recruit a sub-optimal share of women, given the preferences of voters. This implies that a gender quota might raise voter welfare where competition is low (Casas-Arce and Saiz, 2011). But the role played by the party leadership in drawing up the list has not been examined. Our theory and empirics focus precisely on this issue and show that the competence of the party leadership is key.

In the next section, we provide some background on our empirical context and gender quotas in Sweden. In Section 3, we lay out the model and generate empirical implications. Section 4 discusses data and measurement. The econometric results are collected in Section 5. Section 6 concludes.

2 Swedish Local Politics and Gender Quotas

This section summarizes some basic characteristics of Swedish local politics and the voluntary gender quotas adopted by Swedish political parties. The description is centered on three stylized facts which we will use to guide our theoretical model in Section 3.

Swedish municipalities Politics in Sweden is organized as a parliamentary system with proportional representation, implemented through an electoral system with party lists. Sweden has three levels of government: one national parliament, 21 county assemblies, and 290 municipal councils. Figure 1 shows the counties (thick borders) and municipalities (thin borders) on a map. At each level, the majority party or coalition forms the government

and appoints the prime minister, or the equivalent position at the local level, the chairperson of the municipal council board. Elections are held every four years (every three years prior to 1994) and parties are allocated seats in proportion to their vote shares. Since elections are synchronized for the local, county and national levels, turnout is typically 80-90 percent of eligible voters. Since 1998, voters have the option of casting one preferential vote for a single candidate on the ballot.

[Figure 1 here]

In contrast to many other unitary states, local assemblies have significant political autonomy and economic importance. They control budgets amounting to 15-20 percent of GDP and employ around 20 percent of the country's labor force. There are some intergovernmental transfers but the bulk of municipal revenue is raised by a local income tax with a tax rate, set by the municipal council, typically exceeding 20 percent. The right to local self-government is guaranteed in the Swedish Instrument of Government, which stipulates that local authorities determine their own affairs. Moreover, under the 1991 Local Government Act 2.1, local authorities are responsible for all public-interest matters relevant to the municipal council and population, which are not the exclusive responsibility of the state or some other body. Despite their substantial influence, work by municipal politicians is mostly unpaid and carried out in conjunction with a private-sector or public-sector career. Typically, only the chairperson of the municipal council receives a full-time salary.

Municipalities differ widely in size – the land area varies from 9 to 19,447 square kilometers and population varies from 2,558 to 780,817 inhabitants. The municipal council varies in size between 31 and 101 members, with an average of 46 seats, as illustrated with four size classes in Figure 1. No explicit electoral threshold exist for representation, which is instead implicitly determined by district magnitude. Since this threshold is low, all of the seven main national political parties tend to have at least some representation in each municipal assembly. These parties fall into two main political blocks, where the left block consists of the Left Party, the Social Democrats, and the Green party,⁷ and the center-right block consists of the Christian Democrats, the Center party, Liberal party and the Conservatives.

⁷The Green party can also be considered as independent as in Pettersson-Lidbom's (2008) study.

Three core facts about Swedish municipal government are useful in setting the scene for our study.

Stylized fact #1: Municipal political leaders are mostly male As in most countries, men in Sweden historically held a monopoly over the right to vote and to hold political office. Women have held the unqualified right to vote since 1919 and do not face formal restrictions on holding political office. Even though Sweden is often viewed as a world leader in female representation, men continued to dominate the positions of political power long after the female franchise.

At the municipal level, a simple way to assess the extent of male overrepresentation is to look at the share of men among those ranked first on party ballots. This position is normally reserved for a politician who is appointed chairperson of the municipal council board after the election, in the case of the majority party, or the party group leader in other cases. In the first year of our sample, 1988, men held 80 percent of all such positions (83 percent in the Social Democratic party) and in 1991 they held 79 percent (82 percent).

Stylized fact #2: Local leaders control the composition of the party list Party ballot composition is at the heart of the proportional election system. Positions on the list determine who is elected, but also who is given a high list rank and hence a more influential political position. Lists are composed in three steps, as sketched in Figure 2.

[Figure 2 here]

First, a group of potential candidates is selected from among the party membership by either internal nominations (Left party and Social Democrats) or an internal primary (the other parties). In both cases, this first step is administered by a selection committee which collects the results. Second, the committee uses the results to put together a preliminary list. Third, this list is subject to a vote in a meeting of party members.

Local party leaders normally exert strong influence over the decisions by the selection committee, which effectively controls the composition of the list. The committee administers the first selection stage and determines the ranking at the second proposal stage. The influence of rank-and-file party members is limited throughout this process. Even when an internal primary is conducted, candidate lists are usually ranked by the committee,

or administered in conjunction with party lists from the previous election as "guidance". This enables the leadership to have indirect influence over the outcome of the primary vote (Soininen and Etzler, 2006). Rank-and-file members also lack much influence at the third stage where, in theory, they can challenge the list suggested by the committee. But, in practice, few changes are made.

Stylized fact #3: Effective gender quotas require placement mandates More than one hundred countries worldwide have adopted some form of gender quota for political representation. However, some quotas are commonly viewed to be more effective than others in increasing the number of women holding political office. For example, a pure list quota for women in a proportional election systems is problematic, unless the quota is accompanied by a mandate on list placement. This is because women may end up towards the bottom of the list (see e.g., Norris, 2004 and Krook, 2010, and for evidence on Spain, Casas-Arce and Saiz, 2011 and Campa, 2011).

As Table 1 shows, all Swedish parties have adopted some form of voluntary commitment to gender parity, using measures that range from goals and non-mandatory recommendations (right-center block) to stricter regulations with placement mandates (left block). The trend over time has been towards stricter policies. For example, the Social Democrats began with a target for the share of women on lists: 40 percent ahead of the 1988 election and 50 percent ahead of the 1991 election. But it was only in 1993 – after a credible threat by women to form a break-away feminist party – that the party adopted a mandated quota with a “zipper” placement rule to ensure parity of gender placement throughout the list. This quota was imposed on all municipalities by the central party.

[Table 1 and Figure 3 here]

The effectiveness of the zipper system in the case of the Social Democratic party is illustrated in Figure 3. In the 1988 and 1991 elections the share of women increased only marginally, while the response in the 1994 election was large. Indeed, the deviation from 50% is now mostly explicable by randomness in election outcomes, bearing in mind that some parties by chance obtain an odd numbers of seats, coupled with the fact that the first-ranked candidate still tend to be male even under the zipper system. That said, a small number of local party groups did not apply the quota to the letter.

3 Model

We model competition between two political parties in a proportional representation (PR) election through their choice of candidates. Following the general election, however, each party leadership faces an internal leadership election amongst the party's representatives. This creates a trade-off in the selection of candidates.

Prospective candidates differ in two dimensions: competence and gender. Greater competence is threatening to the party leadership, as any leader is more likely to be challenged internally by more able candidates. For related reasons, male leaders have a specific bias against female candidates. Male politicians also have a bias against female politicians in general, due to different policy preferences. This creates another trade-off in the selection of candidates.

This model has some interest in its own right, being the first (we know of) to study how two competing parties choose list composition in a PR-election. But our main purpose is to make empirical predictions about, first, the determinants of equilibrium party-list composition in a pre-quota equilibrium and, second, the effects of a quota for female candidates in one party on the candidate composition of both parties. Thus, we attempt to construct the model in terms of observable variables.

3.1 Basic Structure

Parties Two parties – labeled $k = s, b$ (for Social Democrats and Bourgeois) – form a political duopoly. The parties participate in an election – in our application, for a municipal council– in which they control the policy and candidate selection process. Since the electoral rule – at the time of our application – is closed-list PR, each party offers a list of candidates. The parties also control policy implementation after the election. In line with the motivating discussion in Section 2, party leaders are male and control the list choice of the party.

Population composition The population differs in two dimensions. The first one is gender: women and men are denoted by $G = \{W, M\}$. The second is competence, where we also distinguish two types: competent and mediocre (non-competent), denoted by $X \in \{C, D\}$. To simplify the analysis, and focus on the choices by male politicians, we assume all female politicians are

competent. Given the rest of the model, this is without loss of generality (the utility of all individuals is increasing in competence for a given gender composition). Thus, there are three population types – women, competent men, and mediocre men – the shares of which can be described by two numbers.

Timing of events We consider a static model with the following timing of events.

1. Each party k has an existing, male, leadership of quality e_k
2. Each leadership designs its party's list⁸: i.e., the *share* of women w_k and the *share* of the men that are competent c_k
3. The council election is held and the party list that wins a majority of the votes (by PR) wins the most seats
4. The leadership in each party is up for re-election, where only those with a council seat can be challengers and can take part in leadership selection.

In the following subsection, we discuss the details of each stage. As usual, we are looking for a subgame perfect equilibrium. Thus, we proceed in reverse order.

3.2 Building Blocks

Leadership survival Informally, we think about Stage 4 as a citizen-candidate contest within each party. But we model this in a somewhat reduced-form way. Consider a male leader of party k , with some innate popularity or quality $e_k \in [0, \bar{e}]$, with $\bar{e} > 1$. In general, a male leader would survive the internal leadership election with probability $Q(e_k, w_k, c_k)$, increasing in the first argument and decreasing in the second and third. Leaders with higher innate quality survive the leadership election with higher probability. But the probability of survival decreases in the share of women and

⁸If $n \in [0, 1]$ indexes the position on a list, the general problem for each party is to pick a pair of measurable functions $\{\hat{w}(n), \hat{c}(n)\} \in [0, 1] \rightarrow \{0, 1\}$ denoting whether a woman or a competent man is selected for the n th position. Here, we focus on the special case where the list is structured so that the mean fraction of women and competent men are invariant to the fraction of seats won.

the share of competent men, as both are sources of stronger internal competition. To simplify the analysis, we assume that survival is deterministic, as follows

$$Q(e_k, w_k, c_k) = \begin{cases} 1 & \text{if } w_k + (1 - w_k)c_k \leq e_k \\ 0 & \text{otherwise .} \end{cases}$$

We will refer to the inequality

$$w_k + (1 - w_k)c_k \leq e_k \tag{1}$$

as the *quality constraint*. Clearly if $e_k \geq 1$, this constraint on candidate selection is not binding. But if e_k is closer to zero, the quality constraint restricts the choices the leader is willing to make. In the empirical analysis to follow, we measure e_k by the competence of the (male) party leadership. To further simplify the analysis, we assume that survival is a *lexicographic* priority of the leader.⁹

Swing voters Some voters have weak party attachments and vote for either party based on the policy utility that they derive from the choices made by an elected council majority. Among these *swing voters*, the two gender groups have preferences over party lists given by:

$$v_k^G = \mu(z_k) + \beta[w_k + (1 - w_k)c_k], \quad G \in \{W, M\} , \tag{2}$$

where $z = w$ for W , and $1 - w$ for M and where $\mu(\cdot)$ is a concave and single-peaked function. We assume that $\mu_z(z) \geq 0$ as $z \leq z^*$, $\frac{1}{2} < z^* \leq 1$. Thus, female voters prefer more female candidates on the list, up to some point z^* at which female candidates make up a majority. Preferences for male voters are completely symmetric in the opposite direction. For future reference, $w^* = 1 - z^* < \frac{1}{2}$ is the optimal fraction of competent female candidates preferred by men.

Competence is a valence issue, so that both gender groups like more competent candidates in equal measure. The fact that voters hold preferences

⁹If the outcome of the leadership election is probabilistic (so that the function is $Q(\cdot)$ is smooth) and leaders maximize expected utility, we need stronger assumptions to guarantee the existence of equilibrium in the game, as reaction functions can be discontinuous at a point where the leader faces a discrete choice between pursuing his own survival versus maximize the interests of his party. A preference for survival in such cases would be guaranteed in a model with a smooth probability of surviving, as long as the rents from being a leader are large enough.

directly over elected politicians is consistent with a citizen-candidate model, where politician types map into policies via some unmodeled bargaining procedure after the election.

Voter behavior Let $\sigma/2$ be the fraction of swing voters of type J , equally many among women and men. The remaining voters $1 - \sigma$ are loyal to one of the parties and we refer to these as *committed*. A fraction $(1 + \lambda)/2$ of the committed voters is attached to party s . Parameter $\lambda \in [-1, 1]$ thus measures the Social Democratic party's advantage in terms of committed voters.

The behavior of swing voters is described by a conventional probabilistic voting model.¹⁰ Thus, we suppose that a swing voter casts her ballot for party s over party b if:

$$\omega - \eta + v_s^G - v_b^G > 0 ,$$

where ω is a voter-specific shock in favor of party s , and η a common shock in favor of party b that affects every swing voter's party assessments. For simplicity, let ω be uniformly distributed on $\omega \in \left[-\frac{1}{2\phi}, \frac{1}{2\phi}\right]$ and η uniformly distributed on $\left[-\frac{1}{2\xi}, \frac{1}{2\xi}\right]$.¹¹

We define "representative" swing-voter utility offered by party k as:

$$v_k = \frac{1}{2} \sum_{G \in \{W, M\}} v_k^G = \rho(w_k) + \beta[w_k + (1 - w_k)c_k], \quad k = s, b,$$

where $\rho(w) = \frac{1}{2}[\mu(w) + \mu(1 - w)]$. By symmetry and concavity, function $\rho(w)$ has its maximum at $w = \frac{1}{2}$ and derivative $\rho_w(w) \gtrless 0$ as $w \lesseqgtr \frac{1}{2}$. Selecting more female candidates – as long as these are underrepresented – is thus electorally valuable for parties, as is selecting a larger share of competent men.

This observation brings out a first trade-off in the model: while picking more female or competent male candidates raises the probability that the party wins the external election, it also cuts the probability that the (male) leader survives the internal leadership election.

¹⁰See, for example, Persson and Tabellini (2000).

¹¹The same basic model can also be used to study multiplicative shocks, i.e. where the voting rule is:

$$\omega + \eta + \log(v_s) - \log(v_b) > 0.$$

The probability of winning Each municipality has a single voting district and the electoral formula is PR. Party s wins a council majority if its party list obtains more than half the votes, which – given our assumptions above – can be written:

$$\sigma 2\phi [v_s - v_b - \eta] + (1 - \sigma) \lambda > 0 .$$

It follows that party s wins if the common shock η in favor of party b falls short of the threshold

$$\hat{\eta} = \kappa + [v_s - v_b] , \quad (3)$$

where $\kappa = \frac{\lambda(1-\sigma)}{\sigma 2\phi}$. The threshold $\hat{\eta}$ depends on: (i) party s 's innate political advantage, as measured by (composite) parameter κ , (ii) its candidate (policy) advantage, making it more attractive than party b , as measured by $[v_s - v_b]$.

A large κ means that party s can withstand a larger negative popularity shock and still win the general election. Thus κ captures the degree of political competition, and a value close to 0 represents a situation of tight, neck-and-neck competition. This depends on any advantage that a party receives in terms of attached voters, as represented by λ . This advantage/disadvantage is exogenous and depends on the distribution of voters across municipalities. However, the candidate advantage of party s , as measured by $[v_s - v_b]$, is endogenous and determined by strategic behavior of the two parties at Stage 2. This is studied next.

Optimal list design Male party leaders have the same intrinsic preferences over candidates as male swing voters in (2). Consider the leader in party s . Given our assumptions, the utility to voters when party s wins, is:

$$v_s = \rho(w_a) + \beta [w_s + (1 - w_s)c_s] .$$

We now solve for the optimal list (w_s, c_s) given the quality constraint (1) and the level of swing-voter utility that can be implemented. To do so, we first define a lower bound on swing-voter utility, as a function of the quality of the party leader, given that he acts to maximize his own preferences, subject only to the quality constraint guaranteeing his own survival:

$$\underline{v}(e) = \begin{cases} \rho(e) + \beta e & \text{if } e \leq w^* \\ \rho(w^*) + \beta e & \text{if } w^* < e_k \leq 1 \\ \rho(w^*) + \beta & \text{if } 1 < e_k \leq \bar{e} . \end{cases} \quad (4)$$

A leader with quality in the interval $(0, w^*]$, chooses only female candidates, as his quality goes up. For values of e above his optimum share of women w^* , he adds only competent males.

The optimization problem for a party leader, when he is constrained not only by his own survival, but also potentially by the utility delivered to the swing voters is:

$$\max_{c,w} \{\mu(1-w) + \beta[w + c(1-w)]\} \quad (5)$$

subject to $\rho(w) + \beta[w + c(1-w)] \geq v$ and $w + (1-w)c \leq e$. The solution can be described by a pair of functions $w(v, e_k), c(v, e_k)$ and a range of feasible swing voter utility $v \in [\underline{v}(e_k), \bar{v}(e_k)]$. The key result which is proved formally in the Appendix (along with all other results) is:

Proposition 1 *Let $w(v, e_k), c(v, e_k)$ solve (5) for party k with $e_k \in [0, \bar{e}]$. Then:*

$$(w(v, e_k), c(v, e_k)) = \begin{cases} (e_k, 0) & \text{if } e_k \leq w^* \\ (\tilde{w}(v, e_k), \max\{0, \frac{e_k - \tilde{w}(v, e_k)}{1 - \tilde{w}(v, e_k)}\}) & \text{if } w^* < e_k < 1 \\ (\tilde{w}(v, 1), 1) & \text{if } 1 \leq e_k \leq \bar{e} \end{cases} \quad (6)$$

where $\tilde{w}(v, e_k) = \max\{w^*, \min\{\rho^{-1}(v - \beta e_k), 1/2\}\}$.

This result is intuitive. When leader quality is low, the quality constraint is binding. Then, the shares w and c are pinned down by the two constraints in (5). A conflict of interest between the party and the swing voters only arises when e_k exceeds w^* at which point the leader would like more competent male candidates, while the swing voters would like more female candidates. If the swing-voter utility constraint is binding, more women and a smaller share of competent men are put on the list. When the quality constraint is no longer binding, the fraction of female candidates w is set either at the optimal level preferred by the leader, w^* , or at a higher level to satisfy the swing voters.

By Proposition 1, the swing-voter utility a party can implement depends on the qualifications of its leadership with maximal utility being:

$$\bar{v}(e_k) = \begin{cases} \underline{v}(e_k) & \text{if } e_k \leq w^* \\ \rho\left(\frac{1}{2}\right) + \beta e_k & \text{if } w^* < e_k < 1 \\ \rho\left(\frac{1}{2}\right) + \beta & \text{if } 1 \leq e_k \leq \bar{e} \end{cases} \quad (7)$$

Qualified leaders (high e) have more flexibility than weakly qualified leaders (low e) and therefore compete more intensively for office. Thus a party with a less competent leadership is at an electoral disadvantage, all else equal. In the limiting case when $e_k = 0$, a male-dominated party offers $w_k = c_k = 0$, i.e., a party slate with only incompetent men. At the other end of the spectrum, a highly competent leader, $e_k \geq 1$, can give the swing voters their ideal point, although he may not choose to do so depending on the state of political competition. For moderate competence, $e_k \in [w^*, 1]$, leaders reward swing voters by a larger share of women than their own preference, i.e., they compete by appointing women rather than competent men.

For all $v \in [\underline{v}(e_k), \bar{v}(e_k)]$, let

$$V(v, e) = \mu(1 - w(v, e)) + \beta[w(v, e) + (1 - w(v, e))c(v, e)] \quad (8)$$

be the utility of a male leader when swing-voter utility is v . This function summarizes the analysis of candidate selection for given v . The key observation, proven in the appendix, is that $V(v, e)$ is decreasing in v whenever the swing-voter utility constraint is binding. This says that the party leadership prefers a lower level of swing-voter utility to be offered *by either party*.

3.3 Political Equilibrium

We now consider how parties optimally choose their lists. Here, we exploit the recursive approach suggested above, where party leaders choose how much to offer swing voters while obeying the quality constraint. We then use Proposition 1 to infer the list composition implicit in the choice of v by a leader with competence e_k .

Payoffs for parties Given a pair of promised utility levels to the representative swing voter, the electoral outcome depends solely on the aggregate shock η , favoring party b . By condition (3) and our assumption that η is uniformly distributed, we can write the probability that party s wins as:

$$P(\kappa + v_a - v_b) = \begin{cases} 0 & \text{if } \xi[\kappa + v_a - v_b] \leq -\frac{1}{2} \\ 1 & \text{if } \xi[\kappa + v_a - v_b] \geq \frac{1}{2} \\ \frac{1}{2} + \xi[\kappa + v_a - v_b] & \text{otherwise .} \end{cases} \quad (9)$$

The second (first) line says that if party s has a sufficiently large advantage (disadvantage) as measured by κ , then it wins (loses) the election for sure.

The ex ante payoff to (the leadership of) party a when the parties offer $\{v_s, v_b\}$ to swing voters is:

$$S^s(v_s, v_b; e_s, e_b) = P(\kappa + v_s - v_b)[Z + V(v_s, e_s)] + [1 - P(\kappa + v_s - v_b)]V(v_b, e_b) ,$$

where Z is an extra rent for the leadership when the party wins office. The payoff for party b is:

$$S^b(v_s, v_b; e_s, e_b) = [1 - P(\kappa + v_s - v_b)]V(v_b, e_b) + P(\kappa + v_s - v_b)[Z + V(v_s, e_s)] .$$

Equilibrium electoral strategy The currency of electoral strategy is the utility level offered to the representative swing voter by each party, viz.¹²

$$\{v_s, v_b\} \in [\underline{v}(e_s), \bar{v}(e_s)] \times [\underline{v}(e_b), \bar{v}(e_b)] .$$

The model is thus about picking allocations from the Pareto frontier between the ideal points of party leaders and swing voters. Our reduced-form model assumes that the parties can credibly offer utilities to the swing voters, through the composition of their lists. While post-election bargaining within the winning party is left implicit here, the model is in the spirit of the citizen-candidate model introduced by Osborne and Slivinski (1996) and Besley and Coate (1997).

We now look for a Nash equilibrium between the parties:

$$v_s^*(v_b) = \arg \max_{v \in [\underline{v}(e_s), \bar{v}(e_s)]} \{S^s(v, v_b; e_s, e_b)\}$$

$$v_b^*(v_s) = \arg \max_{v \in [\underline{v}(e_b), \bar{v}(e_b)]} \{S^b(v, v_b; e_s, e_b)\} .$$

A priori, the model may appear complicated, due to different possible corner solutions depending on the extent of competition (κ), and the ability of the leaders to behave flexibly given their competence (e_k). But the analysis is greatly simplified as this is a supermodular game – i.e., a game where reaction functions slope upwards. Conditions for the existence of a Nash equilibrium are then undemanding and we are able to handle the corner solutions routinely.

Each party faces a basic trade-off.¹³ An increase in v raises the probability of winning. However, it negatively affects the party leader's payoff, as it moves

¹² Note that if both leaders are highly incompetent $\max\{e_s, e_b\} < w^*$, then the problem is trivial since $\underline{v}(e_k) = \bar{v}(e_k) = \rho(e_k) + \beta e_k$ for both parties.

¹³The Appendix spells out the first-order conditions.

in the direction preferred by the swing voters. For party s , less competition (higher κ) raises the cost of making swing voters better off, as party s is more likely to win and promises more likely affect policy. The same logic holds in reverse for party b for whom less competition is represented by a more negative value of κ .

Throughout, we study political equilibria under:

Assumption 1

$$[Z + V(\underline{v}(1), 1) - V(\underline{v}(0), 0)] \xi + P[\underline{v}(1) - \underline{v}(0)] \frac{\partial V(\underline{v}(1), 1)}{\partial v} > 0 .$$

This is a restriction on competition, such that when elections are competitive ($\kappa = 0$) a party with the ability to choose competitive candidates ($e = 1$) always chooses swing-voter utility above $\underline{v}(1)$. Then, political competition influences party behavior.

Benchmark political outcomes We first characterize the equilibrium without any gender quota. Since our empirical work will emphasize the Social Democrats, we take the perspective of party s and look at the factors which determine v_s , holding fixed factors affecting party b . But without the quota things are completely symmetric, so an analogous set of results apply to party b .

With the application in mind, we focus on two drivers of equilibrium that we can measure in the data: leader competence, e_s , and political competition, κ . As discussed below equation (12), party s can find itself in three possible situations – at the lower or upper bound of swing-voter utility, or somewhere in between. Moreover, as per Proposition 1, the fraction of female candidates is (weakly) monotonically increasing in swing-voter utility.

We study political equilibria in two clear-cut cases – one where competition is very low and another where it is high (with Assumption 1 holding). Then, we have the following result:

Proposition 2

Case I *For high enough (or negative enough) κ , $v_s^* = \underline{v}(e_s)$ with $w_s = \min\{e_s, w^*\}$ and $c_s = \max\{0, \min\{1, \frac{e_s - w^*}{1 - w^*}\}\}$. The proportions of women and competent men are (weakly) increasing in the competence of party s 's leadership.*

Case II If *Assumption 1* holds, then for high enough e_s ($e_s > w^*$), there exists $\hat{\kappa}(e_s)$ such that $v_s^* > \underline{v}(e_s)$ for all $\kappa < \hat{\kappa}(e_s)$. Moreover, $w_s > w^*$ and $c_s = \min\{1, e_s\} - w_s$. The fractions of competent men and women are (weakly) increasing in the competence of the party s 's leadership.

The results in Proposition 2 are illustrated in Figure 4. Case I corresponds to the third row in the matrix and describes an uncompetitive election, where in the limit party s wins for sure. Therefore, the leader's preferences prevail. As he becomes more competent and suffers a lower risk of losing his position, the proportion of women (up to the point w^*) and competent men go up.¹⁴

Case II corresponds to the first row in the matrix and describes a competitive election (κ close to zero). Then, party s responds to swing voters, raising the fraction of women above its preferred minimum value at the expense of competent men, provided that its leadership is sufficiently competent. The latter condition allows the party leader to increase the fraction of women without a risking his own chances of survival. For intermediate values of κ (the second row in the figure) it is hard to make definite statements, as there exist a number of countervailing effects.

[Figure 4 here]

The results in Proposition 2 imply that a more competent leadership (weakly) raises the shares of female candidates w_s and competent male candidates, c_s (up to the point where $e_a = 1$), but the effect on women is stronger when political competition is strong.

The impact of a gender quota What happens when we superimpose a binding gender quota on this benchmark equilibrium? In the model, the quota implies an additional constraint $w_a = 1/2$ on party s 's choice. It turns out that the impact of the quota is heterogeneous, depending on e_s and κ . This will be important in our empirical analysis below. For the latter, we contrast the effects, when the initial equilibria belongs to the two cases in Proposition 1. The result for party s is:

Proposition 3 *If a quota is introduced for party s , which requires $w_s = 1/2$, then:*

¹⁴In the reverse case, where κ is a large negative number such that party b wins for sure, party a again does not care about electoral concerns. Thus, the leadership again follow its own preferences only.

- (a) For $e_s < \frac{1}{2}$, the fraction of women w_s (trivially) goes up to 1 and the fraction of competent men c_s goes up to 1. For higher levels of e_s , the fraction of women (weakly) go up but the fraction of competent men (weakly) goes down.
- (b) Holding fixed the quality of the party leadership, e_s , the effects on the fraction of women and competent men is always larger (in absolute value) in Case I than in Case II.

The proposition is illustrated in Figure 5. Result (a) uses the fact that when $e_s < 1/2$, the leader cannot fulfill the quality constraint (1). Unconstrained by concerns for his own survival, the leader may wish to maximize his own utility in (5) or the swing voters' utility in (2), depending on the state of political competition. But the binding constraint $w_s = 1/2$, makes it optimal to set $c_s = 1$ in either case.

For higher values of e_s , the leader can continue to satisfy the quality constraint. Then, the quota generally forces a substitution effect towards women away from competent men. This is easiest to see in the case when competition is very low (Case I) and $e_s = 1/2$. Then, the share of women goes up from w^* to $1/2$, while the share of competent men goes down from $\frac{1/2-w^*}{1-w^*}$ to 0. The induced substitution is smaller when competition is high (Case II), as the initial equilibrium has a larger share of women to please swing voters. This last comparison gives the intuition for the result in (b).

[Figure 5 here]

When the leadership is competent and competition is high, there may be only a small effect on the equilibrium, as the party may already have offered a party slate close to the bliss point of the swing voters in the initial pre-quota equilibrium.

A gender quota for party s spills over to party b when it induces an equilibrium response. To see this, observe that (i) a quota forces party s to offer a higher utility v_s to the voters, and (ii) the reaction function of party b slopes upwards and hence provokes higher swing-voter utility when v_s goes up. Using Lemma 1, a strict increase in v_s implies more intense competition, whenever party b 's swing-voter constraint is binding and there is a conflict between the party and voters. This is summarized in:

Proposition 4 *A quota for party s , which requires $w_s = 1/2$, (weakly) increases v_b^* in electoral equilibrium and leads party b to increase its*

fraction of women $\Delta w_b > 0$ and decrease its share of competent men $\Delta c_b < 0$ provided that elections are sufficiently competitive (i.e., κ close enough to zero) and party b 's leadership is sufficiently competent.

Figure 6 illustrates this proposition. The average spillover effect across municipalities on the shares of women and competent men in party b is unambiguously positive, but arises only from places with competent party b leadership and high political competition.

[Figure 6 here]

Discussion Our model has a number of specific features, which are needed to get precise results. But three main aspects of decision-making highlighted by the model are quite general.

The first is how competence of the party leadership shapes its flexibility in compiling a competitive party list. An incompetent leader faces a greater risk of losing power within the party, if he picks anything else than incompetent male candidates. This force reduces the competence of the list and/or the fraction of women candidates.

The second force is more standard in models of political competition. An extreme lack of competition reduces incentives for a party to court swing voters via more women on the list. Instead, parties forced to compete more intensively for swing voters will put in more female candidates.

A third general feature of the approach is the impact of a binding quota in one party on the behavior of other parties in any equilibrium model of political competition. Given the first two forces, a quota tends to induce more intense competition between parties, either indirectly, by relaxing the constraint imposed by the party leader's competence, or directly by raising the appeal of the party to swing voters. This suggests that a quota may well be welfare enhancing from the viewpoint of the general electorate.

4 Data and Measurement

This section discusses how to measure the relevant variables and the parameters in the model. While some of these, like political competition, can be measured directly at the municipal level, the other measures are derived from a panel with individual-level data over 20 years.

Linking of data sets The data originate from party ballots, for all parties, in six waves of elections (1988 to 2010), over the 290 municipalities. From these ballots, we know the list rank of each politician (except for the 1994 election) and the number of votes cast for each list. In each election there are about 55,000 politicians on these ballots (excluding local parties), of which about 13,000 are elected to a municipal council. For the full period, the sample contains 158,448 unique politicians, out of which 44,877 have been elected at least once. Social Democrats make up the lion’s share of those elected, accounting for roughly 40 percent of the group. Thus, each municipal assembly has a substantial Social Democratic delegation, exceeding ten elected politicians in more than 95 percent of the council-election cases.

Because party ballots include the personal identification number of each politician, they can be linked (after ethical approval) to a host of background variables from the administrative registers of Statistics Sweden. This gives us highly reliable information on income, education type and length, age, gender, ethnicity, and occupation. From another register, we also have evaluation scores from the military draft (further details are provided below). The register variables are available for the full sample period and thus not limited to the politicians’ time in elected office.¹⁵

Measuring competence (c in model) Previous studies have approximated the quality or competence of individual politicians by their levels of income and education (see, for example, Besley and Reynal-Querol, 2011 and Galasso and Nannicini, 2011). Although such readily-available measures can capture certain aspects of technical competence and qualifications, they tend to confound quality with representation. An ideal measure of political competence – if this is considered as a valence issue, as in our model in Section 3 and many other models – should capture key abilities to govern, for any socioeconomic type.

To that end, we believe that the residuals from a fully saturated Mincer-style income regression is a good candidate to measure individual competence, for a given set of socioeconomic characteristics.¹⁶ Our preferred equation takes the form:

$$y_{i,a,m,t} = educ_{i,a,t} + (1 + h_i) \cdot empl_{i,a,t} + mun_m + c_i + \varepsilon_{i,a,m,t} , \quad (10)$$

¹⁵Appendix, Table A1 gives summary statistics for the political candidates and the elected politicians, both for the full sample and for the subsample of Social Democrats.

¹⁶See e.g., Heckman (2006) for a discussion about Mincer earnings regressions.

where $y_{i,a,m,t}$ is the disposable income at time t , for politician i , of age a , in municipality m . We are interested in the “individual fixed effect”, c_i , the average income level for an individual, once we hold constant her education level, employment sector, age, and municipality of residence. For each individual, we can thus compute the residual ($c_i + \varepsilon_{i,a,m,t}$) over all years in the panel, and extract the average c_i to measure his/her overall earnings potential, which we use as our main measure of competence. To avoid measurement error, we exclude the few individuals who are employed full-time as politicians, in the year they hold such employment.

The education indicator in these regressions, $educ_{i,a,t}$, is defined by indicator variables for different categories for the level of education.¹⁷ We interact these (seven indicators) with age (16 indicators for 5-year age intervals) and year (20 indicators). With this three-way interaction we capture that the education premium might differ with age, year and cohort. That we want to control for cohort is motivated by the fact that there was a massive expansion of higher education in Sweden over the cohorts that we examine. Apart from the variation in education premium we also capture the overall relationship between age, cohort and year with income.

The employment-sectors indicator, $empl_{i,a,t}$, starts out from highest level of aggregation in the Swedish classification (which is the same as the European NACE code and international ICIC code) and has 13 categories.¹⁸ For the education measure, we interact the employment-sector category with age and year, and we also include an indicator for tertiary education, h_i . This specification is chosen to capture the fact that the wage-tenure profile has different slope across sectors, and might be different within sectors depending

¹⁷The seven categories are: Less than 9 years, 9 years, 2-year secondary education, 3-year secondary education, tertiary education (less than three years), tertiary education (at least three years) and research degree (licenciate or PhD).

¹⁸Our categories are: "Agriculture, hunting and forestry", "Fishing", "Mining and quarrying", "Manufacturing", "Electricity, gas and water supply", "Construction", "Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods", "Hotels and restaurant", "Transport, storage and communication", "Financial intermediation", "Real estate, renting and business activities", "Public administration and defense; compulsory social security", "Education", "Health and social work" and "Other community, social and personal service activities". Two categories, "Activities of households" and "extra-territorial organization and bodies" have less than 30 individual year observation in them. Because of this, we add the former to "Other community, social and personal service activities", and the latter to "Public administration and defense; compulsory social security".

on education level.

Estimating this Mincer equation for those retired from the labor market presents a challenge. Pension income reflects an individual’s wage-earning potential in working life, but its relation to the (earlier) sector of employment is not fully comparable to the currently employed. We address this by computing the income residual of retirees in a separate regression based on the sector of employment in which they worked for the majority of their working-life. For those who retire during the sample period we include them in both samples, i.e. as workers and retirees, and then use the average of their residuals as the final competence score. Furthermore, men and women have different labor-market careers, e.g., due to different time constraints from family responsibilities. Because of this, we also run the regression separately for men and women.

Finally, the Mincer regressions all include municipality fixed effects, mun_m . This captures the fact that different municipalities have different average income levels, especially related to the urban-rural divide.

Having obtained the average residuals (fixed effect) for each individual from (10), we create standardized z -scores for politicians in each party. We separate different parties, since they recruit both members and politicians from different social strata, which may not fully be captured by the control variables in the Mincer regression. Thus, our competence measure allow us to analyze selection within parties. Also, when standardizing the competence measure, we restrict the sample to elected politicians.

In the empirical work, we use the z -scores in two ways. The first one is binary and classifies politicians into competent and mediocre types, as in the model zero as a cutoff score for the residual above which the politician is deemed to be competent. We then compute the share of competent men elected on a list – this measure is called $c(\text{share})$ below. The second way is simply to take the average competence, as the average z -scores of all elected men on a list – this measure is called $c(\text{mean})$ below.

Validation of our competence measure We use two strategies to validate the measurement of competence.

First, we show that it predicts success for the average politician. An extensive analysis is outlined in the paper’s Appendix and shows strong and positive correlations between our competence measure and the candidate’s: (i) re-election success, (ii) share of preferential votes, (iii) appointment to a

chairperson position. These correlations allay a potential concern that our income residuals may define competence in a way that is only relevant for achieving market returns, and hence not relevant for politics.¹⁹

Our second method for validating the competence measure is to correlate it with the scores from ability tests conducted in the Swedish military draft system, a system that for a long time was mandatory for all Swedish 18-year old men.²⁰ Specifically, we use the results from two tests, one written test of the recruit's cognitive ability and a psychologist's rating of his non-cognitive skills. The first written test includes several subtests of logical, verbal, and spatial abilities, as well as a test of the conscript's technical understanding. These four subsets of questions are combined to produce a general score of cognitive ability, ranging from 1 to 9.²¹ This test is commonly perceived as a good measure of general intelligence (Carlstedt, 2000).

The second test derives from an interview with a certified psychologist who follows a specific (but secret) manual that suggests topics to be discussed and how to grade different responses by the recruit. Its aim is to determine a conscript's psychological capacity to meet the requirements of military duty and armed combat. Central to this are the abilities to cope with stress and to contribute to group cohesion. A conscript is given a high score if he is considered to be emotionally stable, persistent, socially outgoing, willing to assume responsibility, and able to take initiatives. Motivation for doing the military service is, however, explicitly not a factor to be evaluated. Grades are given on four different sub-scales which are transformed to a discrete variable ranging from 1 to 9. Besides the interview, these are also based on information about the conscript's results on the tests of cognitive ability, physical endurance, muscular strength, as well as grades from school and the answers on questions about friends, family, hobbies etc. Previous studies have shown that test scores from the military draft, both the cognitive and the non-cognitive portion, are excellent predictors of labor market performance

¹⁹This is a characteristic of the economic models of career choice due to Diermeier et al., (2005), and Keane and Merlo (2010)

²⁰Until 2010, military service was mandatory for all Swedish men and prior to the late 1990s over 90 percent of each cohort enlisted. Exceptions were only made for the physically and mentally challenged recruits. Although the draft was still mandatory from a legal perspective it was largely optional in the more recent year.

²¹The design of the test was revised slightly in 1980, 1994 and 2000, but throughout the period it tests for the same four underlying abilities and was always normalized to a 1-9 scale designed to give a normal distribution

in several dimensions (see e.g., Lindqvist and Vestman, 2011).]

To investigate which test-based characteristics our income-based competence measure accounts for, we construct scatter plots for this z -score and the z -score transformations of each of the two military-draft tests. Our competence measure correlates more strongly with the non-cognitive test score in Figure 7, than with the cognitive test score in Figure 8. But both correlations are precisely estimated: we obtain a regression coefficient of 0.24, with a standard error of 0.01, for the non-cognitive measure, and 0.11 with a standard error of 0.01, for the cognitive measure.²² The stronger correlation with non-cognitive skills in all likelihood reflects the fact that our Mincer regressions control for qualifications such as formal education.

[Figures 7 and 8 here]

The two figures confirm that our income-based measure of competence captures key components of politician competence, which are specifically measured by the draft tests. In some of our empirical results reported below, we use the average of the cognitive and the non-cognitive z -score from the military draft as an alternative measure of competence. As with the income-based competence measures we normalize this z -score at the party level. A competent politician is defined as having a score above the median and we call the share of competent politicians defined in this way $c(\text{draft})$. The disadvantage of this measure is that it is only available for a subset of the (male) politicians in our sample.

Leadership quality (e in model) We approximate the political leader with the top three male politicians on each party ballot, and exclude the list entirely if the first-ranked politician is not male. As in the model, the competence of the leadership is measured continuously, as the average value of the income residuals $c(\text{mean})$ of these three persons.

Political competition (κ in the model) Measuring competition in proportional election systems is complicated by the fact that more than two parties participate in the election. In the Swedish setting, we can however make use of the fact that politics is centered around two stable political

²²The sample in both the figures and the regressions are limited to observations within two standard deviations from the sample mean.

blocks: the left and the center-right. In fact, the strength of the two blocks led Alesina et al. (1997) to classify Sweden as having a bipartisan political system. This means that the absolute difference in vote shares between these two blocks is an appropriate measure for the main dimension of political competition, which is also the method used in other studies.²³ To capture persistence in competition, we use a three-election moving average of the absolute difference in vote shares.

We do not use the realized vote shares in the municipal election, however, as these measure the combination of exogenous voter characteristics (κ in the model) and the platforms offered by the parties (v_s and v_b in the model). To reduce endogeneity vis-à-vis the other variables (such as e_s and e_b), we measure competition in terms of the vote shares by the ballots from the municipality which were cast in the national parliamentary election.

The suitability of this competition measure can be illustrated in several ways. First, holding a seat majority is relevant for decision making power: in 90% of the cases when a single party has more than half of the council seats, the chairperson of the council board is a member of that party. Second, governing coalitions across the traditional blocks are uncommon, existing in less than one fifth of the cases when one block holds a majority of the seats. Previous research on Swedish municipalities has found a causal effect from majority positions of political blocks on policy outcomes (Pettersson-Lidbom, 2008)

Finally, our preferred measure assumes that (as in the model) men and women are equally likely to be swing voters. This is corroborated by Swedish survey evidence regarding the share of Swedes of each gender that report being “not committed” to the party that they report to prefer.²⁴

5 Empirical Results

We now use the data discussed in Section 4 to test the empirical predictions derived in Section 3. As in the theory, we proceed in two steps. We first study the initial (pre-quota) equilibrium, which we take to be represented of the 1991 election outcome. Then, we study the effect of the Social Democratic quota introduced in 1993, using data from all the elections in our sample.

²³See, for example, Svaleryd and Vlachos, (2009) and Folke and Rickne, (2012).

²⁴See Appendix, Figure A1.

5.1 Party Ballots in Equilibrium

Our theoretical model makes two main predictions about the equilibrium composition of party ballots. First, as the quality of the party leadership increases, we expect more nominations for women and competent men. Second, when competition between the political parties is high we expect more female nominees, but fewer competent men.

Cross-tabulation of the data Figure 9 gives an empirical analogue to Figure 4. It shows how the average fraction of women and competent men varies with leadership quality and competition. To capture the timing of the list composition undertaken by the incumbent leadership, we measure leadership quality in the 1988 election data and competition using the data from previous elections. The data on the shares of women and competent men come instead from the 1991 election. We consider all political parties, but restrict the sample to municipality-party observations with at least eight elected representatives in the assembly. We also exclude party groups with a female leader.

The top row of Figure 9 corresponds to Case I in the theory where competition is in the top tercile (neck-and-neck). The bottom row corresponds to Case II, meaning that competition is in the bottom tercile (little-or-no competition).²⁵

Moving from the left to the right across the columns in the figure, we compare party groups with increasing leadership quality. According to theory, we expect higher quality leaders to be less subject to the Quality Constraint, i.e., they are less constrained in their choice of followers. The raw patterns in the data confirm this prediction; a higher quality leadership is correlated with more competent (male) politicians and more gender diversity.

Moving from the bottom row to the top row of Figure 9 corresponds to moving from the theoretical case of low political competition to that of high competition, i.e., whether the Swing Voter Constraint is binding. We expect this to drive the nomination of more women in the top two terciles of leadership quality and for there to be fewer competent men from the mid-range of that variable. The raw data are not, however, particularly supportive of this. More women are found on ballots in more electorally competitive municipalities and when leadership quality is in the bottom and

²⁵We show that nominations in the Social Democrats conform to the overall pattern in an equivalent figure in the Appendix (Figure A2).

middle terciles.²⁶ The selection of competent men seems, however, to increase when parties need to cater to the preferences of swing voters.

[Figure 9 here]

Regression evidence We now turn to regression evidence on the predicted differences in equilibrium ballot composition between the cells of Figure 9. For each of level of leadership quality and competition, we first run a full-sample analysis and then restrict the sample to the sub-divisions corresponding to the cells of the figure. We can now include control variables to capture, among other things, variation in w^* , the leadership's optimal level of female representation. The latter may vary due to different attitudes toward gender equality across Swedish regions with their origins in cultural and historical socioeconomic traits. For example, this could be correlated with historical production patterns biased towards agriculture, industry or services. Thus, our specification now includes fixed effects for each of the two features illustrated in Figure 1 above, namely counties and municipal council size, the latter being an institutional characteristic which is well-known to correlate positively with female representation (see Welch and Studlar, 1990 and Svaleryd, 2009).²⁷

Table 2 gives the results for leadership quality. The upper panel contains the estimates for the full sample of parties, including party fixed effects, and the lower panel looks only at the Social Democratic party groups. For the nomination of women, the positive correlation with the quality of the leadership is statistically significant across party-groups, also when we sub-divide the sample into high and low competition municipalities. None of the estimates, however, remain statistically significant once we add the fixed-effect controls and the coefficients also shrink in magnitude. This could be because the regional culture and/or council-size drive female representation instead of leadership quality. But a caveat to this interpretation is that our controls could be correlated with both the share of women and with leadership quality so that these two relationships cannot properly be disentangled in this

²⁶The sample selection of party groups is slightly skewed across these two levels of competition. Large municipalities have on average more competition and also larger municipal assemblies, increasing the probability that one of bourgeoisie party groups join the Social Democrats over the eight-person threshold.

²⁷Swedish geographers have established that a number of socioeconomic indicators of gender equality co-vary with historical factors connected to resource endowments, for example in agriculture and capital ownership (Forsberg, 1997).

specification – i.e., the dominant variation in leadership quality may pertain to different counties and municipalities of varying sizes. For the selection of men, the results support our prior from the theory. Selection unambiguously improves with leadership quality, whether or not we include the controls.

[Table 2 here]

Table 3 repeats the exercise for variations in political competition. The weak support for the theoretical prediction for this variable remains. The difference in the average share of women between party groups in municipalities in the top and bottom terciles of political competition is not statistically significant in any specification. The same holds true for the nominations of competent men. Although both of these results accord with predictions for the top and bottom terciles of leadership quality, there is no significant negative result in the middle tercile. This could reflect small sample sizes, noisy measures of competition, or terciles of leader quality not corresponding to the theoretical ranges in Figure 4.

[Table 3 here]

Table 4 contains the estimates from a more complicated specification, which allows for a heterogeneous effect with respect to political competition of initial competence on the share of women and the share of competent men. In particular, we test whether results differ by the level of competition in the pre-quota equilibrium, by interacting leadership quality with indicators of competition. Comparing the results in Tables 3 and 4, we find that the correlation between initial leadership quality and the competence of elected men does not appear to be intensified by either neck-and-neck or little-or-no competition. The positive effect on leadership quality is found for all parties and the Social Democrats by themselves. However, as the table shows, we now find an effect – even with controls – of initial competence on the fraction of women elected, where competition is either intense or non-existent (the two cases where the theory has bite).

[Table 4 here]

5.2 The Effects of the Quota

As summarized in Figure 5, our model makes two main predictions about how a gender quota impacts on the selection of men in the same party. If the party leadership is of low quality, it is unable to survive the internal leadership election when the quota is imposed, so the quality constraint is relaxed, allowing it to increase the share of competent men as well. On the other hand, high-quality leaderships meet the quota by replacing some competent men with quota women to ensure their own survival as leaders. To test this proposition, we develop a difference-in-difference specification to examine how the quota impacts the share of competent men.

Tabulating the data The cross-tabulations in Figure 10 form the empirical counterpart to Figure 5. It shows the mean changes in the share of women, the share of competent men $c(\text{share})$, and the average competence of the elected men $c(\text{mean})$ between Social Democratic party groups in 1991 and 1994 (recall that the quota was introduced in 1993). Overall, the distribution of these means concur with the predictions of the model. The key finding is that there is an increase in the share of competent men where the leadership quality was low in 1991, and a corresponding decrease where it was high. This is precisely what the theory predicts. It is important to bear in mind that the share of women went up the most, where both leadership quality and competition was low prior to the quota.

[Figure 10 here]

Difference-in-difference specification But a concern with the cross-tabulations is that an increase in male competence where leadership quality was low could not only reflect the quota itself, but also general time trends. To disentangle the two, and hence tease out the effect of the quota, we use the following specification:

$$c_{m,t} = \alpha + \beta_t \Delta w_m * elec_t + elec_t + mun_m + \varepsilon_{m,t} , \quad (11)$$

where $c_{m,t}$ is our measure of male competence, and the quota impact is defined by Δw_m , the change in the share of women between 1991 and 1994 in percentage points. Thus, even though all municipalities receive a “treatment”, this treatment is not constant across municipalities, but varies to

deliver a "dose-response" based on the bite of the quota. Thus, we are effectively estimating a difference-in-differences specification (before vs. after, for those with high vs. low bites of the quota). The key coefficient is β_t which captures the relationship between the quota impact, Δw_m , and being in an election year after (or before) the quota was introduced. The specification also includes fixed effects for each election date, denoted by $elec_t$, and for each municipality, denoted by mun_m . We exclude the municipalities with a female leader in 1991 and the 20 municipalities that did not comply with the quota.²⁸

We estimate two different versions of (11). In the first, we simply interact the bite of the quota with a post-quota dummy – i.e., we set $\beta_t = 0$ in 1988 and 1991 and constrain β_t to take on the same value in all elections from 1994. In the second, we examine time trends more carefully by interacting the bite of the quota with each election year, using the 1991 pre-quota election year as the reference point: $\beta_{1991} = 0$. To ensure that any quota effect is not due to pre-trends, municipalities experiencing a large quota bite should not experience boosts in the share of competent men before the quota was introduced. Thus, we like the coefficient β_{1988} to be insignificant and close to zero. We expect β_{1994} , the estimated effect of the quota, to be positive and significant. Finally, the coefficients β_t , for $t > 1994$, should be similar in magnitude to β_{1994} , as we expect the quota to permanently affect the competence of selected men.

Econometric results The results of estimating (11) are found in Tables 5 and 6. Columns (1) and (2) of Table 5 present results for our binary measure of competence, $c(\text{share})$, while the mean measure – $c(\text{mean})$ – is used in columns (3) and (4). Results for competence measure $c(\text{draft})$ – i.e., the military-draft scores – appear in columns (5) and (6). The results for the average effect in post-quota period are in the odd-numbered columns, and those with year-interactions for each election date are in the even-numbered columns.

Columns (1) and (2) show a positive and significant effect of the quota. The point estimates for the effect are 0.19 and 0.36 respectively. Thus, a ten percentage point larger increase in the share of women is associated with an increase in the share of competent men of 1.9 or 3.6 percentage points. The estimates for the years after the introduction of the quota are similar to that

²⁸Defined as having less than 40% elected women in 1994.

for 1994, while the estimate for 1988 is gratifyingly close to zero, suggesting that the effect we find is not the product of a general trend. Columns (3) and (4) find similar results. A point estimate of 0.35, indicates that a ten percentage point larger impact of the quota is associated with higher average male competence of about one tenth of a standard deviation of the pre-quota mean for the Social Democratic party groups.

[Table 5 here]

Turning to the draft-based competence measures in columns (5) and (6), we find an even stronger effect from the quota. The point estimates are about the same for 1994 and the other years after the quota and close to zero for 1988. They suggest that a ten percentage point larger impact of the quota increases the share of competent men by 5-6 percentage points. One explanation for the larger estimate here is that the cognitive part of the draft test captures competence factors related to formal qualifications of politicians. Such factors, e.g., the education level, are controlled out by the Mincer equation.

Our difference-in-difference specification is unable to tell us whether the quota effect is driven by a change in the selection process or by increased competition among the men as fewer men are selected. To address this issue, we estimate a specification where we control for the number of men elected to the party group. The results appear in Table 6 which is otherwise the same as Table 5.

[Table 6 here]

Part of the quota effect does seem to be explained by fewer men being elected. For the share of competent men, in columns (1) and (2), the point estimates are reduced to about a quarter of the initial size and lose their statistical significance. The same happens for the average measure of competence in columns (3) and (4), in which case the estimate is reduced to about two thirds. However, the estimates for the draft-score competence measure in columns (5) and (6), are not reduced and remain significantly different from zero. All in all, this suggests that the quota effect that we find is a combination of an improvement in the selection process along with fewer men being elected.

Testing for spill-over effects Our model predicts that, if political competition is high enough and party b 's leadership is of sufficiently high quality, then the introduction of a gender quota in party s will have an impact on the list composition of party b . Moreover, we expect this effect to be larger, the greater the bite of the quota on party s . We expect the party s quota to push party b to increase its share of women. However, as leadership quality in party b is constant, these women will replace competent men as leaders seeks to ensure their survival, i.e. fulfill the quality constraint.

Testing this empirically in our context is tricky. Over the relevant years, the Center party and the Conservative party are the two main competitors to the Social Democrats, but both parties have substantially smaller party delegations on average. Requiring those party groups to contain at least eight elected politicians and have a party list topped by a man leaves only 157 groups spread over 120 municipalities.

We regress the ballot composition variables in these other parties on the extent to which the quota bites for the Social Democratic party group in the same municipality where, as above, the quota bite is measured as the percentage change in the share of elected women between 1991 and 1994. The results in Table 7 do not find significant evidence of spill-overs, neither in the full sample nor in the sub-category of municipalities in the top terciles of both leadership quality and competition (not reported).²⁹

[Table 7 here]

Effects on women's competence Our model explicitly leaves out the selection of women by assuming that all women are competent. To assess the overall impact of the quota it is still interesting to examine the change in the selection of women, as well as how it relates to the changes in the selection of men. To do this, we cross-tabulate the shares of competent men and women before and after the introduction of the quota, by municipalities above (large Δw) and below (small Δw) the median bite of the quota. As the competence measure is computed separately for men and women, we can consistently compare the change in selection within but not between genders. For the latter purpose, education might be a more suitable measure, although

²⁹It could be added that the common wisdom among Swedish political scientists is that there was indeed spill-overs from the Social Democrat's quota, but in the form of "contagion" on the other large parties' own quota policies and ahead of the 1998 election (add refs if we want this note)

the types of higher education attained by men and women do differ. We therefore add the share of each gender that has obtained at least a tertiary degree to our descriptive statistics. The results are in Table 8.

[Table 8 here]

Starting with the pre-quota equilibrium in 1991, two facts stand out. First, irrespective of the measure, overall competence is higher where the quota (subsequently) had smaller impact because the initial share of women was larger. Second, where the quota had the largest impact, the competence gap between men and women is larger: 6 percentage points by income residuals, and 7.5 percentage points by university education. Where the quota had smaller bite, there is virtually no difference in the share of competent men and women, but a large education gap. Thus, few women made it into these municipal party delegations. But the ones who did, were more qualified than in the other municipality group. This comparison is hard to square with the idea that competent women were absent due to a supply constraint, as in the theoretical model of Julio and Tavares (2010).

The post-quota outcomes in Table 8 show that the competence gap between men and women is eliminated where the quota had its greatest bite. This convergence reflects an higher male competence as well as a lower female competence. The education gap is slightly reduced, but women are still substantially more likely to hold a tertiary degree. In contrast, we do not see substantial relative changes between men and women in places with small quota bites.

Even though the female entrants did not crowd out relatively competent men, we could be concerned that the female newcomers were even more mediocre than the mediocre men they replaced. Assessing the overall quota impact on women's competence, we do indeed see reductions in both groups of municipalities. This could be because the Social Democrats were very successful in the 1994 elections, with the average municipality group increasing its size by more than a quarter. Therefore, candidates further down the list were elected, especially women in places with a large quota bite. This fact complicates an analysis of the overall impact of the quota on competence.

As mentioned above, we can only use educational attainment to compare how the quota affected the relative competence of men and women. Table 8 shows that the quota was clearly followed by higher educational attainment among elected politicians, not only of men but also of women. Thus, women

who entered public office with the quota were more highly educated than the men they replaced and were also better educated than the incumbent women, echoing the empirical results for Italy in Baltrunaite et al. (2012). However, we should be clear that this may signify a change in representation of the educated as much as an increase in competence.

6 Concluding Comments

Failures to recruit competent politicians and achieve equal gender representation remain sources of concern in many mature democracies. The academic and popular debate sometimes sees the goals of diversity and competence as in tension with one another. For example, in the debate on gender quotas, it is often claimed that a supply constraint for women results in a quota replacing competent men by mediocre women. We have argued, to the contrary, that achieving gender parity through quotas can actually promote competence by reducing the number of mediocre men.

We believe the paper makes theoretical, as well as empirical, contributions. Theoretically, we propose a model, which portrays low representation of women before the quota as an equilibrium outcome that reflects a combination of mediocre leaders, who fear for their own political careers, and weak electoral competition. This model delivers sharp predictions, which we take to the data.

Empirically, we find heterogeneous effects of a quota, unilaterally imposed by Sweden's largest political party, across 290 municipalities. This heterogeneity mirrors the baseline political representation, particularly its dependence on the competence of the male party leadership. Moreover, the findings line up with the theoretical prediction that the competence of male politicians increases more in municipalities where the quota had more bite due to low leadership competence. This pattern is not the consequence of pre-trends in representation, nor is it just a temporary effect.

The fact that the quota improved male competence the most (least) in localities with low-quality (high-quality) leaderships, suggests that policies that have a direct effect on recruitment may be used to strengthen recruitment. For example, leadership quality could be raised by reforming procedures for leadership selection or reducing the leadership's influence over ballot ranking.

A second empirical contribution of the paper is its measurement of competence which moves beyond levels of educational achievement or income.

Using individual time-series socioeconomic data, we measure competence by the earnings potential of politicians in the market outside politics, conditional on education and occupation. This measure is closely associated not only with political success but also with leadership and cognitive-ability scores from the military draft. In future work, we plan to exploit this measure, exploring the contribution of competence to policy making in politics and other non-market contexts.

Using equilibrium models of politics to inform the debate about gender quotas is not only useful for the conceptual clarity that it brings. It also allows a means of structuring the empirical work and for interpreting the findings for Sweden. Additionally, it provides a vehicle for discussing the effects of quotas in other settings.

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Appendix

Proofs of Propositions

Proof of Proposition 1 Suppose first that the quality constraint is binding, i.e., when $e_k < 1$, but the swing-voter utility constraint is not. Then the payoff of the leader is

$$\mu(1 - w) + \beta e_k$$

which is increasing in w for all $w \leq w^*$. Thus, $w = \min[e_k, w^*]$ and $c = e_k - w$. Suppose instead that both constraints are binding and $e_k \geq w^*$. Then, w solves:

$$v = \rho(w) + \beta e_k$$

as long as $w \leq 1/2$. So

$$w = \min \{ \rho^{-1}(v - \beta e_k), 1/2 \}.$$

And $c = \min \{ 0, \frac{e_k - w}{1 - w} \}$. Now suppose that $e_k \geq 1$. If the swing voter utility constraint is not binding, then $w = w^*$ and $c = 1$. If the swing voter utility constraint is binding, w solves

$$v = \rho(w) + e_k$$

so

$$w = \min \{ \rho^{-1}(v - \beta), 1/2 \}.$$

And $c = 1$. Putting these together yields the result. ■

Proof of Proposition 2 The first-order conditions for the choice of v_s is

$$[Z + V(v, e_s) - V(v_b, e_b)] \frac{\partial P}{\partial v} + P(\kappa + v - v_b) \frac{\partial V(v, e_a)}{\partial v} \begin{cases} \geq 0 & v = \bar{v}(e_s) \\ = 0 & v \in (\underline{v}(e_s), \bar{v}(e_s)) \\ \leq 0 & v = \underline{v}(e_s) \end{cases}, \quad (12)$$

while for v_b we have

$$[Z + V(v, e_b) - V(v_s, e_s)] \frac{\partial P}{\partial v} + [1 - P(\kappa + v_s - v)] \frac{\partial V(v, e_b)}{\partial v} \begin{cases} \geq 0 & v = \bar{v}(e_b) \\ = 0 & v \in (\underline{v}(e_b), \bar{v}(e_b)) \\ \leq 0 & v = \underline{v}(e_b) \end{cases} . \quad (13)$$

Now suppose that κ gets positive enough so that

$$P(\kappa + v_s - v_b) \rightarrow 1 \text{ for all } v_s \in (\underline{v}(e_s), \bar{v}(e_s)) \text{ and } v_b \in (\underline{v}(e_b), \bar{v}(e_b)).$$

Then the optimal list solves (5) without the swing voter utility constraint binding. There is a parallel case for party b as κ becomes negative. This yields Case I.

Now suppose that $\kappa \rightarrow 0$ and e_s is high enough. This implies that (12) binds with equality and hence that the swing voter utility constraint binds in (5). Since $e_s > 1$, the result now follows from Proposition 1. This is Case II. An analogous argument applies to party b using (13). ■

Proof of Proposition 3 Begin with the case where $e_s \leq 1/2$. Then, the quality constraint can no longer be satisfied and the party leader's payoff is

$$\mu(1/2) + \beta \left(\frac{1+c}{2} \right)$$

which is increasing in c . If $e_s \in (1/2, 1)$, then

$$c_s = 2e_s - 1 < \frac{e_s - \tilde{w}(v, e_s)}{1 - \tilde{w}(v, e_s)}$$

where $\tilde{w}(v, e_s)$ is defined in Proposition 1. Turning to party b , Proposition 2 implies that the fraction of women and competent men is always lower in Case I than Case II. The result follows immediately therefore for the fraction of women. Turning to the fraction competent men, observe that the difference in Case I is

$$\max \left\{ 0, \min \left\{ 1, \frac{e_s - w^*}{1 - w^*} \right\} \right\} - \min \{1, 2e_s - 1\}$$

and in Case II is

$$\max \left\{ 0, \min \left\{ 1, \frac{e_s - \tilde{w}(v, e_s)}{1 - \tilde{w}(v, e_s)} \right\} \right\} - \min \{1, 2e_s - 1\}$$

The result follows from observing that

$$\max \left\{ 0, \min \left\{ 1, \frac{e_s - w^*}{1 - w^*} \right\} \right\} \geq \max \left\{ 0, \min \left\{ 1, \frac{e_s - \tilde{w}(v, e_s)}{1 - \tilde{w}(v, e_s)} \right\} \right\}. \quad \blacksquare$$

Proof of Proposition 4 Proposition 3 implies that v_s is always higher in political equilibrium when there is a gender quota. This follows since in cases where e_s is low and the quality constraint cannot be satisfied, then $c_s = 1$. If $e_s \geq 1/2$, then swing voter utility is

$$\mu(1/2) + \beta \min \{e_s, 1\} \geq \mu(\tilde{w}(v, e_s)) + \beta \min \{e_s, 1\}$$

This follows from using (13) and the observation that the game is super-modular. Then, observe that $\tilde{w}(v, e_s)$ is increasing in v . For the second part, focus on Case I where $e_b > 1/2$. Then, observe that

$$c_b = 2e_b - 1 \leq \frac{e_b - \tilde{w}(v, e_b)}{1 - \tilde{w}(v, e_b)}$$

as claimed. \blacksquare

Validation of our competence measure

If our measure of political competence is valid, it should predict success in the political workplace, both in terms of a political career and in voter support. Three variables are used to capture such success. The first is the politician's share of all preferential votes on her party's ballot in that election, a direct assessment of relative voter support. The second is a dummy variable for re-election, which directly determines career advancements via the seniority system (see Folke and Rickne, 2012 for a thorough motivation of this career measure). The third is a dummy variable for appointment to a chair position, on either the municipal-council board or one of the committees. This measure captures strong support in the politician from the party group by the entrustment of leadership tasks. Using it for estimation, however, requires us to restrict the sample to parties eligible for chair positions, namely those in the current majority.

Three simple regressions are estimated on the following form:

$$x_{i,t+1} = \beta c_i + \phi_{i,t} + \epsilon_{i,t}$$

where $x_{i,t+1}$ is either of our three measures of political success. Note that these are measured in the next election period, or after the election, $t+1$, except in the case of the preferential votes in election t . Our parameter of interest is β , which captures the relationship between our competence measure, c_i , a continuous z -score of the income residuals from equation (10), and the dependent variable. We measure the outcomes with one forward lag so as to allow us to compare specifications with and without fixed effects for list rank, ϕ_{it} , across the dependent variables. These controls particularly important in the case of the preferential votes, as voters to cast such votes for top-ranked candidates by default (Montabes and Ortega, 2002). Such behavior may be captured by β , because income residuals are positively correlated with list rank. The fixed effects are interacted with categorical variables for group size to ensure that a correlation between group size and the relative concentration of “default” preferential votes for the top-ranked candidates does not confound our estimates.

The results are presented in Table A3. They show strong positive correlations between our measure of competence and all three dependent variables. In the case of preferential votes, in columns (1) and (2), the estimate without the list-rank fixed effects shows that a one standard deviation higher competence score is associated with drawing close to 2 percentage points more of the party’s preferential votes in the municipal election. When holding list rank constant, this estimate is reduced to drawing close to 1 percentage point more votes. Still, this is a strong indication that our competence measure predicts direct voter support.

For the event of re-election, columns (3) and (4), our estimates show that candidates with one standard deviation higher competence have a 5 percentage point higher probability of being re-elected, less than half of which can be explained by controlling for list rank. Hence, our competence measure is a strong predictor of a continued political career. Finally, we find that parties reward politicians with a higher competence measure in the distribution of positions of greater political influence. A one standard deviation higher competence is associated with a 6 percentage point greater probability of becoming (or remaining) appointed to a chair position.

Municipal Council Size

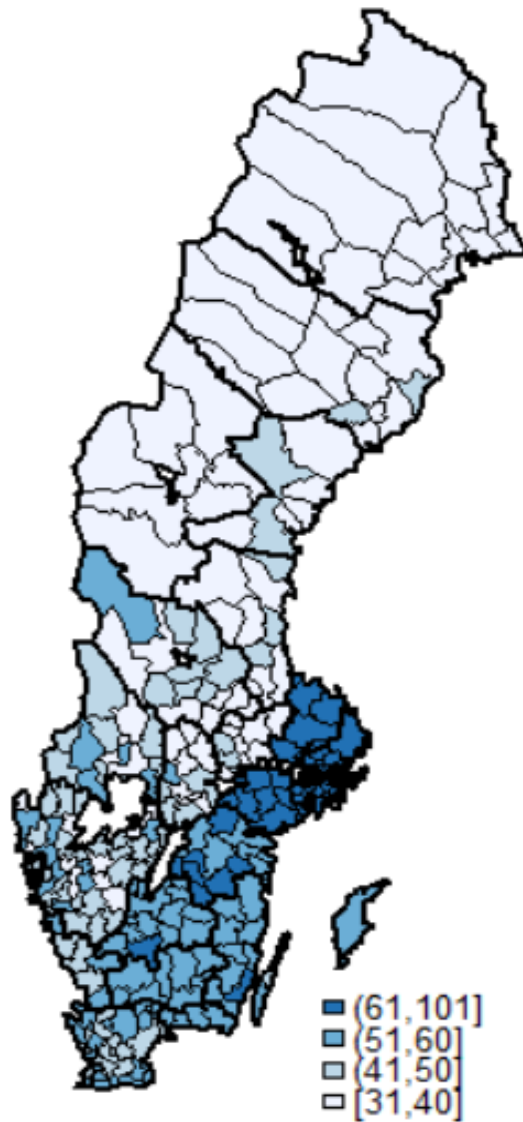


Figure 1. Swedish counties (21) and municipalities (290), by municipal council size.

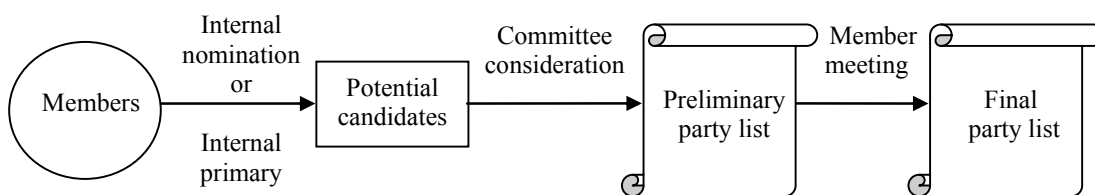


Figure 2. Process of party list composition in Swedish political parties

Table 1. Hard and soft quotas in Swedish political parties

LEFT BLOCK	Party	Year	Target	Mandate	
LEFT BLOCK	Left party	1987		Share of women at least equal to the female share of the constituency	
		1993		Minimum 40% of either sex	
		1997		Minimum 50% women	
	Social Democrats	1987	Minimum 40% women at all party levels		
		1990	50/50		
		1993		50% women, zipper system	
	Green party	1987		40% women	
		1997		50% women, plus or minus one person	
	CENTER-RIGHT BLOCK	Liberal party	1974	40% women	
			1984	50% women, zipper system	
Christian Democrats		1987	Minimum 40% of either sex		
Center party		1996	50/50		
Conservative party		1993	50/50		

Source: Authors' own classification based on Krook et al. (2006) and Freidenvall et al. (2006).

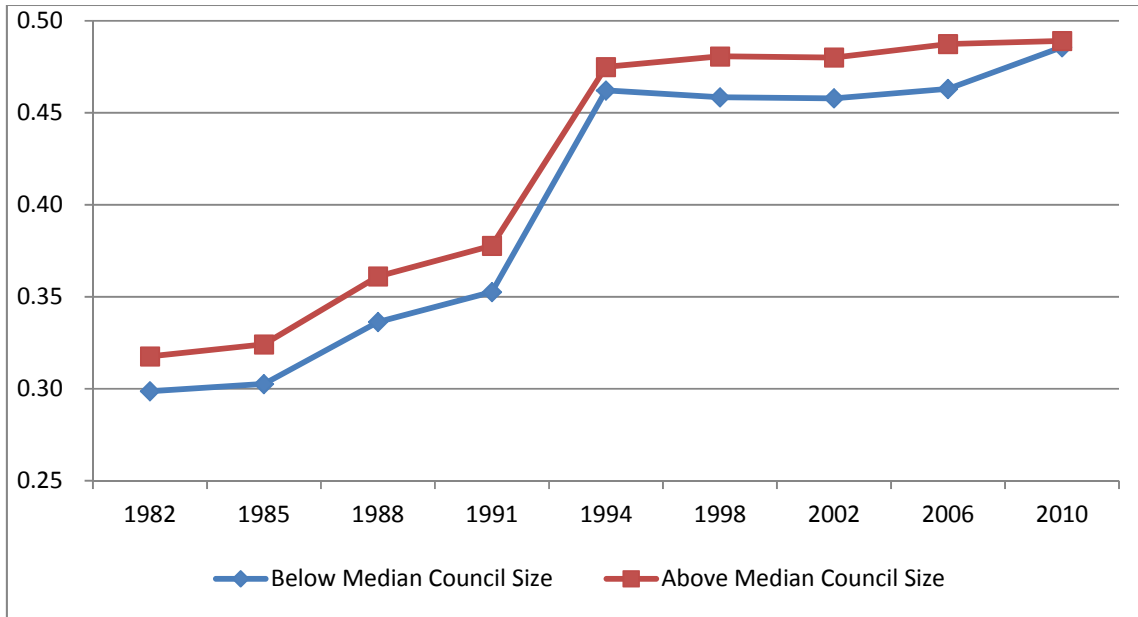
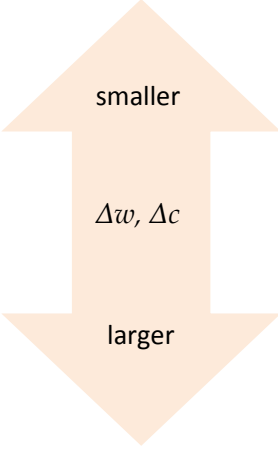


Figure 3. Response of the share of elected Social Democratic women to the adoption of a zipper gender quota in 1993.

		Leadership quality			
		$e < w^*$	$w^* \leq e < 1$	$1 \leq e$	
		QC binding	QC binding	QC not binding	
Neck-and-neck competition	SWC binding	$w = e$ $c = 0$	$w^* < w < 1/2$ $c = (e - w)/(1 - w)$	$w^* < w \leq 1/2$ $c = 1$	
Midway competition					
Little or no competition	SWC not binding	$w = e$ $c = 0$	$w = w^*$ $c = (e - w^*)/(1 - w^*)$	$w = w^*$ $c = 1$	

Figure 4. Illustration of Proposition 2 on pre-quota list composition in equilibrium, depending on e and κ .

		Leadership quality	
		$e < 1/2$	$1/2 \leq e$
		QC binding	QC binding or not
Neck-and-neck competition	SWC binding	$\Delta w < 1/2 - \text{Min}[e, w^*]$ $\Delta c > 1 - \text{Max}[0, (e-w^*)/(1-w^*)]$	$0 \leq \Delta w < 1/2 - w^*$ $\Delta c = -\Delta w(1-c)/(1-w)$
Midway competition			
Little or no competition	SWC not binding	$\Delta w = 1/2 - \text{Min}(e, w^*)$ $\Delta c = 1 - \text{Max}[0, (e-w^*)/(1-w^*)]$	$\Delta w = 1/2 - w^*$ $\Delta c = -\Delta w(1-c)/(1-w^*)$



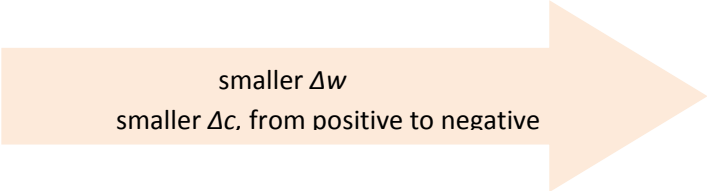


Figure 5. Illustration of Proposition 3 on the effect of quota in Social Democrats, depending on e and κ .

		Leadership quality	
		$e < w^*$	$w^* \leq e$
		QC binding	QC binding or not
Neck-and-neck competition	SWC binding	$\Delta w = 0$ $\Delta c = 0$	$\Delta w > 0$ $\Delta c = -\Delta w(1-c)/(1-w)$
Midway competition			
Little or no competition	SWC not binding	$\Delta w = 0$ $\Delta c = 0$	$\Delta w = 0$ $\Delta c = 0$

Figure 6. Illustration of Proposition 4 on the effect of Social Democratic quota in other parties, depending on e and κ

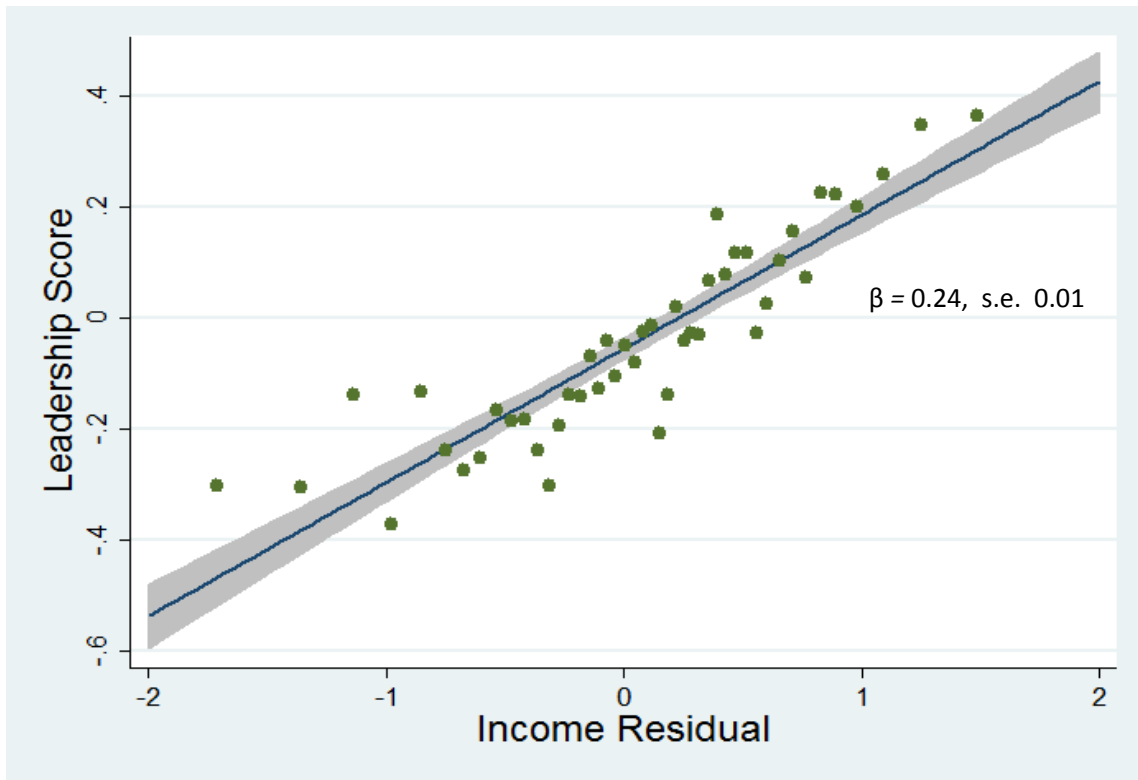


Figure 7. Correlation between non-cognitive, leadership, test from the military draft (z-score) and income residuals (z-score). All politicians elected at least once during the 1988-2010 period. Each bin contains 250 individuals.

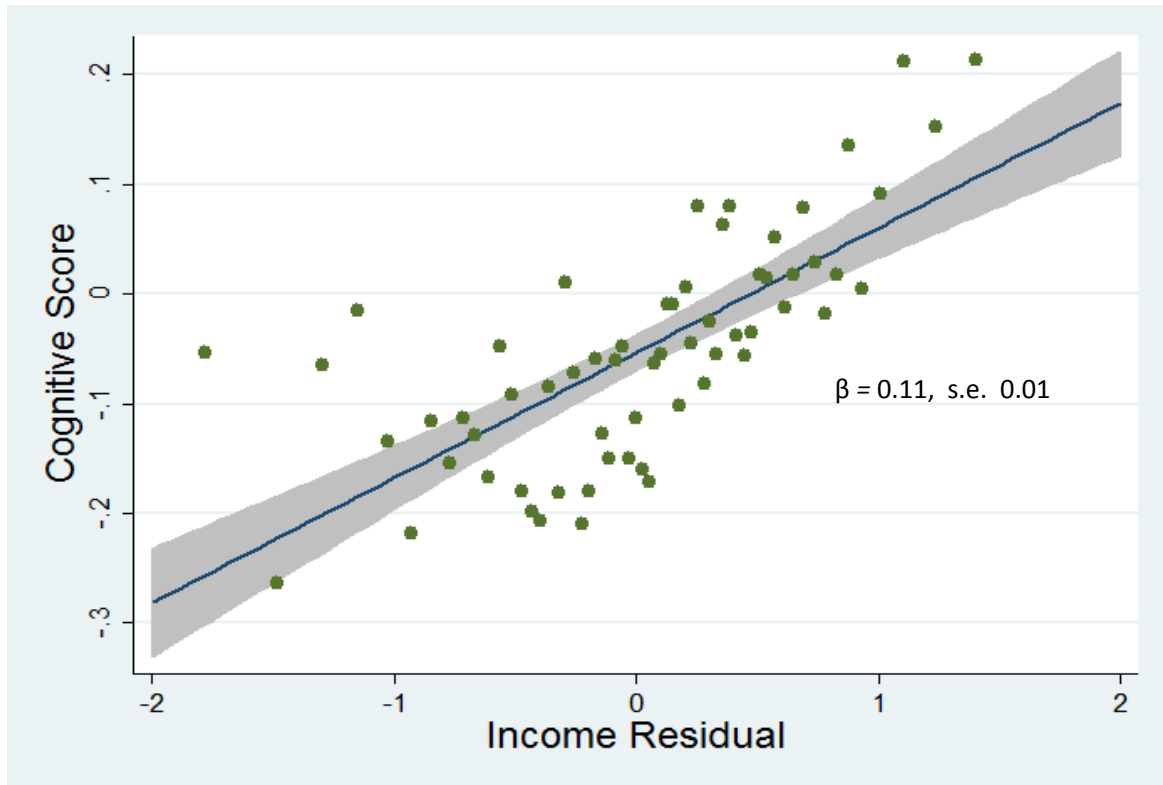


Figure 8. Correlation between cognitive test from the military draft (z-score) and income residuals (z-score). All politicians elected at least once during the 1988-2010 period. Each bin contains 250 individuals.

Figure 9. Empirical pattern of w and c , depending on e and κ , all parties

		Leadership quality		
		e tercile 1	e tercile 2	e tercile 3
		QC binding	QC binding	QC not binding
Neck-and-neck competition	SWC binding	$w = 31.4$ c (share) = 42.8 c (mean) = -0.08	$w = 34.0$ c (share) = 57.4 c (mean) = 0.14	$w = 34.0$ c (share) = 67.1 c (mean) = 0.32
Midway competition				
Little or no competition	SWC not binding	$w = 30.4$ c (share) = 41.0 c (mean) = -0.21	$w = 32.9$ c (share) = 51.7 c (mean) = 0.06	$w = 36.7$ c (share) = 59.4 c (mean) = 0.24

Note: Mean income residuals underlying c (mean) measured in z-score, and share underlying c (share) are share of mean with z above median. While e and κ are measured in 1988, w and c are measured in 1991. Only party groups with more than eight members and a man on top of the list are included.

Table 2. Linear association of w and c with e , for top and bottom terciles of political competition, all parties and Social democrats.

ALL PARTIES						
	Share of women		Share of competent men		Mean competence of men	
All municipalities						
Leadership quality, e	1.73** (0.67)	0.59 (0.67)	13.11*** (1.27)	11.79*** (1.35)	0.30 *** (2.62)	27.92*** (2.63)
Controls		yes		yes		Yes
Obs	479	479	479	479	479	479
Neck-and-Neck						
Leadership quality, e	2.15* (1.20)	0.79 (1.40)	13.35*** (2.18)	10.79*** (2.43)	28.38*** (4.79)	22.15*** (4.87)
Controls		yes		yes		Yes
Obs	174	174	174	174	174	174
Little or no comp						
Leadership quality, e	1.73** (0.67)	0.59 (0.67)	13.11*** (1.27)	11.79*** (1.35)	29.77*** (2.62)	27.92*** (2.63)
Controls		yes		yes		Yes
Obs	134	134	134	134	134	134
SOCIAL DEMOCRATS						
All municipalities						
Leadership quality, e	1.79** (0.83)	-0.50 (0.86)	13.77*** (1.91)	9.84*** (2.01)	30.41*** (4.01)	23.16*** (3.96)
Controls		yes		yes		Yes
Obs	239	239	239	239	239	239
Neck-and-Neck						
Leadership quality, e	2.74 (1.69)	1.04 (1.36)	18.40*** (3.33)	11.87*** (2.95)	37.66*** (8.54)	22.41** (8.84)
Controls		yes		yes		Yes
Obs	77	77	77	77	77	77
Little or no comp.						
Leadership quality, e	2.70** (1.23)	2.41* (1.32)	7.55** (2.94)	6.63 (4.10)	21.74*** (6.02)	21.33** (8.32)
Controls		yes		yes		Yes
Obs	79	79	79	79	79	79

Note: Robust standard errors in parenthesis. * significant at 10%; ** significant at 5%; *** significant at 1%. Controls variables are fixed effects for council size (4 categories) and county (21). The specifications for all parties also include party fixed effects.

Table 3. Linear association of w and c with low κ , depending on e , all parties and Social Democrats

ALL PARTIES						
	Share of women		Share of competent men		Average competence of men	
All municipalities						
Neck-and-Neck	0.69	0.13	4.87*	2.62	0.11**	0.06
	(1.25)	(1.20)	(2.48)	(2.52)	(0.04)	(0.05)
Controls		yes		yes		yes
Obs	314	314	314	314	314	314
<hr/>						
<i>e</i> first tercile						
Neck-and-Neck	2.38	-0.54	0.13	-2.27	0.12*	0.14
	(1.99)	(2.02)	(4.58)	(5.31)	(0.07)	(0.09)
Controls		yes		yes		yes
Obs	95	95	95	95	95	95
<hr/>						
<i>e</i> second tercile						
Leadership quality, <i>e</i>	1.96	2.16	3.95	-1.79	0.05	-0.04
	(2.45)	(3.06)	(4.84)	(6.48)	(0.06)	(0.09)
Controls		yes		yes		yes
Obs	97	97	97	97	97	97
<hr/>						
<i>e</i> third tercile						
Neck-and-Neck	-1.06	-2.48	5.32	4.41	0.07	0.001
	(1.94)	(2.21)	(3.38)	(3.85)	(0.08)	(0.08)
Controls		yes		yes		yes
Obs	122	122	122	122	122	122
<hr/>						
SOCIAL DEMOCRATS						
All municipalities						
Neck-and-Neck	1.49	1.59	1.39	-2.71	0.06	-0.03
	(1.56)	(1.82)	(3.17)	(3.43)	(0.06)	(0.06)
Controls		yes		yes		yes
Obs	162	162	162	162	162	162
<hr/>						
<i>e</i> first tercile						
Neck-and-Neck	0.41	-1.04	-4.44	-2.44	0.10	0.14*
	(2.56)	(3.99)	(5.06)	(4.71)	(0.08)	(0.07)
Controls		yes		yes		Yes
Obs	52	52	52	52	52	52
<hr/>						
<i>e</i> second tercile						
Leadership quality, <i>e</i>	5.07	5.56	1.95	-4.96	-0.02	-0.13
	(3.38)	(5.66)	(5.65)	(10.31)	(0.08)	(0.16)
Controls		yes		yes		yes
Obs	97	97	97	97	97	97
<hr/>						
<i>e</i> third tercile						
Neck-and-Neck	0.64	2.26	6.73	2.36	0.12	-0.005
	(2.24)	(2.88)	(4.75)	(7.41)	(0.10)	(0.15)
Controls		yes		yes		yes
Obs	58	58	58	58	58	58

Note: Robust standard errors in parenthesis: * significant at 10%; ** significant at 5%; *** significant at 1%.

Controls variables are fixed effects for council size (4 categories) and county (21). The specifications for all parties also include party fixed effects.

Table 4. Linear association of w and c with e and κ , all parties and Social Democrats

ALL PARTIES						
	Share of women		Share of competent men		Average competence of men	
Leadership quality, e	-0.18 (1.21)	-1.15 (1.18)	15.07*** (1.58)	14.11*** (1.72)	0.33*** (0.04)	0.32*** (0.04)
(Neck-and-Neck OR Little-or No Competition)* e	2.75* (1.43)	2.50* (1.32)	-2.99 (2.28)	-3.34 (2.29)	-0.05 (0.05)	-0.06 (0.05)
Little-or-No Competition	-2.08* (1.25)	-1.94 (1.19)	1.48 (2.04)	0.16 (1.92)	0.02 (0.04)	-0.01 (0.04)
Neck-and-Neck	-2.38* (1.28)	-1.82 (1.20)	-2.71 (2.28)	-2.47 (2.43)	-0.07 (0.04)	-0.07* (0.04)
Control variables		yes		yes		yes
Obs	479	479	479	479	479	479
SOCIAL DEMOCRATS						
Leadership quality, e	-0.15 (1.57)	-3.68* (1.93)	18.23*** (2.29)	13.11*** (2.37)	0.36*** (0.04)	0.27*** (0.04)
(Neck-and-Neck OR Little-or No Competition)* e	2.87 (1.86)	4.52** (1.94)	-6.22* (3.34)	-4.42 (3.14)	-0.08 (0.07)	-0.05 (0.06)
Little-or-No Competition	-1.35 (1.79)	-1.82 (1.72)	-1.63 (3.24)	-3.67 (3.07)	0.01 (0.06)	-0.04 (0.05)
Neck-and-Neck	-2.82 (1.72)	-2.95 (1.89)	-3.24 (3.20)	-2.71 (3.49)	-0.06 (0.06)	-0.05 (0.05)
Control variables		yes		yes		yes
Obs	239	239	239	239	239	239

Note: Robust standard errors in parenthesis: * significant at 10%; ** significant at 5%; *** significant at 1%. Controls variables are fixed effects for council size (4 categories) and county (21). The specifications for all parties also include party fixed effects.

Figure 10. Changes in w and c between 1991 and 1994 depending on e and κ , Social Democrats

		Leadership quality	
		e below median	e above median
		QC binding	QC binding
Neck-and-neck competition	SWC binding	$\Delta w = 11.4$ Δc (share) = 4.7 Δc (mean) = 0.07	$\Delta w = 11.4$ Δc (share) = 0.8 Δc (mean) = -0.06
Little or no competition	SWC <i>not</i> binding	$\Delta w = 13.5$ Δc (share) = -1.5 Δc (mean) = 0.015	$\Delta w = 10.6$ Δc (share) = -0.6 Δc (mean) = -0.035

Table 5 Difference-in-Difference regressions of c on Δw , 1988-2006, Social Democrats

	Income residual		Average draft score	
	c (share)	c (mean)	c (draft)	c (draft)
Post1991* Δw	0.19** (0.09)	0.36** (0.15)	0.63*** (0.21)	
D1988* Δw	0.06 (0.14)	-0.03 (0.24)	-0.07 (0.36)	
D1994*Δw	0.32** (0.13)	0.51** (0.24)	0.64** (0.30)	
D1998* Δw	0.20 (0.13)	0.13 (0.24)	0.57** (0.27)	
D2002* Δw	0.24* (0.15)	0.37 (0.25)	0.75** (0.31)	
D2006* Δw	0.14 (0.14)	0.36 (0.28)	0.44 (0.27)	
Obs	1,317	1,317	1,317	1,140

Note: Regressions also include municipality fixed effects and election period fixed effects. Pre1991 is the reference category for odd columns and D1991* Δw is the reference category for even columns. Robust standard errors in parenthesis: * significant at 10%; ** significant at 5%; *** significant at 1%

Table 6 Difference-in-Difference regressions of c on Δw , 1988-2006, Social Democrats. Including the number of elected men as a control variable

	Income residual		Average draft score	
	c (share)	c (mean)	c (draft)	
Post1991* Δw	0.06 (0.09)	0.20 (0.17)	0.70*** (0.22)	
D1988* Δw	-0.09 (0.14)	-0.20 (0.25)	-0.04 (0.36)	
D1994*Δw	0.05 (0.13)	0.26 (0.22)	0.74** (0.32)	
D1998* Δw	0.04 (0.13)	0.01 (0.24)	0.65** (0.29)	
D2002* Δw	0.10 (0.13)	0.35 (0.25)	0.84*** (0.32)	
D2006* Δw	0.11 (0.14)	0.41 (0.29)	0.53* (0.28)	
Obs	1,317	1,317	1,317	1,140

Note: Regressions also include municipality fixed effects and election period fixed effects. Pre1991 is the reference category for uneven numbered columns and D1991* Δw is the reference category for even numbered columns. Robust standard errors in parenthesis: * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 7. Spill-overs from the Social Democrats' quota on w and c of other parties

	Share of women	Share of competent men	Average competence of men
Δw in Social Democrats	0.10 (0.08)	0.00 (0.20)	-0.02 0.37
obs	157	157	157

Note: Robust standard errors clustered at the municipality level in parenthesis: * significant at 10%; ** significant at 5%; *** significant at 1%. Sample includes all party groups with a male leader and at least eight elected representatives.

Table 8. Shares of competent men and women among elected Social Democratic men and women in 1991 and 1994, by quota impact, below or above median change in the share of elected women.

	Small Δw		Large Δw	
	Pre-quota 1991	Post-quota 1994	Pre-quota 1991	Post-quota 1994
Men				
Share of competent, $c(\text{share})$	53.6	52.1	46.7	48.7
Share of university educated	22.7	22.3	16.9	18.5
Women				
Share of competent, $c(\text{share})$	54.2	52.2	52.8	48.6
Share of university educated	31.5	30.1	24.4	24.8

Appendix Tables and Figures

Table A1. Summary statistics

All listed politicians	All years	1988	1991	1994	1998	2002	2006	2010
Women	40		37	40	40	40	41	42
Share of with university education	40		34	37	40	42	45	47
Average disposable real income	143.6		121.7	118.4	124.2	146.1	172.8	184.4
Observations	323,667	323,667	59,308	57,172	52,892	51,079	51,080	52,136
All elected politicians								
Women	41	34	34	41	42	42	42	43
Share of first ranked men	71	80	79		71	71	68	67
Share of with university education	44	34	40	40	45	47	49	51
Average disposable real income	159.0		135.4	131.6	135.9	160.4	191.1	202.1
Observations	93,083	13,381	13,526	13,550	13,388	13,272	13,079	12,970
Elected Social Democrats								
Women	46	35	37	47	47	47	48	49
Share of first ranked men	69	82	83		65	65	63	62
Share of with university education	31	22	27	29	33	34	36	38
Average disposable real income	156.8		139.0	129.4	138.3	162.9	182.7	199.1
Observations	36,659	5,790	5,191	6,141	4,949	5,156	4,842	4,594

Table A2. Distribution of answers to the question "If there was an election today, how important would the following reasons be for your choice of party"? All voters, and Social Democratic voters in parenthesis.

	One of the most important reasons	A pretty important reason	Not a very important reason	Not an important reason at all
The party has competent politicians that can handle the country's affairs	71 (75)	20 (18)	2 (1)	1 (0)
The party has good standpoints on specific issues	56 (53)	33 (38)	3 (2)	1 (0)
The party has a good ideology	48 (48)	37 (39)	6 (5)	2 (1)
The party has a good leader	37 (41)	43 (42)	9 (7)	2 (1)
The party was the least bad option	19 (19)	26 (29)	30 (27)	14 (14)
The party put forth good opinions in the media	12 (13)	45 (48)	27 (26)	6 (4)
I always vote for the same party	12 (20)	12 (17)	27 (29)	41 (28)

Source: Year 2000 Society, Opinions and Mass Media Survey, Gothenburg University. N=3,546 (1,021). Social Democratic voters are defined as those listing the Social Democrats as their preferred party.

Table A3. Correlations between income residuals (continuous z-score) and political success measures, with and without fixed effects for list rank.

	Preferential vote share		Re-election = 1		Chairpersonship = 1	
Income residual	1.84*** (0.12)	0.90*** (0.11)	5.2*** (0.31)	2.94*** (0.30)	5.62*** (0.56)	2.38*** (0.51)
List rank FE		Yes		Yes		yes
Observations	35,230	35,230	60,063	47,655	11,774	11,774
Sample	1998-2010		1991-2010	1991, 1998-2010	2006-2010	

Notes: Preferential vote share is the share of preferential votes cast for the individual politician as a share of the total number of preferential votes cast for the party in the municipal election. Chairpersonships include the municipal council board, the municipal council, or a committee. List rank data not available for 1994. * significant at 10%; ** significant at 5%; *** significant at 1%.

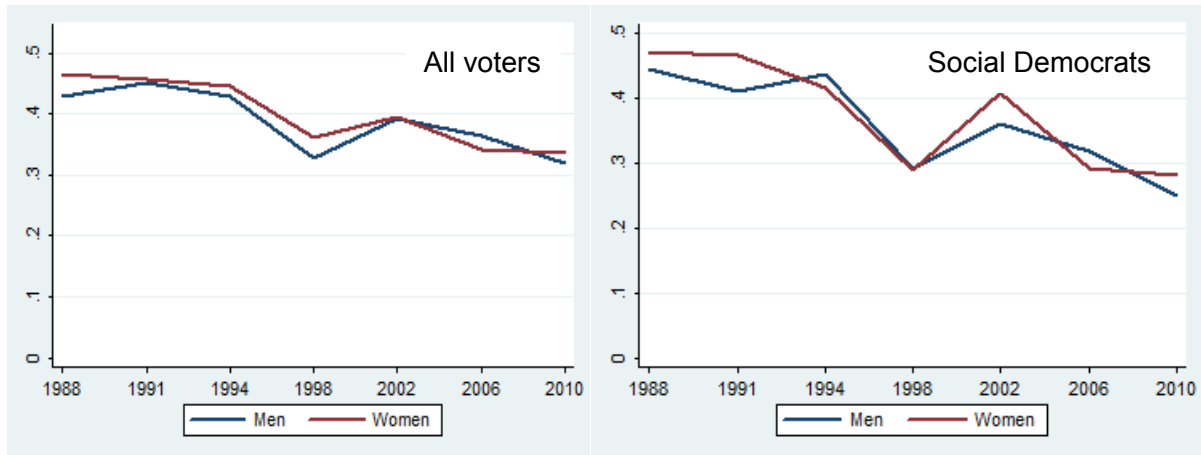


Figure A1. Share of voters that report to be “not committed” to their preferred party. Society, Opinions and Mass Media Survey, representative sample of the Swedish population, survey conducted by the department of Political Science, Gothenburg University, Sweden.

Figure A2. Empirical pattern of w and c , depending on e and κ , Social Democrats

		Leadership quality		
		e tercile 1	e tercile 2	e tercile 3
		QC binding	QC binding	QC not binding
Neck-and-neck competition	SWC binding	$w = 34.2$	$w = 36.4$	$w = 39.1$
		c (share) = 33.8 c (mean) = -0.13	c (share) = 49.6 c (mean) = 0.01	c (share) = 60.6 c (mean) = 0.28
Midway competition				
Little or no competition	SWC not binding	$w = 33.7$	$w = 31.3$	$w = 38.5$
		c (share) = 38.3 c (mean) = -0.24	c (share) = 47.7 c (mean) = 0.03	c (share) = 53.8 c (mean) = 0.17

Note: continuous income residuals measured in z-score, and binary as $z > 0$. e and κ are measured in 1988, and w and c in 1991. Only party groups with more than eight members are included.