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

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Abstract

Efforts to increase female political representation are often thought to be at odds with meritocracy. This paper develops a theoretical framework and an empirical analysis to examine this idea. We show how the survival concerns of a mediocre male party leaders can create incentives for gender imbalance and lead to more incompetent men in office. The predictions are confronted with data on candidates in seven parties and seven elections (1988-2010) in Swedish municipalities. Specifically, we use administrative data on labor market performance to craete a measure of politician competence. We investigate the effects of the "zipper" quota, requiring party groups to alternate male and female names on the ballot, unilaterally implemented by the Social Democratic party in 1993. Far from being at odds with meritocracy, this quota raised the competence of male politicians where it raised female representation the most.

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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 in Sweden (S-Kvinnor) 1995-2003.

1 Introduction

It is often claimed that representative democracies need men and women of competence and integrity to operate well. But whether one should attempt to engineer changes in the composition of the political class remains contested. Nonetheless, gender representation has seen many initiatives. In particular, half of all countries use some type of gender-based electoral quota to shape parliamentary representation.

The empirical literature on the consequences of women's representation is somewhat equivocal. Citizen-candidate models, such as Besley and Coate (1997) suggest that representation should matter for policy if women have different policy priorities than men.[1] When it comes to the impact of quotas on other outcomes – such as the competence of elected politicians – we know even less.

Leading models of political selection, as Banks and Sundaram (1998), commonly assume that politician competence can be treated as a valence issue. This assumption is echoed by Swedish voters, who in the year 2000 were surveyed about their reasons for choosing a party. Competence was ranked as most important, with 71 percent of respondents saying that parties should have "competent politicians that can handle the country's affairs". Just how voters interpret the idea of competence is not entirely clear.[2] In this paper, we use a unique dataset to measure competence, which is analogous to one proposed by Merlo et. al. (2010), and allows us to gauge the competence of each candidate.

Even though gender quotas are common, their merits are hotly debated. Proponents see quotas as an expedient device to achieve equal representa-

[1] Recent studies which all find effects include Chattopadhya 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.

[2] Competence and its importance is sometimes measured indirectly as in Galasso and Nannicini (2011) who find that parties place the most educated candidates in the highly contested electoral districts in Italy.

tion, while opponents see them as a threat to meritocracy. A considerable body of research touches on these issues.[3] Recent studies have looked at the characteristics of women (and occasionally men) who enter politics following the introduction of quotas. But the literature frequently lacks a plausible source of exogenous variation to establish the impact of quotas on competence. Focusing on a single political assembly makes it difficult to separate the effect of the quota from other simultaneous events. In studies of regional party groups, only a limited amount can be learned from quotas with nomination mandates, since the parties themselves determine the share of elected women.[4]

This paper studies the effects of gender quotas theoretically and empirically. In our model, two parties select the gender and competence of politicians on their lists under proportional representation (PR). Increasing the fraction of women toward gender parity, or increasing the fraction of competent men, appeals to voters and might therefore raise the chances of winning an election. But a male party leader may feel threatened by appointing women and competent men, especially when he is of mediocre competence.[5] This creates a dilemma for party leaders who may only be able to appeal to voters by risking their own position. We show how a mediocre male leader responds to this concern by appointing fewer women and competent men. A gender quota may force mediocre leaders to realign their priorities, putting greater weight on voter preferences which simultaneously boosts gender equality and politician competence. This is clearest if the leader is displaced by the mandated rise in women's representation, creating

[3]Studieis of the spread of reforms and their numeric impact on representation are 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).

[4]Murray (2010) finds that women who entered parliament in association with France's quota law were equally active and efficient lawmakers as their male colleagues. O'Brien (2012) finds no difference in merits between women on reserved and contested seats in the parliament of Uganda. Baltrunaite et al (2012) study Italy and show that the education of male and female politicians both went up with a quota that mandated that either gender hade to make one third of the candidates on the party ballots. Julio and Tavares (2011) discuss theoretically how the supply of politicians relate to gender discrimination, and how it responds to a quota.

[5]The focus on the tension between internal survival and external success is similar to Caillaud and Tirole (2002). However, they study the choice of platform quality under plurality rule as opposed to list selection under proportional representation.

a "double dividend" in gender representation and competence.[6]

Our evidence uses individual data on all candidates on all party lists in all Swedish municipalities in all elections since 1988. We code the gender of all politicians and derive a measure for the competence of party followers and party leaders. This competence measure exploits variation in income conditional on occupation, education, location, and age. Data from the Swedish military draft show that (for men) this competence measure is strongly related to the leadership ability of a candidate, as assessed by a trained psychologist. The competence measure is also strongly related to political success.

We first pinpoint the determinants of the pre-quota list composition in 1991, showing that the shares of women and competent men are both going up with leadership competence, as our model predicts. Then, we study the effects of the 1993 party-specific "zipper quota" implemented by the Social Democratic party. Where political competition was weak, this quota raised the competence of men in municipalities where the initial share of women and competent men were both relatively low. This finding is not due to pre-trends in male competence and can only partially be accounted for by fewer seats being available for male politicians. It is also robust to alternative measures of political competition and to adding a range of municipal characteristics as controls. Moreover, we show that the quota made it more likely that incompetent leaders were replaced. These results hold up when we look at the complete sample of municipalities, including those with the strongest political competition. However, the point estimates are smaller in size, in line with the model prediction of smaller impacts in more competitive elections. We also look for evidence of spillover effects on other parties.

In the next section, we provide some background to the empirical context and gender quotas in Sweden. Against this background, Section 3 lays out the model and its empirical predictions. Section 4 discusses data and

[6] A recent literature has attributed changes in the composition of party ballots to demand factors rather than candidate supply. For example, Bagues and Esteve-Volart (2012) have suggested that a lack of political competition leaves room for party organizations to recruit fewer women relative to what voters want. This implies that a gender quota might increase voter welfare if implementation is uniform across districts (as shown by Casas-Arce and Saiz, 2011). Explicitly modelling the role played by the party leadership in drawing up the list is similar in spirit to Egorov and Sonin (2011) who show how quality and diversity may be compromised by mediocre leaders wishing to hold on to power, and Gagliarducci and Paserman (2011), who link the survival of leaders to the composition of followers.

measurement. The baseline econometric results are collected in Section 5. Theoretical and empirical extensions are presented in Section 6. Section 7 concludes.

2 Context

This section summarizes some basic features of Swedish local politics and the gender quotas adopted by Swedish political parties. It highlights five stylized facts which will guide the modeling assumptions in Section 3.

Swedish municipalities Throughout its political system Sweden uses parliamentary government with a PR electoral system implemented through party lists. The three levels of government entail one national parliament, 21 county assemblies, and 290 municipal councils. The map in Figure 1 shows the counties (thick borders) and municipalities (thin borders). At each level, the majority party or coalition forms the government. Just as the majority appoints the prime minister at the national level, the local majority appoints the chairperson of the local council board. Each municipality is therefore a microcosmic parliamentary system where each local party organization determines the composition of its own electoral ballot.

[Figure 1 here]

Elections are held every four years (three years prior to 1994) and parties obtain seats in proportion to their vote shares. Elections are synchronized for all three levels, with a 80-90 percent turnout among eligible voters. Party lists were traditionally closed with an order of candidates decided by the party.[7] The party ballots often contain information beyond candidate names, such as age, education and/or occupation, and city of residence within the municipality. Figure 2 gives an example of a ballot from the Social Democratic party in 2006.

[Figure 2 here]

[7] From 1998 onwards a flexible list system with one optional preferential vote was introduced. Since more than nine out of ten preferential votes have been cast for politicians who would have been elected without them (due do to their high list rank), this system has only marginally changed the composition of those elected.

Local municipalities in Sweden have significant political autonomy and control budgets of 15-20 percent of GDP, employing around 20 percent of the country's labor force. While some intergovernmental transfers exist, the bulk of municipal revenue is raised via a local income tax set by the municipal council and 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 municipality which are not the exclusive responsibility of the state. Despite their substantial influence, municipal politicians do unpaid political work in parallel with their regular career. Typically, only the chairperson of the municipal council board receives a full-time salary.

Municipalities differ widely in size – land area varies from 9 to 19,447 square kilometers and population ranges from 2,558 to 780,817 inhabitants. Councils vary in size between 31 and 101 members, with an average of 46, as illustrated in Figure 1. Representation is not subject to an explicit electoral threshold, and seven major political parties tend to be represented in each municipality. These fall into two main political blocks, with the Left Party, the Social Democrats, and the Green Party to the left, and the Christian Democrats, the Center Party, the Liberal Party, and the Conservatives to the center-right.[8]

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

Stylized fact 1: Municipal political leaders are mostly male Following the global pattern, men historically held a monopoly over political office in Sweden and the right to vote. Although modern-day Sweden is often viewed as a leader in female representation, men have continued to dominate the positions of political power long after the female franchise in 1919.

A simple measure of male over-representation at the municipal level is the share of men among the first names on party ballots. The top-ranked position is normally reserved for chairpersons of the municipal council board, in majority parties, or party-group leaders in minority cases. Data from the 2006 and 2010 elections shows that the top ranked politician on the largest

[8]In fact, the strength of the two blocks led Alesina et al. (1997) to classify Sweden as having a bipartisan political system.The Green party is sometimes considered independent as in Pettersson-Lidbom's (2008) study.

majority party's ballot was the chairperson of the municipal council board in 9 out of 10 cases. In 1991, the last election before the Social Democratic zipper quota, men held 79 percent of the top ranked positions (82 percent in the Social Democratic party).

Stylized fact 2: Local leaders control party list composition Party-ballot composition is at the heart of a PR closed-list election system as a candidate's list rank determines whether he/she is elected. Lists in Sweden are composed in three steps**.** First, a group of potential candidates is selected from among the party membership by internal nominations (Left party and Social Democrats) or an internal primary (the other parties). This step is administered by a selection committee. In a second step, this committee uses the results to put together a preliminary list. Finally, this list is subject to a vote in a party-member meeting.

Local party leaders normally exert strong influence over the selection committee, which administers the selection stage and determines the ranking at the proposal stage. Rank-and-file party members can only support their preferred candidate(s) in the internal nomination, or vote for them in the internal primary. However nominations and votes are heavily influenced and coordinated by senior party members and leaders. In internal primaries, candidate lists are usually ranked by the committee, or set up with party lists from the previous election as "guidance", such that the leadership has indirect influence over the primary vote (Soininen and Etzler, 2006). Rank-and-file members also lack much influence at the final stage, where typically few changes are made.

Figure 3 displays data from a large survey of municipal politicians about the influence over electoral-ballot composition. It shows clearly that the party leadership is thought to be substantially more influential than elected representatives.

[Figure 3 here]

Stylized fact 3: Policy preferences among voters and politicians differ by gender A large literature argues that politicians' preferences reflect their life experience (Phillips, 1995), gender experiences being an important example. Figure 4 plots the responses by male and female Swedish voters and politicians in a large 2009 survey about their opinions on two proposals about gender issues. The first is a proposal to "work politically toward

gender equality" while the second is a proposal of "raising taxes rather than reducing public services". For both survey questions, women have a more favorable attitude than men among voters as well as politicians.

[**Figure 4 here**]

Stylized fact 4: Competition for party leader is (sometimes) organized along gender lines Following Stylized fact 3, we expect politicians to prefer a leader of their own gender, all else equal. Female party members may be less likely than male members to support the re-election of a male leader for any given level of competence. When the Social Democrats introduced their zipper quota, the party's women's association formalized their efforts on gaining political influence into a political handbook, clearly stating a *modus operandi* along gender lines.[9]

Stylized fact 5: Only placement mandates are effective More than a hundred countries worldwide have adopted some gender quota to raise female numerical representation. Quotas take different forms, but some are more effective than others. If a party policy – or national quota law – only dictates that a certain share of the candidates should be women, this share tends to be found 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). More effective measures, so-called placement mandates, state that women have to be placed in certain electable positions.

All Swedish parties have voluntarily adopted measures towards gender parity, ranging from goals and recommendations (center-right block) to stricter placement mandates (left block). Table W1 (in the Web Appendix) summarizes the main strategies for all parties. The Social Democrats began by

[9]The handbook asks women to: "Analyze carefully the power structure of your council or organization. Where are the most important decisions taken? Is there a shortage of women there? The answer to the latter question is often yes. Make sure that women are introduced and nominated at that particular decision level. Draw up a clear strategy for what power positions must be held by women and how women can most successfully be launched for that particular job. .... After careful consideration, select one or more candidates whom you wish to support. The selection must be realistic and the probability of winning must be fairly large. Launch your candidate in good time before the meeting at which the decision on new members or chairperson is to be taken. ... Make sure women will be in the majority at the meeting. If possible, seek male allies" (Social Democratic Women in Sweden, 1995).

targeting the female list share: 40 and 50 percent for the 1988 and 1991 elections. Only in 1993 – after a credible threat to form a feminist party which would likely have claimed both politicians and voters from the party – did the Social Democrats adopt a quota where every second candidate had to be a woman. This "zipper" quota was imposed on all municipalities by the central party.

[Figure 5 here]

Figure 5 shows the distribution of *changes* in the share of elected women over all municipalities in quota implementation years in Sweden's three largest parties at the time. Following the Social Democrat's zipper quota (in 1994), the average change was 10.1 percentage points. Following the recommendations of 50 percent list shares in the Conservative Party (in 1994) and the Center Party (in 1998), it was only 2.5 and 1 percentage points, respectively.

Figure 6 illustrates the same point, by showing *levels* of the shares of women in the same parties over time. It illustrates the effectiveness of the Social Democrats' zipper system: the share of elected women went up dramatically in the 1994 election[10], whereas the party's recommendations of 40 and 50 percent women (in 1988 and 1991) had been far less effective in increasing women's representation. The graph also shows much smaller increase in the shares of elected women in the Conservative and Center parties after their recommendations of a 50% share (in 1994 and 1998 respectively).

[Figure 6 here]

3 Model

Male leaders of two political parties in a PR election *choose* the candidates on their closed party lists (cf Stylized facts 1 and 2). Prospective candidates differ in two dimensions: competence and gender. Leaders top the list unless they choose to resign in favor of an interim leader. Following the general election, each party leader faces an internal leadership election among the party's representatives. This creates a trade-off in the selection of candidates:

[10]Indeed, deviations from 50% female representation after the quota is explained mostly by randomness in election outcomes: some local party groups obtain an odd numbers of seats and the first-ranked candidate still tends to be male. Only a small number of party groups did not apply the quota to the letter.

greater competence may please voters, but threatens party leaders who are more likely challenged by more able candidates. Due to *gender*-differences in policy *preferences* (cf Stylized fact 3), female politicians may strive to *replace* male leaders (cf Stylized fact 4). This model may have some interest in its own right, being the first (we know of) to study how competing parties choose list composition in a PR-election. But our main purpose is to make empirical predictions about list composition in a pre-quota equilibrium and the equilibrium response to a *binding* quota for female candidates in one of the parties (cf Stylized fact 5).

In this section, we present the structure of the full model. But we study only the choices of the party imposing the quota when it can safely ignore the responses by voters and the other party due to low political competition. This serves to focus on the most novel aspect of the model, the list choice of a male leader who trades off his own policy preferences against his survival probability as party leader. The resulting predictions are most plausibly tested on data from municipalities where political competition is low or absent. In Section 6, we extend the analysis to a full Nash equilibrium with strategic behavior by both parties in the face of the voter behavior. This fuller equilibrium analysis also allows us to study spill-over effects of the quota to parties other than the Social Democrats.

3.1 Basic Structure

Parties Two parties, labeled $K = D, B$ (for Social *D*emocrats and *B*ourgeois), participate in an election for a municipal council. The electoral rule is closed-list PR with each party offering a list of candidates. Party leaders are male and control list composition. The winning party implements policy after the election.

Population The population differs in two dimensions. The first is gender: *W*omen and *M*en are denoted by $G = \{W, M\}$. The second is competence, where we distinguish two types: competent and mediocre, denoted by $X \in \{0, 1\}$.[11] To simplify the analysis and focus on the competence of male politicians, we assume all female politicians are competent. Given the

[11] In the data, we define two measures of competence: one binary – as in the model, – and the other continuous. It is possible to formulate an alternative model with continuous competence that reaches similar predictions to the ones we will obtain here.

rest of the model, this is without loss of generality (the utility of everyone is increasing in competence for a given gender composition). Thus, we have three types – women, competent men, and mediocre men – the shares of which can be described by two numbers. In the Appendix, we show that our main qualitative conclusions (Propositions 1 and 2) continue to hold when all women are mediocre rather than competent.

We consider the special case when the list is structured so that the fractions of women, w_K, and competent men, r_K on the list are invariant to the number of seats won. This is equivalent to assuming that the fractions do not vary within the segment of the party list where the politicians have a realistic probability of getting elected.[12]

Leaders Each party has a leader who varies in three characteristics: gender, competence $L_K \in \{0,1\}$ where $L_K = 1$ denotes a competent leader, and resilience $m_K \in [0,1]$. We focus on male leaders and define their "survival power" as

$$S_K = \theta L_K + (1-\theta)\, m_K \ ,$$

where $\theta < 1/2$ is the importance of competence for survival as a party leader. Below, S_K has a specific effect on the survival chance of a leader.

Incumbent leaders at the outset of the game have a competence level $L_K = l_K$. If such a leader resigns (see below), he appoints a replacement leader with competence $L_K = l'_K$. Finally, if an incumbent leader loses an approval vote (see below), we suppose that a new leader is picked at random. Such leaders are competent with probability ρ.[13]

The resilience of incumbent leaders is drawn at random at the outset of the game from a uniform distribution on $[0,1]$. This draw, along with the resilience shock, determines their survival power which we denote by s_K. Thus $s_K = \theta l_K + (1-\theta)\, m_K$. Mediocre leaders always have less survival power (all else equal), Specifically, for mediocre incumbent leaders survival power is distributed on support $[0, 1-\theta]$ while for competent incumbent leaders we have $s_K \in [\theta, 1]$. The support for the distribution of survival power for competent leaders is thus shifted to the right by θ, but still partly overlaps with that for mediocre leaders. In the data, we will be able to

[12] A more general problem, left for future work, would be to let $n \in [0,1]$ index the list position and then let each party pick a pair of measurable functions $\{\hat{w}(n), \hat{r}(n)\} \in [0,1] \to \{0,1\}$ denoting that a woman or a competent man is selected for the nth position.

[13] However, as we shall see below, such appointments are out-of-equilibrium events.

measure the competence of leaders (and other politicians), but not their survival power. However, the positive correlation we have assumed is enough to draw qualitative conclusions in terms of observables.

Approval of incumbent leaders We assume that incumbent leaders who do not resign are subject to an approval vote for staying on. We think about such votes through the lens of a reduced-form citizen candidate model. In general, we can specify the probability that an incumbent leader of type s_K survives an internal leadership election when the composition of the elected group is (w_K, r_K) as $Q(s_K, w_K, r_K)$, a function which is increasing in its first argument and decreasing in the second and third. Having more women increases the internal opposition to a male leader since women have different policy preferences than men (see below). We will work throughout with a specification where survival is deterministic so that:

$$Q(s_K, w_K, r_K) = \begin{cases} 1 & \text{if } \; w_K + (1 - w_K) r_K \leq s_K \\ 0 & \text{otherwise .} \end{cases}$$

This considerably simplifies the analysis, because when

$$w_K + (1 - w_K) r_K \leq s_K \tag{1}$$

the leader survives for sure. We refer to (1) as the *competence constraint*. For the highest possible survival power, $s_K = 1$, this constraint is (barely) not binding. However for s_K is closer to zero, the competence constraint restricts the leader's list choices if he cares about his own survival. To make life simpler, we will assume that survival is a *lexicographic* priority of the leader.[14]

Party competence The party's competence is a weighted average of the competence of its leadership and its rank-and-file representatives, such that

$$c_K = \alpha L_K + (1 - \alpha) r_K \ , \tag{2}$$

[14]Suppose the outcome of the leadership election is probabilistic (so that the function is $Q(\cdot)$ is smooth) and leaders maximize expected utility. Then, we need stronger assumptions to guarantee that an equlibrium exists, as reaction functions can be discontinuous at a point where the leader faces a discrete choice between pursuing his own survival versus the interests of his party. A preference for survival in a model with a smooth survival probability would be guaranteed if the rents from being a leader are large enough.

where the weight $0 < \alpha < 1$ could just mechanically reflects the leader's share in the party's total representation, or allow for an additional weight on leaders due to a greater influence over policy.

Timing of events The model has the following sequence of events:

1. Each party K has a male leader of competence l_K and resilience m_K . Hence, his survival power is $s_K = \theta l_K + (1 - \theta) m_K$.

2. The incumbent leader designs his party's list comprising the *share* of women, w_K, and the *share* of competent male followers, r_K.

3. Leaders decide whether to stay on. If a leader decides to leave, he appoints a replacement leader with competence l'_K.

4. The council election is held with seat shares awarded in proportion to vote shares.

5. Any incumbent leader who has stayed on at Stage 3 is subject to an approval vote, where only serving politicians – i.e., those with a council seat – can participate. If the leader does not survive, then a new leader is picked at random. However, a replacement leader appointed at Stage 3 automatically remains in office.[15]

The following subsections discuss each stage working backwards. We will look for a subgame-perfect equilibrium. The analysis develops a core case, with further development of the model in Section 6 and some details relegated to the Appendix.

3.2 Stage 5: Leader Survival

Since replacement leaders remain in office by assumption, we only have to consider what happens to incumbent leaders who have chosen to remain in office at stage 3. As long as (1) is satisfied, the leader continues. We will

[15] With these assumption, there is only one prospective leader change in the model. In a multi-period extension, a replacement leader appointed at stage 3 (or a new leader drawn at stage 5) of the current period would draw a relilience shock at stage 1 of the next period, and then be subject to an approval vote at stage 5 of the next period (provided he does not resign in between).

focus on the case where the incumbent leader stays on office in this case and show at stage 3 that this is indeed the case given our assumptions. This is because we have assumed that there is lexicographic priority attached to leadership survival.

3.3 Stage 4: Council Election

Preferences of swing voters Some voters cast their ballot based on the utility they derive from policy choices of the elected party. Among these *swing voters*, men and women have preferences over party lists given by:

$$v_K^G = \mu(z_K) + \beta[w_K + (1 - w_K)c_K], \quad G = W, M \ , \tag{3}$$

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

Competence is a valence issue: both gender groups like more competent candidates in equal measure. Swing voters do not pay any attention to the survival power of leaders, beyond their competence, as survival power *per se* is not policy relevant.[16]

The fact that voters hold preferences directly over elected politicians is consistent with a citizen-candidate model, as introduced by Osborne and Slivinski (1996) and Besley and Coate (1997), where politician types map into policies via some unmodeled bargaining procedure after the election.

We explicitly assume that male party leaders have policy preferences that coincide with those of male swing voters.

Representative swing-voter utility Aggregating over male and female voters, and assuming they are equally many, we can define "representative" swing-voter utility offered by party K:

$$v_K = \frac{1}{2} \sum_{G \in \{W,M\}} v_K^G \ = \rho(w_K) + \beta[w_K + (1 - w_K)c_K], \quad K = D, B, \tag{4}$$

[16] This could be underpinned by supposing that the survival power of a leader is only observed within the party and not by voters.

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 $\rho_w(w) \gtreqless 0$ as $w \lesseqgtr \frac{1}{2}$. Selecting more female candidates – when these are underrepresented – is thus electorally valuable for parties, as is selecting a larger share of competent men.

Election outcome We can study competition for swing voters using a standard probabilistic voting model, where each party has a share of committed voters and the shocks to swing-voter preferences have a uniform distribution. As shown in the Appendix, this is summarized by a (piecewise linear) increasing function for the probability that party D wins: $P(\kappa + v_D - v_B)$ where v_D and v_B are the swing-voter utilities offered by the two parties, and κ is a measure of any electoral advantage for party D due to a larger share of committed voters.

3.4 Stage 3: Leader Resignations

Since an incumbent leader has a lexicographic preference for (the rents associated with) survival, he will not to resign as long as he can survive as leader in the approval vote at Stage 5, given the list composition (w_K, r_K) chosen at Stage 2. Leader survival is assured when the competence constraint (1) is fulfilled. If it is not, the party leader just wants to maximize his policy preferences. Using the definition of c_K, these are given by

$$v_K^M = \mu(1 - w_K) + \beta\{w_K + [\alpha L_K + (1-\alpha) r_K](1 - w_K)\} .$$

Since v_K^M is increasing in L_K, a mediocre leader who cannot survive will resign and appoint a competent replacement leader $l'_K = 1$. A competent leader is indifferent between resigning and not, and we assume that such a leader resigns as well. But the qualitative results to follow do not depend on what tie-breaking assumption we make.[17] This formulation also assumes that the replacement leader is male. This is consistent with our assumption that male policy preferences are biased towards men.

Let $L(s_K) \in \{l_K, l'_K\}$ denote the competence of the leader in power at the end of stage 3. Then, the results can be summarized as follows:

[17] Since competent leaders who will lose for sure have low resilience draws, this could be finessed by supposing that resilience matters at least a little to voters. If leaders expect mean reversion in the next leader's resilience, or can even observe a highly resilient successor, this would give a strict preference for resignation in such cases.

Lemma 1 *In the resignation decision at Stage 3 there are two possibilities:*
(i) *if* $w_K + (1 - w_k)r_K \leq s_K$, *the incumbent leader chooses to stay in power,* $L(s_K) = l_K$
(ii) *if* $w_K + (1 - w_K)r_K > s_K$, *the leader resigns and picks a competent replacement leader,* $L(s_K) = l'_K = 1$.

Thus, an incumbent leader resigns only when he knows he will lose for sure. In this case, he picks the kind of replacement leader who is best for his own policy utility (alternatively the electoral chances of the party), namely a competent leader. By assumption, this replacement leader is not subject to an approval vote at Stage 5 and will thus always remain in office after the council election has been held at Stage 4.

3.5 Stage 2: List Design

The list is chosen by the incumbent leader who anticipates whether he will be in office at stage 3. We first study how optimal list design in political equilibrium varies with the survival power and competence of the leader. Then, we ask how the list changes when a binding party-specific quota is introduced. This results in two key predictions that we can take to the data.

It is most convenient to study the choices of the shares of women and competent (rank-and-file) men on the party list in two steps. In the first, each male party leader chooses list composition, constrained by a concern about his own survival and the requirement that the representative swing voter gets no less than a certain utility level v. In the second step, the parties compete for swing voters by choosing v_K.

In general, we can write the optimal fraction of women and the optimal fraction of competent men when the swing voter utility is v and a leader of type l is anticipated to be in office when the election takes place and the incumbent leader has survival power power s as $\{w(v, s, L), r(v, s, L)\}$. Then let

$$\begin{aligned} V(v, s, L) &= \mu(1 - w(v, s, L)) \\ &\quad + \beta[w(v, s, L) + [\alpha l + (1 - \alpha)r(v, s, L)](1 - w(v, s, L))] \end{aligned}$$

We will study this for the pre- and post-quota equilibrium below.

In this section, we abstract from the need to court swing voters and instead home in on the preference-survival trade-off faced by the party leader.

Hence, we focus on the cases where leaders ignore the swing-voter constraint (6). Specifically, they only supply $v = \underline{v}(s_K)$, defined as the lower bound on swing-voter utility, $\underline{v}(s_K) \in \arg\max_v \{V(v, s_K, L(s_K))\}$, given their survival power s_K $(K \in \{D, B\})$. In the Appendix, we show formally that when political competition is below a well-defined bound, it is indeed optimal for the parties to only supply $v = \underline{v}(s_K)$. This is the outcome when the party faces no effective competition. In Section 6, we reintroduce the swing-voter constraint and consider the outcome when parties compete with each other for swing voters and may choose to set $v > \underline{v}(s_K)$.

Pre-quota choices In the pre-quota situation, the lexicographic preference for survival implies that the leader never resigns and is not replaced at Stage 5. Hence, $L(s_K) = l_K$. Thus r and w solve the the following problem:

$$V(v, s_K, l_K) = \max_{r,w} \{\mu(1-w) + \beta[w + [\alpha l_K + (1-\alpha)r](1-w)]\} \tag{5}$$

$$\text{subject to}$$

$$w + (1-w)r = s_K$$

and

$$\rho(w) + \beta\{w + [\alpha l_K + (1-\alpha)r](1-w)\} \geq v\ . \tag{6}$$

The Appendix spells out the detailed properties of this program. Here, we just note it is decreasing in v – i.e., it is costly for leaders to make a concession to swing voters whenever (6) is binding.

When (6) is slack, then the solution is:[18]

$$w(s_K), r(s_K) = \begin{cases} s_K, 0 & \text{if } \ s_K \leq w^* \\ w^*, \frac{s_K - w^*}{1-w^*} & \text{if } \ w^* < s_K \leq 1. \end{cases} \tag{7}$$

There are two ranges. If the leader has low survival power, which is much more likely when he is mediocre, it is optimal to have only women and no competent men. A leader with more survival power picks his ideal number of women, w^*, and tops up the list with competent men to the point where the competence constraint is just binding. A leader with maximal survival power, which requires that he is competent, fields only competent men on

[18] In the Appendix, we provide a general solution to the list-design problem (without a quota).

the list and his preferred fraction of women, w^*. Note that the competence level of the leader does not affect the solution.

It is easy to see that the solution fulfils the following proposition:

Lemma 2 *Suppose that $v = \underline{v}(s_K)$. Then, ceteris paribus, the fractions of women and competent men are both weakly increasing in s_K.*

The result is intuitive. Male party leaders choose less than one half of women and may choose fewer than 100% competent men, as they trade off their innate preferences and their fear of replacement. Party leaders with greater survival power are less likely to be threatened by women or competent men. Since their preferences in (3) value women (up to share w^*) and competent men (up to share 1), they choose (weakly) higher shares of both groups.

Lemma 2 is not so useful for empirical purposes, because in the data we will not be able to observe survival power s_K directly. However, we will be able to observe the competence of leaders. Given that the survival power for competent leaders is higher than that of mediocre leaders – recall that s_K has support $[\theta, 1]$ and $[0, 1-\theta]$ in the two groups – the following result is immediate.

Proposition 1 *Suppose that $v = \underline{v}(s_K)$. Then, the expected fractions of women and competent men appointed by competent leaders, $l_K = 1$, are higher than those appointed by mediocre leaders, $l_K = 0$.*

Since this is stated in terms of observables, we will show below how this prediction can be taken to the data.

Post-quota choices We now consider what happens when a quota is introduced. This raises the possibility that a leader will resign because he cannot survive. This will definitely be the case if $1/2 > s_K$ as half of the elected party representatives will now be women. Otherwise, the problem solved by the leader is as in (5) but with an additional constraint that $w \geq 1/2$. We continue to focus on the case where the swing-voter constraint remains slack. We have the following instead of (7):

$$w(s_K), r(s_K) = \begin{cases} \frac{1}{2}, 1 & \text{if } s_K \leq \frac{1}{2} \\ \frac{1}{2}, 2s_K - 1 & \text{if } \frac{1}{2} < s_K \leq 1. \end{cases} \tag{8}$$

Again there are two ranges. In the first of these, the leader resigns (case (ii) of Lemma 1) and in the second the leader does not resign and picks

few enough competent men to ensure that he survives. He always picks the minimum number of women to fulfil the quota[19]

The effect of the quota We can find the effect of the quota by comparing (7) and (8). The impact on the fraction of women is almost mechanical, given the pre-quota equilibrium. As party leaders set the pre-quota share of women w_D lower than 1/2, the quota is binding, with bite $\Delta w_D = \frac{1}{2} - w_D$. However, the impact of the quota will be heterogeneous reflecting the fact the pre-quote starting position is different. The main issue concerns what happens to the fraction of competent men, $\Delta r_D = \overline{r}_D - r_D$ where $\overline{r}_D$ and r_D denote the post- and pre-quota shares. The proof of the following result is in the Appendix.

Lemma 3 *Suppose that $v = \underline{v}(s_K)$. Then, the effect of a binding quota in party D relative to the pre-quota equilibrium, ceteris paribus, depends on leader survival power. For leaders with the lowest survival power ($s_D < \frac{1}{2}$), the effect of the quota (Δw_D) is the largest and the fraction of competent men increases ($\Delta r_D > 0$). For leaders with higher survival power ($\frac{1}{2} \leq s_D \leq 1$) the effect of the quota is smaller (Δw_D) and the share of competent men goes down ($\Delta r_D \leq 0$).*

For incumbent leaders with low enough survival power, the quota makes it impossible to fulfill the competence constraint. These leaders resign and pick competent replacement leaders and appoint (only) competent men. Leaders with higher survival power can still satisfy the competence constraint, and do so by *reducing* the fraction of competent men balancing this against the required increase in women to bolster their own survival power. Competent leaders with the greatest survival power ($s_D = 1$) are not threatened by the quota – they satisfy the quota by appointing more women and fewer men, but maintain the share of competent men at its maximum of 1.

We now combine Lemmas 1 and 3 to generate a prediction on observable outcomes.

Proposition 2 *Suppose that $v = \underline{v}(s_K)$. Then, the effect of a binding quota in party D relative to the pre-quota equilibrium, depends on leader competence as follows. The increase in the fraction of women (Δw_D) is largest for mediocre leaders. Mediocre leaders are more likely to respond*

[19]Note that $L\left(\frac{1}{2}, 1, s_K\right) = l'_K$ for $s_K \leq 1/2$ and $L\left(\frac{1}{2}, 2s_K - 1, s_K\right) = l_K$ for $s_K \geq 1/2$.

to the quota by increasing the fraction of competent men ($\Delta r_D > 0$). *They are also more likely to resign from their leadership position* (*implying that* $\Delta l_D = 1$).

The key prediction from this proposition is a positive correlation between Δw_D and Δr_D and a positive correlation between Δw_D and Δl_D over the range of leadership competence.

Empirical implications Proposition 1 holds when the swing-voter constraint is slack. Hence, it is most appropriate to study how the shares of women and competent men vary with leader competence in a subset of municipalities where political competition is low or absent. The solution in (7) suggests that we might want to control for variables that proxy for w^*, since this parameter may be correlated with leader competence.

To test Proposition 2, we should again focus on municipalities with low political competition. Since the bite of the (binding) quota is predetermined (by previous outcomes) in the first election when the quota applies, we can test for a positive effect of the quota bite on the share of competent men using a difference-in-difference specification. However, the positive correlation predicted by Proposition 2 requires that leader competence L, through its effect on survival power s, be the main driver of the correlation between the change in the fraction of women and male competence. Using (7), it is easy to show (see the Appendix) that if the main driver of this relationship is male preferences (w^*), then the correlation will be negative rather than positive. We discuss how to account for this in the empirical specification below.

These predictions are best tested at the municipality-party level. However, testing the last part of Proposition 2 about leader resignations is better done at the level of individual party leaders.

4 Measurement

This section deals with measurement of the relevant variables and parameters in the model. Some measures are derived from a large panel of individual data over 20 years.

Linking data sets Our data originate from party ballots from the Swedish Election Authority, for seven parties, in seven elections (1988 to 2010), for 290 municipal councils. From these ballots, we know the list rank of each politician and the number of votes cast for each list. In each election, about 55,000 politicians appear on the ballots (excluding local parties), about 13,000 of which are elected. 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 that group. Thus, each municipal council has a substantial Social Democratic delegation, exceeding ten elected politicians in more than 95 percent of council-elections.

The party ballots include personal identification numbers, which 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, and occupation. From another register, we also have evaluation scores from the military draft (see further below). The register variables are available for the full sample period and are thus not limited to the politicians' time in elected office.

Measuring competence Previous studies have proxied the quality or competence of politicians by their income or educational attainment.[20] Although such measures can capture certain aspects of technical competence and qualifications, they tend to confound competence with representation. A good measure of political competence – defined as valence in our model – should capture key abilities to govern, regardless of socioeconomic type.

To approach that goal, we measure competence using the residuals from a fully saturated Mincer equation, defined over a large set of socioeconomic characteristics.[21] We begin by estimating:

$$y_{i,a,j,t} = educ_{i,a,t} + (1 + h_i) \times empl_{i,a,t} + mun_j + c_i + \varepsilon_{i,a,j,t} \ , \qquad (9)$$

where $y_{i,a,j,t}$ is the disposable income at time t, for politician i, of age a, in municipality j. We are interested in the "individual fixed effect", c_i, the average income level for an individual, once we hold constant her cohort-specific

[20] See, for example, Merlo et al. (2010), Besley and Reynal-Querol (2011) and Galasso and Nannicini (2011).

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

education level and employment sector, age, and municipality of residence. For each individual, we thus compute the residual $(c_i + \varepsilon_{i,a,j,t})$ over all years in the panel, and extract the average c_i to measure his/her overall earnings potential as our main measure of competence. To minimize measurement error and endogeneity, we exclude wage observations for the small number of individuals who are employed full-time as politicians when they hold such employment and in following years.[22] All specifications include municipality fixed effects, mun_j to capture systematic income differences over regions or between urban and rural areas.

The education measure in these regressions, $educ_{i,a,t}$, uses indicator variables representing each level of educational attainment.[23] We interact these seven indicators with age (16 indicators for 5-year age intervals) and year (20 indicators). By including this three-way interaction, we allow returns to education to differ by age, year and cohort. Controlling for cohort is especially important, since higher education in Sweden expanded drastically over the age groups that we stud. Apart from the variation in the returns to education, we also capture the overall relationship between age, cohort and year with income.

The employment-sector indicator, $empl_{i,a,t}$, captures the highest level in the Swedish classification (same as the European NACE code and international ICIC code) and has 13 categories.[24] As for the education measure, we interact the employment-sector category with age and year as well as including an indicator variable for tertiary education, h_i. This specification captures the fact that the wage-tenure profile differs between sectors, and

[22]We also exclude all wage observations for politicians who move on to a seat in the national parliament.

[23]The 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).

[24]Our 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".

might differ within sectors depending on the level of education. We do not have enough observations to interact each one of the control variables with the municipality dummy.[25]

Estimating (9) for retirees is not straightforward. Even though pensions reflect the individual's former earning potential, Mincer equations of the retired and people in the workforce differ as retirees do not have a current employment sector. We therefore compute the income residuals of retirees in a separate regression, based on the sector in which they were employed during the majority of their working-life. Those retired in the sample period are included in the worker and retiree samples, and we use the average of their residuals as the final competence score. As men and women have different career profiles, we run the regression separately for men and women.

After obtaining the average residuals (fixed effect) for each individual from (9), 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 analysis, we proxy the share of competent followers r_K, and the leadership competence L_K, in two ways. Each has its pros and cons. The first measure corresponds closely to the model in Section 3: it is a binary indicator of competence that defines a politician as competent if her income residual is above the median residual of the party, and as mediocre otherwise. The leader competence is the average of this binary indicator among the top-three male politicians on each party ballot (the list is excluded if the first-ranked politician is not male).[26] The share of competent followers is

[25] One might argue that our competence measure should not net out the effects of education and industrial sector on income, if voters prefer educated politicians or persons from certain sectors, or if education and occupation choices are the results of competence. To shed light on the sensitivity of our results to our particular measure of competence, we re-run the (9) without the education and occupation controls. The results for this robustness check is contained in the Web Appendix.

[26] While a cutoff of three is somewhat arbitrary, it may be a good indicator of the senior party membership and a good proxy for the key decision-making group. Also, as mentioned above, the computation of the competence measure excludes the incomes of full-time politicians during and after their time in office. We thus remove the income of the chairman of the council board in (the many) municipalities where the Social Democrats are the largest party in the governing majority. Since the Social Democrats are key to

the average of the binary variable among all elected men not among the top three.

The second competence measure is simply the average of the residual among the leadership and the followers, respectively. This continuous measure is more sensitive to outliers than the binary measure and could also capture wage spreads between entry jobs and more advanced positions for blue or white collar workers within the same employment sectors. Another disadvantage is that it puts more weight on observations from white collar workers compared to blue collar workers. On the other hand, the continuous measure does not rely on an a priori judgement about a cut-off to define a competent politician and it also preserves more variation in income residuals which could reflect meaningful differences in competence. For the leadership's competence, in particular, being close or far above the cut-off for the binary measure could potentially be important for survival. Our empirical analysis below will give results for both the "binary" and the "continuous" competence measure.

Validating competence We validate our competence measures by showing that they (i) predict political success for the average politician and (ii) correlate strongly with the scores from ability tests in the Swedish military draft system.

Political Success The first of three variables we use to gauge political success is the share of all preferential votes cast on the party's ballot obtained by each politician in each specific election (since 1998), a direct assessment of relative voter support. The second is a dummy variable for re-election (since 1991), a direct measure of career advancements via the seniority system (Folke and Rickne, 2012 motivate this measure). The third is a dummy for appointment as the chair of the council board or a committee (available since 2006). This measure captures strong support from the among the party group, but restricts the sample to majority party groups whose politicians are eligible for chair positions.

Three regressions are estimated as:

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

our empirical results, we therefore need to measure leadership competence for more than a single politician.

where $x_{i,t}$ is the measure of political success or scores from ability tests. Note that political success is measured either after election t (appointment as chair or preferential votes), or after election $t+1$ (re-election). Parameter β captures the correlation between our competence measure, c_i, and the dependent variable. Our competence measure is either the binary indicator or the continuous z-score of the income residuals from equation (9). As we measure the political success outcomes after election t, we can compare specifications with and without fixed effects for list rank, $\phi_{i,t}$ on the ballot in election t. This control is particularly important for preferential votes, as voters may cast such votes for top-ranked candidates by default (Montabes and Ortega, 2002, Folke, Persson and Rickne, 2014). This could conflate our estimate of β, as income residuals are positively correlated with list rank. [27] For the ability tests we only use one observation per individual as the two competence measures are constant over time. Also, we to not include the list rank fixed effects for the ability tests.

Results appear in Table 1. There is a consistent significant positive correlation between the competence measures and all three dependent variables which survives after controlling for list rank fixed effects. In the case of preferential votes in column (1), competent politicians on our binary measure earn 2.34 percentage points more preferential votes on average. In the lower pane, the estimate of 1.18 shows that a one standard deviation higher competence score is associated with drawing more than 1 percentage points more of the party's preferential votes. Holding list rank constant, this estimate is reduced to 0.34 percentage points. Together these provide strong evidence that our competence measure predicts direct voter support, in line with our model. For re-election in Columns (3) and (4), our estimates continue to be positive and highly significant. This shows that our competence measures are strong predictors of a continued political career. In Columns (5) and (6), we find that parties reward politicians with a higher competence measures with positions of greater political influence. Being competent according to our binary measure is associated with a 4 percentage point higher probability of becoming (or remaining) a chairperson. In sum, the correlations Table 1 allay a potential concern that our income residuals may define competence in a way that is only relevant for market returns, and not for politics.[28]

[27] The fixed effects are further interacted with categorical variables for party-group size to ensure that a correlation between group size and the relative concentration of "default" preferential votes for the top-ranked candidates do not confound our estimates.

[28] This is a characteristic of the economic models of career choice due to Diermeier et

[Table 1 here]

Ability tests How do our competence measures correlate with the scores from ability tests conducted in the Swedish military draft system, which used to be mandatory for all 18-year old men?[29] We use scores on two test. The first and written test evaluates cognitive ability by combining several tests of logical, verbal and spatial ability into a general score from 1 to 9.[30] This test is similar to the armed forces qualifying tests (AFQT) in the US and is commonly perceived as a good measure of general intelligence (Carlstedt, 2000).

The second test is an interview with a certified psychologist, who follows a specific (though secret) manual on which topics to discuss and how to grade responses. The objective is to determine a conscript's psychological capacity to deal with military duty and armed combat, principally his ability to cope with stress and to contribute to group cohesion. A conscript obtains a high score if he is considered to be emotionally stable, persistent, socially outgoing, willing to assume responsibility, and able to take initiatives. However, motivation for military service is explicitly not a factor to be evaluated. Grades on four different sub-scales are transformed to a discrete 1 to 9 scale. Besides the interview, this score is 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 both these military test scores, the cognitive test and the non-cognitive test, are excellent predictors of labor-market performance (see e.g., Lindqvist and Vestman, 2011).

Figure 7 shows scatter plots for the z-score of our (continuous) competence measure and the z-score transformations of the two military-draft tests. The correlation is stronger with non-cognitive skills (see right graph) than for the cognitive skills (left graph). In all likelihood reflects the fact that

al., (2005), and Keane and Merlo (2010)

[29] Until 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 physically and mentally challenged recruits. In more recent years, the draft was still mandatory de jure, largely optional de facto.

[30] The 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

our Mincer regressions control for qualifications such as formal education. The regression results in columns (7) and (8) confirm that the positive relationships seen in Figure 7 are also strongly statistically significant for both measures of competence. These correlations confirm that our income-based measure of competence captures key components of politician competence, which are specifically measured by the draft tests.

[Figure 7 here]

Measuring competition As mentioned above, the cleanest way to study the predictions in Section 3 is to limit the sample to municipalities with low political competition. To measure competition, we exploit the aforementioned block structure of Swedish politics. We first take the absolute difference in vote shares between the left and center-right blocks and average this over the past three elections.[31] Then, we define low-competition municipalities as the bottom two thirds of the distribution.

As a robustness check, we also define a municipality as having a low level of competition if either one the two blocks held a majority in each of the 5 election periods between 1974, when the current division of Swedish municipalities was established, and 1991. According to this definition, 182 out of the 284 municipalities formed in 1974 are defined has having low competition.[32]

Measuring gender preference The model predictions concern the shares of women and competent men, when the pre-quota equilibrium and the bite of the quota are driven by variation in leadership competence L_K rather than male preferences w^*. To control for the local taste heterogeneity of men, we use three sets of variables on the local economic and political context: (i) the municipality's gap in per-capita income between men and women (measured in 1991), (ii) four categorical dummy variables for size of the municipal assembly, and (iii) dummy variables for six municipality types.[33]

[31] See, for example, Svaleryd and Vlachos, (2009) and Folke and Rickne, (2012).

[32] Both measures assume implicitly that men and women are equally likely to be swing voters. This is corroborated by Swedish surveys where men and women have consistently found to be equally represented among those who report that they have a weak affiliation to their party of choice (Holmberg, 1991).

[33] This socioeconomic classification is done by Statistics Sweden and classifies each municipality as one of: average (benchmark) type, large city, suburban city, mid-size city, sparsely populated area, rural area, or industrial or mining town.

This choice of variables follows previous work which has outlined the cultural geography of gender equality in Sweden (Forsberg, 1997).

Controlling for different preferences is not unambiguously desirable. To the extent that leader competence is correlated with men's taste for gender equality across municipalities, controlling for the latter may simply mask the impact of the former factor. Moreover, if our control variables that proxy for the taste for gender equality are correlated with leader competence, we may eliminate variation in our variable of interest. We will return to this when discussing the results.

5 Results

We now bring the predictions from Section 3 to the data discussed in Section 4. First, we study the initial (pre-quota) equilibrium, as represented by the 1991 election outcome. Then, we study the effect of the Social Democratic quota introduced in 1993. Following the model predictions, we focus on municipalities where political competition is classified as low. (In Section 6.2, we conduct the same tests on the sample of all municipalities.)

5.1 Pre-quota Equilibrium

Proposition 1 predicts a positive correlation between leadership competence in party K, L_K, with the share of women, w_K, and the share of competent male followers r_K. To examine this correlation, we consider all party groups with more than eight elected representatives in each of the 1988 and 1991 elections with a man on the ballot's first position in 1988. All Social Democratic groups meet this size restriction. However, for the other parties this means dropping about 25% of the observations. Although a threshold of eight is somewhat arbitrary, the sample restriction allows us to compare the compositions of Social Democratic groups to other groups of comparable size. It also gives a meaningful distinction between the male political leaders and followers, which is not the case for smaller groups.

Graphical evidence First, we plot binned averages of w_K and r_K (measured in 1991) against L_K (measured in 1988) with ten party-group observations in each bin. Figure 8 shows positive correlations between L_K and w_K, as well as between L_K and r_K. This holds regardless of whether we consider

all parties or just the Social Democrats. That said, the relation for the share of women in the Social Democrats appears a bit noisy.

[Figure 8 here]

Regression evidence We now report results from estimating OLS regressions between leadership competence L_K and w_K and r_K. We do this with and without the three sets of contextual controls which try to capture variation in w^* across municipalities. The results appear in Table 2, with controls omitted (included) in odd-numbered (even-numbered) columns. The first four columns use our binary competence measure, while the next four use the continuous measure. Results are in the top pane for the full sample and in the bottom pane for the Social Democrats.

Columns (1-2) and (5-6) show positive correlations between L_K and w_K, although the correlation is not significant in the Social-Democrat groups. When we add the control variables, the size of the correlation is smaller and less precisely estimated. This suggests that our control variables have an independent influence on w_K via variation across municipalities in w^*. Columns (3-4) and (7-8) look at the share of competent men. In this case, the positive correlation is strong and significant whether or controls are included and in both samples.

[Table 2 here]

Taken together these results suggest a strong correlation between the competence of male candidates on the list and a more competent leadership, as Proposition 1 predicts. For women's representation, controls that proxy for w^* in the theory weaken the correlation. This variation in gender preferences appear to swamp any additional effect from the competence of the male leadership on gender representation.

5.2 Effects of the Quota

The theoretical model ties the evidence in Table 2 to the competence constraint that drives Proposition 1. Moreover, a criticism of these cross-sectional correlations is that some common omitted factor may drive leadership competence, the fraction of competent men outside the leadership, and the fraction of women in the pre-quota equilibrium. The natural experiment from the

quota provides a further – and more satisfactory – opportunity to test the model via the comparative statics in Proposition 2. The first testable prediction is that the share of competent men on the party list will go up by more in those municipalities where the fraction of women increases the most, because leaders will chose to appoint more competent male followers and some mediocre male leaders may also be compelled to resign. The second testable implication is that probability of individual mediocre leaders resigning will be greatest where the fraction of women increases the most.

Male competence – specification To test the first prediction, we use a difference-in-difference specification across all election periods, but with particular focus on the 1994 election, which was the first following the introduction of the zipper quota. This approach allow us to more forcefully argue that our results are not driven by a general trend, due to other factors than the quota, in the selection of competent men. We use elections beyond 1994 to assess whether the quota had a permanent effect as our model would suggest, and we use elections before 1994 to make sure that any effect we find does not reflect a pre-trend.

Among Social Democratic party groups, we estimate:

$$r_{j,t} = \alpha + \beta_t \Delta w_{j,94-91} \times elec_t + X'_{j,pre-quota} \times elec_t + elec_t + mun_j + \varepsilon_{j,t} \ , \quad (10)$$

where $r_{j,t}$ is our measure of male competence, and the quota bite is defined by $\Delta w_{j,94-91}$, the change in the share of women between 1991 and 1994 in percentage points. The specification includes dummy variables for each election year, denoted by $elec_t$, and for each municipality, denoted by mun_j. We include the same contextual controls as in Table 2 measured in the pre quota years, $X'_{j,pre-quota}$, but now interacted with the election-year dummies. These are intended to to purge the relationship between $r_{j,t}$ and $\Delta w_{j,94-91}$ from the influence that w^* might have on the increase in the fraction of women following the quota introduction.

Our specification creates a heterogeneous treatment effect of the quota across municipalities. We focus on municipalities with a male on the top of the ballot in 1991, and we also exclude from the sample, the 20 municipalities that did not comply with the quota (here defined as having fewer than 40% women in the party group in 1994).[34]

[34]This removes about 10% of the sample, but the results of the paper are robust to this sample restriction.

The coefficient of interest is β_t which captures the relationship between the quota impact, $\Delta w_{j,94-91}$, and being in an election year after (or before) the quota was introduced. We leave out the 1991 interaction variable to make the pre-quota election year the reference category – i.e., we normalize β_{91} to 0. As the theory suggests that municipalities where the impact of the quota was larger should not experience increases in the share of competent men prior to the quota, we expect the coefficient β_{1988} to be insignificant and/or close to zero. Coefficient β_{94} gives the impact effect of the quota, and the coefficients β_t, for $t > 1994$, should be similar in sign and magnitude to β_{94} if the zipper quota permanently affected the selection of men.

As before, we present results for the binary and continuous measures of competence, and for two different groups of politicians. The first includes all elected men while the second holds the number of men in the party group constant at the 1991 number for all other election periods to check if the quota effect is driven by fewer men being elected due to the quota.[35]

Male competence – results

[Table 3 here]

Table 3 shows the results. Using the binary measure, the coefficient for the immediate quota effect, β_{94}, is positive and significant regardless of the party group definition and whether controls are included. The coefficients imply that a 10 percentage point increase in the proportion of women due to the quota leads to a 4 percentage-point increase in the share of competent men. Including the control variables for municipality characteristics in the pre-quota years, increases the point estimates in all specifications. This suggests that the estimated effects are indeed based on a larger increase in the proportion of women due to the quota due to mediocre leaders, rather than a preference for fewer women in political office (i.e., lower w^*). The estimates for β_{88} are typically close to zero and statistically insignificant. The β_t coefficients for elections after 1994 are similar in magnitude to β_{94}, suggesting that the effect of the quota was indeed permanent. The estimates are only slightly smaller when we keep the number of men constant, suggesting that

[35] To define this we create a counterfactual group of men in each election year. This group is defined as those men from each party list that would have been elected if as many men had been elected as in 1991. This robustness check is allowed by our unique data which includes not only the elected men but all nominated men on every list.

our results are mainly driven by a selection effect rather than by fewer men being elected.

The results are weaker for our continuous competence measure. Although the estimates are positive in all specifications, they are not statistically significant when we hold the number of men constant. The estimate in column 5 suggests that a 10 percentage point larger increase in the share of women due to the quota leads to an increase in the average competence of the men of 0.04 standard deviations.

The results in Tables 2 and 3 together support the prediction that a larger increase in the fraction of women due to the quota is associated with a larger hike in the selection of competent male representatives. This would be difficult to explain by some omitted common factor driving the initial competence of the leadership as well as the fraction of women and competent men. Indeed, if that were the explanation for the findings in Table 2, there would be no particular reason to expect an increase in male competence in those municipalities where the quota had its biggest effect. By contrast, our theory – based on survival concerns among mediocre male leaders – suggests a persuasive interpretation of this finding.

Leadership survival – specification To test the second prediction of Proposition 2, we also use a similar regression, but with two important differences. We now conduct the analysis at the level of the individual politician, and we use a triple-difference specification. The latter asks how the survival (re-election) of politicians are related to their competence, the effect of the quota, and the election period. This regression speaks to a main mechanism suggested by the model: we expect mediocre leaders to resign in those places where leaders were forced to increase the share of women the most.

For our sample of male Social Democratic party leaders, i.e., the top-three male individuals on each party list, we estimate:

$$\begin{aligned} s_{i,j,t} &= \alpha + \beta_t(\Delta w_{j,91-94} \times elec_t \times l_i) + (elec_t \times l_i) + (\Delta w_{j,91-94} \times l_i) \\ &\quad + (\Delta w_{j,91-94} \times elec_t) + l_i + elec_t + mun_j + \varepsilon_{i,j,t} \ , \end{aligned}$$

where $s_{i,j,t}$ is a dummy for individual i remaining in the party leadership of municipality j from the previous election period.$t-1$. The competence of the individual politician, l_i, is interacted with the quota bite, $\Delta w_{j,91-94}$, the dummies for elections periods, $elec_t$, as well as the interaction between these two variables. The coefficient of interest is the estimates from the

triple interaction term for the year that the quota was introduced, β_{94}. This captures how the quota impacted on the survival of competent leaders relative to mediocre leaders. A positive coefficient implies that the quota raised the relative survival of competent leaders. As before, the sample is restricted to male-led lists and the low competition municipalities.[36]

Leadership survival – results Table 4 shows the results. With the binary competence measure, the coefficient for the immediate quota effect, β_{94}, is positive, but insignificant. But the point estimate is large and suggests that a 10 percentage point larger quota bite leads to a 12 percentage-point increase in the relative survival rate of a competent male leader. For the continuous measure the estimate is positive and statistically significant, suggesting that a 10 percentage point larger quota bite leads to a 11 percentage point increase in the probability of survival for leaders with one standard deviation higher competence. These results confirm the prediction of the model, namely that the gender quota decreased the relative survival rate of mediocre male leaders relative to competent ones.

[Table 4 here]

6 Extensions

In this section, we discuss five additional issues. First, we ask whether the empirical results discussed in the previous section are empirically robust to alternative definitions of key variables. Second, we ask – theoretically and empirically – how our findings vary with the within-municipality political competition. Third, we ask – theoretically and empirically – how the introduction of a quota in the Social Democratic party affects the list composition in other parties. Fourth, we briefly explore the empirical pattern when women are allowed to be mediocre as well as competent and check the quota impact on the selection of politicians of both genders. Finally, we discuss the relationship between the gender quota and electoral success of the Social Democratic party.

[36] We do not include the contextual controls since this would make the specification much more complicated.

6.1 Robustness

We test the robustness of our baseline results in four ways.

Measuring competence We look at alternative ways of measuring competence by repeating the analysis of Propositions 1 and 2, but with a changed specification for the Mincer earnings regression on our competence measures are based. Specifically, we drop the controls for education and occupation to allow wage differences due to these characteristics to be included in the assessment of competence. The results hold up albeit with some minor variations in the findings. In the pre-quota equilibrium (see Table W2 in the Web Appendix) we find a stronger relationship between leader competence and the share of women in the party groups. For the quota impact, the results are weaker but remain broadly consistent with the baseline findings. For leadership survival (see Table W4), the results also show a slightly weaker relationship between the extent to which the quota bites and departure of mediocre leaders.

We have also replace the earnings-based measure of competence with the scores for the military-draft tests (see Tables W5 and W6). As with the income residual,we use the z-score at the party level and define the binary measure of competence as having a score above the median. Due to the smaller number of men doing the military draft tests, we cannot use this variable to measure leadership competence. Also, the sample is too small to run the individual level analysis of leader survival. It is arguable that these results are more shaky due to the smaller sample size and cohort related missing data in the competence variable. The pre-quota prediction in Proposition 1 does not hold up. For the difference-in-difference test of the quota, the results for the binary competence measure are stronger than in for the baseline results, while the results for the continuous competence measure are no longer statistically significant. However, the estimated relationship between the bite of the quota is stronger.

Measuring political competition Another robustness check that we have undertaken (Tables W7-W9) is to consider an alternative measure for political competition. We replace the vote-based variable with a measure of the stability of the political majority (see Section 4). For Proposition 1, the results give somewhat weaker support for the positive relationship between

leader competence and the share of women in the party group, but the other results are similar to the original findings.

Controlling for the candidate pool Municipalities could vary in the supply of politicians. With many competent politicians in the candidate pool, it is easier to pick both competent leaders as well as competent rank and file politicians. One way to alleviate this concern is to construct a control variable which measures the competence of non-elected candidates on the party list. So, for example, when the dependent variable is the share of competent men, we control for the share of competent men amongst those nominated on the list but not elected. In practice, we estimate the difference for the outcome variable between the elected and nominated (see Tables W10-11). The pre-quota equilibrium relationship between leader and follower competence is reduced slightly in size when we add this control. However, the coefficients remain statistically significant. The results on the impact of the quota remain largely identical to the baseline results. Thus, a greater supply of competent men in the groups where the quota had a larger impact does not explain the effect of the gender quota on candidate selection.

6.2 Political Competition

Theory The two parties begin with leaders with survival power $\{s_D, s_B\}$. Let

$$\bar{v}\left(s_K\right) = \rho(\frac{1}{2}) + \beta\left[1 + \frac{\alpha\left[L\left(s_K\right) - 1\right]}{2}\right]$$

be the maximal swing-voter utility when party K has a leader with survival power s_K. Since no leader in place at the end of Stage 3 is replaced, the voters regard the leader choice as fixed when choosing which party to vote for.

By (3) and (4), a male party leader has a lower preferred share of women than the representative swing voter (w^* vs. $\frac{1}{2}$). Picking more female candidates to please the electorate may thus have a cost to the leaders in terms of (implicit) policy outcomes. Picking more female or competent (rank-and-file) male candidates to please the electorate – or to satisfy the leader's own preferences also make the leader less likely to survive as per the competence constraint. This is embodied in $V\left(v_K, s_K, L\left(s_K\right)\right)$.

Then, the payoff to the party-D leadership can be written as:

$$\begin{aligned} Y^D\left(v_D, v_B; s_D, s_B\right) &= P\left(\kappa + v_D - v_B\right)\left[Z + V\left(v_D, s_D, L\left(s_D\right)\right)\right] \\ &\quad + [1 - P\left(\kappa + v_D - v_B\right)] V\left(v_B, s_B, L\left(s_B\right)\right) \ , \end{aligned}$$

where Z is any auxiliary policy outcome or rents only obtained when winning the election. The payoff for party B is analogous:

$$\begin{aligned} Y^B\left(v_D, v_B; s_D, s_B\right) &= \left[1 - P\left(\kappa + v_D - v_B\right)\right] V\left(v_B, s_B, L\left(s_B\right)\right) \\ &\quad + P\left(\kappa + v_D - v_B\right)\left[Z + V\left(v_D, s_D, L\left(s_D\right)\right)\right] \ . \end{aligned}$$

Parties choose levels of swing-voter utility from a feasible range $\{v_D, v_B\} \in [\underline{v}\left(s_D\right), \bar{v}\left(s_S\right)] \times [\underline{v}\left(s_B\right), \bar{v}\left(s_B\right)]$, to form a Nash equilibrium. The party leadership trades off the probability of winning against a lower personal utility from winning. Given the solution to the previous list-composition problem for a given level of swing-voter utility in (5), we can then derive the general implications for the share of women and of competent men and, in particular, how these vary with the competence of the leadership.

When do the previous predictions hold? As shown in the Appendix, the predictions in Propositions 1 and 2 are all conditional on κ, a parameter that reflects the competitiveness of the election. If the absolute value of κ is high – i.e., when either party has a substantial advantage in the share of committed voters, parties have no incentive to compete for swing voters. As the outcome of the election is basically known in advance – i.e.,$P\left(\kappa + v_D - v_B\right)$ is either zero or one for all $\{v_D, v_B\}$ – party leaders might as well as minimize v_K to maximize their own payoff $V(v, s_K, L\left(s_K\right))$. Proposition 1 and 2 apply exactly in this case.

When κ is closer to zero, competition is more intense, making it is sometimes optimal to offer more than the minimal swing-voter utility, i.e. $v_K > \underline{v}\left(s_K\right)$. This is achieved either by raising the share of competent male candidates or by rasing the share of women above w^*. The comparative statics are essentially the same as in Proposition 1 and 2. However, there is one minor modification when simultaneously $v > \underline{v}\left(s_K\right)$, the competence constraint is binding, and $s_K \in [w^*, 1]$. In this part of the parameter space, an increase in leader competence relaxes the competence constraint such that the leader may reduce the fraction of women to satisfy the swing-voter utility constraint. This means that there is a range of parameters where the quota

bite may be non-monotonic in s_K. However, the broad thrust of the comparative statics (provided that there is sufficient variation in s_K relative to w^* in the data) is preserved.

Data We now look at the same specifications as in Tables 2, 3 and 4, but expand the sample to include all municipalities, i.e., also those with the highest levels of political competition.

[Table 5 here]

Table 5 parallels Table 2, and the results are largely similar, although the relationship between leader competence and the share of women becomes stronger and is significant for both samples and for both measures of competence. As before, including the control variables weakens the positive relationships between leader competence and the fraction of women. The positive correlation between a competent male leadership and male follower competence continues to be strong.

[Table 6 here]

Table 6 parallels Table 3. Here, the relationship between the quota bite and the selection of competent men is essentially the same when we look at all elected men. When we keep the number of men constant the relationship is weaker than in Table 3, underlining the importance of focusing on less competitive municipalities to test Proposition 2. Where competition is strong, it is more likely that electoral concerns, rather than the trade-off between male preferences for gender equality and leadership survival, dictated the pre-quota outcome.

[Table 7 here]

Table 7 parallels its low-competition counterpart, Table 4, but has smaller point estimates. For both measures of competence the individual-level relationship between leader survival and the quota bite is reduced by about one third. For the continuous measure, the estimate remains statistically significant as the standard errors are also lower.

6.3 Spillovers

Theory The model predicts (see the Appendix) that a gender quota in party D will spill over to list composition in party B, if simultaneously political competition is high enough and party B's leadership is competent enough $s_B \in [w^*, 1]$. Moreover, we expect this spillover effect to be larger, the greater the bite of the quota on party D. In particular, we expect the party D quota to push party B to raise its share of women. However, for given leader competence in party B, these women will replace competent men when leaders seek to ensure their own survival.

Data Testing this empirically is not trivial in our context. Over the relevant years, the Center party and the Conservative party were the two main competitors to the Social Democrats, but both parties had substantially smaller party delegations on average. Requiring the party lists to have at least eight elected politicians and be topped by a man leaves us with only 157 groups in a mere 120 municipalities.

We test for spillovers by regressing the fractions of women and competent men in these other parties on the quota bite for the Social Democrats in the same municipality. Table 8 reports the results for the full sample of municipalities (columns 1-3), the top tercile of political competition (columns 4-6), and the two bottom terciles of competition (columns 7-9). The results do not show significant evidence of spill-overs, neither in the full sample nor in the sub-samples with different levels of competition.[37]

[Table 8 here]

6.4 Women's Competence

Our simple theoretical model does not consider the selection of women. However, we can empirically examine the impact of the quota on female competence. Even though our baseline results suggest that the inflow of "quota women" did not crowd out competent men, perhaps it made room for mediocre women? This question is closely related to the reason for women's numerical under-representation. Our model assumes this reason to be a weak

[37] Other forms of spillovers have been detected by scholars, e.g., "contagion" from the Social Democrat's zipper quota on other parties' internal discussions, with impacts on their strategies for female representation in future periods (Wängnerud, 2001).

demand from male party leaders. Critics of quotas often presuppose that the root of female underrepresentation is a weak supply of qualified women who want to be politicians. Unless women are discriminated against both at the private and political labor markets, as in the model by Julio and Tavares (2010), parties forced to expand their share of women would then have to resort to mediocre candidates.

We first examine the pre-quota associations between the share of women in the party group, women's average competence and the female-male competence gap in the group. The latter is defined as women's average competence minus men's average competence: a positive gap meaning that women are relatively more competent than men. Figure 9 shows no association between the share of women and women's average competence. It also shows negative associations between the share of women and the female-male competence gap. In groups with more women, these are of similar or lower competence than the men, but the competence gap is positive in groups with the lowest share of women. This result speaks strongly against the conjecture that a supply constraint is the main reason for women's low representation. Instead, it supports our focus on demand-based explanations of female underrepresentation prior to the quota.

[Figure 9 here]

Difference-in-difference results If the supply of competent women was exhausted prior to the quota, the quota would cause an inflow of mediocre women. This seems unlikely given the patterns in Figure 9, but let us nevertheless briefly address the issue of mediocre "quota women". To do this, we use our income-based measure to gauge the impact of the quota on the competence of female representatives. Then, we employ the same difference-in-difference specification as in Table 3, to see how women's competence varied with the quota bite.

[Table 9 here]

The results appear in Table 9. Columns (1) and (2) suggest that there is no association between the quota bite and the change in the fraction of competent women. For the continuous competence measure (columns 3-4), the point estimates suggest that women's average competence was reduced as a function of the quota. However, unlike the positive estimate for men, this estimate is far from statistically significant.

6.5 Electoral Performance

Does affirmative action force organizations to reduce quality to achieve gender parity? While this question is at the core of the quota debate, it is not straightforward to test in our data. The model's prediction is, however, clear. The quota not only adds a number of women, but also pushes mediocre leaders to resign and appoint more competent male followers. All three effects increase the representative swing voter's utility. That said, the impact of the quota on the municipal party groups' performance is less straightforward to assess than in studies which have found positive effects of a purely local reform (Casas-Arce and Saiz, 2011). This is because the quota that we are studying was introduced simultaneously at both the national and local levels. The elections at both of these levels take place on the same day with only 20% of the voters splitting their vote between national and municipal elections. This makes it difficult to disentangle local and national effects.

Figure W2 in the Web Appendix shows the Social Democrats vote share in the national parliament and the average municipality. The 1994 election stands out as the most successful election in the 1991-2010 period in both time series. In the parliamentary election, the party improved its vote share by 7.5 percentage points. Clearly, this national success for the Social Democrats could have a "coat-tail" effect in the municipal election. To shed further light on the local electoral results we estimate our baseline difference-in-difference specification for the bit of the quota with the Social Democratic local vote share as the dependent variable. The results are given in Table 9, columns (5-8). The coefficients for the 1994 election are positive and significant at the 10 percent level even after we add our control variables and use the full sample of municipalities. The 1994 election was a resounding success for the Social Democrats, and (arguably) this was enhanced in municipalities where the local parties were forced to make the largest increases in the share of women candidates. This finding, which is in line with the other results presented in this paper, goes against the idea that there is a trade-off between increasing gender representation and party performance.

7 Conclusions

A failure to recruit competent politicians and achieve gender equality in political representation remains a concern in many democracies. Some con-

tributors to academic and popular debate see the goals of representation and competence as conflicting. In debates about gender quotas, some claim that supply constraints make quotas counterproductive by replacing competent men with mediocre women. Based on first principles and evidence we have argued that, on the contrary, gender quotas can increase the competence of the political class by reducing the share of mediocre men.

Our paper makes theoretical and empirical contributions. In our model, a low pre-quota representation of women is an equilibrium outcome driven by mediocre male leaders failing to pick female candidates (or competent men) since they worry about their own survival as leaders. When the share of women is increased by a mandatory quota, mediocre leaders may be forced to shift attention from surviving to winning the election. If so, they increase the competence of male politicians.

One empirical contribution of the paper is to create a new measure of competence based on the earnings of politicians outside of politics, conditional on age, education, occupation, and time. 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 how competence contributes to policy-making in politics and other non-market contexts.

Using this competence measure, we explore some predictions from the theory. We find that competence of party leaders correlates with a larger representation of both women and competent men. We analyze a heterogeneous effect of a gender quota unilaterally imposed by Sweden's largest political party on its own party groups across the country's 290 municipalities. The empirical findings line up with the predictions: male competence increases more in municipalities with the greatest effect of the quota, a reflection of low leadership competence in the baseline equilibrium. This pattern does not reflect pre-trends in representation, nor is it just a temporary effect, and it mirrors only partially the lower number of seats now available for men.

The findings are stronger where political competition is weak. Competence among elected women was unaffected by the quota. Moreover, a low pre-quota share of women was associated with a large competence gap in women's favor. After the quota, the average competence of women and men converged. Taken together, the results suggest that the gender quota did indeed create a crisis for mediocre politicians. Moreover, given the complexion of the political elite in Social-Democratic party groups, this was a crisis of the mediocre man.

Using equilibrium models to inform the debate about gender quotas is useful not only for the conceptual clarity it brings. It also helps us to structure the empirical work and interpret the findings for politics in Sweden. A similar approach can be used to analyze the effects of quotas in other contexts and countries.

8 Appendix

8.1 List Design Absent a Quota

In the absence of a quota, the initial leadership always survives. The utility to voters when party K wins, is therefore:

$$v_K = \rho(w_K) + \beta\left[w_K + (1 - w_K)\left[\alpha l_K + (1 - \alpha) r_K\right]\right] .$$

Define

$$\underline{r}(S, L), \underline{w}(S, L) = \arg\max_{r,w} \left\{\mu(1 - w) + \beta\left[w + \left[\alpha L + (1 - \alpha) r\right](1 - w)\right]\right\}$$

$$\text{subject to}$$

$$w + (1 - w)r = S.$$

Then,

$$\underline{v}(S) = \begin{cases} \rho(S) + \beta\left[\alpha L(S) + (1 - \alpha) S\right] & \text{if } S \leq w^* \\ \rho(w^*) + \beta\left[\alpha L(S) + (1 - \alpha) S\right] & \text{if } w^* < S \leq 1 \end{cases}$$

gives the lower bound on swing voter utility. Observe that this lower bound is (weakly) increasing in S.

The solution to (5) can be described by a pair of functions $w(v, s_K, l_K), r(v, s_K, l_K)$ and a range of feasible swing voter utility $v \in [\underline{v}(s_K), \bar{v}(s_K)]$.

Lemma A1 *Let $w(v, s_K, l_K), r(v, s_K, l_K)$ solve (5) for party K with $s_K \in [0, 1]$. Then:*

$$\left(w(v, s_K, l_K), r(v, s_K, l_K)\right) = \begin{cases} (s_K, 0) & \text{if } s_K \leq w^* \\ \left(\widetilde{w}(v, s_K, l_K), \max\left\{0, \frac{s_K - \widetilde{w}(v, s_K, l_K)}{1 - \widetilde{w}(v, s_K, l_K)}\right\}\right) & \text{else} \\ \left(\widetilde{w}(v, 1, l_K), 1, l_K\right) & \text{if } s_K = 1 . \end{cases}$$

where $\widetilde{w}(v, s_K, l_K) = \max\left\{w^*, \min\left\{\rho^{-1}\left(v - \beta\left[\alpha l_K + (1 - \alpha) s_K\right]\right), 1/2\right\}\right\}$.

Moreover, $V_v(v, s, l) \leq 0$, $V_s(v, s, l) \geq 0$, $V_{vv}(v, s, l) \leq 0$ *and* $V_{vs}(v, s, l) \geq 0$.

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

$$\mu(1 - w) + \beta\left[\alpha l_K + (1 - \alpha) s_K\right]$$

which is increasing in w for all $w \leq w^*$ Thus, $w = \min[s_K, w^*]$ and $r = s_K - w$.

Suppose instead that both constraints are binding and $s_K \geq w^*$. Then, w solves:

$$v = \rho(w) + \beta\left[\alpha l_K + (1-\alpha)\, s_K\right]$$

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

$$w = \min\left\{\rho^{-1}\left(v - \beta\left[\alpha l_K + (1-\alpha)\, s_K\right]\right), 1/2\right\}$$

and $r = \min\left\{0, \frac{s_K - w}{1-w}\right\}$. Now suppose that $s_K = 1$. If the swing-voter utility constraint is not binding, then $w = w^*$ and $r = 1$. If the swing-voter utility constraint is binding, w solves

$$v = \rho(w) + \beta\left[\alpha l_K + (1-\alpha)\right]$$

so

$$w = \min\left\{\rho^{-1}\left(v - \beta\left[\alpha l_K + (1-\alpha)\right]\right), 1/2\right\}$$

and $r = 1$.

We now prove the stated properties of $V(v, S, L)$. Suppose first that $s \leq w^*$. Then $V(v, S, L) = \mu(1-S) + \beta\left[\alpha L + (1-\alpha)\, S\right]$. Then, the result holds since $\mu(1-S)$ is increasing when $S \leq w^*$. Next, observe that if

$$\widetilde{w}(v, s_K, l_K) = \rho^{-1}\left(v - \beta\left[\alpha l_K + (1-\alpha)\, s_K\right]\right),$$

then

$$\begin{aligned} \widetilde{w}_v(v, s_K, l_K) &= \frac{1}{\rho_w\left(v - \beta\left[\alpha l_K + (1-\alpha)\, s_K\right]\right)} \\ &\text{and} \\ \widetilde{w}_s(v, s_K, l_K) &= -\frac{\beta}{\rho_w(v - \beta\left[\alpha l_K + (1-\alpha)\, s_K\right])}. \end{aligned}$$

Now consider the other extreme where $s = 1$, so the competence constant is not binding. In this case $V(v, S, L) = \mu(1 - \widetilde{w}(v, 1, L)) + \beta\left[\alpha L + (1-\alpha)\right]$. Thus,

$$V_v = -\mu_z(1 - \widetilde{w}(v, 1, L))\, \widetilde{w}_v(v, 1, L) \text{ and } V_s = 0.$$

Note that the only interesting case is

$$\widetilde{w}(v, 1, L) = \rho^{-1}\left(v - \beta\left[\alpha L - (1-\alpha)\right]\right),$$

otherwise $\widetilde{w}_v(v,1,L)=0$. Moreover:

$$\widetilde{w}_v(v,s_K,l_K)=\frac{1}{\rho_w(v-\beta[\alpha l_K+(1-\alpha)s_K])}>0,$$

since $\rho_w(v-\beta[\alpha l_K+(1-\alpha)s_K])>0$ for all v such that $\widetilde{w}(v,1,L)\in[w^*,1/2]$. So $V_v<0$ since $\mu_z(1-w)>0$ for $w\in[w^*,1/2]$. Now observe that

$$V_{vv}=\mu_{zz}(1-\widetilde{w}(v,1,L))(\widetilde{w}_v(v,1,L))^2-\mu'(1-\widetilde{w}(v,1,L))\widetilde{w}_{vv}(v,1,L).$$

The result follows now by noting that $\mu_{zz}(\cdot)<0$ and

$$\widetilde{w}_{vv}(v,s_K,l_K)=-\frac{1}{\rho_{ww}(v-\beta[\alpha l_K+(1-\alpha)s_K])}>0.$$

Finally, consider the case where both constraints are binding so that

$$V(v,S,L)=\mu(1-\widetilde{w}(v,S,L))+\beta[\alpha L+(1-\alpha)S]$$

Thus,

$$V_v=-\mu_z(1-\widetilde{w}(v,S,L))\widetilde{w}_v(v,S,L)\ \text{ and }\ -\mu_z(1-\widetilde{w}(v,S,L))\widetilde{w}_s(v,S,L).$$

The only interesting case is

$$\widetilde{w}(v,S,L)=\rho^{-1}(v-\beta[\alpha L+(1-\alpha)S]),$$

otherwise $\widetilde{w}_v(v,S,L)=\widetilde{w}_s(v,S,L)=0$. Because

$$\begin{aligned}\widetilde{w}_v(v,s_K,l_K) &= \frac{1}{\rho_w(v-\beta[\alpha l_K+(1-\alpha)s_K])}>0\\ &\text{and}\\ \widetilde{w}_s(v,s_K,l_K) &= -\frac{\beta}{\rho_w(v-\beta[\alpha l_K+(1-\alpha)s_K])}<0\end{aligned}$$

$V_v<0$ and $V_s>0$ in this case as claimed. Finally, $V_{vv}=$
$\mu_z(1-\widetilde{w}(v,S,L))(\widetilde{w}_v(v,S,L))^2-\mu_z(1-\widetilde{w}(v,S,L))\widetilde{w}_{vv}(v,S,L)<0$ and
$V_{vs}=\mu_{zz}(1-\widetilde{w}(v,S,L))\widetilde{w}_v(v,S,L)\widetilde{w}_s(v,S,L)-\mu_z(1-\widetilde{w}(v,S,L))\widetilde{w}_{vs}(v,S,L)>$
0, since $\mu_{zz}(\cdot)<0$ and $\rho_{ww}(\cdot)<0$ and

$$\begin{aligned}\widetilde{w}_{vv}(v,s_K,l_K) &= -\frac{1}{\rho_{ww}(v-\beta[\alpha l_K+(1-\alpha)s_K])}>0\\ &\text{and}\\ \widetilde{w}_{vs}(v,s_K,l_K) &= \frac{\beta}{\rho_{ww}(v-\beta[\alpha l_K+(1-\alpha)s_K])}<0.\end{aligned}$$

This proves the result. ■

Observe that, using Lemma A1, the upper bound on swing-voter utility is now defined as

$$\bar{v}(s_K) = \begin{cases} \underline{v}(s_K, L(s_K)) & \text{if } s_K \leq w^* \\ \rho\left(\frac{1}{2}\right) + \beta\left[\alpha L(s_K) + (1-\alpha) s_K\right] & \text{if } w^* < s_K < 1 \end{cases}$$

8.2 List Design with a Quota

In this case $w_K = 1/2$. Now we have two cases depending on whether the leader resigns. In the case where the leader resigns, $s_K \leq 1/2$, then

$$\bar{v}(s_K) = \underline{v}(s_K) = \rho\left(\frac{1}{2}\right) + \beta.$$

and

$$V(v, s_K, L(s_K)) = \mu\left(\frac{1}{2}\right) + \beta.$$

Now if $s_K > 1/2$, then

$$\bar{v}(s_K) = \underline{v}(s_K) = \rho\left(\frac{1}{2}\right) + \beta\left[\alpha l_K + (1-\alpha)\left[s_K - \frac{1}{2}\right]\right]$$

and

$$V(v, s_K, L(s_K)) = \mu\left(\frac{1}{2}\right) + \beta\left[\alpha l_K + (1-\alpha)\left[s_K - \frac{1}{2}\right]\right]$$

so there v is pinned down exactly by s_K.

8.3 Political Competition

Let σ be the fraction of swing voters, 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 D. Parameter $\lambda \in [-1, 1]$ thus measures the Social Democrats' advantage in terms of committed voters.

The probability of winning The behavior of swing voters is described by a conventional probabilistic voting model.[38] Thus, we suppose that a swing voter casts her ballot for party D over party B if:

$$\boldsymbol{\omega} - \eta + v_D^G - v_B^G > 0 \ ,$$

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

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

$$\sigma 2\phi \left[v_D - v_B - \eta\right] + (1 - \sigma)\lambda > 0 \ .$$

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

$$\hat{\eta} = \kappa + \left[v_D - v_B\right] \ ,$$

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 $[v_D - v_B]$.

Given a pair of promised utility levels to the representative swing voter, the probability that party D wins is:

$$P\left(\kappa + v_D - v_B\right) = \begin{cases} 0 \ \text{ if } \ \xi\left[\kappa + v_D - v_B\right] \leq -\frac{1}{2} \\ 1 \ \text{ if } \ \xi\left[\kappa + v_D - v_B\right] \geq \frac{1}{2} \\ \frac{1}{2} + \xi\left[\kappa + v_D - v_B\right] \ \text{ otherwise} \ . \end{cases}$$

Optimal choice of swing-voter utility Given the problem of political competition stated in Section 6, the first-order conditions for the choice of v_D is

[38] See, for example, Persson and Tabellini (2000).

$$[Z + V(v, s_D, L(s_D)) - V(v_B, s_B, L(s_B))] \frac{\partial P}{\partial v}$$
$$+P(\kappa + v - v_B) V_v\left(v, s_D, \hat{l}(s_D)\right) \begin{cases} \geq 0 & v = \bar{v}(s_D) \\ = 0 & v \in (\underline{v}(s_D), \bar{v}(s_D)) \\ \leq 0 & v = \underline{v}(s_D) \end{cases},$$

while for v_B we have

$$[Z + V(v, s_B, L(s_B)) - V(v_D, s_D, L(s_D))] \frac{\partial P}{\partial v}$$
$$+ [1 - P(\kappa + v_D - v)] V_v(v, s_B, L(s_B)) \begin{cases} \geq 0 & v = \bar{v}(s_B) \\ = 0 & v \in (\underline{v}(s_B), \bar{v}(s_B)) \\ \leq 0 & v = \underline{v}(s_B) \end{cases}.$$

It is straightforward to verify that the game is supermodular since $Y^D_{v_D v_B}(v_D, v_B; s_D, s_B) \geq 0$ and $Y^B_{v_D v_B}(v_D, v_B; s_D, s_B) \geq 0$ with strict inequality when the solution is interior. This follows by using Lemma 1 and observing that $V_v(v, S, L) \leq 0$.

Let $\{\hat{v}_D(s_D, s_B), \hat{v}_B(s_D, s_B)\}$ be a Nash equilibrium. Observe that there exists κ^+ and κ^- such for all $\kappa \geq \kappa^+$ we have $P(\kappa + \hat{v}_D - \hat{v}_B) = 1$ and $\kappa \leq \kappa^-$ $P(\kappa + \hat{v}_D - \hat{v}_B) = 0$. In this case, $\{\hat{v}_D(s_D, s_B), \hat{v}_B(s_D, s_B)\} = \{\underline{v}(s_D), \underline{v}(s_B)\}$. For $\kappa \in [\kappa^-, \kappa^+]$, then the solution has $\hat{v}_K > \underline{v}(s_K)$ for at least one party $K \in \{D, B\}$.

Proof of Lemma 2 Suppose that the solution indeed has $\hat{v}_D(s_D, s_B) = \underline{v}(s_D)$, because the level of competition is outside the range $\kappa \in [\kappa^-, \kappa^+]$. We need to show that $w(\underline{v}(s_D), s_D, L(s_D))$ and $r(\underline{v}(s_D), s_D, L(s_D))$ are weakly increasing in s. We need to show that:

$$\frac{dw(\underline{v}(s_D), s_D, L(s_D))}{ds_D} \geq 0 \text{ and } \frac{dr(\underline{v}(s_D), s_D, L(s_D))}{ds_D} \geq 0.$$

There are two ranges to consider:
(i) $s_D < w^*$: Then from Lemma A1:

$$\frac{dw(\underline{v}(s_D), s_D, L(s_D))}{ds_D} = 1 \text{ and } \frac{dr(\underline{v}(s_D), s_D, L(s_D))}{ds_D} = 0.$$

(ii) $s_D \in [w^*, 1]$: Then from Lemma A1, $\widetilde{w}\left(\underline{v}\left(s\right), s_D, L\left(s_D\right)\right) = w^*$, so that:

$$\frac{dw\left(\underline{v}\left(s_D\right), s_D, L\left(s_D\right)\right)}{ds_D} = 0 \text{ and } \frac{dr\left(\underline{v}\left(s_D\right), s_D, L\left(s_D\right)\right)}{ds_D} = \frac{1}{1-w^*} > 0$$

as required. ■

Proof of Lemma 3 There are two ranges to consider:
(i) $s_D \leq 1/2$. Then the competence constraint cannot bind ex post ($s_D \leq 1/2$). Hence. the leader is removed for sure if the party wins and so it is optimal to set $r_D = 1$. Thus, the fraction of competent men must increase. The bite of the quota is

$$\Delta w_D = \frac{1}{2} - \min\left\{s_D, w^*\right\}$$

using Lemma A1. Note that

$$\Delta r_D = 1 - \min\left\{0, \frac{s_D - w^*}{1-w^*}\right\} > 0.$$

(iii) $s_D \in [1/2, 1]$. Now

$$\begin{aligned} \Delta r_D &= 2s_D - 1 - \frac{s_D - w^*}{1-w^*} - 2s_D + 1 \\ &= -\frac{\left[1-s_D\right]\left(1-2w^*\right)}{1-w^*} < 0. \end{aligned}$$

The quota bite is

$$\Delta w_D = \frac{1}{2} - w^*.$$

So the quota bite is at its highest when $s_D < w^*$ and constant above that range, while the change in the share of competent men is positive in the range $s_D \leq 1/2$, and negative or zero above for $s_D > 1/2$. ■

Correlation due to variation in w^* To see the limitation of this result, consider the range of survival power $s_D \in [1/2, 1]$, where both Δw_D and Δr_D depend on w^*. From the expressions in (iii), we have

$$\frac{d(\Delta w_D)}{dw^*} = -1 \text{ and } \frac{d(\Delta r_D)}{dw^*} = \frac{1}{(1-w^*)^2} > 0 \ .$$

In this range, the implied correlation between the quota bite and the change in the share of competent men is indeed negative rather than positive (as claimed at the very end of Section 3)..

Properties of the solution under political competition Now consider an interior solution, when the swing-voter constraint is no longer slack. We first show that $\hat{v}_D(s_D, s_B)$ is increasing in s_D (a parallel argument can be applied to party B). Since the game is supermodular:

$$\begin{aligned}\frac{d\hat{v}_D(s_D, s_B)}{ds_D} &\geq -\frac{\xi V_s + P(\cdot) V_{vs}}{2V_v\xi + P(\cdot) V_{vv}} = \beta\left[\frac{\xi V_v + P(\cdot) V_{vv}}{2V_v\xi + P(\cdot) V_{vv}}\right] \\ &= \beta\phi_1 > \beta > 0\end{aligned}$$

using Lemma 1. Hence, we write

$$\frac{d\hat{v}_D(s_D, s_B)}{ds_D} = \phi_0 + \beta\phi_1 \ ,$$

where $\phi_0 \geq 0$. However, if $\widetilde{w}(\hat{v}_D(s_D, s_B), s_D, L(s_D)) = \rho^{-1}(\hat{v}_D(s_D, s_B) - \beta[\alpha L(s_D) + (1-\alpha) s_D])$, then:

$$\frac{d\widetilde{w}(\hat{v}_D(s_D, s_B), s_D, L(s_D))}{ds} = \frac{[\phi_0 + \beta\phi_1 - \beta]}{\rho_w(\hat{v}_D(s_D, s_B) - \beta[\alpha L(s_D) + (1-\alpha) s_D])} \ .$$

Since $\phi_1 < 1$, we cannot rule out $\frac{d\widetilde{w}(\hat{v}_D(s_D,s_B),s_D,L(s_D))}{ds} < 0$ in this range. However, in other ranges, it is straightforward to check that w and r are both increasing in s_D.

Spillover effects of the quota in party *D* to party *B* Spillovers will only occur where the outcome is sufficiently competitive so that $v_B > \underline{v}(s_B)$ and $v_D > \underline{v}(s_D)$. We know that v_D is always higher in political equilibrium in the wake of a gender quota. This follows since where s_D is low and the quality constraint cannot be satisfied, $r_D = 1$. If $s_D \geq 1/2$, then swing-voter utility is

$$\begin{aligned}&\mu(1/2) + \beta\left[\alpha\hat{l}(s_D) + (1-\alpha)\min\{s_D, 1\}\right] \\ \geq\ &\mu(\widetilde{w}(v, s_D, L(s_D))) + \beta[\alpha L(s_D) + (1-\alpha)\min\{s_D, 1\}] \ .\end{aligned}$$

This follows from (**??**) and the observation that the game is supermodular.

Now observe that $\widetilde{w}(v, s_D, L(s_D))$ is increasing in v from Lemma 1. Thus, a quota for party D, which requires $w_D = 1/2$, (weakly) increases v_B^* in electoral equilibrium and leads party B to increase its fraction of women

$\Delta w_B > 0$. What is the impact on the fraction of competent men in party B? If $s_B < w^*$, there is no effect. But if $s_B \in [w^*, 1]$, we have

$$\frac{\partial r_B}{\partial v_B} = \frac{[s_B - 1]\,\widetilde{w}_v\,(v_B, s_B, L\,(s_B))}{[1 - \widetilde{w}\,(v_B, s_B, L\,(s_B))]^2} < 0\ .$$

Thus, a quota in party D decreases party B's share of competent men $\Delta r_B < 0$ provided that elections are sufficiently competitive (i.e., κ close enough to zero) and its leadership is competent enough.

8.4 All Women Incompetent

What happens to Propositions 1 and 2, if we make the alternative assumption that all female candidates are incompetent rather than competent? As before, we denote the shares of women and competent rank and file men fielded by party K, as w_K and r_K. The timing of the model is unchanged.

Leadership election At Stage 4, the leadership election we now have to take a stand on how threatened the male leadership is by incompetent women. Let us write the competence constraint as $\gamma w + r(1 - w) \leq S$ and assume that $0 < \gamma < 1$. That is, a larger number of incompetent women are still a threat to leadership survival, but less so than competent men (and less than in the baseline model where women are competent).

Council election At Stage 3, the council election, we have to rewrite the male preferences – held by male voters and party leaders – as

$$v^M = \mu(1 - w_K) + \beta[\alpha L_K + (1 - \alpha)r](1 - w_K)],$$

where $\mu(\cdot)$ is concave and single-peaked. We assume that $-\mu_z(1) > \gamma\,(1 - \alpha)\,\beta$.

List design At stage 2, the optimal list-design, a male party leader, with a slack swing-voter constraint, maximizes

$$\max_{r,w} \{\mu\,(1 - w) + \beta\,[(1 - w)\,[\alpha L + (1 - \alpha)\,r]]\} \text{ subject to}$$

$$\gamma w + (1 - w)r \leq S\ .$$

Suppose we are at the point $S = w = r = 0$ and S goes up marginally by dS. To satisfy the competence constraint, the leader can choose to (i) appoint

$dr = dS$ competent men, which gives a gain of $\beta\,(1-\alpha)\,(1-w)dS$, or (ii) appoint $dw = dS/\gamma$ incompetent women, which gives a gain of $-\frac{\mu_z(1)}{\gamma} > \gamma\,(1-\alpha)\,\beta(1-w)dS$. So the best choice is still to appoint more women. As S rises, the party leader will optimally continue appointing women until the break-even point $-\mu_z(1-w^{**}) = \gamma\,(1-\alpha)\,(1-w^{**})\beta$. Note that $w^{**} < w^{*}$, since $-\mu_z(1-w^{**}) < -\mu_z(1-w^{*}) = 0$. After this point, the male leader will instead appoint competent men, as S goes up.

This means that Lemma A1 continues to hold, but with a lower stopping point for appointing women w^{**} replacing w^{*}. As Propositions 1 and 2 only rely on the qualitative properties of Lemma A1, they continue to hold also in this case.

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Tables and Figures

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

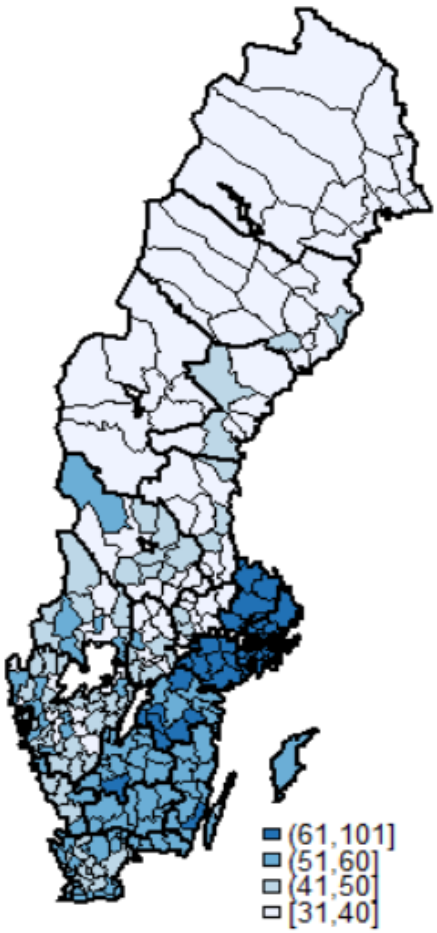
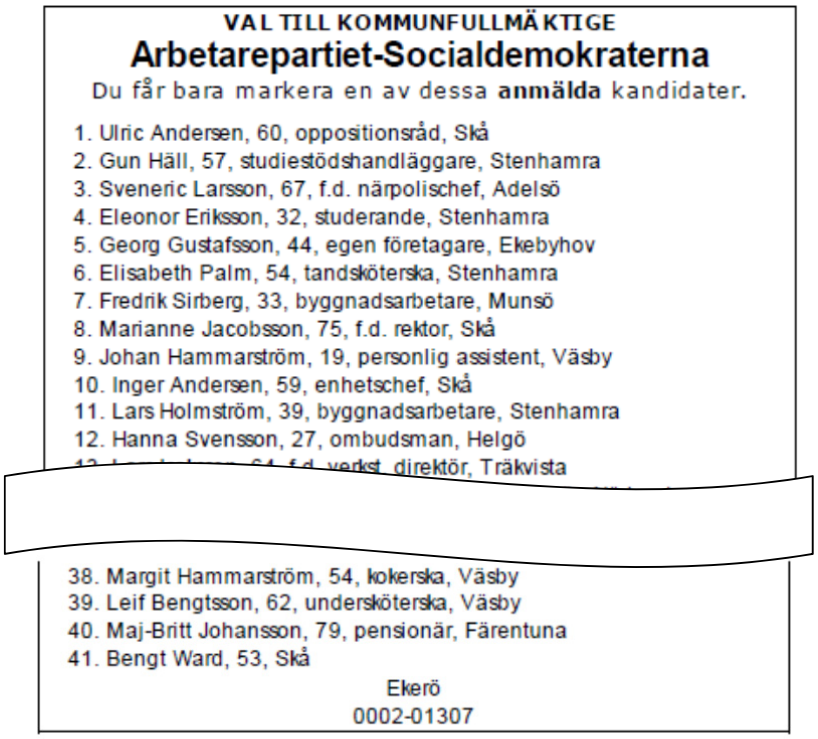


Figure 2: Example of "zipped" ballot from Social Democrats, 2006 election


VAL TILL KOMMUNFULLMÄKTIGE

Arbetarepartiet-Socialdemokraterna

Du får bara markera en av dessa **anmälda** kandidater.

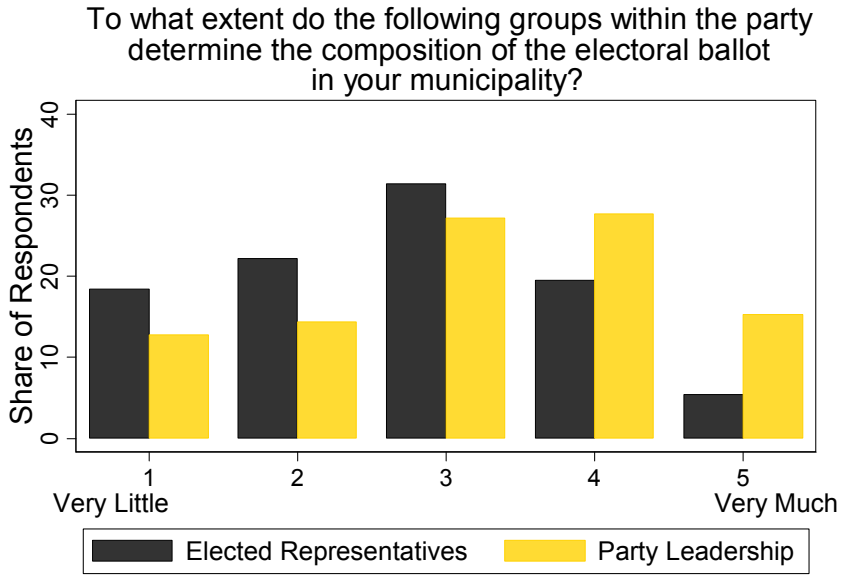
1. Ulric Andersen, 60, oppositionsråd, Skå
2. Gun Häll, 57, studiestödshandläggare, Stenhamra
3. Sveneric Larsson, 67, f.d. närpolischef, Adelsö
4. Eleonor Eriksson, 32, studerande, Stenhamra
5. Georg Gustafsson, 44, egen företagare, Ekebyhov
6. Elisabeth Palm, 54, tandsköterska, Stenhamra
7. Fredrik Sirberg, 33, byggnadsarbetare, Munsö
8. Marianne Jacobsson, 75, f.d. rektor, Skå
9. Johan Hammarström, 19, personlig assistent, Väsby
10. Inger Andersen, 59, enhetschef, Skå
11. Lars Holmström, 39, byggnadsarbetare, Stenhamra
12. Hanna Svensson, 27, ombudsman, Helgö

38. Margit Hammarström, 54, kokerska, Väsby
39. Leif Bengtsson, 62, undersköterska, Väsby
40. Maj-Britt Johansson, 79, pensionär, Färentuna
41. Bengt Ward, 53, Skå

Ekerö

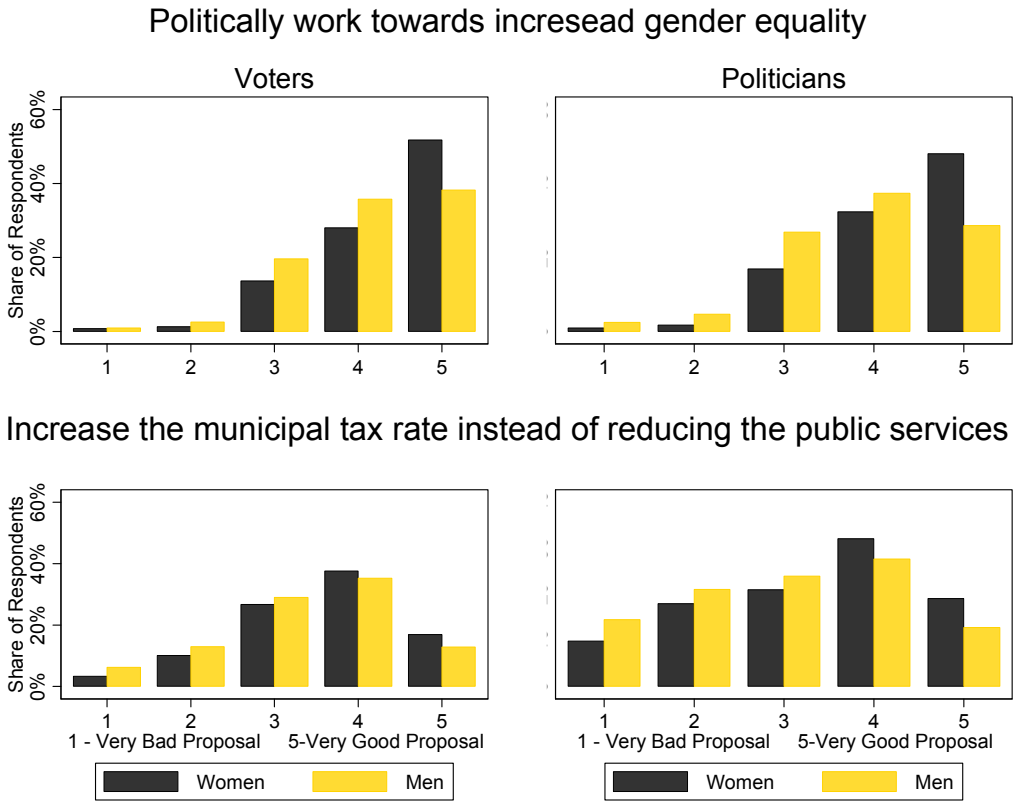
0002-01307

Figure 3: Perceived influence over the composition of the electoral ballot



Notes: Survey responses from the year 2012 Survey of Local Swedish Politicians, N=4,801 (Gilljam and Karlsson, 2009).

Figure 4: Distributions of the perceived desirability of political proposals promoting gender equality (top) and redistribution (bottom) among male and female voters (left), and politicians (right)



Notes: Data for voters is from the 2009 Society Opinion Media (SOM) voter survey with N=4,926 for the gender equality question and N=1,687 for the redistribution question (Gothenburg University, 2009); Politician data is from the 2009 Survey of Swedish Local Politicians with N= 9,500 on both questions (Gilljam and Karlsson, 2009).

Figure 5: Density curve for the changes in the share of elected women in municipal party groups by strategy types for increased female representation, recommended share of female candidates vs. zipper quota

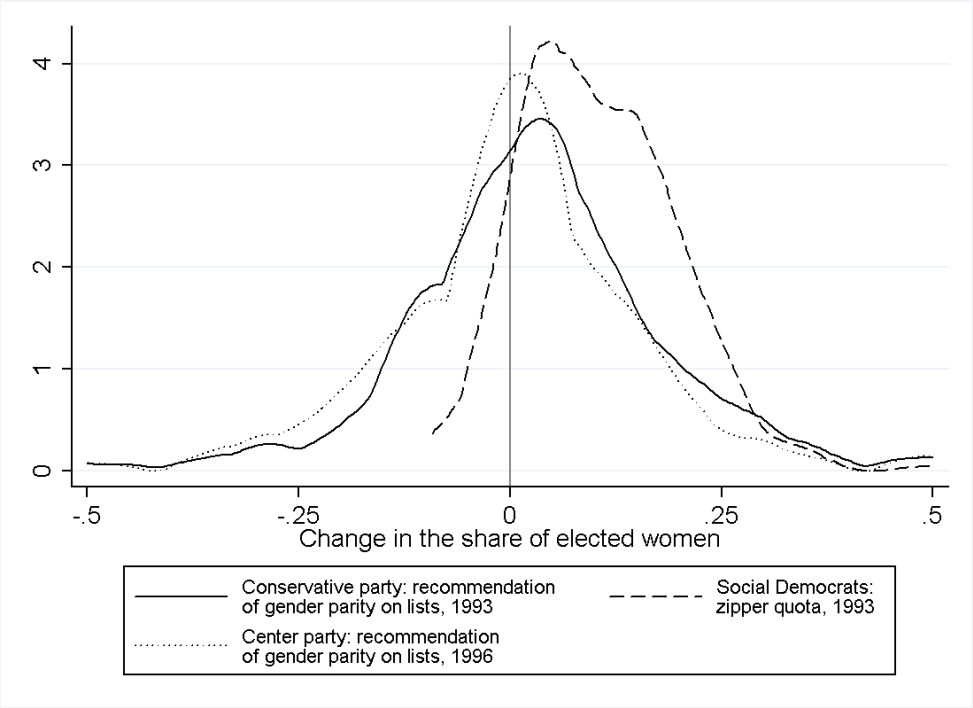


Figure 6: Average share of elected women in Social Democratic, Conservative Party and Center Party municipal party groups over time

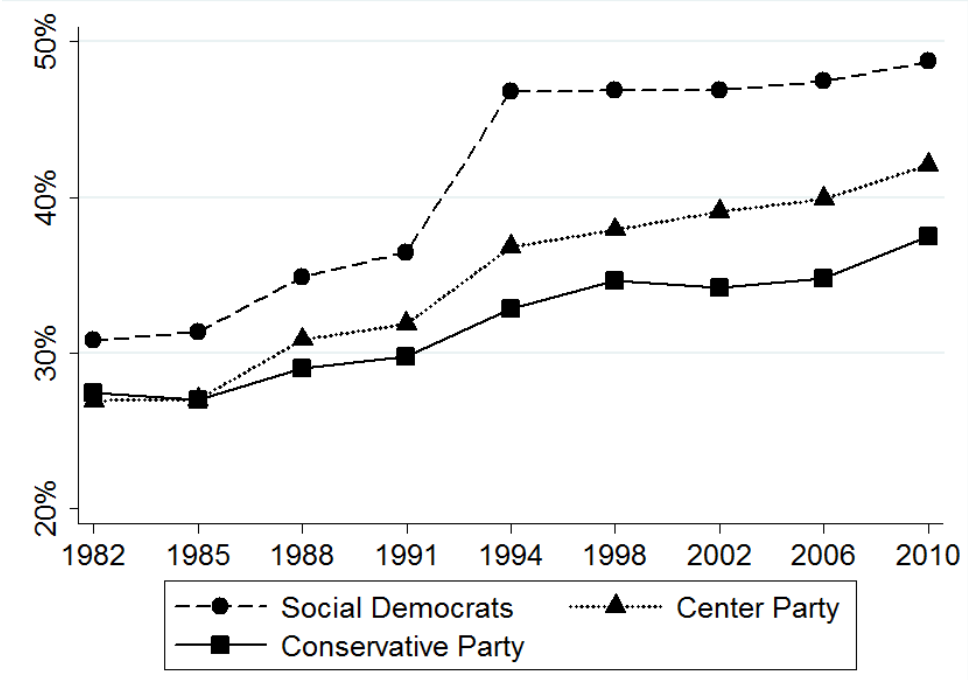
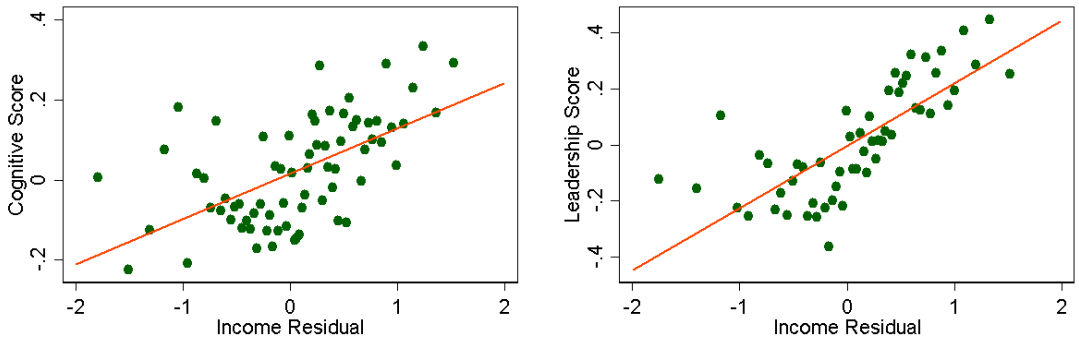


Table 1: Correlations between individual competence and political success measures, with and without fixed effects for list rank, as well as correlation with competence measured through draft data

	Preferential vote share		*Re-election*		*Chairpersonship*		*Cognitive score*	*Leadership score*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Binary competence	0.023***	0.006***	0.063***	0.037***	0.095***	0.039***	0.149***	0.296***
	(0.002)	(0.001)	(0.005)	(0.005)	(0.009)	(0.008)	(0.023)	(0.026)
List rank FE		yes		yes		yes		
Observations	44,119	44,119	56,879	56,879	15,578	15,578	7,296	5,710
Continuous competence	0.012***	0.003***	0.030***	0.017***	0.042***	0.015***	0.094***	0.153***
	(0.001)	(0.001)	(0.003)	(0.003)	(0.005)	(0.004)	(0.013)	(0.169)
List rank FE		yes		yes		yes		
Observations	44,119	44,119	56,879	56,879	15,578	15,578	7,296	5,710

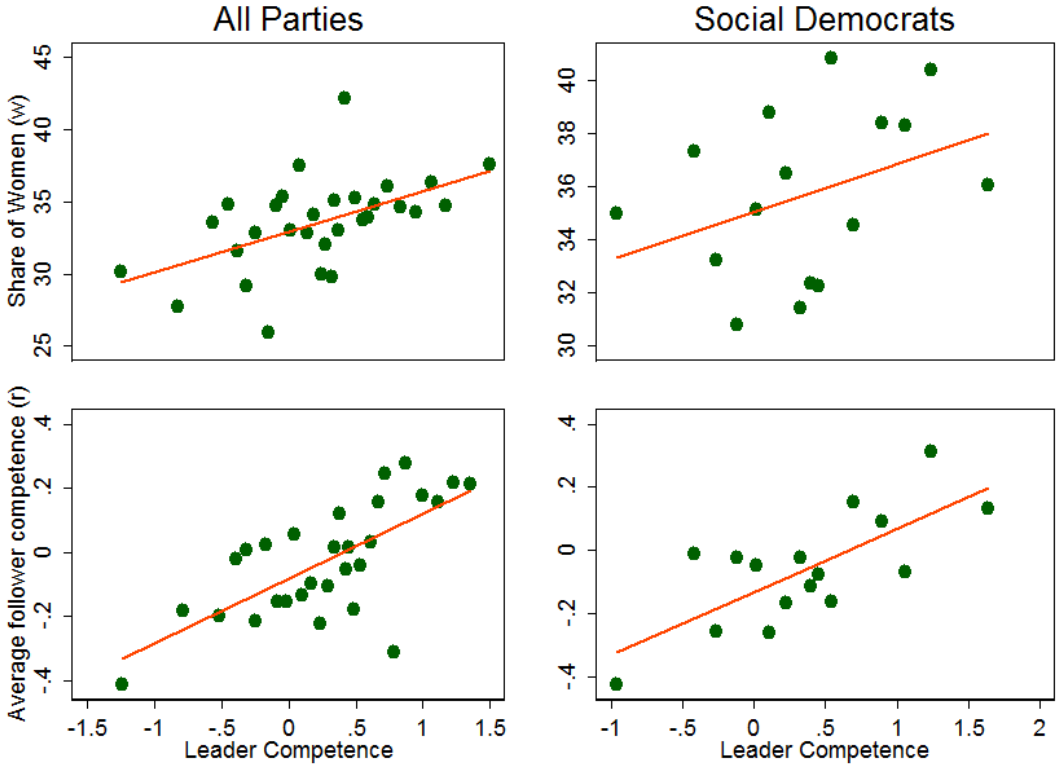
Notes: Preferential vote share is the share of preferential votes cast for the individual politician as a share of the total number of preferential votes cast for the party in the municipal election. Chairpersonships include the municipal council board, the municipal council, or a committee. Draft scores are transformed to z-scores. Robust standard errors clustered at the municipality level in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Figure 7: Correlations between income residual measure of competence (x-axis) and z-scores on cognitive and leadership scores on military draft tests (y-axis)



Notes: Authors' own data for all politicians elected for office at least one period between 1988-2010. Each bin contains 100 individuals.

Figure 8: Correlation between continuous leadership competence in 1988 (x-axis) and shares of elected women and competent male followers (continuous measure), in 1991 municipal party groups (y-axis)



Notes: Authors' own data. Each bin includes 10 party groups and the sample is restricted to municipalities with competition in the two lowest terciles, where competition is the difference in vote shares between the left and the center-right political blocks.

Table 2: Leadership competence vs. pre-quota shares of women (*w*) and competent male followers (*r*), low and intermediate competition municipalities

	Binary competence measure				*Continuous competence measure*			
	Share of women (w)		*Share of competent followers (r)*		*Share of women (w)*		*Average follower competence (r)*	
All parties	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Leadership competence	0.034*	0.016	0.244***	0.225***	0.022***	0.013	0.19***	0.16***
	(0.017)	(0.018)	(0.047)	(0.049)	(0.008)	(0.008)	(0.05)	(0.05)
Control variables		yes		yes		yes		yes
Observations	298	298	296	296	298	298	296	296
Social Democrats								
Leadership competence	0.030	0.010	0.264***	0.204***	0.020*	0.004	0.21***	0.12**
	(0.025)	(0.024)	(0.061)	(0.065)	(0.012)	(0.013)	(0.06)	(0.06)
Control variables		yes		yes		yes		yes
Observations	157	157	157	157	157	157	157	157

Notes: Robust standard errors clustered at the municipality level in parenthesis. Control variables are 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 2) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, sparsely populated, rural, mid-size cities, industrial and mining. Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 3: Difference-in-difference regressions of male competence on the quota bite, 1988-2010, Social Democrats, low competition municipalities

	Binary competence measure				*Continuous competence measure*			
	All elected men		*Constant number of men*		*All elected men*		*Constant number of men*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D1988*$\Delta w_{94\text{-}91}$	0.19	0.24	0.09	0.10	0.14	0.22	-0.11	-0.07
	(0.15)	(0.18)	(0.16)	(0.18)	(0.28)	(0.30)	(0.30)	(0.33)
D1991*$\Delta w_{94\text{-}91}$	*Reference year*							
D1994*$\Delta w_{94\text{-}91}$	**0.41*** **	**0.52*** **	**0.25***	**0.36****	**0.42***	**0.58****	**0.07**	**0.25**
	(0.15)	**(0.15)**	**(0.14)**	**(0.15)**	**(0.24)**	**(0.25)**	**(0.23)**	**(0.24)**
D1998*$\Delta w_{94\text{-}91}$	0.21	0.20	0.20	0.25	-0.17	-0.17	-0.15	-0.11
	(0.19)	(0.20)	(0.15)	(0.16)	(0.28)	(0.30)	(0.24)	(0.25)
D2002*$\Delta w_{94\text{-}91}$	0.34	0.37	0.35*	0.41*	0.54	0.58	0.29	0.29
	(0.26)	(0.29)	(0.20)	(0.23)	(0.39)	(0.45)	(0.33)	(0.36)
D2006*$\Delta w_{94\text{-}91}$	0.21	0.24	0.16	0.19	0.24	0.16	-0.00	-0.13
	(0.20)	(0.21)	(0.19)	(0.19)	(0.38)	(0.36)	(0.34)	(0.32)
D2010*$\Delta w_{94\text{-}91}$	0.31	0.30	0.06	0.00	0.29	0.09	-0.31	-0.60
	(0.21)	(0.24)	(0.17)	(0.19)	(0.45)	(0.53)	(0.35)	(0.38)
Controls		yes		yes		yes		yes
Observations	978	966	978	966	978	966	978	966

Notes: Robust standard errors clustered at the municipality level in parenthesis. All regressions include fixed effects for years and municipalities. Control variables include 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 3) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, mid-size cities, sparsely populated areas, rural areas, and industrial and mining towns. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 4: Difference-in-difference regressions for leadership survival on leader competence and quota bite, low competition municipalities, Social Democrats

	Binary competence measure	*Continuous competence measure*
D1991*$\Delta w_{94\text{-}91}$*leader competence	Reference year	
D1994*$\Delta w_{94\text{-}91}$* leader competence	1.18 (0.80)	1.10*** (0.38)
D1998*$\Delta w_{94\text{-}91}$* leader competence	0.37 (0.88)	0.36 (0.42)
D2002*$\Delta w_{94\text{-}91}$* leader competence	1.98** (0.90)	1.08*** (0.38)
D2006*$\Delta w_{94\text{-}91}$* leader competence	0.15 (0.79)	-0.04 (0.43)
D2010*$\Delta w_{94\text{-}91}$* leader competence	0.91 (0.94)	0.62 (0.61)
Observations	2,148	2,148

Notes: The table contains the results from estimating a fully saturated triple interaction model which also includes municipality fixed effects. Robust standard errors clustered at the municipality level in parenthesis. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5: Leadership competence vs. pre-quota shares of women (*w*) and competent male followers (*r*), all municipalities

	Binary competence measure				*Continuous competence measure*			
	Share of women (w)		*Share of competent followers (r)*		*Share of women (w)*		*Average follower competence (r)*	
All parties	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Leadership competence	0.032**	0.014	0.209***	0.187***	1.80***	0.76	18.22***	13.72***
	(0.014)	(0.013)	(0.036)	(0.036)	(0.67)	(0.72)	(3.78)	(3.81)
Control variables		yes		yes		yes		yes
Observations	470	470	466	466	470	470	466	466
Social Democrats								
Leadership competence	0.048**	0.024	0.229***	0.157***	2.02**	0.39	21.96***	11.36***
	(0.020)	(0.019)	(0.044)	(0.044)	(0.93)	(0.99)	(4.38)	(4.02)
Control variables		yes		yes		yes		yes
Observations	239	239	239	239	239	239	239	239

Notes: Robust standard errors clustered at the municipality level in parenthesis. Control variables are 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 2) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, sparsely populated, rural, mid-size cities, industrial and mining. Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6: Difference-in-difference regressions of r on Δw, 1988-2010, Social Democrats, all municipalities

	Binary competence measure				*Continuous competence measure*			
	All elected Men		*Constant Number of Men*		*All elected Men*		*Constant Number of Men*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D1988*$\Delta w_{94\text{-}91}$	0.10	0.11	-0.02	-0.05	0.05	0.05	-0.22	-0.24
	(0.11)	(0.12)	(0.11)	(0.12)	(0.20)	(0.22)	(0.24)	(0.26)
D1991*$\Delta w_{94\text{-}91}$				*Reference Year*				
D1994*$\Delta w_{94\text{-}91}$	**0.29*** **	**0.52*** **	**0.09**	**0.16**	**0.45** **	**0.52** **	**-0.05**	**0.00**
	(0.11)	**(0.15)**	**(0.10)**	**(0.11)**	**(0.20)**	**(0.21)**	**(0.20)**	**(0.21)**
D1998*$\Delta w_{94\text{-}91}$	0.23	0.20	0.12	0.17	0.17	0.10	0.01	-0.03
	(0.14)	(0.20)	(0.13)	(0.13)	(0.25)	(0.26)	(0.23)	(0.23)
D2002*$\Delta w_{94\text{-}91}$	0.34*	0.37	0.27*	0.27	0.50	0.37	0.22	0.08
	(0.18)	(0.29)	(0.15)	(0.17)	(0.31)	(0.34)	(0.29)	(0.31)
D2006*$\Delta w_{94\text{-}91}$	0.33**	0.24	0.14	0.13	0.52	0.37	0.14	-0.06
	(0.16)	(0.21)	(0.14)	(0.16)	(0.33)	(0.35)	(0.30)	(0.30)
D2010*$\Delta w_{94\text{-}91}$	0.38**	0.30	0.07	0.01	0.62*	0.34	0.03	-0.35
	(0.16)	(0.24)	(0.14)	(0.15)	(0.36)	(0.40)	(0.34)	(0.35)
Control variables		yes		yes		yes		yes
Observations	1,532	966	1,537	1,519	1,537	1,519	1,537	1,519

Notes: Robust standard errors clustered at the municipality level in parenthesis. All regressions include fixed effects for years and municipalities. Control variables include 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 3) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, mid-size cities, sparsely populated areas, rural areas, and industrial and mining towns. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 7: Difference-in-difference regressions for leadership survival on leader competence and quota bite, all municipalities, Social Democrats

	Binary competence measure	*Continuous competence measure*
D1991*$\Delta w_{94\text{-}91}$*leader competence	Reference year	
D1994*$\Delta w_{94\text{-}91}$* leader competence	0.94	0.75**
	(0.60)	(0.30)
D1998*$\Delta w_{94\text{-}91}$* leader competence	0.11	0.12
	(0.70)	(0.32)
D2002*$\Delta w_{94\text{-}91}$* leader competence	0.85	0.57*
	(0.70)	(0.29)
D2006*$\Delta w_{94\text{-}91}$* leader competence	0.26	0.04
	(0.68)	(0.34)
D2010*$\Delta w_{94\text{-}91}$* leader competence	0.33	0.19
	(0.75)	(0.44)
Observations	3,331	3,331

Notes: The table contains the results from estimating a fully saturated triple interaction model which also includes municipality fixed effects. Robust standard errors clustered at the municipality level in parenthesis. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 8: Spill-Overs from the Social Democrats' quota on *w* and *c* of other parties

	Full sample			High competition			Low competition		
	w	c (bin)	c (cont)	w	c (bin)	c (cont)	w	c (bin)	c (cont)
$\Delta w_{94\text{-}91}$ in the Social Democrats	0.10	0.03	-0.05	0.04	-0.22	0.08	0.11	-0.05	-0.80
	(0.08)	(0.21)	(0.39)	(0.11)	(0.25)	(0.40)	(0.15)	(0.25)	(0.49)
Observations	157	148	148	73	69	69	83	78	78

Notes: Sample includes all party groups with a male leader and at least eight elected representatives. High and low competition refer to municipalities in the top tercile and the two bottom terciles, where competition is the difference in vote shares between the left and the center-right political blocks in previous elections. Robust standard errors clustered at the municipality level in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%.

Figure 9: Correlations between the share of elected women in 1991 (x-axis) and elected women's competence (y-axis, top row) and the gender gap in competence, women's average competence minus men's average competence (y-axis, bottom row)

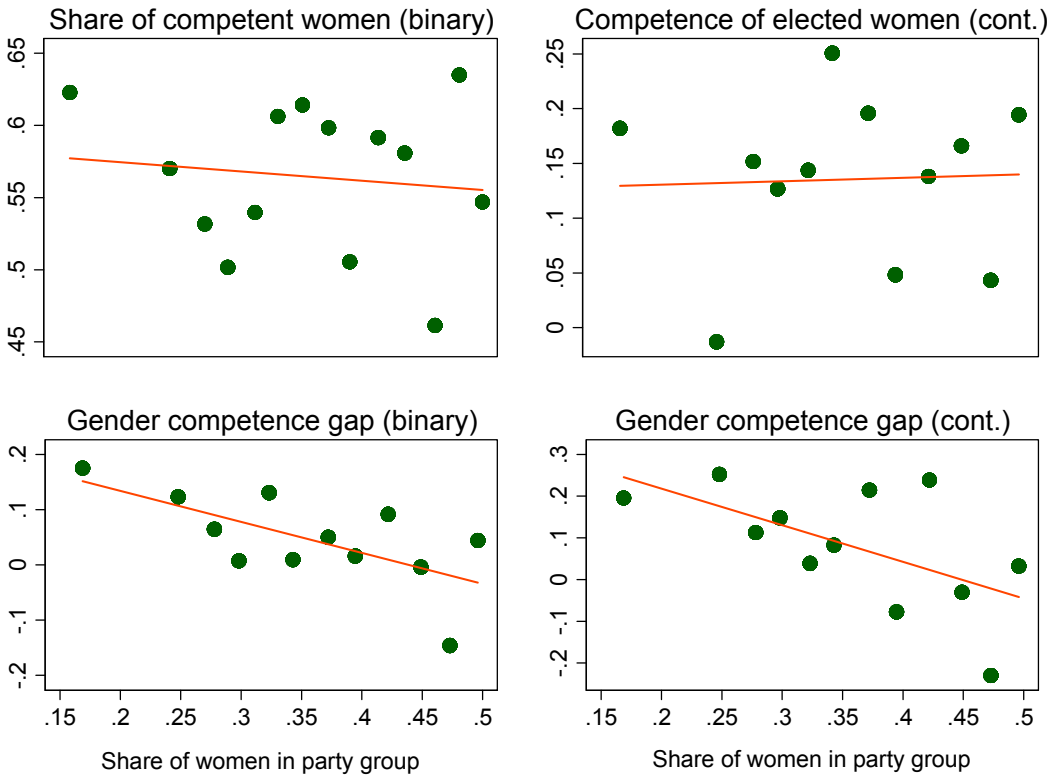


Table 9: Difference-in-difference regressions of women's competence and local party vote shares on $\Delta w_{94\text{-}91}$, 1988-2010, Social Democrats

	Competence of the elected women, all municipalities				*Party vote share regressions*			
	Binary competence measure		*Continuous competence measure*		*Low Competition*		*All Municipalities*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D1982*$\Delta w_{94\text{-}91}$					-0.11**	-0.08	-0.06*	-0.01
					(0.05)	(0.05)	(0.04)	(0.04)
D1985*$\Delta w_{94\text{-}91}$					-0.07**	-0.06	-0.03	0.00
					(0.04)	(0.04)	(0.03)	(0.03)
D1988*$\Delta w_{94\text{-}91}$	-0.06	0.02	-0.60	-0.54	0.02	0.02	0.03	0.04
	(0.19)	(0.21)	(0.41)	(0.47)	(0.03)	(0.03)	(0.03)	(0.03)
D1991*$\Delta w_{94\text{-}91}$	*Reference year*							
D1994*$\Delta w_{94\text{-}91}$	**0.00**	**0.03**	**-0.41**	**-0.37**	**0.04**	**0.08**	**0.03**	**0.07***
	(0.18)	**(0.19)**	**(0.40)**	**(0.42)**	**(0.05)**	**(0.05)**	**(0.03)**	**(0.04)**
D1998*$\Delta w_{94\text{-}91}$	0.12	0.15	-0.10	-0.19	0.04	0.06	0.02	0.05
	(0.20)	(0.22)	(0.41)	(0.44)	(0.05)	(0.05)	(0.04)	(0.04)
D2002*$\Delta w_{94\text{-}91}$	0.34	0.41*	0.39	0.42	0.03	0.03	0.02	0.04
	(0.22)	(0.23)	(0.49)	(0.49)	(0.06)	(0.05)	(0.04)	(0.04)
D2006*$\Delta w_{94\text{-}91}$	0.01	0.11	0.01	0.07	0.06	0.07	0.04	0.04
	(0.25)	(0.27)	(0.50)	(0.55)	(0.07)	(0.07)	(0.05)	(0.05)
D2010*$\Delta w_{94\text{-}91}$	-0.32	-0.25	-0.39	-0.47	0.06	0.05	0.05	0.01
	(0.25)	(0.26)	(0.56)	(0.59)	(0.08)	(0.08)	(0.05)	(0.05)
Control variables		yes		yes		yes		yes
Observations	1,536	1,518	1,537	1,519	1,259	1,241	1,977	1,950

Notes: Robust standard errors clustered at the municipality level in parenthesis. All regressions include fixed effects for years and municipalities. Control variables include 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 3) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, mid-size cities, sparsely populated areas, rural areas, and industrial and mining towns. * significant at 10%; ** significant at 5%; *** significant at 1%.

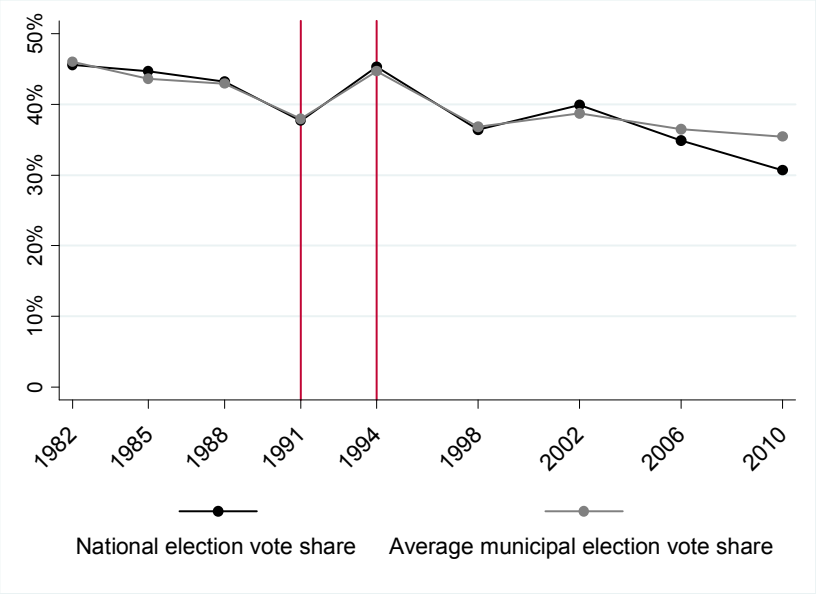
Web Appendix (not for publication)

Table W1: Summary of strategies to increase female numerical representation in Swedish political parties.

LEFT BLOCK	Party	Year	Target	Mandate
	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	

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

Figure W2: National election vote share of the Social Democratic party, 1982-2010



Note: The vertical lines mark the introduction of the gender quota in 1994.

Table W2: Leadership competence vs. pre-quota shares of women (*w*) and competent male followers (*r*), low and intermediate competition municipalities. Income based competence measure without controls for education and employment sector

	Binary competence measure				*Continuous competence measure*			
	Share of women (w)		*Share of competent followers (r)*		*Share of women (w)*		*Average follower competence (r)*	
All parties	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Leadership competence	0.040**	0.025	0.156***	0.124**	0.030***	0.020**	0.180***	0.125**
	(0.019)	(0.020)	(0.050)	(0.051)	(0.008)	(0.009)	(0.049)	(0.049)
Control variables		yes		yes		yes		yes
Observations	299	299	297	297	299	299	297	297
Social Democrats								
Leadership competence	0.033	0.016	0.110*	0.038	0.029**	0.015	0.197***	0.102*
	(0.026)	(0.028)	(0.066)	(0.062)	(0.011)	(0.013)	(0.056)	(0.053)
Control variables		yes		yes		yes		yes
Observations	158	158	158	158	158	158	158	158

Notes: Robust standard errors clustered at the municipality level in parenthesis. Control variables are 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 2) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, sparsely populated, rural, mid-size cities, industrial and mining. Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table W3: Difference-in-difference regressions of male competence on the quota bite, 1988-2010, Social Democrats, low competition municipalities. Income based competence measure without controls for education and employment sector

	Binary competence measure				*Continuous competence measure*			
	All elected men		*Constant number of men*		*All elected men*		*Constant number of men*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D1988*$\Delta w_{94\text{-}91}$	0.11	0.12	0.06	0.07	0.10	0.22	-0.07	0.04
	(0.15)	(0.16)	(0.18)	(0.18)	(0.30)	(0.31)	(0.31)	(0.32)
D1991*$\Delta w_{94\text{-}91}$	*Reference year*							
D1994*$\Delta w_{94\text{-}91}$	**0.30****	**0.34****	**0.11**	**0.16**	**0.41***	**0.43***	**0.15**	**0.25**
	(0.14)	**(0.15)**	**(0.12)**	**(0.12)**	**(0.23)**	**(0.24)**	**(0.21)**	**(0.20)**
D1998*$\Delta w_{94\text{-}91}$	0.14	0.07	0.08	0.04	-0.03	-0.19	0.00	-0.08
	(0.18)	(0.17)	(0.15)	(0.14)	(0.27)	(0.26)	(0.25)	(0.24)
D2002*$\Delta w_{94\text{-}91}$	0.28	0.17	0.35*	0.24	0.58*	0.49	0.52*	0.38
	(0.19)	(0.21)	(0.19)	(0.21)	(0.34)	(0.35)	(0.29)	(0.28)
D2006*$\Delta w_{94\text{-}91}$	0.27	0.14	0.17	0.05	0.50	0.24	0.32	0.05
	(0.20)	(0.21)	(0.20)	(0.21)	(0.37)	(0.33)	(0.36)	(0.32)
D2010*$\Delta w_{94\text{-}91}$	0.10	-0.12	-0.06	-0.29	0.38	-0.14	0.01	-0.44
	(0.23)	(0.24)	(0.21)	(0.20)	(0.43)	(0.43)	(0.39)	(0.37)
Controls		yes		yes		yes		yes
Obs	978	966	978	966	978	966	978	966

Notes: Robust standard errors clustered at the municipality level in parenthesis. All regressions include fixed effects for years and municipalities. Control variables include 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 3) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, mid-size cities, sparsely populated areas, rural areas, and industrial and mining towns. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table W4: Difference-in-difference regressions for leadership survival on leader competence and quota bite, low competition municipalities, Social Democrats. Income based competence measure without controls for education and employment sector

	Binary competence measure	*Continuous competence measure*
D1991*$\Delta w_{94\text{-}91}$*leader competence	Reference year	
D1994*$\Delta w_{94\text{-}91}$* leader competence	0.92	0.93**
	(0.78)	(0.40)
D1998*$\Delta w_{94\text{-}91}$* leader competence	0.02	0.51
	(0.73)	(0.36)
D2002*$\Delta w_{94\text{-}91}$* leader competence	1.21	0.90**
	(0.79)	(0.38)
D2006*$\Delta w_{94\text{-}91}$* leader competence	-0.21	-0.21
	(0.89)	(0.41)
D2010*$\Delta w_{94\text{-}91}$* leader competence	1.32	0.92*
	(0.96)	(0.54)
Observations	2,347	2,347

Notes: The table contains the results from estimating a fully saturated triple interaction model which also includes municipality fixed effects. Robust standard errors clustered at the municipality level in parenthesis. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table W5: Leadership competence vs. pre-quota shares of women (*w*) and competent male followers (*r*), low and intermediate competition municipalities

	Binary competence measure		*Continuous competence measure*	
	Share of competent followers (r)		*Average follower competence (r)*	
All parties	(3)	(4)	(7)	(8)
Leadership competence	0.089	-0.051	0.09	-0.05
	(0.090)	(0.092)	(0.10)	(0.09)
Control variables		yes		yes
Observations	201	201	201	201
Social Democrats				
Leadership competence	0.158	0.037	0.10	-0.11
	(0.117)	(0.125)	(0.11)	(0.12)
Control variables		yes		yes
Observations	157	157	117	117

Notes: Robust standard errors clustered at the municipality level in parenthesis. Control variables are 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 2) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, sparsely populated, rural, mid-size cities, industrial and mining. Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table W6: Difference-in-difference regressions of male competence on the quota bite, 1988-2010, Social Democrats, low competition municipalities

	Binary competence measure				*Continuous competence measure*			
	All elected men		*Constant number of men*		*All elected men*		*Constant number of men*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D1988*$\Delta w_{94\text{-}91}$	-0.04	0.22	0.07	0.14	0.51	0.63	0.83	1.04
	(0.41)	(0.59)	(0.47)	(0.67)	(0.96)	(1.19)	(1.08)	(1.35)
D1991*$\Delta w_{94\text{-}91}$	*Reference year*							
D1994*$\Delta w_{94\text{-}91}$	**0.90****	**1.03****	**0.85****	**0.98****	**1.15**	**1.33**	**1.17**	**1.32**
	(0.41)	**(0.51)**	**(0.39)**	**(0.49)**	**(0.78)**	**(0.99)**	**(0.80)**	**(0.96)**
D1998*$\Delta w_{94\text{-}91}$	0.80**	0.74	0.34	0.50	1.65*	1.53	0.92	1.20
	(0.40)	(0.45)	(0.43)	(0.48)	(0.86)	(1.05)	(0.89)	(1.08)
D2002*$\Delta w_{94\text{-}91}$	1.12**	1.43**	0.68	0.86	1.36	1.89	0.96	1.27
	(0.51)	(0.61)	(0.50)	(0.62)	(1.06)	(1.33)	(1.07)	(1.34)
D2006*$\Delta w_{94\text{-}91}$	0.64	0.69	0.36	0.45	0.99	1.11	0.59	0.82
	(0.41)	(0.48)	(0.43)	(0.51)	(0.93)	(1.12)	(0.98)	(1.21)
D2010*$\Delta w_{94\text{-}91}$	0.86*	0.83	0.79	0.70	1.09	1.23	1.02	1.06
	(0.48)	(0.58)	(0.48)	(0.58)	(1.07)	(1.26)	(1.10)	(1.34)
Controls		yes		yes		yes		yes
Obs	857	845	853	841	857	845	853	841

Notes: Robust standard errors clustered at the municipality level in parenthesis. All regressions include fixed effects for years and municipalities. Control variables include 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 3) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, mid-size cities, sparsely populated areas, rural areas, and industrial and mining towns. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table W7: Leadership competence vs. pre-quota shares of women (*w*) and competent male followers (*r*), low and intermediate competition municipalities (alternative definition of competition)

	Binary competence measure				*Continuous competence measure*			
	Share of women (w)		*Share of competent followers (r)*		*Share of women (w)*		*Average follower competence (r)*	
All parties	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Leadership competence	0.022	0.006	0.222***	0.213***	0.016*	0.008	0.17***	0.16***
	(0.018)	(0.018)	(0.046)	(0.047)	(0.008)	(0.009)	(0.05)	(0.06)
Control variables		yes		yes		yes		yes
Observations	290	290	288	288	290	290	288	288
Social Democrats								
Leadership competence	0.021	0.006	0.245***	0.205***	0.014	0.001	0.20***	0.14**
	(0.025)	(0.026)	(0.056)	(0.054)	(0.018)	(0.013)	(0.05)	(0.06)
Control variables		yes		yes		yes		yes
Observations	152	152	152	152	152	152	152	152

Notes: Robust standard errors clustered at the municipality level in parenthesis. Control variables are 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 2) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, sparsely populated, rural, mid-size cities, industrial and mining. Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table W8: Difference-in-difference regressions of male competence on the quota bite, 1988-2010, Social Democrats, low competition municipalities (alternative definition of competition).

	Binary competence measure				*Continuous competence measure*			
	All elected men		*Constant number of men*		*All elected men*		*Constant number of men*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D1988*$\Delta w_{94\text{-}91}$	0.22	0.24	0.07	0.05	0.26	0.24	-0.12	-0.13
	(0.14)	(0.15)	(0.14)	(0.15)	(0.23)	(0.26)	(0.26)	(0.30)
D1991*$\Delta w_{94\text{-}91}$	*Reference year*							
D1994*$\Delta w_{94\text{-}91}$	**0.40*** **	**0.54*** **	**0.23***	**0.36****	**0.39***	**0.52****	**-0.09**	**0.03**
	(0.14)	**(0.13)**	**(0.14)**	**(0.14)**	**(0.23)**	**(0.25)**	**(0.24)**	**(0.27)**
D1998*$\Delta w_{94\text{-}91}$	0.23	0.26	0.13	0.23	-0.00	-0.07	-0.15	-0.12
	(0.19)	(0.20)	(0.15)	(0.16)	(0.28)	(0.30)	(0.23)	(0.24)
D2002*$\Delta w_{94\text{-}91}$	0.32	0.35	0.25	0.31	0.48	0.35	0.07	-0.08
	(0.25)	(0.28)	(0.19)	(0.23)	(0.39)	(0.45)	(0.33)	(0.38)
D2006*$\Delta w_{94\text{-}91}$	0.11	0.17	0.02	0.05	0.27	0.13	-0.10	-0.31
	(0.19)	(0.21)	(0.19)	(0.20)	(0.38)	(0.39)	(0.35)	(0.34)
D2010*$\Delta w_{94\text{-}91}$	0.26	0.27	0.04	0.00	0.28	-0.01	-0.31	-0.61*
	(0.21)	(0.23)	(0.18)	(0.19)	(0.44)	(0.53)	(0.35)	(0.36)
Controls		yes		yes		yes		yes
Observations	963	945	963	945	963	945	963	945

Notes: Robust standard errors clustered at the municipality level in parenthesis. All regressions include fixed effects for years and municipalities. Control variables include 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 3) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, mid-size cities, sparsely populated areas, rural areas, and industrial and mining towns. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table W9: Difference-in-difference regressions for leadership survival on leader competence and quota bite, low competition municipalities, Social Democrats (alternative definition of competition)

	Binary competence measure	*Continuous competence measure*
D1991*$\Delta w_{94\text{-}91}$*leader competence	Reference year	
D1994*$\Delta w_{94\text{-}91}$* leader competence	0.96	1.00***
	(0.73)	(0.35)
D1998*$\Delta w_{94\text{-}91}$* leader competence	1.46*	0.78**
	(0.77)	(0.38)
D2002*$\Delta w_{94\text{-}91}$* leader competence	1.96**	1.14***
	(0.89)	(0.38)
D2006*$\Delta w_{94\text{-}91}$* leader competence	0.33	0.19
	(0.77)	(0.44)
D2010*$\Delta w_{94\text{-}91}$* leader competence	1.09	0.93
	(0.93)	(0.59)
Observations	2,078	2,078

Notes: The table contains the results from estimating a fully saturated triple interaction model which also includes municipality fixed effects. Robust standard errors clustered at the municipality level in parenthesis. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table W10: Leadership competence vs. pre-quota shares of women (*w*) and competent male followers (*r*), low and intermediate competition municipalities.

Including a control for the dependent variable measured among nominated politicians

	Binary competence measure				*Continuous competence measure*			
	Share of women (w)		*Share of competent followers (r)*		*Share of women (w)*		*Average follower competence (r)*	
All parties	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Leadership competence	0.026	0.010	0.232***	0.214***	0.018**	0.010	0.195***	0.159***
	(0.018)	(0.018)	(0.048)	(0.050)	(0.008)	(0.008)	(0.048)	(0.054)
Control variables		yes		yes		yes		yes
Observations	298	298	296	296	298	298	296	296
Social Democrats								
Leadership competence	0.018	0.002	0.244***	0.192***	0.012	-0.002	0.208***	0.121**
	(0.025)	(0.025)	(0.061)	(0.066)	(0.011)	(0.013)	(0.057)	(0.059)
Control variables		yes		yes		yes		yes
Observations	157	157	157	157	157	157	157	157

Notes: Robust standard errors clustered at the municipality level in parenthesis. Control variables are 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 2) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, sparsely populated, rural, mid-size cities, industrial and mining. Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table W11: Difference-in-difference regressions of male competence on the quota bite, 1988-2010, Social Democrats, low competition municipalities

Including a control for the dependent variable measured among the nominated politicians

	Binary competence measure				*Continuous competence measure*			
	All elected nen		*Constant number of men*		*All elected men*		*Constant number of men*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D1991*$\Delta w_{94\text{-}91}$	*Reference year*							
D1994*$\Delta w_{94\text{-}91}$	**0.43*** **	**0.55*** **	**0.25***	**0.37****	**0.43***	**0.59****	**0.04**	**0.24**
	(0.15)	**(0.16)**	**(0.14)**	**(0.15)**	**(0.24)**	**(0.25)**	**(0.23)**	**(0.24)**
D1998*$\Delta w_{94\text{-}91}$	0.26	0.29	0.21	0.29*	-0.15	-0.15	-0.20	-0.15
	(0.18)	(0.20)	(0.16)	(0.17)	(0.28)	(0.30)	(0.24)	(0.26)
D2002*$\Delta w_{94\text{-}91}$	0.36	0.42	0.36*	0.44*	0.56	0.61	0.23	0.25
	(0.26)	(0.29)	(0.20)	(0.23)	(0.40)	(0.45)	(0.34)	(0.37)
D2006*$\Delta w_{94\text{-}91}$	0.22	0.26	0.17	0.21	0.24	0.15	-0.02	-0.14
	(0.21)	(0.22)	(0.19)	(0.20)	(0.38)	(0.36)	(0.35)	(0.32)
D2010*$\Delta w_{94\text{-}91}$	0.31	0.31	0.06	0.02	0.29	0.07	-0.34	-0.60
	(0.21)	(0.23)	(0.17)	(0.19)	(0.45)	(0.53)	(0.36)	(0.38)
Controls		yes		yes		yes		yes
Obs	840	828	840	828	840	828	840	828

Notes: Robust standard errors clustered at the municipality level in parenthesis. All regressions include fixed effects for years and municipalities. Control variables include 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 3) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, mid-size cities, sparsely populated areas, rural areas, and industrial and mining towns. * significant at 10%; ** significant at 5%; *** significant at 1%.