

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

Timothy Besley, Olle Folke, Torsten Persson, and Johanna Rickne

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## Abstract

This paper develops a model where party leaders choose the competence of politicians on the ballot to trade off electoral success against their own survival. The predicted correlation between the competence of party leaders and followers is strongly supported in Swedish data. We use a novel approach based on register data for the earnings of the whole population to measure the competence of all politicians in seven parties and nine municipal elections (1982-2010). We then look at the effects on competence of a "zipper" quota, requiring party groups to alternate male and females on the ballot, which was 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. We argue that resignations of mediocre leaders was a key channel through which this happened.

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# 1 Introduction

Representative democracies are frequently said to need competent men or women to function effectively. However, this argument hinges on many premises including how parties promote candidates and how voters value them. As one example, party leaders may be reluctant to promote talent in their own party if this threatens their own standing. Such reluctance may create a vicious circle of mediocrity where low-quality leaders select low-quality followers in order to maintain their position. Cosy arrangements between mediocre leaders and candidates can be shaken up in a variety of ways. One interesting possibility is the introduction of quotas on the gender composition of candidates for political representation.

More than one hundred countries have introduced some form of gender quota in their electoral systems. The merits of these policies remain hotly debated in the academic literature, as well as in the public discussion.<sup>1</sup> Those who advocate quotas see them primarily as a means to improve the representation of women, while others denounce them as a threat to meritocratic selection of politicians.

In 1993, Sweden's Social Democratic party centrally adopted a gender quota and imposed it on all its local party groups. Although their primary aim was to improve the representation of women, quota proponents thought it likely that the reform would raise competence across the board. Indeed, Inger Segelström – the chair of Social Democratic Women in Sweden (S-Kvinnor) 1995-2003 – made this point succinctly in a personal communication:

"At the time, 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 ..."

In this paper, we study the selection of politicians in Sweden with regard to their competence, both theoretically and empirically. Moreover, we exploit the Social Democratic quota as a shock to the system and ask how it altered the competence of the party's elected politicians, men as well as women, and leaders as well as followers.

An analysis of competence in politics should treat the selection of competence as the result of a non-trivial choice. Following standard models of political selection, as Banks and Sundaram (1998), we suppose that competence of politicians can be treated as a valence issue, an assumption echoed by Swedish voters.<sup>2</sup> We start by drawing up a simple model where a party offering higher-competence candidates on its ballot stands a greater chance of winning the election. The party leader picks

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<sup>1</sup>Studies 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 Casas-Arce and Saiz 2015).

<sup>2</sup>When surveyed in 2000 about their reasons for choosing a party, they ranked competence as most important, with 71 percent of respondents saying that parties should have "competent politicians that can handle the country's affairs".

candidates to trade off electoral success against his own survival, which is threatened by more competent followers. This resulting model 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 to Gagliarducci and Paserman (2011) who link the survival of leaders to the composition of followers.<sup>3</sup>

This simple model predicts that less competent leaders pick less competent followers. To check if such a correlation is present in the data requires convincing measures of competence for a large number of polities.<sup>4</sup> We use rich individual data for all candidates on all party lists in all Swedish municipalities in all elections since 1982. To gauge the competence of these candidates, we develop a unique measure, which exploits variation in income, conditional on occupation, education, location, and age, and is estimated on administrative micro data for the full Swedish population.<sup>5</sup> Data from the Swedish military draft show that (for men) our competence measure is strongly related to cognitive scores and leadership abilities, as assessed by a trained psychologist. Our measure is also strongly related to political success. Using this competence measure, we find a close correlation between the competence of political leaders and followers in line with the simple model.

We then exploit the Social Democratic gender quota as a shock to the political equilibrium. Citizen-candidate models, such as Besley and Coate (1997), suggest that representation should matter for policy if women have different policy priorities than men.<sup>6</sup> Along the lines of our earlier discussion, a gender quota may also have threatened the survival of incumbent leaders who were predominantly male. We show that competence progressively increased the more a local Social Democratic party was forced to increase its proportion of elected women. Contrary to the expectations of quota denouncers, the competence of women did not go down but stayed roughly constant. However, the competence of men went up significantly in the elections following the quota. This improvement was not limited to elected followers further down the party ballot, but occurred also at the very top – i.e., among the local party’s leadership. In fact, a key mechanism seems to have run through greater resignations of mediocre male leaders, and their more competent successors picking more competent candidates.

As a final step in the analysis, we get back to theory. Specifically, we interpret the empirical results on the effects of the quota by extending our simple theoretical model with politicians of different gender and with prospective resignations of leaders. This model adds to recent theoretical work on the selection of politicians. Compared to Julio and Tavares (2010), Galasso and Nannicini (2011), or Casas-Arce and Saiz (2015), we explicitly model the trade-off facing a political leadership

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<sup>3</sup>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.

<sup>4</sup>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.

<sup>5</sup>Our measure is conceptually similar to the measure proposed in Merlo et. al. (2010).

<sup>6</sup>Recent studies which all find effects include Chattopadhyaya and Duflo (2004) for Indian villages, Rehavi (2008) for U.S. states, and Svaleryd (2009) for Swedish municipalities, while no effects are found by Ferreira and Gyorko (2011) for U.S. cities and Campa (2011) for Spanish municipalities.

that dominates list selection in a PR system. This model should be useful in future efforts to study effects of electoral reforms that either target leaders directly – by limiting their age or number of terms – or restrict the scope of their power over electoral ballot composition – such as quotas for women or other political minorities. Although the model describes a PR-system, the basic intuition could travel to majoritarian systems, or even private organizations such as corporate boards.

The paper is also related to a recent literature which attributes changes in the composition of party ballots to demand factors rather than candidate supply. For example, Esteve-Volart and Bagues (2012) suggest that a lack of political competition leaves room for party organizations to recruit fewer women than what voter prefer. This implies that a gender quota might raise voter welfare if it is consistently implemented in all districts, which is indicated in Casas-Arce and Saiz (2015). 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 (2014) study Italy and show that the education of male and female politicians both went up with a quota which mandated each gender to make up at least one third of the candidates on party ballots. This way, our results are related to theirs.

The remainder of the paper is organized as follows. In the next section, we provide some background on the empirical context. Section 3 lays out a simple model where party leaders of different competence select the competence composition of the ballot so as to trade off electoral success against their own survival. Section 4 discusses data, measurement, and confronts the prediction from our simple model with data from Sweden. In Section 5, we discuss the introduction of the Social Democratic gender quota. We exploit the fact that the quota bound to a different degree across municipalities to estimate its effect on the competence of politicians, on men and women and on leaders and followers. Section 6 draws on the empirical findings to extend the simple model from Section 3 in two directions. Section 7 concludes.

## 2 Context

This section summarizes some basic features of Swedish local politics, which serve as background to the analysis. 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. Our paper focuses on the municipalities.

[Figure 1 here]

**Municipalities** 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 micro-cosmic parliamentary system where each local party organization determines the composition of its own electoral ballot.

Elections are held every four years (every three years prior to 1994) and parties obtain seats in proportion to their vote shares. Municipal elections are synchronized with those at the higher levels, with a 80-90 percent turnout among eligible voters. Party lists were traditionally closed with an order of candidates decided by the local party.<sup>7</sup>

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 and 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 political 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 have 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 Social Democrats, the Left Party and the Green Party to the left, and the Christian Democrats, the Center Party, the Liberal Party, and the Conservatives to the center-right.<sup>8</sup>

**Party leaders** Local party leaders control the composition of lists in the in Sweden's PR closed-list election system. Given the party vote share, 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 (in the Left party and the Social Democrats) or an internal primary among local party members (in the other parties). This step is administered by a selection committee. In a second step, the committee uses the results to put

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<sup>7</sup>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.

<sup>8</sup>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. In addition to the parties in the two blocs, two anti-immigration parties have had a substantial presence in the municipal councils during our time period, New Democracy in the 90s, and the Sweden Democrats in the 00s.

together a preliminary list. Finally, this list is subject to a vote in a party-member meeting.

Local party leaders 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 support their preferred candidate(s) in the internal nomination or primary, but nominations and votes are heavily influenced and coordinated by senior party members and leaders. 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 (Soininen and Etzler, 2006). Rank-and-file members also lack much influence at the final stage, a vote at the member meeting, where few changes are typically made.

Figure 2 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 2 here]

### 3 A Simple Model

Leaders of two political parties in a PR election *choose* the candidates to appear on closed party lists. Prospective candidates differ in their competence. 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: greater competence may please voters, but threatens party leaders who are more likely challenged by more able candidates.

**Basic structure** Two *parties*, labeled  $K = D, B$  (for Social Democrats and Bourgeois), participate in an election for a municipal council. Politicians come in two *types*: competent and mediocre. The utility of voters is increasing in competence. We consider the special case when the proportion of competent candidates  $r_K$  on the party list is invariant to the number of seats won. This is equivalent to assuming that the fractions do not vary within the segment of the list where candidates have a realistic probability of getting elected.

Each party has a *leader* with competence  $l_K \in [0, 1]$ , a higher  $l_K$  denoting more competence. Below, we will assume that leader survival is stochastic, due to a "popularity shock"  $\varepsilon$ , but increasing in the leader's competence relative to his followers.

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

$$c_K = \alpha l_K + (1 - \alpha)r_K. \tag{1}$$

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

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

1. Each party  $K$  has a leader with competence  $l_K$ .
2. Each incumbent leader chooses the share of competent candidates  $r_K$ .
3. The council election is held.
4. A popularity shock  $\varepsilon$  for each leader is realized, followed by a leadership contest in each party where the leader's chance of survival is increasing in  $l_K - r_K$ .
5. Payoffs are realized.

**Stage 4: Leadership contest** The leader survives if

$$r_K - l_K + \varepsilon < 0.$$

Suppose that  $Q(\cdot)$  is the c.d.f. of the popularity shock  $\varepsilon$  which is symmetrically distributed around zero with log concave density  $q(\cdot)$ . The probability of surviving as leader is thus  $Q(l_K - r_K)$ . Note that the resilience shock is not known at list-design stage 2.

**Stage 3: Council election** Voters cast their ballot based on the utility they derive from policy of the elected party, which is simply  $v_K = c_K$ . Competence is a valence issue: all voters like more competent candidates in equal measure. Voters do not pay any attention to the survival power of leaders, beyond their competence, as survival power *per se* is not policy relevant. Preferences directly over elected politicians are consistent with a citizen-candidate model – in the style of Osborne and Slivinski (1996) and Besley and Coate (1997) – where politician types map into policies via an unmodeled bargaining procedure after the election.

We can study competition for voters in a standard probabilistic voting model. This is summarized by an increasing function for the probability that party  $D$  wins:  $P(v_D - v_B)$  where  $v_D$  and  $v_B$  are the utilities offered by the two parties. Under some regularity conditions, the density  $p(\cdot)$  of this function has a single maximum at  $v_D = v_B$ .

**Stage 2: List design** The list is chosen by the incumbent leader. To fix ideas, consider the choices by the leader in party  $D$ . Since competence is a valence issue, and there are no issues of representation, choosing competence is equivalent to choosing  $v_D = \alpha l_D + (1 - \alpha) r_D$ . We assume that the leader gets ego rents  $e$  from holding the leadership, and utility  $E$  normalized to 1 from the party winning the election. His expected payoff when choosing  $r_D$  is thus

$$\tilde{V}(l_D, r_D) = Q(l_D - r_D) e + P(\alpha l_D + (1 - \alpha) r_D - v_B).$$

The first-order condition for an interior solution, given  $l_D$  and a given value of  $v_B$ , is

$$-q(l_D - r_D)e + (1 - \alpha)p(v_D - v_B) = 0. \quad (2)$$

There is a trade off: a higher  $r_D$  increases the chance of winning externally, but increases the chance of losing internally. With a parallel condition for party  $B$ , we have the following prediction:

**Prediction** *In any political equilibrium, more competent leaders pick more competent candidate lists.*

**Proof.** The second-order condition is

$$-q'(l_D - r_D)e + (1 - \alpha)^2 p'(v_D - v_B) < 0,$$

which is more likely to hold if  $r_D < l_D$  since this gives  $q'(l_D - r_D) > 0$ . An interior optimum may require that  $e$  is big enough. To see the effect of higher leader competence, use Cramer's rule to get

$$\begin{aligned} & \begin{bmatrix} -q'(l_D - r_D)e + (1 - \alpha)^2 p'(v_D - v_B) & -(1 - \alpha)^2 p'(v_D - v_B) \\ -(1 - \alpha)^2 p'(v_D - v_B) & -q'(l_B - r_B)e + (1 - \alpha)^2 p'(v_D - v_B) \end{bmatrix} \begin{bmatrix} dr_D \\ dr_B \end{bmatrix} \\ &= \begin{bmatrix} -q'(l_D - r_D)e \\ 0 \end{bmatrix} dl_D. \end{aligned}$$

Let

$$\begin{aligned} \Delta &= [-q'(l_B - r_B)e + p'(v_D - v_B)] [-q'(l_B - r_B)e + (1 - \alpha)^2 p'(v_D - v_B)] \\ &\quad - [(1 - \alpha)^2 p'(v_D - v_B)]^2 \end{aligned}$$

which must be positive for a stable equilibrium (Routh-Hurwitz). Thus

$$\frac{dr_D}{dl_D} = \frac{[-q'(l_B - r_B)e + (1 - \alpha)^2 p'(v_D - v_B)] [-q'(l_D - r_D)e]}{\Delta} > 0.$$

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For reference in Section 6, define the equilibrium maximized payoff for a given  $v_B$  as

$$V(l_D) = \text{Max}_{r_D} \{ [Q(l_D - r_D)]e + P[\alpha l_D + (1 - \alpha)r_D - v_B] \}.$$



## 4 Data and Results for Competence

Central to the model in the previous section is the idea that politicians differ in their competence. We now discuss how to construct a measure of competence, which we will use to evaluate the main model prediction.

**Linking data sets** Our data originate from party ballots from the Swedish Election Authority. These data cover nine waves of elections (1982 to 2010) across the 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), and about 13,000 persons are elected to a municipal council. For the full period, the sample contains 202,536 unique politicians, out of which 53,218 have been elected at least once. Social Democrats make up the lion's share, roughly 40 percent, of those elected. Thus, each municipal council has a substantial Social Democratic delegation, exceeding ten elected politicians in more than 95 percent of council-elections.

Party ballots must be reported to the Electoral Agency and include the mandatory personal identification number of every politician. These numbers were linked (after ethical approval) to a host of background variables from the administrative registers kept by Statistics Sweden. This gives us highly reliable information on income, education type and length, age, sex, and occupation. From another register, we also have evaluation scores from the military draft (further details provided below). The register variables are available for the full sample period and are thus not limited to the politicians' time in elected office.

Besides our dataset for politicians, we also have access to the same variables for the entire working-age population and for the whole time period. The population data are used to calculate our main competence measure, which is discussed next.

### 4.1 Measuring Competence

Previous studies have proxied the quality or competence of politicians by their income or educational attainment.<sup>9</sup> Although such measures can capture certain aspects of technical competence and qualifications, they tend to confound competence with representation (e.g., Carnes 2013). A good measure of political competence should capture key cognitive and non-cognitive skills which influence policy-making ability, independently of socioeconomic type. To reflect this, we develop a new measure of competence which is estimated as an individual's earnings relative to other people of similar age and similar labor market characteristics, i.e., experience and occupation. Thus we implicitly assume that a voter prefers to be represented by the most competent politician from a similar social background as herself.

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<sup>9</sup>See, for example, Merlo et al. (2010), Besley and Reynal-Querol (2011), Galasso and Nannicini (2011), and Baltrunaite et al. (2014).

**Estimating a Mincer regression** Our specific competence measure comes from the residuals of a Mincer regression, defined over a large set of socioeconomic characteristics.<sup>10</sup> This equation is estimated on each annual cross-section between 1990 and 2012. We use these estimates to construct a residual for each individual in each year. Then, we take the average of each person's residuals across different years to reduce idiosyncratic variation in earnings. Concretely, we estimate:

$$y_{i,t} = f(\text{age}_{i,t}, \text{educ}_{i,t}, \text{empl}_{i,t}) + \alpha_m + \varepsilon_{i,t}, \quad (3)$$

where  $y_{i,t}$  is the disposable income for person  $i$  in year  $t$ . Comparable labor-market experiences are constructed by interacting a range of binary indicators with each other. We create indicators for age (for five-year intervals), education (a dummy for tertiary education or above) and employment sector (13 one-digit industrial codes<sup>11</sup>). Function  $f$  captures the fact that the estimation includes a fixed effect for each possible interaction. Our Mincer regression also includes municipality fixed effects  $a_m$  to capture systematic income differences over regions or between urban and rural areas. This flexible approach captures earnings-tenure profiles between sectors and by education.<sup>12</sup>

To minimize the possibility of measurement error and endogeneity in this procedure, we drop observations for politicians in all years they hold a full-time political appointment, and in all years after they leave this post.<sup>13</sup> To avoid confounding competence with labor-market behavior driven by gender norms or retirement behavior, we estimate equation (3) separately on subsamples reflecting gender and retirement status (whether or not individuals are aged over 65).<sup>14</sup>

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<sup>10</sup>See e.g., Heckman (2006) for a discussion about Mincer earnings regressions.

<sup>11</sup>These are the same as the European NACE code and international ICIC code, namely: "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 restaurants", "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" contain fewer than 30 individual-year observations. 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".

<sup>12</sup>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 (3) without the education and occupation controls. The results for this robustness check is contained in the Web Appendix.

<sup>13</sup>We also exclude all earnings observations for politicians who move on to a seat in the national parliament.

<sup>14</sup>More than 30% of the women who work, do so part time compared to less than 10% of the men. Women also take parental leave and engage in care activities that drive an increase in the gender pay gap when couples that have children. Kleven et al. (2015) show that the female child penalty in earnings increases in the relative skills of the woman compared to her spouse. Estimating (3) for retirees is not straightforward. Even though pensions reflect an individual's former earnings potential, we do not have a current employment sector. Thus, we compute their income residual based on the sector in which they were employed during the majority of their working-life. For those who retire during the sample period, we can only include the years during which they belong to the workforce when we calculate the average of their residuals as the final competence score.

**A binary competence measure** After computing the average residuals across time for each individual in the population from the annual estimates of (3), we construct standardized  $z$ -scores for elected politicians in each party. We differentiate by party to reflect the fact that parties recruit members and candidates from different social strata which may or may not be fully captured by the control variables in the Mincer regression. Thus, our approach allows us to analyze selection within parties.

In the empirical analysis, we measure the share of competent followers  $r_K$ , and leadership competence  $l_K$ , based on a binary indicator of competence. This classifies a politician as competent if her income residual is above the median residual of all elected politicians in her party, and as mediocre otherwise. Leader competence  $l_K$  is the average of this binary indicator among the *top-three* politicians on each party ballot.<sup>15</sup> The share of competent followers  $r_K$  is the average of the binary variable over all elected politicians excluding the top three.

Apart from its consistency with the model, the binary measure is empirically attractive, because earnings could have a different variance within age-education-employment sector cells, and this variance could be correlated with earnings levels. This would be true, for example, if highly educated individuals in the financial sector have greater wage dispersion in the late 90s as some become CEOs. A continuous measure of competence would then still reflect the level of income, something we would wish to avoid.

As a means of validating this competence measure, we now show that it: (i) predicts political success for the average politician and (ii) correlates positively with the scores from ability tests in the Swedish military draft system (for male politicians).

**Validating competence by political success** We use four measures of political success. The first gauges voter support as the number of preference votes obtained by each politician as a fraction of local party's total. This data is available since 1998 when voters were allowed to cast a single and voluntary preference vote for one person on their selected ballot. The second measure is a dummy variable denoting whether a politician is re-elected in the next election, and zero if he or she is not. It provides a direct measure of career advancements via the seniority system (Folke and Rickne, forthcoming, motivate the use of this measure). The third measure of political success is a continuous measure of a politician's list rank, where lower numbers signify a higher position on the ballot. The fourth is a dummy variable for being the top-ranked (#1) politician on the party ballot. This rank is usually reserved for chairpersons of the municipal council board, in majority parties, or party-group

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<sup>15</sup>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, commonly referred to as the leadership "troika" in local Swedish politics. 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 who was already in office in our first election year (1982) and for whom we lack pre-appointment observations of his or her earnings. Because the Social Democrats make this appointment in a large number of municipalities, and this party is the one for which we study the gender quota below, we need to measure leadership competence for more than a single politician.

leaders in minority parties.<sup>16</sup>

We estimate the following regression:

$$x_{i,t} = \beta c_i + \phi_{i,t} + \epsilon_{i,t} , \quad (4)$$

where  $x_{i,t}$  is one of our measures of political success. While political success is mostly measured in the election at  $t$  (list rank, being top ranked, or preference vote share), re-election occurs in the election at  $t + 1$ . Parameter  $\beta$  captures the correlation between our binary competence measure  $c_i$  and the dependent variable. When we measure political-success as preference vote share or re-election, we can compare specifications with and without fixed effects for list rank,  $\phi_{i,t}$ . This control is particularly important for preference votes, as voters may cast such votes for top-ranked candidates by default (Montabes and Ortega, 2002, Folke, Persson and Rickne, 2015), which could conflate our estimate of  $\beta$  since income residuals are positively correlated with list rank.

The results from running equation (4) appear in the first six columns of Table 1. We find positive and statistically significant correlations between the competence measure and all four dependent variables, correlations that also survive controls for the list-rank fixed effects. In the case of preference votes in column (1), competent politicians earn 0.7 percentage points more preference votes than medicare politicians. Holding list rank constant in column (2), this estimate is reduced to 0.21 percentage points. These estimates provide strong evidence that our competence measure predicts direct voter support, in line with in our model assumption that voters value competence.

The estimates in columns (3) and (4) show that our competence measure is a strong predictor of a having a longer political career. In Columns (5) and (6), we find that competent politicians have positions higher up on the party list and that they are more likely to occupy the top slot. Being competent is associated with a 4 percentage points higher probability of becoming (or remaining) top ranked. Taken together, the results in Table 1 show that our income residuals are relevant for politics as well as for market returns.

[Table 1 here]

**Validating competence by enlistment tests** We now examine how our competence measure is correlated with the scores from ability tests conducted in the Swedish military draft system, which used to be mandatory for all 18-year old men. Two test scores are used. The first is a written test that evaluates cognitive ability by combining tests of logical, verbal and spatial ability into a general score from 1 to 9.<sup>17</sup> This test is similar to the armed forces qualifying tests (AFQT) in the US and

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<sup>16</sup>As further discussed in Folke, Persson, and Rickne (2015), data from a large mandatory survey of all post-election appointments made by local parties in the 2006 and 2010 elections shows that the top-ranked politician on the largest majority party’s ballot was appointed to the position of chairperson of the municipal council board (the equivalent of mayor) in 9 out of 10 cases.

<sup>17</sup>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.

is commonly perceived as a good measure of general intelligence (Carlstedt, 2000).

The second test is based on an interview with a trained psychologist who follows a specific (though secret) manual to decide which topics to discuss and how to grade the responses. The objective of the interview is to determine a conscript's psychological capacity to deal with military duty and armed combat, especially his ability to cope with stress and to foster group cohesion. A conscript with a high score is considered to be emotionally stable, persistent, socially outgoing, willing to assume responsibility, and able to take initiatives. Motivation for military service is not considered. Grades on four different sub-scales are turned into a discrete 1 through 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 the cognitive and non-cognitive tests are both excellent predictors of labor-market performance (see e.g., Lindqvist and Vestman, 2011).

We use each of the enlistment variables as the dependent variable in regression (4) and estimate the correlation in a sample of all men born between 1951 and 1979.<sup>18</sup> Estimates are presented in columns (7) and (8) of Table 1. They show that men considered competent according to our binary measure have significantly higher average scores on both tests, a 0.26 points higher average on the cognitive test and a 0.39 points higher average on the leadership test. This corresponds to 14% of a standard deviation for the cognitive score, and 23% of a standard deviation for the leadership score, in the full population.

## 4.2 Empirical Results on Competence

The model in Section 3 predicts a positive correlation between leadership competence in party  $K$ ,  $l_K$ , and the share of competent followers in that party,  $r_K$ . To examine this correlation, we consider all parties with more than eight elected representatives in each election between 1982 and 2010. Nearly all (99%) of the Social Democratic groups meet this size restriction. For other parties, it excludes around 25% of the observations. Although a threshold of eight is somewhat arbitrary, this sample restriction allows us to compare Social Democratic groups to other groups of comparable size. It also gives a meaningful distinction between political leaders and followers, which makes less sense for smaller groups.

**Leadership and follower competence** Guided by our model, we measure  $l_K$  by the average competence of the incumbent leadership (the top-three politicians on the list) in place in the *previous* election, and  $r_K$  by the share of competent politicians further down the list in the *current* election. We then use OLS regressions to relate the selection of followers to the competence of the leadership.

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<sup>18</sup>For these cohorts, enlistment was mandatory and exceptions were only made for physically and mentally challenged recruits. For cohorts after 1979, the draft was still mandatory de jure, but largely optional de facto.

The resulting correlations are presented in Table 2. Column (1) shows a strong pair-wise correlation. In column (2), we regress follower competence on the average competence among the current, rather than the past, top-three candidates on the list. As implied by the model, this competence correlation is weaker than that between current followers and the previous leadership.

[Table 2 here]

In column (3), we include both the current and lagged leadership competence measures. Here we find that the lagged measure is more important, while current competence becomes statistically insignificant with a point estimate that drops to nearly zero. Column (4) shows that the correlation does not simply reflect strong autocorrelation among the followers.

Column (5) addresses the natural concern that some omitted municipality characteristic simultaneously drives the selection of leaders and followers. We create interacted fixed effects for all parties and municipalities and include these in the regression equation. In this specification, the correlation between lagged top-three competence and follower competence just reflects time variation within local parties. Importantly, our estimate survives this specification. It also survives in column (6), for an alternative specification with interacted fixed effects for municipalities and election periods.

In columns (7) and (8), we replace the outcome variable by the average follower competence in terms of the cognitive enlistment score and the leadership enlistment score, respectively. The estimated correlation is equally strong for these alternative competence measures.

Taken together, the results in Table 2 demonstrate a strong correlation between the competence of elected politicians further down the list and the competence of the leadership, in line with the prediction from our simple model.

## 5 The Gender Quota

We now discuss the gender quota which was introduced by the central party board of the Social Democratic party and imposed on all of its 290 local parties. We will show that the competence of a local party's elected politicians is related to the "bite of the quota", defined for each municipality as the change in the proportion of women among the elected Social Democratic in 1994 (the first election of the quota) compared to 1991 (the last election before the quota). We analyze how this quota bite was related to the competence of men as well as women, and leaders as well as followers.

### 5.1 Background Facts

Following the global pattern, men historically held a monopoly over political office in Sweden, while women lacked the rights to vote or to run for office. Although modern-day Sweden is a world leader in women's descriptive representation, men continued to dominate 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. In 1991, the last election before the Social Democratic quota, men held 79 percent of the top-ranked positions (82 percent in the Social Democratic party).

**Gender quotas in Sweden and beyond** More than one hundred countries worldwide have adopted some kind of gender quota to increase women's descriptive representation. Quotas take different forms, but some are more effective than others. Some party policies or national quota laws only dictate that a certain share of the candidates should be women. With such quotas for the electoral ballot rather than for elected politicians one often find the required share of women towards the bottom of the list (see e.g., Norris, 2004 and Krook, 2010, and for evidence on Spain, Casas-Arce and Saiz, 2015, and Campa, 2011). More effective quotas include placement mandates that require women to be placed in certain electable positions on the ballot.

All Swedish parties have voluntarily adopted strategies to improve gender parity of its political candidates. These strategies have ranged from goals and recommendations (center-right-bloc parties) to quotas with placement mandates (left-bloc parties).

**The Social Democratic zipper quota** The Social Democrats began by targeting the share of women among its nominated politicians, giving recommendations of 40 and 50 percent respectively for the 1988 and 1991 elections. Only in 1993 – after a credible threat from an outside group to form a feminist party, which would have claimed a fraction of both politicians and voters from the party – did it adopt a placement mandate. Specifically, all electoral ballots were to be "zipped" by gender, alternating men and women throughout the entire list of nominees. The decision about this quota was taken by the central party board and imposed on all local parties. Figure 3 gives an example of a zippered ballot from the Social Democratic party (in 2006).

[Figure 3 here]

The top panel of Figure 3 shows *average levels* of the shares of elected women in Sweden's three largest parties over time and across the 290 municipalities. It illustrates the effectiveness of the Social Democrats' zipper quota in raising female representation relative to parties that did not introduce quotas. The average share of elected women went up dramatically in the 1994 election<sup>19</sup>, by about 10 percentage points, whereas the party's recommendations of 40 and 50 percent women (in 1988 and 1991) had been far less effective. The graph also shows much smaller increase in the shares of elected women in the two next largest parties, the Conservative and Center parties, after their recommendations of a 50% share in 1994 and 1998 respectively, by 2.5 and 1 percentage points.

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<sup>19</sup>Indeed, deviations from 50% female representation after the quota is explained mostly by randomness in election outcomes: some local party groups obtain an odd number 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.

The bottom panel of Figure 3 illustrates the same point by showing the *distribution of changes* in the share of elected women over all municipalities in the years that the three parties implemented the changes. Clearly, the graph shows that the Social Democratic zipper quota was more effective than the recommendations in the other two parties. Within the Social Democrats, the quota bite also varied across municipalities; the smallest changes were a fall in the share of women by a few percentage points, while the largest amounted to an increase by around 30 percentage points. It is this variation in the bite we will use to analyze the impact of the quota on the selection of politicians.

[Figure 4 here]

## 5.2 Empirical Results on the Impact of the Quota

The model in Section 3 ties the evidence in Section 4 to the leader's competence. But these cross-municipality (and within-municipality) correlations might conceivably reflect a common (time-varying) omitted factor which drives leadership competence and the fraction of competent politicians. The quota introduced by the Social Democrats can help to cut through this concern, as it offers a different window on the relationship between the competence of leaders and followers. Specifically, the "shock" of the new quota may have disrupted the cosy dominance enjoyed by mediocre male leaders.

There are good reasons to think that the quota affected mediocre male leaders in particular. Support for such leaders may have dropped disproportionately when the quota was introduced. Moreover, as argued by Murray (2014), a quota reduces the number of elected seats available for men. With fewer seats to distribute, the quota may have limited the ability of mediocre leaders to nominate mediocre followers to sustain their continued leadership. These disruptions are likely to have been larger where the quota bite – measured as the change in the share of elected women from 1991 to 1994 – was larger.

There is also evidence that internal opposition to male leaders was organized in part along gender lines. In particular, the Women's Branch of the Social Democrats had lobbied for a gender quota ever since the organization was created in the early 1900s, and was intent on making the most of this policy when it was finally attained. A handbook was distributed to all local parties with guidelines on how to transform "numbers" to "influence". An important part of this strategy was to have women replace men in positions of power.<sup>20</sup>

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<sup>20</sup>In one section, 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). O'Brien and Rickne (forthcoming) document that the quota indeed had a positive impact on the probability of female leadership



**Competence and the quota – simple difference in differences** In Table 3 we start by examining the impact of the quota on average competence, and by gender. It shows the results from simple difference-in-difference regressions, where the bite of the quota is interacted with a dummy for the post-quota period (1994-2010). Specifically, we estimate the following regression for all election years:

$$r_{m,t} = \Delta w_{m,94-91} \times \rho_t + \alpha_m + \varepsilon_{m,t}. \quad (5)$$

The dependent variable  $r_{m,t}$  is a measure of competence among either (1) all elected Social Democrats; (2) male elected Social Democrats; or (3) female elected Social Democrats, in municipality  $m$  at election time  $t$ . The quota bite variable  $\Delta w_{m,94-91}$  is interacted with  $\rho_t$ , a dummy variable which is equal to one for all elections after 1991. All regressions include municipal fixed effects,  $\alpha_m$ . This means that we exploit the randomness over time in the quota reform, estimating the pre-post selection difference within the same municipality as it relates to the size of the quota bite. We also show the results with and without municipality-specific (linear) time trends.

We focus on municipalities with a male politician on top of the ballot in 1991, whose nomination decision for the 1994 electoral ballot was constrained by the quota. This restriction removes around 60 local parties (20% of the sample). We also exclude from the sample the 20 local parties that did not comply with the quota (here defined as having below 40% elected women 1994), a restriction that reduces sample size by an additional 7%.<sup>21</sup>

[Table 3 here]

For the selection of all politicians in columns (1) and (2), the results show a positive and significant impact, as long as municipality time trends are included in the regression equation. However, we can also study separate effects by gender: columns (3) and (4) for men vs. (5) and (6) for women. These estimates clearly show that the full-sample finding mainly reflects an improvement in the selection of men. The coefficient in column (4) is 0.383, which means that a 10 percentage point larger quota bite (equal to the cross-sectional average for all municipalities) raised the proportion of competent men by 3.8 percentage points. Given an average of 50 percent competent politicians in the average municipality (by definition, from the normalization), this corresponds to an 8 percent increase in the share of competent men.

For women, we obtain a negative coefficient in the regression specification without municipality trends, but a positive coefficient when trends are included. In neither case, however, is the estimate statistically different from zero, suggesting that the quota had neither a positive nor a negative impact on the selection of competent women. This is interesting in view of the meritocratic critique of gender quotas mentioned in the introduction, namely that raising the share of women through a quota must necessarily come at the price of a worse selection of women.

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in the local parties.

<sup>21</sup>In the robustness analysis below, we show that our results exist in the full, un-restricted, sample as well.

**Competence and the quota – dynamic difference in differences** Given that our data covers a long time period after (and before) the quota was introduced, we can also examine the evolution of the quota impact over time. For this purpose, we estimate:

$$r_{m,t} = \beta_t \Delta w_{m,94-91} \times elec_t + elec_t + \alpha_m + \varepsilon_{m,t} , \quad (6)$$

This specification includes dummy variables for each election year, denoted by  $elec_t$ , and for each municipality, denoted by  $\alpha_m$ . The coefficient of interest is now  $\beta_t$  which captures the relationship between the quota impact,  $\Delta w_{m,94-91}$ , and being in a specific election year  $t$  after (or before) the quota was introduced. We leave out the 1991 interaction variable to make the immediate pre-quota election year the reference category – i.e., we normalize  $\beta_{91}$  to 0. As we do not expect municipalities with a larger quota impact to experience any effect on competence prior to the quota, the coefficients  $\beta_{1982}$ ,  $\beta_{1985}$  and  $\beta_{1988}$  should be insignificant and/or close to zero. Coefficient  $\beta_{94}$  gives the impact effect of the quota, and the coefficients  $\beta_t$ , for  $t > 1994$ , should be similar in sign and magnitude to  $\beta_{94}$  if the zipper quota had a paramount effect on selection.

Our estimation results are illustrated graphically in Figure 5, which examines men and women combined (the left graph), as well as separately (the right graph). The plotted estimates of  $\beta_t$  for the pre-quota era – the 1982, 1985 and 1988 election periods – show that we should not be concerned about pre-trends. The estimates are close to zero, lack statistical significance, and do not show any systematic temporal pattern. This strongly suggests that our estimated effects are causal and not confounded by pre-trends in the outcome variable(s) prior to the quota adoption.

Figure 5 also adds further insights about the effects of the quota. First, competence improved immediately upon the introduction in 1994. This effect is statistically significant for two more elections thereafter, a total period of 12 years. As the right graph shows, the improved selection was limited to male politicians. This is in line with the simple pre-post difference-in-differences results in Table 3.

Another intriguing pattern is that the coefficient on overall selection is close to zero for the last two elections. But this masks a gender difference, where the estimates for the men are still positive but insignificant, while the estimates for women are negative but insignificant. This time path could be driven by a decline in the competence-selection among both men and women in municipalities with a large quota bite. While this is an interesting possibility, we leave a further exploration of these dynamic developments for future research.

[Figure 5 here].

**Competence and the quota – leaders and followers** We next examine whether the selection of leaders and followers were differentially impacted by the quota bite. Given the results in Table 3 and Figure 5, we expect any effects to be dominated by the selection on male politicians. Table

4 largely confirms this expectation. Here, we repeat the same difference-in-differences exercise as in Table 3, but separately for politicians in the top-three slots on the ballot – the leaders – and those below – the followers. Pane A shows the results for all politicians, while pane B shows them for men only.

The positive coefficients indicate that selection improved in both groups. However, for politicians of both sexes, the only statistically significant estimate is that for followers in the specification with municipality-level trends. For male politicians, again only one coefficient is statistically significant, but this time it is the one for followers in the specification without municipality trends. This suggests a weak tendency for a stricter quota to induce more competent politicians, especially among male followers.

[Table 4 here]

More can be learned from period-by-period estimation. In Figure 6, we use the same graphical approach as in Figure 5, plotting the point estimates and their standard errors. Comparing the left and right graphs, we see that the effects are driven by quota’s impacts on the men. The figure paints a pretty clear picture, namely a positive impact of the quota bite on leaders as well as followers, but with a different temporal pattern. For leaders, we see a large positive impact in 1994, the first election with the quota. For followers, the improved competence instead appears in 1998 and 2002, i.e., in the two subsequent elections. In addition, and like in Figure 5, both groups record smaller estimates that lack statistical significance in the two last elections of the sample period, 2006 and 2010.<sup>22</sup>

[Figure 6 here]

**Competence and the quota – impact via resignations** It is intriguing that leader competence improved upon the introduction of the quota. Since the higher competence among 1994 leaders is measured relative to 1991 leaders, it could potentially reflect party leaders resigning. To explain the results in Figure 6, such resignations would have to occur immediately after the quota introduction. Therefore, we use period-by-period estimation to analyze resignations.

We create new outcome variable  $s_{i,t}$  that takes a value 1 if politician  $i$ , elected to the top-three on the electoral ballot in period  $t - 1$ , resigns in election  $t$ . Resignation is measured by a particular person disappearing from the ballot in election  $t$ . To examine whether male mediocre leaders resign, we create a measure of *mediocrity*, a dummy variable denoted  $l_i$ . We then run the following regression:

$$s_{i,t} = \beta_t(\Delta w_{m,91-94} \times elec_t \times l_i) + (elec_t \times l_i) + (\Delta w_{m,91-94} \times l_i) + (\Delta w_{m,91-94} \times elec_t) + (a_m \times l_i) + l_i + elec_t + \alpha_m + \varepsilon_{i,t} . \quad (7)$$

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<sup>22</sup>A corresponding figure for the selection of female leaders and followers is shown in the Appendix, Figure W2.

The mediocrity variable,  $l_i$ , is interacted with the quota bite,  $\Delta w_{m,91-94}$ , the dummies for election periods,  $elec_t$ , as well as all interactions between these variables. We are particularly interested in coefficient  $\beta_{94}$ , which captures the resignation of mediocre leaders *relative to* competent leaders in the first election under the quota compared to the relative resignation rate in the reference year, 1991. Thus, a positive coefficient implies that a stricter quota increased the relative resignation probability of mediocre leaders.

Results are illustrated graphically in Figure 7. The right-hand graph reports the coefficients from (7), while the left-hand graph reports separately estimated resignation probabilities for competent and mediocre leaders.

[Figure 7 here]

A stricter gender quota increased the resignation rate of mediocre leaders in the three elections following its implementation. The left figure shows a clearly higher resignation rate among mediocre leaders than among competent leaders, which is statistically significant at the 5 percent level in these three elections. In 1994, the point estimate suggests that a 10 percentage point larger quota bite led to a 11 percentage point higher resignation probability for mediocre leaders than for competent leaders.

It thus seems that many mediocre leaders left immediately in the places where the quota was really going to bind, which increased leader competence in these municipalities already in the 1994 election. Following the logic of the model in Section 3, we might expect that this initial boost in competence made the new competent leaders appoint more competent followers in subsequent election periods, in accordance with the empirical pattern observed in the right part of Figure 6.

**Auxiliary findings and robustness** In the Web Appendix, we discuss and analyze some additional issues. First, we do not find any impact of the quota on the Social Democrat’s electoral success (Table W1 and Figure W1). Second, we ask if higher male competence is a mere consequence of a smaller number of men elected after the quota and find this not to be the case (Table W2). Third, we rule out that the improvement in male competence reflects a supply effect related to the quota bite (Table W3).

We also discuss and report on some robustness tests. First, we demonstrate that the main results essentially remain when we drop the sample restrictions discussed above (Table W4). Second, we show that the results are robust to measuring the quota bite as the difference between the share of women elected in 1991 and 0.5, rather than the share of women elected in 1994, (Table W5). Third, we try to rule out that our basic measure of quota bite is correlated with a shock to the demand for competent men by showing that the main results hold up when we control for a number of economic and political municipal characteristics interacted with all election-year dummies (Table W6). Fourth, we show that the Social Democratic quota did not have any important spillover effects

on other political parties (Table W7). Fifth, and finally, we find that our main result remain when we use the leadership score as the dependent variable, rather than the average residual from the Mincer regression (Table W8).

**Summary** In this section, we have shown that a larger bite of the Social Democratic gender quota raised the quality of the party’s elected candidates. The higher competence seems to derive entirely from the selection of male politicians, with no significant deterioration (or improvement) of female competence. A careful look at the time patterns, and at leaders vs. followers, reveals that the competence of male party leaders went up in the first election under the quota, while the competence of elected male followers only went up in the next few elections. Upon closer inspection, the immediate improvement in leadership competence reflected a larger than usual resignation rate among mediocre leaders.

## 6 Making Sense of the Results

The simple model we presented in Section 3 does not have any place for gender or for leader resignations. We now extend the model with these features to interpret the effects of the quota documented in the previous section. As we will show, leader resignations can indeed play a central role in explaining our findings for the competence of male leaders and followers following the introduction of the quota.

**Extending the model** In the extended model, politicians are either male or female. As in the data, we focus on male party leaders. The share of women on the ballot of party  $D$  is denoted by  $w_D$ . This share is chosen by party leaders at stage 2 along with  $r_D$ . In analogy with the assumption in the core model, we assume that the choice of  $w_D$  is unaffected by the number of seats won by party  $D$ .<sup>23</sup>

The representative voter has the following policy utility from having party  $D$  in power

$$v_D = \alpha l_D + (1 - \alpha)r_D + \mu(w_D) \ ,$$

where  $\mu(\cdot)$  is a concave function with a maximum at  $1/2$ , meaning that the average voter not only likes party competence but also likes gender equality. Throughout this section, we focus on a partial-equilibrium analysis, where  $v_B$ , the policy utility offered by party  $B$ , is held fixed. This theoretical simplification allows us to hone in the role of the gender quota, absent political competition. It also makes sense in view of the empirical results in the Web Appendix that the spillover effects of the Social Democratic quota to other parties were limited.

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<sup>23</sup>To keep the model as simple as possible, we let the leader choose competence and gender of the followers independently of each other.

**Leadership survival** Suppose now that the leadership survives at stage 5 if

$$\sigma(w_D, r_D) - l_D + \varepsilon < 0 ,$$

where  $\sigma(\cdot)$  is a "threat function" increasing and convex in both arguments. It follows that the leader's probability of surviving the leadership election is  $Q(l_D - \sigma(w_D, r_D))$

**The optimal choice of  $r$  and  $w$**  Now consider the optimal choice of the shares of female and competent politicians at stage 2. This gives first-order conditions

$$w_D: \quad -\sigma_1 q(l_D - \sigma(w_D, r_D))e + p(v_D - v_B)\mu'(w_B) = 0 \quad (8)$$

and

$$r_D: \quad -\sigma_2 q(l_D - \sigma(w_D, r_D))e + p(v_D - v_B)(1 - \alpha) = 0 . \quad (9)$$

The second of these determines optimal competence  $r_D^*$  along a similar tradeoff as in the simple model without gender. The first condition tells us that  $w_K^* < 1/2$ . Since there is a larger threat to survival with more women,  $\sigma_1 > 0$ , the leader chooses  $w_K^*$  on its upward-sloping part with  $\mu'(w_K^*) > 0$ .

**A quota in party  $D$**  Now consider the impact of a binding quota at 50% women. Thus, we assume that  $w_D = 1/2$ . To derive the impact on competence for  $w \geq w_K^*$  define  $R_D(w)$  from

$$\begin{aligned} & -\sigma_2(w, R_D(w, l_D))q(l_D - \sigma(w, R_D(w, l_D)))e + \\ & p(\alpha l_D + (1 - \alpha)R_D(w, l_D) + \mu(w) - v_B)(1 - \alpha) = 0 . \end{aligned}$$

Optimal choice of competence under a quota is thus  $R_D(1/2, l_D)$ . The change in competence from imposition of a quota is now given by

$$\Delta r_D = \int_{w_D^*}^{1/2} \frac{\partial R_D(w, l_D)}{\partial w} dw \cong \frac{\partial R_D(w_D^*, l_D)}{\partial w} \left[ \frac{1}{2} - w_D^* \right] ,$$

where  $\frac{\partial R_D(w_D^*, l_D)}{\partial w} = \frac{-\sigma_{21}q(l_D - \sigma(w_D^*, R_D(w_D^*, l_D))) + \sigma_2\sigma_1q'(l_D - \sigma(w_D^*, R_D(w_D^*, l_D)))e + \mu'(w_D^*)p'(v_D - v_B)(1 - \alpha)}{\sigma_{22}q(l_D - \sigma(w_D^*, R_D(w_D^*, l_D))) + (\sigma_2)^2q'(l_D - \sigma(w_D^*, R_D(w_D^*, l_D)))e - p'(v_D - v_B)(1 - \alpha)^2}$ . The sign of  $\frac{\partial R_D(w_D^*, l_D)}{\partial w}$  is uncertain without further assumptions about the cross-derivative of the threat function  $\sigma$  and the shape of the densities  $q$  and  $p$ . Whatever the sign, however,  $\Delta r_D$  is proportional to the quota bite, in line with the empirical specifications in Section 5.

We can also look at the impact of a quota on leadership survival, which is given by:

$$\Delta \sigma = \int_{w_D^*}^{1/2} \frac{d\sigma(w, R_D(w, l_D))}{dw} dw \cong \frac{d\sigma(w_D^*, R_D(w_D^*))}{dw} \left[ \frac{1}{2} - w_D^* \right] ,$$

which is also ambiguous due to the ambiguous sign of  $\partial R_D(w_D^*, l_D) / \partial w$ .

This first extension of the model thus suggests that the effects of the quota are indeed proportional to its bite. But it does not give a strong presumption about how a quota might affect competence and leadership survival.

**Timing with leader resignations** The extension above does not allow leaders to resign. We now explore this possibility by adding a resignation decision between stages 1 and 2 in the previous model timing:

1. Party  $D$  has a leader with competence  $l_D$ .
- 1.5 The incumbent male leader  $l_D$  may choose to resign, and if he does, a new male leader with competence  $z_D$  is drawn at random. Expected competence of the new leader is thus  $E(z_D)$ .
2. The leader chooses the share of competent candidates  $r_D$  and the share of women  $w_D$ .
3. The council election is held.
4. A popularity shock  $\varepsilon$  for the leader is realized followed by a leadership contest in each party, where the leader's chance of survival is increasing in  $l_D - r_D$ .
5. Payoffs are realized.

Let the equilibrium maximized payoff for a given  $v_B$  and  $w_D$  be

$$V(l_D, w_D, v_B) = \text{Max}_{r_D} \{ [Q(l_D - \sigma(w_D, r_D))] e + P[\alpha l_D + (1 - \alpha)r_D + \mu(w_D) - v_B] \}. \quad (10)$$

Note that

$$\begin{aligned} \frac{\partial V(l_D, w_D, v_B)}{\partial l_D} &= \left[ q \left( l_D - \sigma \left( \frac{1}{2}, R_D(w_D, l_D) \right) \right) \right] e \\ &+ \alpha p (\alpha l_D + (1 - \alpha)R_D(w_D, l_D) + \mu(w_D) - v_B) > 0, \end{aligned}$$

i.e., a more competent leader has a higher payoff if he chooses to remain in office.<sup>24</sup>

If the leader decides to resign at stage 1.5, his expected utility no longer includes the expected ego rents, only the expected payoff to the party from having another leader. In this event, a new leader with competence  $z_D$  will be picked randomly from the pool and choose optimal levels of  $\{r_D, w_D\}$ . Following a resignation and a new leader competence of  $z_D$ , the optimal choice of women solves:

$$W(z_D, k) = \max_{w \geq 0} \{ V(z_D, w_D, v_B) : w \geq k \},$$

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<sup>24</sup>If  $w_D = \arg \max_{w_D} V(l_D, w_D, v_B)$  then the envelope theorem assures that this is still the case.

where  $k = 1/2$  is the case with a quota and  $k = 0$  is the case without a quota. The expected payoff to the incumbent leader of resigning, and triggering a leader lottery, is therefore

$$\hat{V}_D(k, v_B) = E[P[\alpha z_D + (1 - \alpha) R_D(W(z_D, k), z_D) + \mu(W(z_D, k)) - v_B]], \quad (11)$$

where the expectation  $E$  is taken with respect to  $z_D$ . We assume that  $\partial \hat{V}(q, v_B) / \partial k \geq 0$  for all  $k \in [0, 1/2]$ , which says that the expected probability of winning the general election is higher when a leader faces a stricter gender quota. Moreover  $\frac{\partial V(l_D, W(l_D, k), v_B)}{\partial l_D} > 0$  for  $k \in [0, 1/2]$ .

**Equilibrium resignations** The incumbent decides whether to resign at stage 1.5 by comparing the continuation value without resignation  $V(l_D, W(l_D, k), v_B)$  from (10) with resignation  $\hat{V}_D(k, v_B)$  from (11). Define  $\hat{l}_D(k)$  implicitly by

$$V(\hat{l}_D(k), W(\hat{l}_D(k), k), v_B) = \hat{V}_D(k, v_B)$$

and suppose that  $\hat{l}_D(k) \in [0, 1]$  for all  $k \in [0, 1/2]$ . A leader with competence  $\hat{l}_D(k)$  is thus indifferent to resigning, whereas leaders with  $l_D < \hat{l}_D(k)$  resign. Moreover, for  $W(k, l_D) < k$ ,

$$\frac{\partial \hat{l}_D(k)}{\partial k} = - \left[ \frac{\partial V(l_D, W(k, l_D), v_B)}{\partial k} - \frac{\hat{V}_D(k, v_B)}{\partial k} \right] / \frac{\partial V(l_D, W(k, l_D), v_B)}{\partial l_D} > 0.$$

This implies that that  $\hat{l}_D(k)$  is increasing in the relevant range, so more leaders resign with a higher gender quota. The reason is that a leader who stays in office faces a greater threat to survival. Since mediocre leaders face the largest threat, they are the first to resign.

Therefore, the introduction of a gender quota will lead to more resignations of mediocre leaders. The shift in the resignation point for leader competence is approximately given by:

$$\hat{l}\left(\frac{1}{2}\right) - \hat{l}_D(0) \simeq \frac{\partial \hat{l}_D(0)}{\partial q} \left[ \frac{1}{2} - W(0, l_D) \right],$$

such that mediocre leaders resign more frequently where the quota bite is larger. Following *any* resignation, there is an expected increase in the competence of all politicians on the list.

We summarize the results as:

**Prediction** *The introduction of a quota raises the resignation rate for mediocre leaders, with a larger effect at a greater quota bite. The expected competence of politicians increases following such leader resignations.*

Our second extension of the model thus makes sense of the overwhelmingly positive, and immediate, effect of a gender quota on resignations of mediocre leaders. It also provides a mechanism by which followers on party lists become more competent following the introduction of a quota.



**Summary** The extensions of the simple model make clear why we should expect the effects of a gender quota to be proportional to the quota bite. They also show that quotas have theoretically ambiguous effects on competence, unless we consider departures of incompetent leaders through resignations. The theoretical findings in this section rhyme well with the empirical findings in the previous section. Resignations of leaders appears to be an important selection mechanism for quotas to improve generalized competence.

## 7 Conclusion

A failure to recruit competent politicians remains a concern in many democracies. Some contributors to academic and popular debates see the goals of representation and competence as conflicting. In debates about gender quotas, it is common to claim that supply constraints make quotas counterproductive by replacing competent men with mediocre women. Based on first principles and empirical evidence, we have argued that, on the contrary, quotas can increase the competence of the political class by reducing the share of mediocre men.

We have developed a model for the selection of candidate competence in a list system. Party leaders with mediocre competence fail to pick competent candidates as they worry about their own survival. When the share of women is increased by a mandatory quota, mediocre male leaders may be motivated to shift attention from surviving to winning the election. This can lead to leadership turnover and raise candidate competence.

One of the empirical contributions of the paper is to propose a new measure of competence, which is based on the earnings of politicians outside of politics, conditional on age, education, occupation, and time. This new competence measure is closely associated not only with political success but also with leadership and cognitive-ability scores from the military draft. With this measure in hand, we have explored the link between the competence of leaders and candidates further down the list, finding a strong link between the two.

We have also studied the causal impact of a gender quota on selection, finding that a stricter quota had a positive effect on competence, especially among men. Our analysis uncovers a distinct temporal pattern in the impact on leader and follower selection. The quota had an immediate effect on the selection of male leaders by triggering a wave of resignations of mediocre leaders. In subsequent elections, men at lower list ranks also became more competent, which could well be due to the preceding improvement in the leadership.

Our paper is part of a wider agenda that points to selection as a serious force in politics. It is important to understand political selection in a broader context, in particular the political motives to bring in more competent candidates. Of course, a gender quota may be important in its own right as a means of promoting equality in political representation. Our results suggest that a quota may also help disrupt some of the political forces that maintain the dominance of a mediocre male elite.

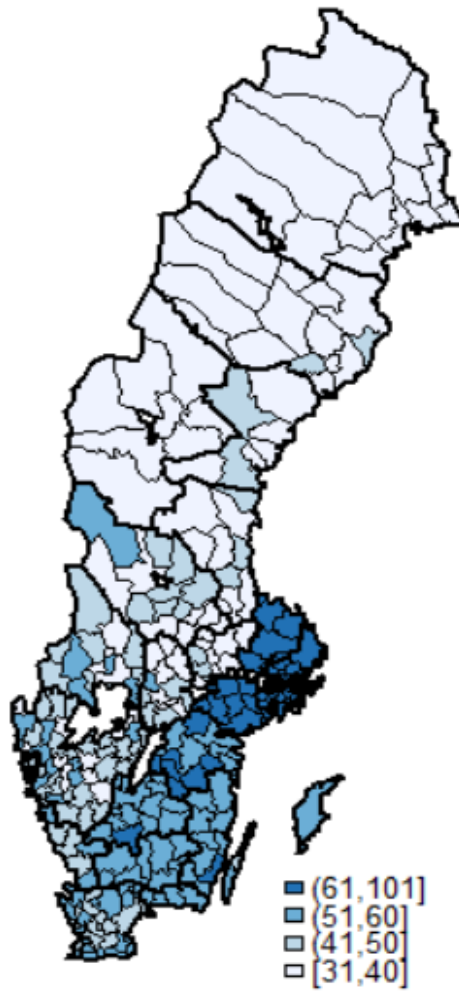
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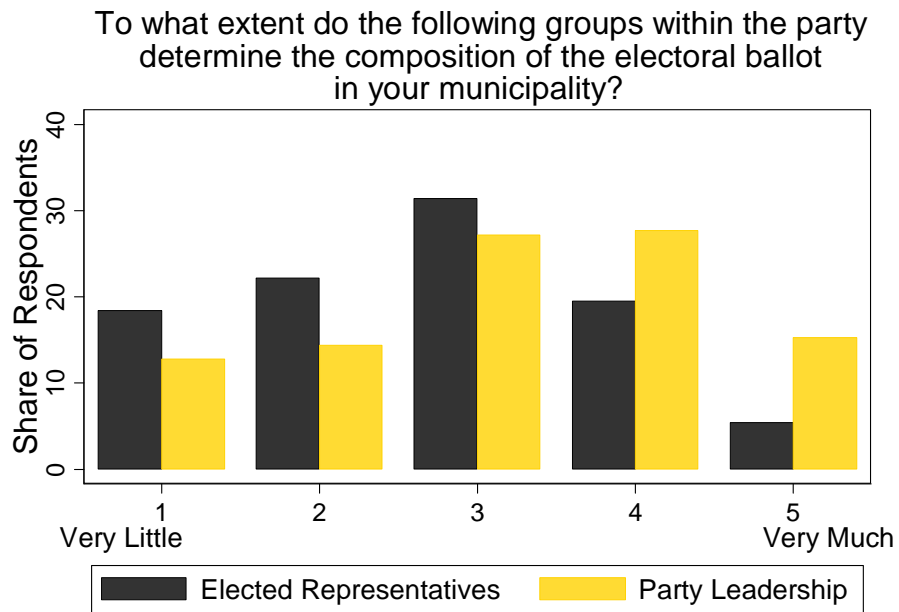
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**Figure 1.** Swedish counties (21) and municipalities (290), by municipal council size.



**Figure 2.** 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, 2014).

**Table 1.** Correlations between individual competence and political success measures, with and without fixed effects for list rank

	<i>Preference vote share</i>		<i>Re-election</i>		<i>List rank</i>	<i>Top ranked</i>	<i>Cognitive score</i>	<i>Leadership score</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Competent	0.70*** (0.01)	0.21*** 0.02	7.53*** (0.37)	7.21*** (0.38)	-1.30*** (0.051)	3.92*** (0.24)	0.26*** (0.04)	0.39*** (0.04)
List rank FE		yes		yes				
Observations	58,934	58,934	64,361	64,361	64,361	64,361	7,915	6,318

**Notes:** The coefficients in columns 1-6 should be read so that 1.0 = 1 percentage point. Draft scores in columns 7 and 8 are transformed to z-scores. Robust standard errors clustered at the municipality level in parentheses: \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

**Table 2.** Estimated relationship between leadership competence and follower competence

	Binary Income Residual						Cognitive Enlistment Score	Leadership Enlistment Score
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lagged C Top 3	0.126*** (0.015)		0.124*** (0.014)	0.088*** (0.010)	0.080*** (0.013)	0.033** (0.016)	0.198*** (0.035)	0.119*** (0.033)
C Top 3		0.074*** (0.014)	0.006 (0.014)					
Lagged C Followers				0.445*** (0.020)				
Municipality F.E					yes		yes	yes
Mun*Party F.E						yes		
Observations	2,728	3,340	2,723	2,698	2,728	2,728	1,079	1,311

**Notes:** Robust standard errors clustered at the municipality level in parentheses: \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

**Figure 3.** Example of “zipped” ballot from Social Democrats, 2006 election.

**VAL TILL KOMMUNFULLMÄKTIGE**  
**Arbetarepartiet-Socialdemokraterna**

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

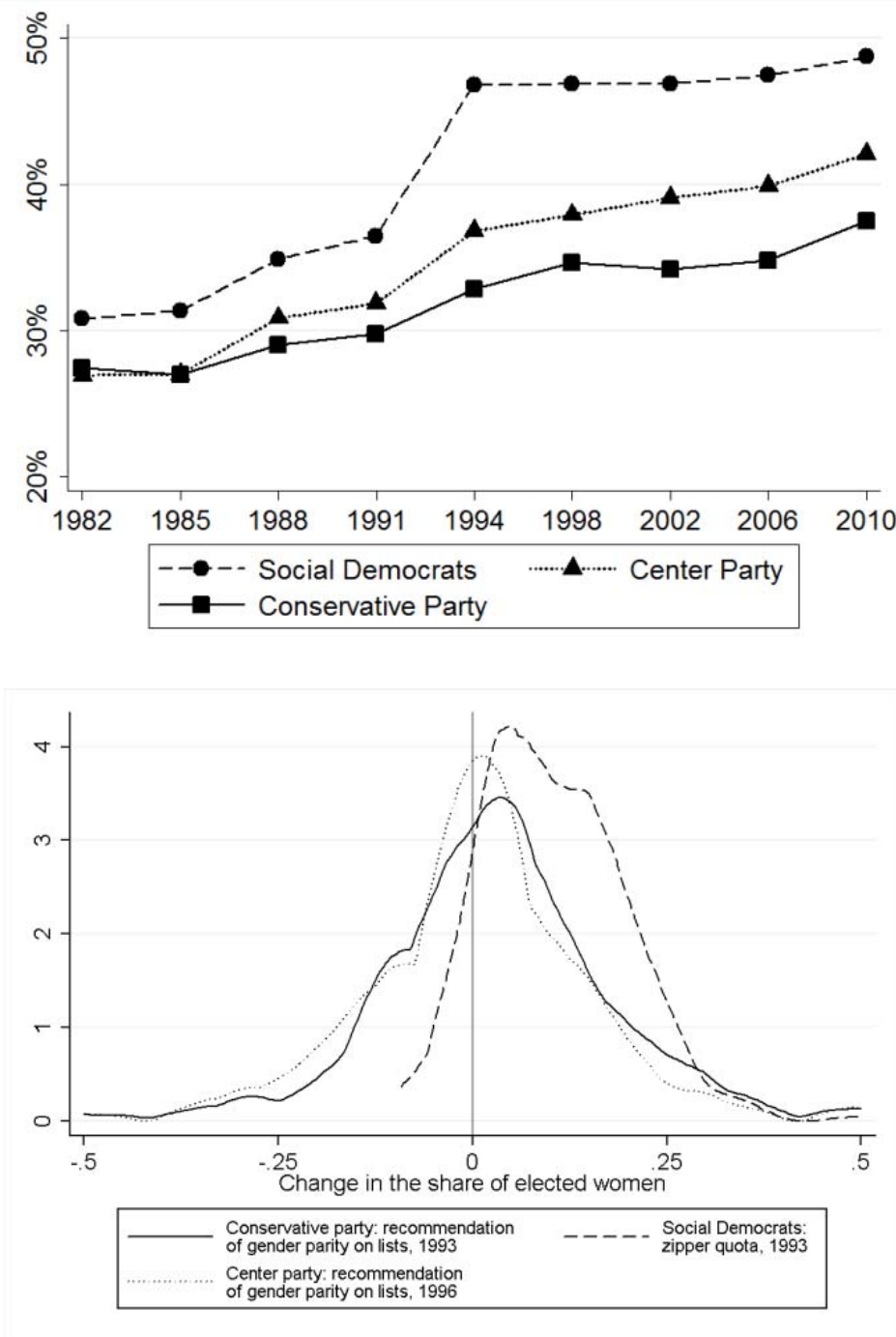
1. Ulric Andersen, 60, oppositionsråd, Skå
2. Gun Häll, 57, studiestödshandläggare, Stenhamra
3. Svereric Larsson, 67, f.d. näpolischef, Adelsö
4. Eleonor Eriksson, 32, studerande, Stenhamra
5. Georg Gustafsson, 44, egen företagare, Ekebyhov
6. Elisabeth Palm, 54, tandsköterska, Stenhamra
7. Fredrik 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
13. ...

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

Ekerö  
0002-01307



**Figure 4.** Average share of elected women in Social Democratic, Conservative Party and Center Party municipal party groups over time (top), and density curves for the changes in the share of elected women in municipal parties by strategy for increased female representation, recommended share of female candidates vs. zipper quota (bottom)



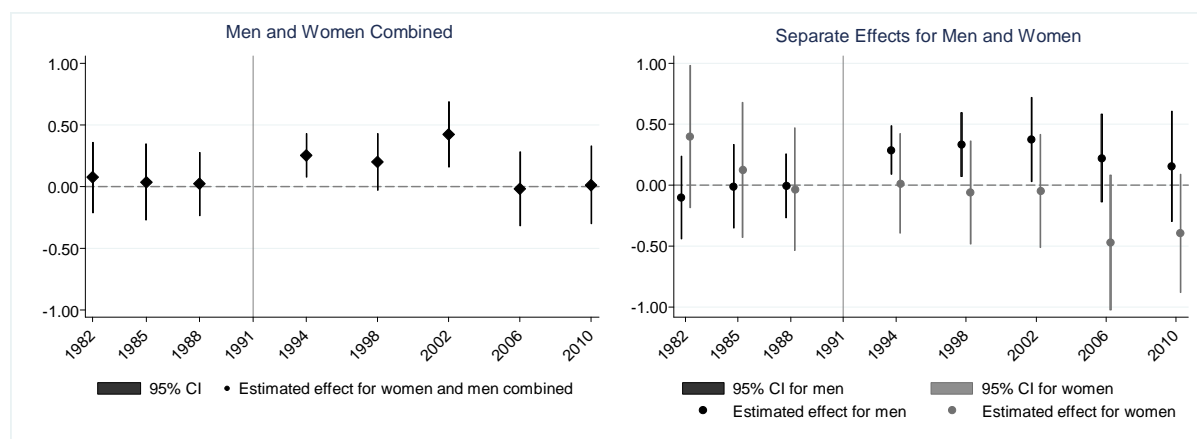
**Notes:** In the bottom figure we compute the change in the share of women in the first election that the strategy was used compared to the previous election. We thus compare the 1991 and 1994 elections for the Social Democrats and the Conservative party, and the 1994 and 1998 election for the Center party.

**Table 3.** Quota impact on the competence of elected politicians

	<i>All Politicians</i>		<i>Male Politicians</i>		<i>Female Politicians</i>	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Post-Quota*Δw<sub>94-91</sub></i>	0.105 (0.099)	0.336*** (0.113)	0.303** (0.117)	0.383** (0.163)	-0.317 (0.198)	0.233 (0.215)
Municipality time trends		yes		yes		yes
Observations	1,795	1,795	1,795	1,795	1,783	1,783

**Notes:** Robust standard errors clustered at the municipality level in parentheses: \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

**Figure 5.** Effect of the gender quota on the fraction(s) of competent men and women



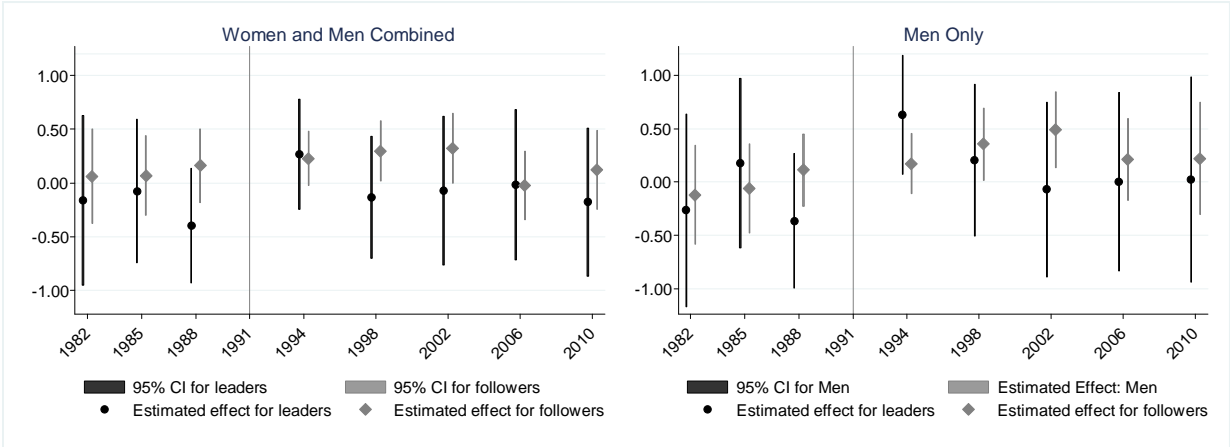
**Notes:** The figure shows the estimated changes in the fraction of competent men and women relative to the reference year (1991) and depending on the change in the share of elected women in 1991-1994.

**Table 4.** Effect of the gender quota on the competence of top three politicians (Leaders) and other elected politicians (Followers)

	Followers	Followers	Leaders	Leaders
<b>A: All Politicians</b>	(1)	(2)	(3)	(4)
<i>Post-Quota*Δw<sub>94-91</sub></i>	0.120	0.305**	0.097	0.319
	(0.108)	(0.139)	(0.251)	(0.332)
Municipality time trends		yes		Yes
Observations	1,769	1,769	1,745	1,745
<b>B: Men Only</b>				
<i>Post-Quota*Δw<sub>94-91</sub></i>	0.310**	0.267	0.267	0.617
	(0.125)	(0.193)	(0.301)	(0.386)
Municipality time trends	yes	yes		yes
Observations	1,767	1,767	1,686	1,686

**Notes:** Robust standard errors clustered at the municipality level in parentheses: \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

**Figure 6.** Effect of the gender quota on the fraction(s) of competent leaders and followers



**Figure 7.** Effect of the gender quota on the rate of resignations among competent and mediocre male leaders

