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

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Abstract

We develop 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, 290 municipalities, and ten elections (1982-2014). We ask how competence was affected by a "zipper" quota, requiring local parties to alternate males and females on the ballot, 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 male leaders was a key driver of this effect.

1   Introduction

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

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 debate.[1] Quota proponents see them primarily as a means to improve the representation of women, while their opponents emphasize the potential threat to meritocratic selection.

In 1993, Sweden's Social Democratic party centrally adopted a gender quota and imposed it on all the local branches of that party (from here, we refer to these branches as local parties). Although their primary aim was to improve the representation of women, proponents of the quota observed that the reform had an impact on the competence of men. 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 became informally known as the crisis of the mediocre man ..."

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

An analysis of competence in politics needs to treat the selection of candidates as an important aspect of political life. Following standard models of political selection, such as Banks and Sundaram (1998), we suppose that competence of politicians is a valence issue, an assumption supported by surveys of Swedish voters.[2] We then develop a simple model where a party that puts forward more competent candidates on its ballot stands a higher chance of winning an election. The party leader picks candidates

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[1]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 included in e.g., Franceschet, Krook and Piscopo (2012). Effects on electoral outcomes for parties suggest that a strict quota may benefit parties with previous male dominance (Casas-Arce and Saiz 2015), as well as to reduce negative bias against women's leadership abilities (Beaman et al. 2009).

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

to trade off electoral success against his or her own survival, which is threatened by more competent followers.[3]

The model predicts that less competent leaders pick less competent followers. To establish whether such a correlation exists in the data requires a convincing measure of competence for a range of polities.[4] We use individual data for all candidates on all party lists in all Swedish municipalities in all elections from 1982 to 2014. 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.[5] 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 competence measure is also strongly related to different aspects of political success as well as to different proxies for the quality of municipal policy. Using this competence measure, we find a close correlation between the competence of political leaders and followers in line with the simple model. We also show that shocks to the composition of followers affect the probability of leader survival.

Next, we exploit the Social Democratic gender quota as a shock to the political equilibrium. Citizen-candidate models, such as Besley and Coate (1997) and Osborne and Slivinski (1996), suggest that representation should matter for policy if women have different policy priorities than men.[6] The quota may also have threatened the survival of incumbent leaders, who were predominantly male. We show that competence increased following the introduction of the quota, and more so in municipalities where the quota led to the biggest increase in the proportion of elected women. Contrary to the expectations of quota sceptics, women's competence did not to go down but stayed roughly constant. However, the competence of the men went up significantly. This improvement was not limited to elected followers further down the party ballot, but also occurred at the very top – i.e., among local party leaders. In fact, a key channel seems to have run through removal of mediocre male leaders, and their more competent successors picking more competent candidates.

As a final step, we extend our model to permit a formal interpretation of the empirical results on the effect of the quota. First, we allow the survival of male leaders to be threatened not only by larger shares of competent followers but also by a larger share of women. This modifies the trade-off between leadership survival and party success, although the effect of a gender quota turns out to be ambiguous. Mediocre leaders can respond to a quota by lowering the fraction of competent men and at the same

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[3]This model is similar in spirit to Egorov and Sonin (2011) who show how quality and diversity may be compromised by mediocre power-hungry leaders, and to Gagliarducci and Paserman (2011) who link leader survival to follower composition. The focus on the tension between internal survival and external success is also similar to Caillaud and Tirole (2002). However, they study the choice of platform quality under plurality rule as opposed to candidate selection under proportional representation.

[4]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 most highly contested electoral districts in Italy.

[5]Our measure is conceptually similar to the measure proposed in Merlo et al. (2010).

[6]Recent studies which all find such gender 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.

time appointing mediocre women to protect their survival. Second, we extend the model to allow for the possibility of leader resignations. This allows us to reconcile the empirical evidence that links the removal of mediocre leaders to the improvement in follower competence, in particular the fact that removal seems to precede higher follower competence.

Although applied to a specific context, the ideas we develop have wider relevance in those polities where there is a desire to increase the representation of women in politics. As we have already noted, more than half of the world's electoral systems have some form of gender quota. Although our model focuses on PR-systems, the basic logic would apply equally well to majoritarian systems where leaders influence candidate selection. The link between quotas and competence that we emphasize may also be relevant outside of politics. It could be applied, for example, to private organizations such as corporate boards, where similar considerations appear in the literature on female board members – see the summary in Eckbo et al. (2016). The core ideas in our model(s) may also apply when studying the effects of other types of representation reforms, such as limitations based on age, the number of terms, or ethnic origins. The common denominator in these cases is that incumbent leaders are influential in appointing followers but beholden to those followers for retaining their leadership position. As a result, representation reforms are likely to disrupt the status quo.

The paper is related to a recent literature on female political representation. For example, Esteve-Volart and Bagues (2012) suggest that a lack of political competition allow party organizations to recruit fewer women compared to what voters prefer. Then a gender quota might increase voter welfare if it is consistently implemented in all districts as indicated in Casas-Arce and Saiz (2015). Murray (2010) finds that women who entered parliament after France's quota law were equally active and efficient as male lawmakers. O'Brien (2012) finds no difference in quality between women in reserved and contested seats in the parliament of Uganda. Baltrunaite et al. (2014) show that the educational attainment of both male and female politicians increased with an Italian quota mandating each gender to make up at least one third of the candidates on party ballots.

The remainder of the paper is organized as follows. In the next section, we provide some background discussion on the empirical context. Section 3 lays out our simple model where party leaders select the composition of the party list to trade off electoral success against their own survival. Section 4 discusses our Swedish data, measurement, and confronts the main prediction from the simple model – that more competent leaders select more competent followers – with the data. In Section 5, we analyze the Social Democratic Party's gender quota. We exploit the fact that the quota had a differential impact across municipalities, depending on the initial fraction of women, in order to estimate its effect on politician competence for men and women and for leaders and followers. Section 6 interprets the empirical findings by extending the model from Section 3 in two directions while section 7 concludes. A Web Appendix includes data definitions and auxiliary empirical material

2 Context

Sweden's municipalities   This section gives some background on local politics in Sweden's 290 municipal councils. Each of these municipalities use exactly the same system, where the council is appointed by proportional representation (PR) elections, implemented through party lists. The majority party or, most often, a majority coalition forms the government. Thus the municipal majority appoints the chairperson of the local council board. This position, the mayor of the municipality, typically goes to the first-ranked politician of the largest party in the governing coalition. Each municipality is effectively a parliamentary system in microcosm, 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 by a PR system where 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 the order of candidates decided by the local party.[7]

Municipalities have significant political autonomy and control budgets of 15-20 percent of GDP. They also employ around 20 percent of the country's labor force. The bulk of municipal revenue is raised via a local income tax, set by the municipal council, which typically exceeds 20 percent. The Swedish Instrument of Government 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. Despite their substantial influence, only the chairperson of the municipal council board receives a full-time salary, with the remainder of the municipal politicians being unpaid.

Municipalities differ widely in size – land area varies from 9 to 19,447 square kilometers and population ranges from 2,442 to 925,934 inhabitants. Councils have between 31 and 101 members, with an average of 46. 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.[8]

Local party leaders   Given the party vote share, a candidate's list rank determines whether s/he is elected. Lists are composed in three steps. First, a selection committee administers selection of potential candidates from the party membership by internal nominations (more common in the Left party and the Social Democrats) or an internal primary among local party members (more common in the other parties). Second, the committee uses the results to put together a preliminary list. Third,

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[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 to high list rank), this system has only marginally changed the composition of those elected.

[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. 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 and 10s.

this list is subject to a vote in a party-member meeting. Local party leaders have a strong influence in each step.

A strong norm in Swedish parties protects local autonomy in composing electoral ballots. Within the local party, the leadership has a great deal of influence over this process. Local party leaders directly or indirectly influence the selection committee, which administers the first selection step and determines the list ranking at the second proposal step. Rank-and-file party members can support their preferred candidate(s) in the internal nomination or primary, but nominations and votes are coordinated by the leadership. Candidate lists are usually ranked by the committee, or set up with party lists from the previous election as "guidance", which is another avenue for the leadership's influence (Soininen and Etzler, 2006). Rank-and-file members also have little say at the member's meeting, where few changes are typically made.

Our model assumes that the leadership knows the competence of followers. This is reasonable given how local parties are organized. Active citizens first enroll as members and participate in meetings in one or more municipality-based party clubs. Surveys among elected councillors suggest that it takes on average 7 years of participation prior to election. Thus the leadership has ample time to observe potential candidates in party meetings and activities before their selection for the ballot.

Figure 1 displays data from a large survey of municipal politicians on their influence over electoral-ballot composition. It shows clearly that the party leadership is thought to be substantially more influential than elected representatives.

[Figure 1 here]

3   A Simple Model

To fix ideas, we lay out a model where leaders of two political parties in a PR election *choose* the candidates to appear on party lists. Prospective candidates differ solely 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 candidate selection: greater competence may please voters, but threatens party leaders as more able candidates pose a greater internal threat.

Basic structure   Two *parties*, labeled $K = D, B$ (for Social *D*emocrats and *B*ourgeois), participate in a municipal-council election. 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 by the party. This is equivalent to assuming that the fractions do not vary within the segment of the list where candidates have a realistic election probability.

Each party has a *leadership* with competence $l_K \in [0, 1]$, a higher l_K denoting greater competence.[9] Below, we will assume that leader survival is stochastic, due to a "popularity shock" ε, but increasing in the leader's competence relative to his followers.

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

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

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 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 followers r_K.

3. The council election is held.

4. A (negative) popularity shock ε 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: The 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 ε, which is symmetrically distributed around zero with log-concave density $q(\cdot)$. Since the popularity shock is not known at list-design stage 2, the probability at that stage of the leader surviving is given by a "survival function" $Q(l_K - r_K)$.

While our main empirical analysis in Section 4 will treat r_K as endogenous, we will also offer some evidence for the impact of competence on survival of leaders based on an (arguably) exogenous shock to r_K. When doing so, we exploit that a negative popularity shock ε has the same impact on the probability of survival as an increase in the share of competent followers, r_K.

Stage 3: The council election Voters cast their ballots based on the policy utility 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 *per se* is not policy relevant. Preferences directly over elected politicians are

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[9]In the empirical work to follow, we will interpret the leadership as three first people on the party list. For now, we will use "the leader" in the interest of brevity.

consistent with a citizen-candidate model – as in Osborne and Slivinski (1996) or Besley and Coate (1997) – where politician types map into policies.

We 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 weak 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 party leader. To fix ideas, consider party D. Since competence is a valence issue, and there are no representation issues, choosing competence is equivalent to choosing $v_D = c_D = \alpha l_D + (1 - \alpha) r_D$. 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.[10] His expected payoff when choosing r_D is thus

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

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

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

There is a trade off: a higher r_D increases the chance of winning externally, but decreases the probability of surviving internally. With a parallel condition for party B, we have:

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

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

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[10] For simplicity, we focus on the case where the ego rent is independent of whether the party wins or loses, but the same basic logic would hold in a more complex model with different values of e according to whether or not the leader's party wins.

require large enough e.) To see the effect of higher leader competence, use Cramer's rule to get

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

$$
=
\begin{bmatrix}
-q'\left(l_D-r_D\right)e \\
0
\end{bmatrix}
dl_D \ .
$$

Let

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

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

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

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4 Data and Results for Competence

Our model highlights the idea that politicians differ by competence. In this section, we discuss how our Swedish data allows us to construct a measure of competence. We also use this measure to evaluate the core model prediction relating the competence of leaders and followers.

4.1 Linking Data Sets

Our data originate from party ballots from the Swedish Election Authority, in ten waves of elections (1982 to 2014) across 290 municipal councils. We know the list rank of each politician and the number of votes cast for each list. In each election year, about 55,000 politicians appear on the ballots (excluding the small parties that lack parliamentary representation), and about 13,000 are elected to a council. For the full period, the sample contains 202,536 unique politicians, out of which 53,218 are elected to office 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 Election Authority and include the mandatory personal identification number of every politician. These numbers were linked (following ethics approval) to a host

of background variables from 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 politician dataset, 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.

4.2   Measuring Competence

Previous studies have approximated the quality or competence of politicians by their income or educational attainment.[11] Although such measures can reflect certain aspects of technical competence and qualifications, they tend to confound competence with representation (see, for example, Carnes 2013). A good measure of political competence should capture cognitive and non-cognitive skills which influence policy-making ability, independently of socioeconomic type. To do so, we develop a new measure: an individual's earnings relative to other people of similar age and similar labor-market characteristics. Thus we implicitly assume that a voter prefers to be represented by the most competent politician from a similar social background as herself.

Estimating a Mincer earnings regression   Our specific competence measure comes from the residuals of a Mincer earnings regression, defined over a large set of socioeconomic characteristics.[12] This equation is estimated on each annual cross-section between 1990 and 2012 (the last year of our individual data). From these estimates, we construct a residual for each individual and year. We then average each individual's residuals across different years to reduce idiosyncratic variation in earnings. Concretely, we estimate:

$$y_{i,t} = f(age_{i,t}, educ_{i,t}, empl_{i,t}) + \alpha_m + \varepsilon_{i,t} \ , \tag{3}$$

where $y_{i,t}$ is disposable income for person i in year t. Comparable labor-market experiences are constructed by interacting a range of binary indicators. We create indicators for age (five-year intervals), education (a dummy for tertiary education or above), and employment sector (13 one-digit industrial codes[13]). Function f captures the fact that the specification includes a fixed effect for each single

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[11]See, for example, Merlo et al. (2010), Besley and Reynal-Querol (2011), Galasso and Nannicini (2011), and Baltrunaite et al. (2014).

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

[13]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 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-

subgroup and for each possible (double and triple) interaction. Our earnings regression also includes municipality fixed effects a_m to capture systematic income differences over regions or between urban and rural areas. This flexible, fully-saturated, approach captures earnings-tenure profiles between sectors and by education.[14]

To minimize the possibility of measurement error and endogeneity in this procedure, we drop observations for politicians in all years when they hold a full-time political appointment, and in all years after they leave such posts.[15] To avoid confounding competence with labor-market behavior driven by gender norms or retirement, we estimate equation (3) separately on sub-samples of men, women, and the retired (individuals aged over 65).[16]

A binary competence measure Having computed average residuals 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 since parties tend to recruit members and candidates from different social strata which may not be captured fully by the control variables in the earnings regression. Thus, our approach allows analyzes 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 individual competence c_i. This classifies politician i as competent if her income residual is above the median residual of all elected politicians in her party, and as mediocre otherwise. Leadership competence l_K is the average of this binary indicator among the *top-three* politicians on each party ballot.[17] 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, since earnings could have a different variance within age-education-employment sector cells. This variance could

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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".

[14]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. Using the (more volatile) residuals from a Mincer regression that leaves out education and occupation results in point estimates that are similar to the baseline results in Table 4 and Figure 4 below, although smaller in (absolute) value and a bit noisier.

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

[16]More than 30% of the women who work, do so part time compared to less than 10% of the men. Women also take larger share of 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). 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 retired before 1990 we do not have data on previous employment and thus cannot calculate the income residual.

[17]While a cutoff of three is somewhat arbitrary, it may be 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 earnings. Because the Social Democrats holds this position in many municipalities, and this party is the source of the gender quota, we need to measure leadership competence for more than a single politician.

be correlated with earnings levels, e.g., 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 effectively reflect the level of the subject's income and not only its deviation from the cell mean, which we wish to avoid.[18]

To validate this competence measure, we show that it: (i) predicts political success for politicians, (ii) correlates positively with the scores from ability tests in the Swedish military draft system (for male politicians), and (iii) correlates with measures of policy success.

Validating competence using political success We use four measures of political success. The first is voter support: the number of preference votes for each politician as a fraction of the local party's total. This data is available since 1998 when voters were allowed to cast a single and voluntary preference vote for a person on their selected ballot. The second is a dummy variable for re-election in the next election, a direct measure of career advancements via seniority (Folke and Rickne, 2016, motivate this measure). The third is a continuous measure of a politician's list rank, where lower numbers signify a higher position on the ballot. The fourth measure of political success is a dummy variable for being the top-ranked (#1) politician on the party ballot, a rank usually reserved for chairpersons of the municipal council board, in majority parties, or party-group leaders in minority parties.[19]

We estimate the following regression:

$$x_{i,t} = \beta c_i + \phi_{i,t} + \epsilon_{i,t} \ , \tag{4}$$

where $x_{i,t}$ is one of our measures of political success. While political success is mostly measured in election t (list rank, being top ranked, or preference vote share), re-election occurs at $t+1$. Parameter β captures the correlation between our binary competence measure c_i and the dependent variable. When political success is the 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, 2016), which could conflate our estimate of β due to the fact that 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 survive controls for list-rank fixed effects. For preference votes in column (1), competent politicians attract around 0.7 percentage points (0.47 standard deviations) more preference votes than

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[18]As shown in Web Appendix Table W1, when we use a continuous measure of competence, the baseline estimates in Table 4 and Figure 4 below have the same signs as as with the binary measure, although they are noisier and somewhat smaller in absolute value.

[19]As further discussed in Folke, Persson, and Rickne (2016), 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.

mediocre politicians. Holding list rank constant in column (2), reduces this estimate to 0.21 percentage points (0.14 standard deviations). These estimates strongly indicate that our competence measure predicts direct voter support, in line with our model's core assumption.

The estimates in columns (3) and (4) show that our competence measure strongly predict a longer political career. In Columns (5) and (6), we find that competent politicians have positions higher up on the party list and 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 c_i are relevant for politics as well as for market returns.[20]

[**Table 1 here**]

Validating competence using enlistment tests As another attempt at validation, we examine how our competence measure c_i correlates with ability-test scores 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.[21] 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 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 response**s.** This interview is intended to determine a conscript's psychological capacity to hold a leadership position in the armed forces, especially the ability to cope with stress and 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 enlistment variable as the dependent variable in regression (4) and estimate the correlation in a sample of all men born between 1951 and 1979.[22] Estimates in columns (7) and (8) of Table 1 show that men considered competent according to our c_i measure have significantly higher average scores on both tests, 0.26 points higher on the cognitive test and 0.39 points higher on the leadership

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[20]Web Appendix Table W2 shows that this validation holds up when we split the sample of politicians into men and women. In fact, the association between competence and political success is a bit stronger for women than for men.

[21]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 within each cohort of recruits.

[22]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 mandatory draft was abolished in 2010.

test. This corresponds to 14% of a (full-population) standard deviation for the cognitive score, and 23% for the leadership score.

Validating competence using policy outcomes   Another way to validate our competence measure is to check whether it is correlated with improved policy outcomes (as assumed in the model of Section 3). To investigate this, we use three (sets of) variables, which together provide a broad picture of the quality of municipal governance.[23]

The first variable is taken from surveys of customer satisfaction in local social services which are available for the most recent elections. Specifically, the *Citizen Satisfaction Index* measures service quality on a scale from 0 to 100 where higher scores denote greater satisfaction. It is based on three questions: (1) "How happy are you with how your municipality handles its various responsibilities?", (2) "How well does your municipal government live up to your expectations?", and (3) "Imagine a municipality that perfectly handles its operations. How close to that ideal would you rank your own municipality?".

The second variable is based on complaints from citizens about administrative decisions made by the municipality. These complaints are directed to Justitieombudsmannen (JO) – a national and independent legal agency – and may, after investigation, lead to a formal criticism of the municipality. We use two measures for each municipality and election period: (1) the total number of JO complaints by citizens against the municipality, and (2) the total number of JO criticisms against the municipality, scaling both by population (in 1000s). In this case, a lower number indicates a better-run municipality.

The third set of variables come from local public-finance outcomes available from 1991 and onwards. As discussed in detail in Web Appendix Section W1, we calculate separate statistics for the stock and flow aspects of municipality finances in a particular election period, specifically (i) the average net accounting surplus as a proportion of total costs, and (ii) the average solvency rate (assets minus debt over assets). We also combine these two variables into an index of *Sustainable Public Finances*, measured on a scale from 1 to 6 (see Table W3). A higher value of this index denotes a more sustainable fiscal policy.

In Table 2, we correlate these measures with the competence of municipal politicians.[24] We report results from two separate sets of regressions. The independent variables are the share of competent elected councilors in the mayor's party (top panel) and the share of top-three politicians on his party's list who are competent (bottom panel). All regressions include election-period fixed effects, and standard errors are clustered at the level of the municipality.

The correlations for all six outcomes and two specifications – except for the number of JO complaints – suggest that more competent politicians in the mayor's party are associated with better policies. For four out of the six measures, the correlations are statistically significant. Moreover, they are often

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[23]See Section W1 in the Web Appendix for details.

[24]Web Appendix Figure W1 shows the distributions of these policy measures, where the unit of observation is the municipality-election period.

substantial in size. For example, the estimate in column (2) of the top panel suggests that all elected politicians in the mayor's party being competent rather than mediocre is associated with a budget surplus of 0.6% rather than a deficit of 1%.

[**Table 2 here**]

4.3 Empirical Results on Competence

The model in Section 3 predicts a positive correlation between leadership competence, l_K, and the share of competent followers, r_K. To examine this correlation, we consider all parties with more than eight elected representatives in each election between 1982 and 2014. Nearly all (99%) of the Social Democratic local parties meet this size restriction. For other parties, it excludes around 25% of the observations. Although this threshold is somewhat arbitrary, looking at groups of eight and above gives a meaningful distinction between political leaders and followers, which would make less sense for smaller groups.

Leader competence and follower selection   We use OLS regressions to relate selection of follower competence to leadership competence. Guided by our model, we measure r_K by the share of competent candidates below the leaders – where leaders are the top-three candidates on the list – in the *current* election. Our model says that r_K is determined by l_K, the average competence of the incumbent leaders. In the spirit of our (static) model, an internal leadership contest will have taken place between the current and the previous election. Depending on the timing and result of this contest, the current slate of followers could thus have been chosen by the top-three people on the list, either in the *previous* election or in the current election. Since our static theory does not provide further guidance, we allow for both possibilities in the empirical specification.

Table 3 presents the resulting correlations. Column (1) shows a strong pair-wise correlation between the competence of past leaders and current followers. In column (2), we instead regress follower competence on the average competence among the current top-three candidates on the list. This competence correlation is also positive, although weaker than that between current followers and previous leaders. This suggests that, on average, the leadership in the previous election exerts a stronger influence on list composition.

[**Table 3 here**]

This is confirmed in column (3), where we include both the current and lagged leadership competence measures. The lagged measure is more important, while current competence becomes statistically insignificant with a point estimate close to zero. Column (4) shows that this correlation does not simply reflect strong auto-correlation among the followers.

Column (5) addresses the natural concern that some omitted municipality characteristics, such as education or urbanization, simultaneously drive the selection of leaders and followers. In this specification, the correlation between lagged top-three competence and follower competence just reflects time variation within municipalities. Importantly, our estimate survives this specification. However, it does not survive an even more demanding specification in column (6), where we include interacted fixed effects by party *and* municipality in the regression equation.

Further checks   In columns (7) and (8), we use the same specification with municipality fixed effects as in column (5), but replace the outcome variable by average follower competence measured by the cognitive enlistment score and the leadership enlistment score, respectively. The estimated correlations are equally strong for these alternative competence measures.

In the Web Appendix we provide two further tests to show that the Table 3 results are not driven by candidate supply (i.e., competent leaders attract more competent party members). First, we create a control variable for the proportion of competent politicians among nominated politicians on the list, i.e., non-elected people who may move up to higher list ranks in future periods. This could be considered a measure of competent candidates in a pool from which leader(s) can choose the top part of the list.[25] As a second test, we replace the outcome variable with the difference in the proportion of competent politicians among the elected candidates and among the persons in this candidate pool. The two sets of estimates in Tables W4 and W5 support the model. Controlling for the candidate pool available to the leadership, mediocre leaders end up choosing relatively, and statistically significantly, worse people than competent leaders.

Summary   Taken together, the results in Table 3 demonstrate a strong correlation between the competence of the party leadership and the competence of elected politicians further down the list. This lines up with the prediction from our simple model which highlighted the trade-off between electoral success governed by the function $P\left(\cdot\right)$ and leadership survival governed by the function $Q\left(\cdot\right)$.

Evidence for the model mechanism   Without a source of exogenous variation, it is difficult to rule out other reasons for competent leaders and followers to be positively correlated. For example, there could be complementarities, due to the consequences of collaboration or to competent leaders and followers enjoying to collaborate. Such complementarities would lead to a positive leader-follower correlation unrelated to the trade-off posited by the model between electoral success and leadership survival.

Section W2 in the Web Appendix presents some direct evidence that leaders selecting a larger number of competent candidates face a tradeoff as highlighted by the model. This relies on plausibly exogenous variation in r_K derived from unanticipated shocks to the party's vote share between the date at which

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[25]In our data, we can verify that in the average election, nearly two thirds (60%) of freshmen councilors were listed on their party's electoral ballot, but not elected, in the previous election.

the ballots are drawn up and the date of the election. We then analyze how leader survival responds to such shocks. The estimates (in Table W6) suggest that a higher share of competent followers does indeed affect the survival chances of the average leader, a result driven by the lower survival probability of mediocre leaders in particular. These results suggest strongly that the threat posed by competent followers for mediocre leaders drives the positive correlation in Table 3, and provide suggestive evidence for the mechanism highlighted by our model.

5 The Gender Quota

In this section, we study the gender quota that was introduced by the national board of the Social Democratic party and imposed on all of its 290 local parties. We show that the competence of a local party's elected politicians is related to the "quota bite", defined for each municipality as the change in the proportion of women among the elected Social Democrats in 1994 (the first election of the quota) compared to 1991 (the last election before the quota). Using a simple pre-post analysis as well as a fully dynamic specification, we analyze how this quota bite affected the competence of men as well as women, and leaders as well as followers. We also analyze how the survival of leaders, especially of mediocre leaders, varied with the quota bite.

5.1 Background Facts

In line with global patterns, men historically held a near monopoly on political office in Sweden, while women lacked the rights to vote or to run for office. Although modern-day Sweden may be 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 82 percent of the first names in that party (79 percent in all parties).

The adoption of gender quotas More than one hundred countries worldwide have adopted some form of electoral gender quota to increase women's representation. While quotas take different forms, 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 ballot quotas 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 balance. These strategies have ranged from goals and recommendations (center-right-bloc parties) to quotas with placement mandates (left-bloc parties). As previously mentioned, there is a strong principle of local autonomy in candidate selection which contributes to the controversy over quotas.

The Social Democratic zipper quota   The Social Democrats began by targeting the share of women among its nominated politicians, with 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 Social Democrats – did the party adopt a placement mandate. The proposed feminist party, known as the Support Stockings (Stödstrumporna), was a national-level network of mostly professional women from the political right *and* the left formed in response to a five percentage-points drop in the proportion of women elected to the Swedish parliament in 1991. This network demanded that political parties adopt zipper quotas (Varannan Damernas) for their ballots. Moreover, any potential trade-off between competence and gender was purposefully down-played in the political and public discussion, which focused around fairness and collaboration between women and men (Törnqvist 2007).[26]

The actions by the Support Stockings pushed the Social Democratic party to adopt zipper quotas for all of their electoral ballots and the decision about this quota was taken by the central party board which imposed it on all local parties. Specifically, local parties were instructed to change their nomination procedures to, first, make two separate candidates lists for men and women, and second, zip the two lists together to alternate male and female names throughout the entire list of nominees. Figure 2 gives an example of a zipped ballot from a 2006 local election.

[**Figure 2 here**]

Finally, we describe women's descriptive representation over time and relate the developments within parties to their strategies for raising the share of women. The top panel in Figure 3 shows time paths of average shares of elected women across the 290 municipalities in each of Sweden's three largest parties: the Social Democrats, the Center party and the Conservative party. The trend in the Social Democrats reflects the effectiveness of the zipper quota in raising female representation relative to parties without quotas in the 1994 election. In that election, the party's average share of elected women went up by about 10 percentage points[27]. This contrasts to the relatively flat trend for the Social Democrats in previous elections when the party issued recommendations of 40 and 50 percent women on their ballots (in 1988 and 1991). Such recommendations were also introduced by the Conservatives (in 1994) and the Center party (in 1998), reforms that also failed to observably shift the women's share of elected seats.

[**Figure 3 here**]

The bottom panel in 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

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[26]The term gender quota was not used in the debate, but was replaced with the term "Every second for the ladies" (Varannan Damernas). This phrase had traditionally been used in communal dancing events to denote the custom that women and men took turns in choosing dance partners.

[27]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.

their gender policies. Clearly, the Social Democratic zipper quota was more effective than the recommendations in the other two parties. Among the Social Democrats, the quota bite also varied across municipalities: a few municipalities saw the share of women fall by a few percentage points, while some saw it rise by as much as 30 percentage points. We use this variation in the Social Democratic quota bite to analyze the impact on the selection of politicians.

5.2   The Impact of the Quota

The model in Section 3 ties the correlation evidence in Section 4 to the leader's competence. But these correlations might conceivably reflect common (time-varying) omitted factors driving both leadership competence and the fraction of competent politicians. The Social Democratic quota can help reduce these simultaneity concerns. In particular, it offers a sharper focus 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.[28] 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.[29]

There may also have been more pressure on mediocre male leaders, if the pre-quota competence gap between elected men and women was larger in the municipalities with mediocre leaders.[30] Section W3 in the Web Appendix presents some evidence that this was indeed the case.

Finally, there is 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.[31]

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[28] As previously noted, 82 percent of the Social Democratic ballots had a man as the top-ranked candidate in 1991. Indeed, the lack of female leaders makes a potential analysis of the impact on follower selection under-powered in the this sub-sample of female-led municipalities.

[29] The competence of male leaders is strongly positively correlated with the share of women prior to the introduction of quota. Moving from all male leaders being competent rather than mediocre in 1988 was (statistically significantly associated) with an almost 5 percentage-point higher share of women in 1991.

[30] We are grateful to a referee for this suggestion.

[31] 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

Simple difference-in-differences   In Table 4, we examine the impact of the quota on average competence as well as on competence 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 (1994-2014). Specifically, we estimate the following regression for all election years:

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

The dependent variable in (5), $r_{m,t}$, is a measure of competence among one of three categories of politicians in municipality m at election time t, namely (i) all elected Social Democrats; (ii) elected male Social Democrats; or (iii) elected female Social Democrats. The quota bite variable $\Delta w_{m,94-91}$ is interacted with dummy variable ρ_t, set equal to one for all elections after 1991. All regressions include municipal fixed effects, α_m. Thus we exploit the randomness in the quota reform, estimating the pre-post selection difference within the same municipality as it relates to the quota bite. To make sure that we capture the effect of the quota, rather than just a general time trends at the municipal level we include municipality-specific (linear) time trends. For completeness, we also present the results without this control. Finally, we cluster standard errors at the municipal level.

Focusing on municipalities with a male politician on top of the ballot in 1991 removes around 60 local parties (approximately 20% of the sample). We also exclude 20 local parties which did not comply fully with the quota (having below 40% elected women in 1994), a restriction that reduces the sample size by an additional 7%.[32]

[**Table 4 here**]

For the selection of all politicians in columns (1) and (2), the results show a positive impact of the quota bite, which is significant once municipality time trends are accounted for. We also study the effects by gender: columns (3) and (4) for men vs. (5) and (6) for women. These estimates show that the overall effect mainly reflects an improvement in the selection of men. The coefficient in column (4) means that a 10 percentage-point larger quota bite (just below the cross-sectional average for all municipalities) raised the proportion of competent men by 4.4 percentage points. Given an average of 50 percent competent politicians in the average municipality (by definition, from the normalization), this corresponds to a 9 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 with trends. In neither case, however, is the estimate significantly different from zero, suggesting that the quota neither raised nor cut the share of competent women.

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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 (2016) document that the quota indeed had a positive impact on the probability of female leadership in the local parties.

[32]In the robustness analysis below, we show that our results hold up in the full, unrestricted, sample as well. Note that a party can comply fully with the zipper mandate, but still have a share of women below 50% if the first name on the list is a man and the number of elected politicians is odd.

This is interesting in view of the meritocratic critique of gender quotas, namely that raising the share of women through a quota must necessarily come at the price of lower competence among women.[33]

Dynamic difference-in-differences As our data covers a long time period after (and before) the quota's introduction, we can also examine the quota impact over time. For this purpose, we estimate:

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

This specification includes dummy variables for each election year, denoted by $elec_t$, and for each municipality, denoted by α_m. The coefficients of interest are now β_t which capture the quota bite, $\Delta w_{m,94-91}$, in each specific election year t after (or before) the quota was introduced. We leave out the 1991 interaction to make the immediate pre-quota election year the reference category – i.e., we normalize β_{91} to 0. As we do not expect municipalities with a larger quota bite to experience any effect on competence prior to the quota, the coefficients β_{82}, β_{85} and β_{88} should be insignificant and close to zero. By examining the estimates for the pre-quota periods, we can explicitly verify that pre-existing trends in the outcomes were not correlated with the size of the quota bite. Coefficient β_{94} gives the impact effect of the quota, and coefficients β_t, for $t > 1994$, capture the effects in subsequent periods. The latter would be similar in sign and magnitude to β_{94} if the zipper quota had a permanent effect on selection. Allowing the effect to vary across elections also addresses the possibility that as more time elapses after the quota introduction the estimates may get nosier as other changes occur in municipalities.

Our estimates are illustrated graphically in Figure 4, which examines men and women combined (the left graph), as well as separately (the right graph). The plotted estimates of β_t for the pre-quota era – the 1982, 1985 and 1988 election periods – show that we need 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).

Figure 4 also adds further insights about the effects of the quota. First, competence improved with a larger quota bite immediately in 1994. The effect is statistically significant for two more elections thereafter, a total period of 12 years. As the right graph shows, the improved selection derives mostly from male politicians. This is in line with the simple pre-post difference-in-differences results in Table 4.

The coefficient on overall selection is close to zero for the last three elections. In the 2006 and 2010 elections, the overall zero appears to mask a gender difference, with positive but insignificant estimates for men, and negative but insignificant estimates for women. However, in the 2014 election competence

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[33] As suggested to us by a referee, the positive effect on overall competence may reflect a composition effect: if a larger share of women than men are competent, then raising the share of women will raise overall competence. In Section W3 of the Web Appendix, we show that there may be such a composition effect, but that it can explain at most 15% of the increase in overall competence after the quota.

among both men and women appear to have converged back to their initial levels. The reasons for this deserve further exploration, something we leave for future research.[34]

[**Figure 4 here**].

Robustness checks   We conduct a range of robustness checks on how the quota affected the selection of politicians. First, the main results essentially remain when we drop the sample restrictions discussed above (Table W7). Second, 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 difference between the share of women elected in 1991 and 1994 (Table W8). Third, we attempt to rule out that our measure of the quota bite is correlated with shocks to the demand for competent men. To do so, we show 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 W9). Fourth, we test for the confounding role of municipal characteristics by using the share of competent politicians in the Conservative and Center Party in the same municipalities as a placebo outcome (Table W10), finding no effect of the Social Democratic quota on the selection in these parties. Fifth, we find that our main results are robust to using the cognitive score and the leadership score from the military draft, rather than our measure based on the residuals from the earnings regression, as the dependent variable (Tables W11 and W12).

Leaders and followers   To better understand the results so far, we examine whether the selection of leaders and followers were differentially impacted by the quota. Given the results in Table 4 and Figure 4, we expect any effects to be dominated by the selection on male politicians. Table 5 largely confirms this expectation. Here, we repeat the same simple difference-in-differences exercise as in Table 4, but separately for politicians in the top-three slots on the ballot – leaders – and those below – followers. Panel A shows the results for all politicians, while panel 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 5 here**]

More can be learned from period-by-period estimation. In Figure 5, we use the same graphical approach as in Figure 4, plotting the point estimates and their standard errors. Comparing the left and right graphs, we see that the effects are driven by the impact on men. The figure paints a clear picture: a positive impact of the quota bite on leaders as well as followers, but with a different temporal pattern.

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[34]We pick this up in the theoretical discussion of dynamic effects in Section 6 below.

For leaders, we see a large positive impact in 1994, the first election with the quota. For followers, the improved competence instead appears in the two subsequent elections in 1998 and 2002.[35] In addition – and similar to Figure 4 – both groups record smaller estimates that lack statistical significance in the last three elections of the sample period.[36]

[**Figure 5 here**]

Leader survival   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 male mediocre leaders not surviving the introduction of the quota. To explain the results in Figure 5, this reduction in leadership survival would have to occur immediately after the quota introduction. Therefore, we use period–by-period estimation to analyze leader survival.

The indicator of survival, denoted $s_{i,t}$, takes the value 1 if politician i, elected to the top-three on the electoral ballot in period $t-1$, re-appears on the list in election t. To examine whether male mediocre leaders survive, we use an individual measure of *mediocrity*, a dummy variable denoted $x_i = 1 - c_i$, which is equal to one if politician i has below median competence. We then run the following regression:

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

The mediocrity dummy, x_i, is interacted with the quota bite, $\Delta w_{m,91-94}$, and the dummies for elections periods, $elec_t$. We also include pair-wise interactions between these three variables. Of particular interest is coefficient β_{94}, which captures the survival of mediocre leaders *relative to* competent leaders in the first election under the quota compared to the relative survival rate in the reference year, 1991. Thus, a negative coefficient implies that a stricter quota decreases the relative survival probability of mediocre leaders.

The results are illustrated graphically in Figure 6. The left-hand graph reports the coefficients β_t from estimating equation (6) separately for mediocre and competent politicians. The right-hand graph instead reports the coefficients β_t from the triple-difference specification in equation (7).

[**Figure 6 here**]

A stricter gender quota does indeed decrease the survival rate of mediocre leaders in the three elections following its implementation. The estimates in left-hand graph show that the quota reduced the survival of mediocre leaders relative to competent leaders in the three election periods following the quota. These differences in the effects on survival are statistically significant at the 5 percent level. In 1994, the point

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[35]The differences in the timing across the two groups should be interpreted with some caution as the estimates are somewhat imprecise.

[36]A corresponding figure for the selection of female leaders and followers is shown in the Web Appendix (Figure W2).

estimate suggests that a 10 percentage point larger quota bite led to an 11 percentage point lower survival probability for mediocre leaders compared to competent leaders. As shown in the right graph, this difference is statistically significant for the first three elections following the quota.

Leader survival and follower competence   That mediocre leaders do not survive (and were replaced by more competent ones) could help explain that the quota also led to higher follower competence. The Web Appendix offers some evidence on this in the form of municipality-level correlations between survival rates of mediocre leaders and the competence of followers. In a cross-municipality regression, we relate the change in the share of competent followers via the quota bite to the average survival rate of mediocre male leaders from the 1991 to the 1994 election in each particular local party. The results (Table W11) indicate that the positive quota effect on follower competence is directly tied to the survival of mediocre male leaders. Specifically, they suggest that the quota impact on follower competence was roughly five times larger if no, rather than all mediocre leaders survived from 1991 to 1994.

Alternative explanations   A "mechanical" explanation for our finding that the quota raised the competence of men could emanate from a local-party ranking according to candidate competence. The fact that the quota forced Social Democratic local parties to cut the number of male candidates to make room for women might then have raised the share of competent men. To address this potential concern, we repeat the analysis holding constant the number of elected men in each local party, either at the same number of men post quota as pre quota (1991), or at the men with the three highest list ranks post and pre quota. The results, found in Web Appendix Table W14, do not provide support for this mechanical explanation. We can also rule out that the improvement in male competence reflects a supply effect related to the quota bite (Table W13).[37]

Higher competence of leaders in the elections following the quota might also be due to pressure from national Social Democratic leaders forcing mediocre leaders to resign. However, we do not believe that this is the case given the strong norm in Swedish national parties to honor the autonomy of their local parties. Recent work by Folke et al. (2016) reinforce that view by citing documents from national party congress meetings.

Finally, we examine if the quota affected election outcomes, as might be expected from the model and the fact that the quota raised competence. Altered election outcomes could either have reinforced, or counteracted, the effect of the quota on male competence by affecting the number of seats won by the party. We use three different electoral outcomes: the local party's number of seats in the municipal assembly, its seat share in the assembly, and its vote share in the local election, as alternative outcome variable in equations (5) and (6). The results do not suggest that electoral effects explain our results (Web Appendix Table W16). A likely reason for this is that gender quota was simultaneously introduced on the Social-Democratic party's national electoral lists. Because local and national elections are held on

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[37]Here, we exploit the fact that the full list better reflects supply compared to elected politicians as in the sequential recruitment model of Norris and Lovenduski (1995). The effect on selection is smaller when we examine the full list.

the same day, reactions to the national-level quota may have obscured local responses. At the national level, we may note that 1994 was the party's most successful election in our (1982-2014) sample period (see Figure W3).[38]

Summary   We have shown that a larger bite of the Social Democratic gender quota raised the competence of elected candidates. This higher competence is due to the selection of male politicians, with no significant change of female competence. A careful look at the time patterns among leaders and 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 went up in the next few elections. Upon closer inspection, the immediate improvement in leadership competence reflects a lower than usual survival rate among mediocre leaders.

6   Making Sense of the Results

To interpret the empirical effects of the quota theoretically, we extend the model from Section 3 in two ways. First, we allow candidate selection by gender as well as competence. This extension adds to recent theoretical work on the selection of politicians. For example, 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 which dominates list selection in a proportional representation (PR) system. Second, we allow leaders to resign strategically "for the good of the party" before the election. The latter gives an unambiguous prediction that a quota triggers a higher resignation rate for mediocre leaders and hence offers a straightforward explanation for the empirical results in Section 5 on the competence of male leaders and followers.

Step 1 extension: Male and female candidates   Politicians now differ by gender as well as competence. We denote the share of women on party D's ballot by w_D. We focus on how male leaders chose w_D and r_D (the share of competent) at selection stage 2. Analogous to our assumption in the core model, w_D is unaffected by the number of seats won by party D. This way, we allow w_D and r_D to be independently optimized by the leadership. Female candidates can thus be competent or mediocre. In other words, we assume that only overall (rather than gender-specific) competence and gender composition of candidates matter for electoral success as well as leader survival.

The representative voter has the following policy payoff from having party D in power:

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

where $\mu\left(\cdot\right)$ is a concave function with a maximum at $1/2$. Thus the average voter likes not only party

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[38]Since the election-period fixed effects will pick up this national trend, and voters are more likely to react to national level representation, additional effects from local variation would become hard to detect empirically.

competence but also gender equality.[39] 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 focus on the role of the gender quota, absent political competition.[40]

Leadership survival Leadership survival now depends on the competence and gender composition of the elected candidates. Specifically, the leadership now survives at stage 5 if

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

where $\sigma\left(\cdot\right)$ is a "threat function" increasing and convex in both arguments. Since our assumed starting point has a male leader in office, more competent followers and more women followers both increase the threat to the incumbent for given l_D.[41] The assumption that a higher share of women raises the threat to a male leader is consistent with the (context-specific) translating-numbers-into-influence strategy among Social Democratic women cited in the beginning of Section 5.2. It is also consistent with a (general) gender-specific component in policy preferences.[42] This threat function replaces the share of competent candidates in the leader's survival function in the leadership contest, such that the latter becomes $Q(l_D - \sigma\left(w_D, r_D\right))$. Function Q is thus decreasing in r_D and w_D. In this formulation, only overall competence and gender balance matter for a leader's survival as he picks a candidate portfolio. Whether chosen women are competent or not does not matter per se.[43]

The optimal choice of r and w The leader chooses r_D and w_D at stage 2 to trade off his own survival against the electoral success of the party. This gives first-order conditions:

$$w_D: \quad -\sigma_1 q(l_D - \sigma\left(w_D^*, r_D^*\right))e + p(\alpha l_D + (1-\alpha)r_D^* + \mu\left(w_D^*\right) - v_B)\mu'(w_D^*) = 0 \tag{8}$$

and

$$r_D: \quad -\sigma_2 q(l_D - \sigma\left(w_D^*, r_D^*\right))e + p(\alpha l_D + (1-\alpha)r_D^* + \mu\left(w_D^*\right) - v_B)(1-\alpha) = 0 \ . \tag{9}$$

where $\{r_D^*, w_D^*\}$ denote optimal choices. The second condition determines optimal competence r_D^* which mirrors the trade-off between leadership survival and party victory of the model without gender.

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[39] This is because the electorate comprises equal numbers of men and women.

[40] It also makes sense in view of the empirical results in the Web Appendix that the introduction of the Social Democratic quota had no effect on the selection in the other parties or on election results.

[41] Over time, as the fraction of women leaders increases, the nature of this threat could change as we discuss further when we consider multi-period implications below.

[42] A large literature has argued that politicians' preferences are associated with their life experiences (Phillips, 1995), with gender-based differences in such experiences being an important example. In Figure W4, we present results from a survey sent to Social Democratic representatives, which supports this argument in our application.

[43] It would be straightforward to extend the model to have the survival threat be a function of the size of the four potential groups of followers differentiated by both gender and competence with separate effects on survival for each group. This could, in principle, allow the model to analyze when the women chosen will be competent. However, specific predictions would be highly dependent on the detailed properties of the threat function.

A similar trade-off shapes the optimal fraction of women w_D^*. This first-order condition implies that $w_D^* < 1/2$ – as more women threaten his survival, $\sigma_1 > 0$, the male leader chooses w_D^* on the upward-sloping part of function $\mu(\cdot)$ such that $\mu'(w_D^*) > 0$. This makes intuitive sense: a male leader will not pursue gender parity even though voters want it, as long as women threaten his survival more than men do.

A quota in party D   Now consider a binding gender quota at 50%, i.e. $w_D = 1/2$. Since we have just shown that $w_D^* < 1/2$, this quota must raise the fraction of women. How much the quota bites will, however, vary with the municipality-specific competence of the initial leadership l_D, the threat function σ, and electoral competition p.

To derive the impact on competence for $w \geq w_K^*$, let us define $R_D(w)$ from

$$-\sigma_2(w, R_D(w, l_D)) q(l_D - \sigma(w, R_D(w, l_D)))e+$$

$$p(\alpha l_D + (1 - \alpha)R_D(w, l_D) + \mu(w) - v_B)(1 - \alpha) = 0 .$$

The optimal choice of competence under a quota is given by $R_D(1/2, l_D)$ and the pre-quota competence level is $R_D(w_D^*, l_D)$. The change in competence due to a quota is given by

$$\Delta r_D = \int_{w_D^*}^{1/2} \frac{\partial R_D(w, l_D)}{\partial w} dw \cong \frac{\partial R_D(w_D^*, l_D)}{\partial w} \left[\frac{1}{2} - w_D^* \right] , \tag{10}$$

where $\frac{\partial R_D(w_D^*, l_D)}{\partial w} =$
$\frac{-\sigma_{21} q(l_D - \sigma(w_D^*, R_D(w_D^*, l_D))) + \sigma_2 \sigma_1 q'(l_D - \sigma(w_D^*, R_D(w_D^*, l_D)))e + \mu'(w_D^*)p'(v_D - v_B)(1 - \alpha)}{\sigma_{22} q(l_D - \sigma(w_D^*, R_D(w_D^*, l_D))) + (\sigma_2)^2 q'(l_D - \sigma(w_D^*, R_D(w_D^*, l_D)))e - p'(v_D - v_B)(1 - \alpha)^2}$. This derivative cannot be signed without more specific assumptions on the shapes of the threat function (and its cross derivative) and the densities $q(\cdot)$ and $p(\cdot)$. Thus, whether a quota raises or cuts competence via this channel is not clear a priori. This makes intuitive sense as an incompetent leader may be motivated to reduce the fraction of competent candidates if this decreases the marginal threat of being replaced at a higher fraction of women. Even though the sign is ambiguous, equation (10) does justify modeling the effect on competence from the introduction of a quota as proportional to the quota bite $\frac{1}{2} - w_D^*$. It thus offers a theoretical rationale for the empirical specifications in Section 5.

However, if the only effect of a gender quota is to change the threat of leader survival, the extended model does not offer a straightforward explanation of the empirical results. Indeed, a quota could make a male leader defend himself by lowering candidate competence as the quota itself elevates the threat to his survival.

In similar vein, we can look at the impact of a quota on leadership survival:

$$\Delta \sigma = \int_{w_D^*}^{1/2} \frac{d\sigma(w, R_D(w, l_D))}{dw} dw \cong \frac{d\sigma(w_D^*, R_D(w_D^*))}{dw} \left[\frac{1}{2} - w_D^* \right] , \tag{11}$$

which is also ambiguous in sign without making further assumptions on the shape of the threat function. This reflects the fact that (10) is ambiguous in sign – with the possibility that a gender quota causes a leader to reduce the fraction of competent candidates sufficiently to nullify the threat of the quota. Once again though, equation (11) does suggest an empirical specification with a changed threat proportional to the quota bite.

Summarizing, when the fractions of competent followers and women both affect expected leader survival, a quota will provoke a competence response. However, the equilibrium predictions for overall competence and leadership survival are ambiguous. But this model extension ignores a possible strategic response to the quota where the leader chooses to step down. Adding this realistic possibility generates a more clear-cut prediction in line with the empirical findings.

Step 2 extension: Leader resignations   To explore the possibility of strategic resignation, we add a new decision between stages 1 and 2 in the model:

1. Party D has a leader with competence l_D.

1.5 The incumbent male leader l_D may choose to resign. If he does, a new male leader with competence z_D is drawn at random. Expected competence of a new leader is thus $E(z_D)$.

2. Whoever is 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 ε for the leader is realized followed by a leadership contest in each party, where the leader's chance of survival is increasing in $l_D - \sigma(w_D, r_D)$.

5. Payoffs are realized.

As above, we ignore inter-party competition, focusing exclusively on leader choices. The new force driving the new result is that resignation is strategically forward-looking, i.e. leaders anticipate the effects of resigning on the party's fortune when a new leader selects the composition of the list. As the competence of a new leader is randomly drawn, a mediocre (competent) incumbent anticipates an incoming leader more (less) competent than himself. This enhances the chances of the party winning, even though the leader loses his personal rent from holding office.

To explore these issues formally, let the equilibrium maximized payoff of the leader with competence level, l_D, and fixed v_B and w_D be

$$V(l_D, w_D, v_B) = \text{Max}_{r_D}\{[Q(l_D - \sigma(w_D, r_D))]\,e + P[\alpha l_D + (1-\alpha)r_D + \mu(w_D) - v_B)]\}. \qquad (12)$$

Note that

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

i.e., a more competent leader has a higher payoff if he chooses to remain in office.[44] This makes sense: a leader facing a lower threat will pick followers who appeal more to voters.

If the leader decides to resign at stage 1.5, his expected utility no longer includes the expected ego rents from leadership. However, he still cares about the expected payoff to the party headed by a fresh leader. In this event, a new leader with competence z_D is picked randomly from the pool and chooses optimal levels of $\{r_D, w_D\}$. Following a resignation and new leader competence z_D, the optimal choice of women solves:

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

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:

$$\hat{V}_D (k, v_B) = E \left[P[\alpha z_D + (1 - \alpha) R_D (W (z_D, k), z_D) + \mu(W (z_D, k)) - v_B)] \right] , \tag{13}$$

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 (12) with resignation $\hat{V}_D (k, v_B)$ from (13). Define $\hat{l}_D (k)$ implicitly by

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

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 $W (k, l_D) < k$,

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

This implies 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.

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[44]If $w_D = \arg\max_{w_D} V (l_D, w_D, v_B)$, the envelope theorem assures that this is still the case.

Therefore, 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.*

The model extension with leader resignations thus gives a clear-cut prediction which is consistent with the empirical findings. Moreover, we find the underlying mechanism quite persuasive since such strategic reactions are a realistic feature of political life. The extension can explain unambiguously why followers become more competent following the introduction of a quota.

We have modeled resignations as purely voluntary. But there could also be social pressure within a party to resign. This could most easily be thought of in terms of the model as diminishing the ego rent from holding office. If the local party could credibly commit to reducing ego rents e using social pressure on a medicare leader who chooses to stay, then "resignations" could be a metaphor for more coercive reasons for departure, a possibility which would reinforce the predictions of the model.

Dynamic considerations   Our model only studies a single period where a quota is either introduced or not. But the empirical findings span a number of elections. Our core ideas remain valid if the leader at the end of the period becomes the incumbent leader at the beginning of the subsequent period. In that case, it may take some time for the effects described here to manifest themselves depending on how popularity shocks to leaders unfold. This will lead to municipality-specific dynamic paths.

A fully-fledged dynamic analysis is beyond the scope of this paper. However, in future developments, a dynamic model might add some interesting features. First, the party could find ways of affecting the competence of leaders so that l_D evolves over time. Second, we would expect the influence of female leaders to grow over time after a quota is introduced. If some of these leaders are mediocre, then pressures to reduce competence among followers would reassert themselves even when leaders are women. Third, we might expect cultural evolution in voter expectations, as they gradually see the impact of the quota on policy and political representation. This evolution could go in different directions depending on what voters perceive. For example, Beaman et al. (2009) report citizens in India raising their perceptions of women's competence when exposed to powerful women politicians.

Such dynamic responses to quotas would be interesting topics for further theoretical research. More than that, the predictions would be ripe for empirical investigation in the Swedish context. Developing

the theory further would also be helpful in identifying exactly which conditions are needed for a combination of a gender quota and leader resignations to result in increased competence. It would also help diagnose whether a quota policy might work, e.g., as part of a program to promote equal opportunity in a developing country.

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 mediocre leaders through resignations. The theoretical findings in this section offer perhaps the simplest interpretation of the empirical findings in the previous section. Resignations of leaders appears to be an important selection mechanism for quotas to improve competence.

7   Conclusion

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

We have developed a model for selecting candidate competence in a PR list system. Mediocre party leaders do not pick competent candidates due to a concern for their own survival. When the share of women is increased by a mandatory quota, more women oppose male leaders due to differing policy preferences. Male leaders could defensively respond by further reducing competence to counter this increased threat to their power. However, they understand that this strategy may threaten the party's electoral success. Just like a CEO may prefer to resign and keep severance pay checks coming as the firm avoids bankruptcy, a political leader may choose to resign to keep the party in power and his preferred policy implemented. Such leadership resignation may raise candidate competence.

One of the main contributions of the paper is to suggest a new approach to measuring competence based on the earnings of politicians outside of politics conditional on age, education, occupation, and time. This new measure is systematically associated with political success, with leadership and cognitive-ability scores from the military draft, and (for elected members of the governing party) with proxies for a well-run municipality. 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 impact of a gender quota on selection, finding that a stricter quota raised 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 competence of male leaders by

triggering a wave of resignations of mediocre leaders. Moreover, where mediocre men resign we find the largest improvements in follower competence in the following election periods. In future work, it would be interesting to see how far the quota can be exploited as an instrumental variable with politician competence and policy outcomes as outcome variables.

Our paper is part of a wider agenda that emphasizes the importance of selection in politics.[45] It is important to understand selection in a broader context, especially the political motives to bring in more competent candidates. Of course, a gender quota may be important in its own right to promote equality in political representation. Our results suggest it may also help to disrupt some of the political forces that maintain the dominance of a mediocre male elite.

[45]See Besley (2005) for background discussion and Dal Bo et al for Swedish evidence.

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Figure 1. Perceived influence over the composition of the electoral ballot.
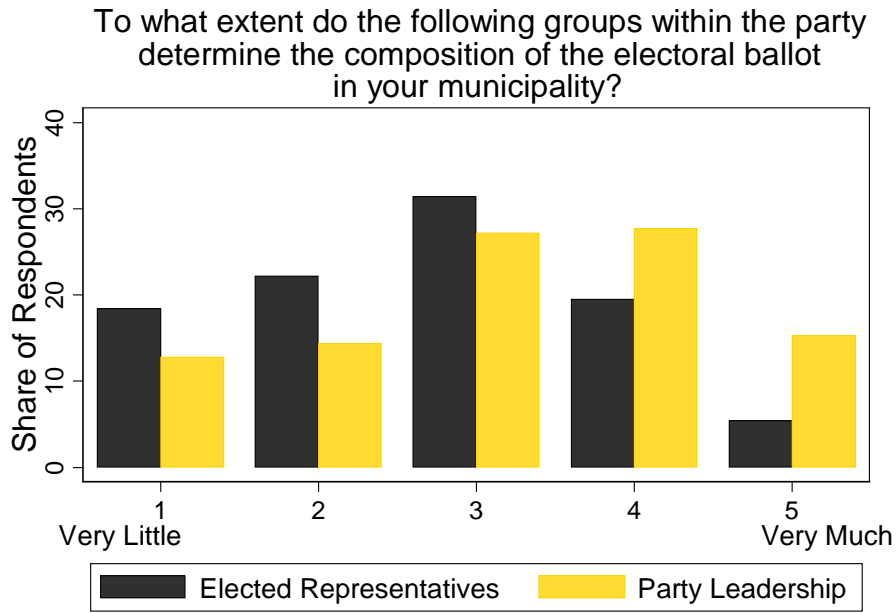
Notes: The figure compares the distribution of politicians' perceptions of the degree of influence that the elected representatives (black bars) and party leadership (yellow bars) have over the process of composing the local party's electoral ballot. Possible responses rank from 1=Very Little influence, to 5 = Very much influence. The Y-axis capture the percentage of respondents in each category. Data is drawn from the 2012 Survey of Local Swedish Politicians (for details, see Gilljam and Karlsson, 2014). We select local parties from the seven main parliamentary parties over our sample period, and exclude local parties with seven or fewer municipal councilors. N = 4 801.

Table 1. Correlations between individual competence and political success measures.

	Preference vote share		Re-election		List rank	Top ranked	Cognitive score	Leadership Score
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Competent	1.90***	0.25*	9.13***	8.49***	-1.03***	4.62***	0.13***	0.24***
	(0.21)	(0.13)	(0.33)	(0.34)	(0.07)	(0.37)	(0.03)	(0.03)
List rank FE		yes		yes				
Observations	54,445	53,627	106,180	101,659	101,659	106,180	19,734	16,015

Notes: The table shows estimation results for the correlations between a binary indicator of individual competence and: (i) four measurements of political success (columns 1-6), and (ii) two measurements of ability from military enlistment data (columns 7 and 8). Politicians are defined as competent if they have an income residual above the median residual of all elected politicians in their political party, and as mediocre otherwise. The estimation method to generate these residuals is explained in Section 4.2. The binary indicator has been multiplied by 100 so that the coefficients in columns 1-6 should be read as 1.0 = 1 percentage point. Draft scores in columns 7 and 8 are transformed to z-scores so that 1.0 = 1 standard deviation. The outcome variables are defined as follows. "Preference vote share" is the politician's number of preference votes divided by the total number of preference votes for all candidates in the same party in the same local election; "Re-election" is a binary indicator for being re-elected in the next election; "List rank" is an integer measure of rank, starting with rank =1 at the top of the electoral ballot; and "Top ranked" is a binary indicator for rank =1. Data includes locally elected politicians from the seven major parties in the national parliament. For preference votes, the sample period is 1998-2014, while it is 1982-2014 for all other dependent variables. Robust standard errors clustered at the municipality level are in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%. All regressions are estimated using OLS.

Table 2. Correlations between share of competent politicians and quality of municipal governance.

	Citizen Satisfaction Index	JO Complaints per 1000	JO Criticisms per 1000	Sustainable Finance Index	Net Result over Total Costs	Average Solvency Rate
Share of competent councilors in party appointing the mayor	3.520*	-0.216	0.001	0.891***	1.610***	14.868***
	(1.871)	(0.171)	(0.030)	(0.289)	(0.389)	(4.291)
Constant	52.042***	1.049***	0.126***	2.993***	-1.024***	3.048
	(0.839)	(0.070)	(0.015)	(0.168)	(0.247)	(2.525)
Election-period FE	yes	yes	yes	yes	yes	yes
Observations	432	1,358	1,358	1,138	1,142	1,138
Share of competent top three in party appointing the mayor	1.851*	-0.122	0.011	0.359**	0.581**	5.802**
	(0.977)	(0.075)	(0.015)	(0.158)	(0.233)	(2.316)
Constant	52.671***	1.016***	0.119***	3.237***	-0.530**	7.220***
	(0.648)	(0.066)	(0.011)	(0.126)	(0.212)	(1.833)
Election-period FE	yes	yes	Yes	yes	yes	yes
Observations	431	1,355	1,355	1,136	1,140	1,136
R-squared	0.012	0.037	0.024	0.042	0.156	0.032

Notes: The table shows the estimated relationship between the share of competent politicians and measures of the quality of municipal governance. In the top panel, the independent variable is the share of competent politicians in the political party which has appointed the mayor. In the lower panel, it is the proportion of competent politicians among the top three people on the ballot of that party, which we use as a measure of the quality of a party's leadership. A politician is defined as competent if they have an income residual above the median residual of all elected politicians in their political party, and as mediocre otherwise (see Section 4.2 for methodological details). The dependent variables are: (1) a Citizen Satisfaction Index based on Statistics Sweden's municipal population surveys, the details of which are explained in Section W1 in the Web Appendix. If a municipality participated twice in the survey during an election period, we average the surveys. (2) The number of complaints per 1000 inhabitants from citizens regarding the municipality's administrative decisions, recorded by the government agency *Justitieombudsmannen* (JO). (3) The number of complaints per thousand inhabitants which resulted in the JO issuing a formal criticism. (4) The average net accounting surplus as a proportion of total municipal spending, from yearly budget data and averaged over each election period. (5) The average solvency rate (assets minus debt over assets) averaged over the election period. (6) A combination of measures (4) and (5) into an index of Sustainable Public Finances, on a scale from 1 to 6, as Detailed in Table W1. Section W1 in the Web Appendix contains more information on these outcomes. The unit of observation is the municipality-election period. Data is for 2005-2014 for (1); 1982-2014 for (2) and (3); and 1991-2014 for (4)-(6). Robust standard errors clustered at the municipality level are in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%. All regressions are estimated using OLS.

Table 3. 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 top-3 competence	0.123*** (0.015)		0.121*** (0.015)	0.096*** (0.011)	0.077*** (0.016)	0.014 (0.021)	0.179*** (0.043)	0.180*** (0.051)
Top-3 competence		0.081*** (0.015)	0.006 (0.016)					
Lagged follower competence				0.369*** (0.020)				
Election-period FE	yes	yes	yes	yes	yes	yes	yes	yes
Municipality FE					yes		yes	yes
Municipality*party FE						yes		
Observations	3,028	3,708	3,015	2,920	3,028	3,028	976	826

Notes: The table shows the estimated relationship between competence of the political leadership and the selection of followers in those parties in future elections. Leaders are defined as the top three politicians on the party's ballot, and followers are defined as the remaining elected politicians further down the ballot. The unit of observation is the local party and election period. The sample includes all parties with at least 8 municipal councilors. The data period is 1982-2014. The three outcome variables measure competence as (i) the binary income residual (columns 1-6), (ii) the cognitive score from the enlistment procedure of the Swedish military (column 7), and (iii) the leadership score from the same procedure (column 8). The enlistment data covers men in the 1951-1980 cohorts only. Robust standard errors clustered at the level of the local party are in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%. All regressions are estimated using OLS.

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
13. ... ..., 64, f.d. verkst. direktör, Träkvista

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. Average share of elected women in local parties (top) and average changes in share of elected women in these parties (bottom) by type of strategy to raise women's representation.
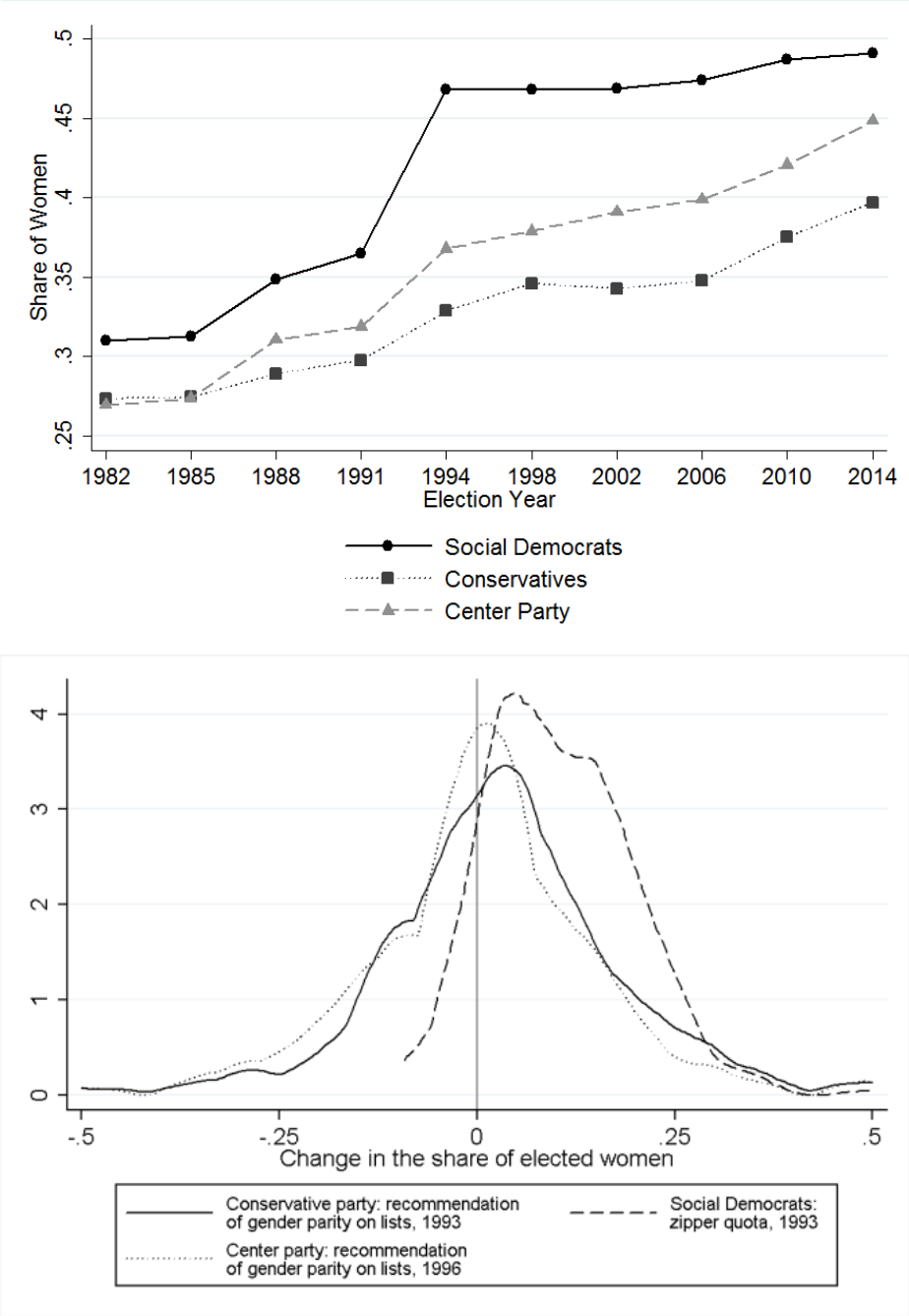

Notes: The top graph shows the development over time in the average proportion of women among the municipal councilors for the three largest political parties in 1982-2014: the Social-Democratic party, the Conservative Party and the Center Party. The bottom graph compares the impact on women's representation of two strategies introduced by these parties: a formal recommendation to increase the proportion of women, introduced by the Conservatives in 1993 and the Center party in 1996; and a zipper quota, introduced by the Social Democrats in 1993. For each party, the sample is the municipal councilors in the election period immediately before, and immediately after, the introduction of each reform. The lines show the distribution across 286 municipalities of the proportion of women after the reform minus the proportion of women before the reform. We thus compare the distribution of impacts on women's numerical representation between the zipper quota (long dash), and recommendations (solid and short-dash).

Table 4. Impact of quota bite on the competence of elected politicians.

	All Politicians		Male Politicians		Female Politicians	
	(1)	(2)	(3)	(4)	(5)	(6)
Post-Quota*$\Delta w_{94\text{-}91}$	0.097	0.288**	0.249**	0.441**	-0.267	0.072
	(0.101)	(0.117)	(0.120)	(0.178)	(0.200)	(0.209)
Municipality FE	yes	yes	yes	yes	yes	yes
Muncipality time trends		yes		yes		yes
Observations	1,996	1,996	1,996	1,996	1,983	1,983

Notes: The table shows estimated impacts of the Social Democrats' zipper quota on the competence of the party's elected politicians. The first two columns show results for the competence of men and women combined, and the remaining show separate estimates for men and women. The dependent variable (see also equation 5) is the proportion of competent politicians among the municipal councillors. Politicians are defined as competent if they have an income residual above the median residual of all elected politicians in their political party, and as mediocre otherwise. The estimation method for generating these residuals is explained in Section 4.2. The "quota bite" ($\Delta w_{94\text{-}91}$), defined for each local Social Democratic party, measures the change in the proportion of women councilors in 1994 (the first election after the quota) compared to 1991 (the last election before the quota). The quota-bite variable is interacted with a dummy for the post-quota period, taking the value 1 for all elections after 1991, and zero otherwise. Estimated coefficients on this interacted variable are shown in the table. All specifications include municipality fixed effects, making the non-interacted quota bite variable redundant. They also include election-period fixed effects, and odd numbered columns control for municipality-specific time trends defined by interactions between municipality fixed effects and a linear time variable. The sample excludes 20 local Social-Democratic parties that did not comply fully with the quota (having below 40% elected women in 1994). It also excludes local parties with a female leader in 1991. Robust standard errors clustered at the municipality level are in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%. All regressions are estimated using OLS.

Figure 4. Effect of the gender quota on the fractions of competent men and women.
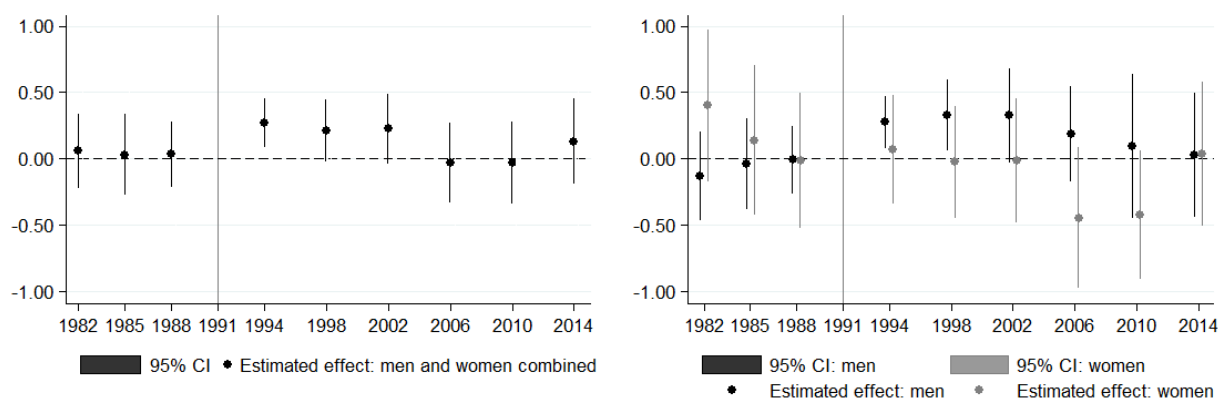

Notes: The figure shows how the Social Democrats' zipper gender quota impacted on the fraction of competent politicians (left) and the fractions of competent male and female politicians (right). The unit of observation is a local Social Democratic party in an election period. Regression equation (6) includes fixed effects for each election and municipality. It also includes interactions between the election dummies and the quota bite in that local party ($\Delta w_{94\text{-}91}$) defined as the change in the proportion of women elected municipal councilors for the Social Democrats in 1994 (the first election of the quota) compared to 1991 (the last election before the quota). The interaction for year 1991 is left out to make the immediate pre-quota election the reference category – i.e., we normalize β_{91} to 0 and mark this reference year with a vertical line. Each dot in the graph shows the estimated interaction effect between the quota bite and the election in question, and the bars indicate 95% confidence intervals. A coefficient of 0.5 implies that a quota bite of 10 percentage points more elected women leads to a 5 percentage-point increase in the proportion of competent politicians in that local party, relative to 1991. The sample excludes 20 local parties that did not comply fully with the quota (having fewer than 40% elected women in 1994). It also excludes local parties with a female leader in 1991. Robust standard errors clustered at the municipality level are in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%. All regressions are estimated using OLS.

Table 5. Effect of the gender quota on the fractions of competent leaders (top-three politicians) and followers (other elected politicians).

| A: All Politicians	Followers (1)	Followers (2)	Leaders (3)	Leaders (4)
Post-Quota*$\Delta w_{94\text{-}91}$	0.093 (0.250)	0.112 (0.109)	0.261 (0.297)	0.234* (0.127)
Municipality FE	yes	Yes	Yes	yes
Muncipality time trends		Yes		yes
Observations	1,945	1,970	1,879	1,968
B: Men Only				
Post-Quota* $\Delta w_{94\text{-}91}$	0.246 (0.311)	0.281** (0.142)	0.498 (0.392)	0.413** (0.197)
Municipality FE	yes	yes	Yes	yes
Muncipality time trends		yes		yes
Observations	1,945	1,970	1,879	1,968

Notes: The figure shows estimates for the impact of the Social Democrats' zipper gender quota on the fraction of competent politician among followers (columns 1 and 2) and leaders (columns 3 and 4). The outcome variable is the fraction of competent politicians in each of these categories, where leaders are represented by the top-three politicians on the Social Democratic party's local ballot, and followers are the remaining elected councilors for the party. The top panel considers the fraction of competent men and women together, and the bottom panel considers only men. The sample excludes 20 local parties that did not comply fully with the quota (having fewer than 40% elected women in 1994). It also excludes local parties with a female leader in 1991. Robust standard errors clustered at the municipality level are in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%. All regressions are estimated using OLS.

Figure 5. Effect of the gender quota on the fractions of competent leaders and followers.
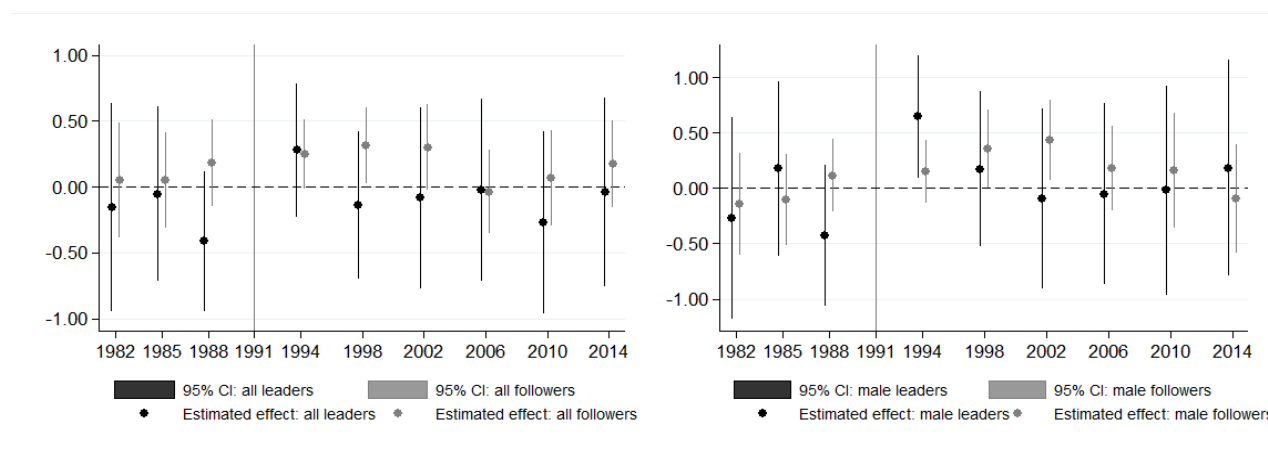
Notes: The figure shows the estimated changes in the fraction of competent followers or leaders relative to the reference year (1991) depending on the change in the share of elected women in the period 1991-1994. The left-hand graph shows estimates for men and women combined, and the right-hand graph show estimates for men only. Details of the estimation methods, sample period, and sample restrictions are found in the notes to Figure 4.

Figure 6. Effect of the gender quota on survival rates of competent and mediocre male leaders.
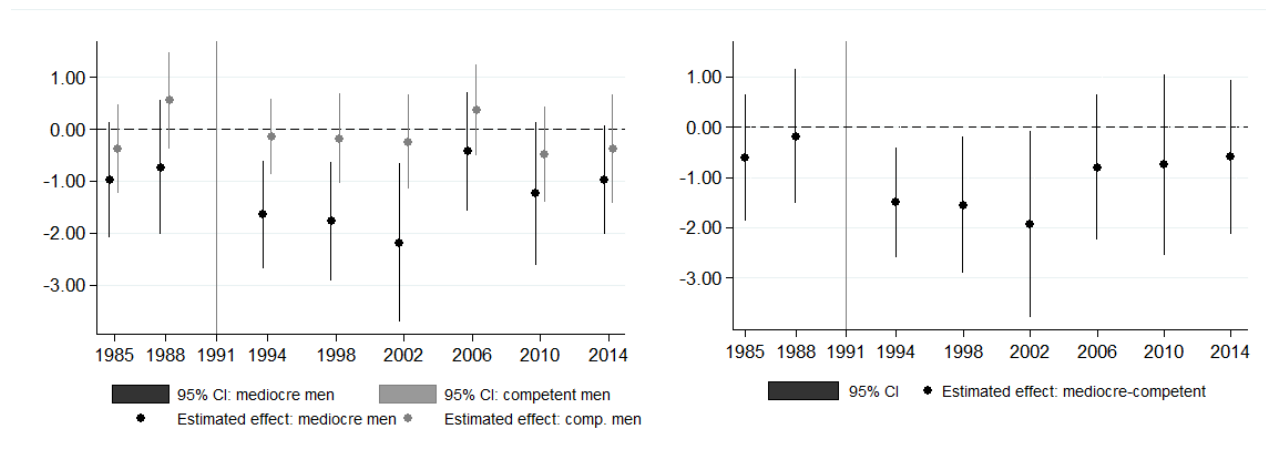
Notes: The figure shows the estimated changes in the survival probability of mediocre and competent male leaders relative to the reference year (1991), depending on the change in the share of elected women when the quota was introduced (1994-1991). The outcome variable captures the survival of the individual politician using a binary indicator that takes a value of 1 if he re-appears on the ballot in an election, and 0 otherwise. The unit of observation is an individual male politician in each election, and the sample includes politicians ranked in one of the top-three slots on the ballot in the previous election. The sample period is 1985-2014. The left-hand graph shows the results for estimating equation (6) – see the description in the notes to Figure 4 – separately for mediocre and competent men. The outcome variable is replaced with the survival indicator. The interaction for the year 1991 is omitted to make the immediate pre-quota election the reference category – i.e., we normalize β_{91} to 0 and mark this reference year with a vertical line. The right-hand graph shows the estimated difference in the treatment effect of the quota between mediocre and competent male leaders. A fully saturated triple-difference model, see equation (7), is used to estimate these differences, and the vertical bars show 95% confidence intervals for this difference. The sample excludes 20 local parties that did not comply fully with the quota (having fewer than 40% elected women in 1994). It also excludes local parties with a female leader in 1991. Robust standard errors clustered at the municipality level are estimated and all regressions are estimated using OLS.