IFN Working Paper No. 985, 2013

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

Timothy Besley, Olle Folke, Torsten Persson and Johanna Rickne

Research Institute of Industrial Economics
P.O. Box 55665
SE-102 15 Stockholm, Sweden
info@ifn.se
www.ifn.se

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September 30, 2013

Abstract

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

*The authors thank seminar participants at Science-Po, Harvard, Stockholm University, Columbia University, SITE, Juan March Institute, LSE, PUC-Rio, MPSA, APSA, EEA, IEB, European Public Choice Society, NBER Summer Institute, CEPR Public Policy Symposium, CEU, Gothenburg University, WZB, Raquel Fernandez, Fernanda Brollo, Christina Xydias, Inger Segelström, Drude Dahlerup, Lena Sommestad, Ola Nilsson, and Mona Lena Krook for helpful comments, Dany Kessel, Johan Arntyr and Sirus Dehdari for expert research assistance, and the Swedish Research Council, CIFAR, ERC and the Torsten and Ragnar Söderberg Foundations for financial support.

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

1 Introduction

It is often said that representative democracies need both men and women of competence and integrity to operate well. But how far one should attempt to engineer changes in the composition of the political class is much debated. Nevertheless, gender representation is an area where a myriad of changes have been made. For example, half of the countries of the world use some type of gender-based electoral quota for their parliament.

The empirical literature on policy effects from greater representation of women is somewhat equivocal. However, citizen-candidate models, such as Besley and Coate (1997) suggest that representation should matter if women have different policy priorities to men.[1] When it comes to the impact of the engineering tools themselves on other outcomes – such as the competence of politicians – we know even less. In this paper, we aim to bridge that knowledge gap.

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

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

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

the one proposed by Merlo et. al. (2010), and persuasively gauges the competence of each individual candidate.

Even though gender quotas are commonly used to fabricate more equal representation, their merits are hotly debated. Proponents see quotas as an expedient device to achieve equal representation, while opponents see them as a threat to meritocracy. There is now a considerable body of research on gender quotas.[3] Recent studies have looked at the characteristics of the women (and occasionally the men) that enter politics following the introduction of quotas. But the literature frequently lacks a plausible source of exogenous variation to establish the impact of quotas on competence. Focusing on a single parliament before and after makes it difficult to separate the effect of the quota from other simultaneous events. In studies of regional party groups, only a limited amount can be learned from quotas with nomination mandates, since the share of elected women will be determined by the parties themselves.[4]

This paper studies the effects of gender quotas theoretically and empirically. In our model, two parties select the gender and competence of politicians on their lists under proportional representation (PR). Increasing the fraction of women toward gender parity, or increasing the fraction of competent men, is appealing to voters and might therefore increase the chances of winning an election. But parties are headed by a male-dominated leadership that prefers an over-representation of men. Moreover, the leadership can be threatened internally by appointing women and, to the extent the leader is mediocre, by appointing competent men.[5] Thus, a mediocre male leadership

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

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

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

appoints fewer women and fewer competent men. Introducing a gender quota can force mediocre leaders to put greater weight on voter preferences than their own preference for re-appointment, which simultaneously boosts both gender diversity and male competence.

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

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

The paper relates to a recent literature which attributes the composition of party ballots to demand factors as opposed to candidate supply. For example, Bagues and Esteve-Volart (2012) have suggested that a lack of political competition leaves room for party organizations to recruit fewer women relative to what voters want. This implies that a gender quota might increase voter welfare if implementation is uniform across districts (as shown by Casas-Arce and Saiz, 2011). We explicitly model the role played by the party leadership in drawing up the list. This is similar in spirit to Egorov and Sonin (2011), who show how quality and diversity may be compromised by mediocre leaders wishing to hold on to power, and Gagliarducci and Paser-

man (2011), who link the survival of leaders to the composition of followers.

In the next section, we provide some background to the empirical context and gender quotas in Sweden. Against this background, Section 3 lays out the model and its empirical predictions. Section 4 discusses data and measurement. The baseline econometric results are collected in Section 5. Theoretical and empirical extensions are presented in Section 6. Section 7 concludes.

2 Context

This section summarizes some basic features of Swedish local politics and the gender quotas adopted by Swedish political parties. After some general description, we highlight five stylized facts which are used to guide our theoretical modelling in Section 3.

Swedish municipalities Politics in Sweden entails a parliamentary form of government and a PR electoral system implemented through party lists. The country has three levels of government: one national parliament, 21 county assemblies, and 290 municipal councils. The map in Figure 1 shows the counties (thick borders) and municipalities (thin borders). At each level, the majority party or coalition forms the government. In the same way as the majority appoints the prime minister at the national level, the local majority appoints the chairperson of the local council board. Each municipality is thus a microcosm of a parliamentary system, and each local party organization determines the composition of its own electoral ballot.

[Figure 1 here]

Elections are held every four years (three years prior to 1994) and parties obtain seats in proportion to their vote shares. Elections are synchronized for all three levels, and turnout is typically 80-90 percent of eligible voters. Before 1998, party lists were closed with an order of candidates decided by the party. In 1998, a flexible list system with one optional preferential vote was introduced. Because more than nine out of ten preferential votes have been cast for politicians who would have been elected without them (due do to their high list rank), this system has only marginally changed the composition of those elected. Party ballots often contain more information

than candidate names, like the person's age, education and/or occupation, and city within the municipality. Figure 2 shows a sample ballot from the Social Democratic party in 2006.

[Figure 2 here]

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

Municipalities differ widely in size – land area varies from 9 to 19,447 square kilometers and population ranges from 2,558 to 780,817 inhabitants. Municipal councils vary in size between 31 and 101 members, with an average of 46 seats, as illustrated with four size classes in Figure 1. Representation is not subject to an explicit electoral threshold, and all of the seven traditional political parties tend to be represented in each municipal assembly. These parties fall into two main political blocks, where the left block consists of the Left Party, the Social Democrats, and the Green Party,[6] and the center-right block consists of the Christian Democrats, the Center Party, the Liberal Party, and the Conservatives.

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

Stylized fact #1: Municipal political leaders are mostly male As in most countries, men in Sweden historically held a monopoly over the access to political office as well as to the right to vote. Even though modern day

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

Sweden is often viewed as a world leader in female representation, men have continued to dominate the positions of political power long after the female franchise in 1919.

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

Stylized fact #2: Local leaders control the composition of the party list Party-ballot composition is at the heart of a PR election system. In systems with closed lists, a candidate's positions on the list determines whether he/she is elected. List rank also indicates who is given a more influential political position after the election. Lists in Sweden are composed in three steps**.** First, a group of potential candidates is selected from among the party membership either by internal nominations (Left party and Social Democrats) or by an internal primary (the other parties). In both cases, this first step is administered by a selection committee that collects the results. In a second step, the committee uses the results to put together a preliminary list. Finally, this list is subject to a vote in a meeting of party members.

Local party leaders normally exert strong influence over the selection committee, which effectively controls the composition of the list. The committee administers the selection stage and determines the ranking at the proposal stage. The influence of rank-and-file party members is limited to supporting their preferred candidate(s) in the internal nomination procedure, or to vote for them in the internal primary. This behavior is, however, heavily influenced and coordinated by the dominant players within the party. Without support of senior members and leaders, a candidate has a small probability of gaining wider support. In the internal primaries, candidate lists are usually ranked by the committee, or administered in conjunction with party lists from the previous election as "guidance". This enables the leadership to have indirect influence over the outcome of the primary vote (Soininen and Etzler, 2006). Rank-and-file members also lack much influence at the final stage where, in theory, they can challenge the list suggested by the committee. But, in practice, few changes are made.

Figure 3 displays data from a large survey of municipal politicians about the influence elected representatives and the party leadership might have over electoral-ballot composition. The figure clearly shows that the party leadership is perceived to be substantially more influential.

[Figure 3 here]

Stylized fact #3: Policy preferences differ by gender, both among voters and politicians A large literature has argued that politicians' preferences are associated with their life experiences (Phillips, 1995), with gender experiences being an important example. To illustrate such preferences for Sweden, Figure 4 plots the responses by male and female voters and politicians in a large 2009 survey about their opinions on two proposals where we expect gender divergence. The first is the attitude towards the proposal to "work politically toward gender equality" while the second is towards the proposal of "raising taxes rather than reducing public services". For both survey questions, women have a more favorable attitude than men among voters as well as politicians.

[Figure 4 here]

Stylized fact #4: Competition for leadership positions within parties is (sometimes) organized along gender lines Following Stylized fact #3, we expect politicians to prefer a leader of their own gender, all else equal. And a female party member is less likely to support the re-election of a male leader for any given level of competence. When the Social Democrats introduced their zipper quota, the party's women's association formalized their efforts on gaining political influence into a political handbook, clearly stating a *modus operandi* along gender lines.[7]

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

Stylized fact #5: Effective gender quotas require placement mandates More than a hundred countries worldwide have adopted some form of gender quota with the aim to increase female numerical representation in political office. Quotas take different forms, but some are more efficient than others. If a party policy – or national quota law – only dictates that a certain share of the candidates should be women, this share tends to be found towards the bottom of the list (see e.g., Norris, 2004 and Krook, 2010, and for evidence on Spain, Casas-Arce and Saiz, 2011, and Campa, 2011). To achieve their aim, policies should state that women have to be placed in certain electable positions: a so-called placement mandate.

All Swedish parties have voluntarily adopted measures towards gender parity, ranging from goals and non-mandatory recommendations (right-center block) to stricter regulations with placement mandates (left block). Table W1 (in the Web Appendix) summarizes the main strategies for each party. Most parties have introduced stricter policies over time. For example, the Social Democrats began with targets for the female list share: 40 percent ahead of the 1988 election and 50 percent ahead of the 1991 election. It was only in 1993 – after a credible threat by women to form a feminist party which would likely have claimed both politicians and voters from the Social Democrats – that the party adopted a quota with a placement rule that every second candidate had to be a woman. This "zipper" quota was imposed on all municipalities by the central party.

[Figure 5 here]

The effectiveness of the Social Democrats' zipper system is illustrated in Figure 5. The response in the 1994 election was large. Indeed, the deviations from 50% female representation after the quota is explained mostly by randomness in election outcomes: some local party groups obtain an odd numbers of seats and the first-ranked candidate still tends to be male. That said, a small number of party groups did not apply the quota to the letter.

The figure also shows two additional things. By showing the impact of the quota in municipalities above (red line) and below (blue line) median municipality population, we want to highlight that the trends are not far

woman candidate's experience and qualifications. In good time before the meeting, ring around and present the arguments in her favor to the other women who will be at the meeting. Make sure women will be in the majority at the meeting. If possible, seek male allies" (Social Democratic Women in Sweden, 1995).

apart. We also see that the Social Democrat's recommendations of 40 and 50 percent women on the ballot (in the 1988 and 1991 elections) were far less efficient in increasing women's numerical political representation than the placement mandate (in 1994).

Figure 6 illustrates the same point by comparing across political parties. It shows the change in the share of elected women over all municipalities, in the election following the Social Democrat's zipper quota (in 1994), and the recommendations of 50 percent female candidates in the Conservative Party (in 1994) and the Center Party (in 1998). In the Social Democrats, the average change was 10.1 percentage points. By contrast, it was only 2.5 and 1 percentage points for the Conservative and Center Party, respectively.

[Figure 6 here]

3 Model

The *male* leadership of two political parties in a PR election *chooses* the candidates on their closed party lists (Stylized Facts # 1 and 2). Prospective candidates differ in two dimensions: competence and gender. Following the general election, the party leader faces an internal leadership election from among the party's representatives. This creates a tradeoff in the selection of candidates. Greater competence may please voters, but it is threatening to the male party leader, who is more likely to be internally challenged by more able candidates and by more female politicians. The latter threat stems from policy preferences that vary across *genders* both among voters and politicians (Stylized Fact # 3), such that female politicians may strive to *replace* male leaders (Stylized fact #4). This creates an additional tradeoff in candidate selection.

The model has some interest in its own right, being the first (that we know of) to study how two competing parties choose list composition in a PR-election. But our main purpose is to make empirical predictions about the determinants of equilibrium party-list composition in a pre-quota equilibrium and the effects of a quota for female candidates in one of the parties.

In this section, we present the structure of the full model. But we study only the partial-equilibrium choices of the one party imposing the quota, when it ignores the responses by voters and the other party. This is to focus on the most novel aspect of the model: how a male leader composes the

party list to trade off his own policy preferences against his probability of survival as party leader. We look at choices before, as well as after, the imposition of a *binding* quota (Stylized Fact #5). The resulting partial-equilibrium predictions are most plausibly tested on data from municipalities where political competition is low or absent. In Section 6, we extend the analysis to a full Nash equilibrium with strategic behavior by both parties, in view of the optimal behavior by voters. There, we show that some of the partial-equilibrium predictions may not hold when political competition is high. The full equilibrium analysis also allows us to study spill-over effects of the quota to other parties.

3.1 Basic Structure

Parties Two parties, labeled $k = s, b$ (for Social Democrats and Bourgeois), participate in an election for a municipal council. Since the electoral rule – at the time of our application – is closed-list PR, each party offers a list of candidates. Party leaders are male and control the list choice of the party. The winning party implements policy after the election.

Population composition The population differs in two dimensions. The first is gender: Women and Men are denoted by $G = \{W, M\}$. The second is competence, where we distinguish two types: Competent and meDiocre, denoted by $X \in \{C, D\}$.To simplify the analysis, and focus on the competence of male politicians, we assume all female politicians are competent. Given the rest of the model, this is without loss of generality (the utility of everyone is increasing in competence for a given gender composition). Thus, we have three types – women, competent men, and mediocre men – the shares of which can be described by two numbers. In the Appendix, we show that our main qualitative conclusions (Propositions 1 and 2) still hold when all women are mediocre rather than competent.

We consider the special case when the list is structured so that the fractions of women and competent men are invariant to the number of seats won. This is equivalent to assuming that the fractions do not vary within the upper segment of the party list where the politicians have some realistic likelihood of getting elected.[8]

[8]A more general problem, left for future work, would be to let $n \in [0, 1]$ index the list position and then let each party pick a pair of measurable functions $\{\hat{w}(n), \hat{c}(n)\} \in$

Timing of events Our model is static, but has the following sequence of events.

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

In the following subsections we discuss each stage. Eventually, we look for a subgame-perfect equilibrium. Thus, we proceed in reverse order. However, we relegate some details, only needed to consider the full equilibrium, to Section 6 and the Appendix.

3.2 Stage 4: Leadership Survival

Think about Stage 4 as a citizen-candidate contest within each party. But we model this contest in a reduced-form way. Consider a male leader of party k, with some innate competence, measured continuously by $e_k \in [0, \overline{e}]$, with $\overline{e} > 1$. In general, a male leader would survive the internal leadership election with probability $Q(e_k, w_k, c_k)$, increasing in the first argument and decreasing in the second and third. More competent politicians survive the leadership election with higher probability. But the probability of survival decreases in the share of women and the share of competent men. Both are sources of stronger internal competition and women also have different preferences. To simplify the analysis, we assume that survival is deterministic:

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

$[0,1] \to \{0,1\}$ denoting that a woman or a competent man is selected for the nth position.

The competence constraint We refer to the inequality

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

as the *competence constraint*. Clearly if $e_k \geq 1$, this constraint on candidate selection is not binding. But if e_k is closer to zero, the competence constraint restricts the leader's choices. To further simplify the analysis, we assume that survival is a *lexicographic* priority of the leader.[9]

3.3 Stage 3: Council Election

Preferences of male and female swing voters Some voters have weak party attachments and vote for either party based on the utility they derive from the policy choices of the elected council majority. Among these *swing voters*, men and women have preferences over party lists given by:

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

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

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

Representative swing-voter utility Aggregating over male and female voters, and assuming they are equally many, we obtain the "representative"

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

swing-voter utility offered by party k:

$$v_k = \frac{1}{2} \sum_{G \in \{W,M\}} v_k^G = \rho(w_k) + \beta[w_k + (1 - w_k)c_k], \quad k = s, b, \tag{3}$$

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

This observation helps illuminate two tradeoffs in the model. First, by (2) and (3), a male party leadership has a lower preferred share of women than the representative swing voter (w^* vs $\frac{1}{2}$). Picking more female candidates to please the electorate may thus have a cost to the leaders in terms of (implicit) policy outcomes. Picking more female or competent male candidates to please the electorate – or to satisfy the leaders' own preferences – has another cost: the leadership is less likely to survive the internal leadership election as per the competence constraint.

3.4 Stage 2: List Design

We now study how the design of an optimal list in political equilibrium varies with the competence of the leadership. Then, we ask how the list changes when a binding party-specific quota is introduced. This results in two key predictions that we take to the data.

Choosing shares of women and competent men It is most convenient to study the outcomes (the shares of women and competent men on the party list) in two stages. In the first, each male party leadership chooses list composition, constrained by concern about its own survival and the requirement that the representative swing voter gets no less than a certain utility level v. In the second stage, the parties compete for the swing voters by choosing v_k. The first stage amounts to the following problem:

$$V(v, e) = \max_{c,w} \{\mu(1 - w) + \beta[w + c(1 - w)]\} \tag{4}$$

$$\text{subject to}$$

$$w + (1 - w)c \leq e$$

and

$$\rho(w) + \beta\left[w + c(1-w)\right] \geq v \ . \tag{5}$$

Function $V(v, e)$ gives the party leaders' payoff, which is an important input into the second-stage model of political competition. The Appendix spells out the detailed properties of this function. Here, we just note that it is decreasing in v, i.e., it is costly for the party leadership to make a concession to swing voters.

In this section, we abstract from the need to court swing voters and instead home in on the preference-survival tradeoff faced by the party leadership. Hence, we focus on the cases where leaders ignore the swing-voter constraint (5). Specifically, they only supply $v = \underline{v}(e_k)$, defined as the lower bound on swing-voter utility, $\underline{v}(e_k) \in \arg\max_v \{V(v, e_k)\}$, given their competence level e_k ($k \in \{s, b\}$). In the Appendix, we show formally that when political competition is below a well-defined bound, it is indeed optimal for the parties to only supply $v = \underline{v}(e_k)$. This is the outcome when the party faces no effective competition. In Section 6, we reintroduce the swing-voter constraint and consider the outcome when parties compete with each other for swing voters and may choose to set $v > \underline{v}(e_k)$.

Pre-quota choices In the Appendix, we provide a general solution to the list-design problem (without a quota). When the swing-voter constraint is slack, the solution is:

$$w(e_k, w^*), c(e_k, w^*) = \begin{cases} e_k, 0 & \text{if } \ e_k \leq w^* \\ w^*, \frac{e_k - w^*}{1 - w^*} & \text{if } \ w^* < e_k < 1 \\ w^*, 1 & \text{if } \ 1 \leq e_k \leq \overline{e} \ . \end{cases} \tag{6}$$

There are three ranges. If the leadership is highly mediocre, it is optimal to have only women and no competent men. A moderately competent leadership has its ideal number of women, w^*, and tops up the list with competent men to the point where the competence constraint is just binding. A highly competent leadership has only competent men on the list and his preferred fraction of women, w^*. It is easy to see that the solution fulfils the following proposition:

Proposition 1 *Suppose that $v = \underline{v}(e_k)$. Then, ceteris paribus, the fractions of women and competent men are both weakly increasing in e_k.*

The result is intuitive. Male party leaders choose less than one half of women and may choose fewer than 100% competent men, as they trade off their innate preferences and their fear of replacement. More competent party leaders are less threatened by women or competent men. Since their preferences in (2) value women (up to share w^*) and competent men (up to share 1), a leadership with greater competence chooses (weakly) higher shares of both groups.

The effect of the quota We now consider the effect of a binding gender quota of 50% in party s. Again, the swing-voter constraint is slack, so the leader can pick his preferred list composition, given a lexicographic preference for survival. The impact on the fraction of women is almost mechanical, given the pre-quota equilibrium. As party leaders set the pre-quota share of women w_s lower than 1/2, the quota is binding, with bite $\Delta w_s = \frac{1}{2} - w_s$. Therefore, our main question concerns the change in the fraction of competent men, $\Delta c_s = \overline{c}_s - c_s$ where $\overline{c}_s$ and c_s denote the post- and pre-quota shares. The following result is proved in the Appendix.

Proposition 2 *Suppose that $v = \underline{v}(e_k)$. Then, the effect of a binding quota in party s relative to the pre-quota equilibrium, ceteris paribus, depends on leader competence. For the least competent leaders ($e_s < \frac{1}{2}$), the bite of the quota (Δw_s) is the largest and the fraction of competent men increases ($\Delta c_s > 0$). For a middle range of leader competence ($\frac{1}{2} \leq e_s < 1$) the bite of the quota is smaller and the share of competent men goes down ($\Delta c_s < 0$). For the most competent leaders ($e_s \geq 1$), the bite of the quota is the same as in the middle range, but there is no impact on the share of competent men ($\Delta c_s = 0$).*

For mediocre leaders, the quota makes it impossible to fulfill the competence constraint. These leaders therefore switch to appointing (only) competent men to satisfy their own preferences. Mid-competent leaders can still satisfy the competence constraint, and do so by reducing the fraction of competent men proportion to the required increase in women, to keep the threat to their leadership constant. Highly competent leaders feel no additional threat, so they satisfy the quota by appointing more women and fewer men, but maintain the share of competent men at its maximum of 1.

Proposition 2 states the relation between the bite of the quota and the change in the share of competent men depending on pre-quota leadership

competence: the lowest levels of e go together with the largest quota bite Δw_s and an increasing share of competent men $\Delta c_s > 0$, while higher levels of e go with a smaller quota bite and a non-increasing share of competent men. Thus, the prediction is a positive correlation between Δw_s and Δc_s, over the full range of leadership competence.

Implications Proposition 1 about pre-quota list composition applies only when the swing-voter constraint is slack. Hence, it is most appropriate to study how the shares of women and competent men vary with leader competence in a subset of municipalities where political competition is low or absent. The solution in (6) suggests that this test should be carried out by controlling for variables that proxy for, w^*, since this parameter may be correlated with leader competence.

To test the prediction in Proposition 2, we should similarly focus on municipalities with low political competition. Since the bite of the (binding) quota is predetermined (by previous outcomes) in the first election when the quota applies, we can test for a positive effect of the quota bite on the share of competent men by a difference-in-difference specification. However, the positive correlation predicted in Proposition 2 requires that leader competence, e, is the main driver of the correlation between quota bite and male competence. Using the solution in (6), it is easy to show (see the Appendix) that if the main driver of this relationship is male preferences w^*, the predicted correlation is negative instead of positive. In the following sections, we discuss how to account for this in the empirical specification.

4 Measurement

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

Linking data sets Our data originate from party ballots from the Swedish Election Authority, for seven parties, in six elections (1988 to 2010), for 290 municipal councils. From these ballots, we know the list rank of each politician and the number of votes cast for each list. In each election, about 55,000 politicians appear on the ballots (excluding local parties), about 13,000 of which are elected. For the full period, the sample contains 158,448 unique

politicians, out of which 44,877 have been elected at least once. Social Democrats make up the lion's share of those elected, accounting for roughly 40 percent of that group. Thus, each municipal council has a substantial Social Democratic delegation, exceeding ten elected politicians in more than 95 percent of council-elections.

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

Measuring competence Previous studies have proxied the quality or competence of politicians by their income or educational attainment (e.g., Besley and Reynal-Querol, 2011 and Galasso and Nannicini, 2011). Although such measures can capture certain aspects of technical competence and qualifications, they tend to confound competence with representation. An ideal measure of political competence – defined as valence, as in our model – should capture key abilities to govern, for *any* socioeconomic type.

To approach that goal, we measure competence using the residuals from a fully saturated Mincer equation, defined over a large set of socioeconomic characteristics.[10] We begin by estimating:

$$y_{i,a,m,t} = educ_{i,a,t} + (1 + h_i) \cdot empl_{i,a,t} + mun_m + c_i + \varepsilon_{i,a,m,t} \ , \qquad (7)$$

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

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

and the years afterwards.[11] All specifications include municipality fixed effects, mun_m to capture systematic income differences over regions or between urban and rural areas.

The education measure in these regressions, $educ_{i,a,t}$, relies on indicator variables representing each level of educational attainment.[12] We interact these (seven indicators) with age (16 indicators for 5-year age intervals) and year (20 indicators). By this three-way interaction, we allow education premia to differ by age, year and cohort. Controlling for cohort is especially important, in view of the massive expansion of higher education in Sweden over the age groups we examine. Apart from the variation in the education premium, we also capture the overall relationship between age, cohort and year with income.

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

How to estimate (7) for retirees is not straightforward: even though pensions reflect the individual's former earning potential, the Mincer equation of

[11] Thus we remove wage observations for individuals that are employed full time as politicians both during this time and the time after they leave their political office. We also exclude all wage observations for politicians who move on to a seat in the national parliament.

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

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

a retired person is not equivalent to that of someone in the workforce because retirees do not have a current sector of employment. We therefore compute the income residuals of retirees in a separate regression, based on the sector in which they were employed during the majority of their working-life. For those who retired during the sample period we include them in both samples, i.e., as workers and retirees, and then use the average of their residuals as the final competence score. Furthermore, men and women have different labor-market careers, e.g., due to different time constraints from family responsibilities. Because of this, we also run the regression separately for men and women.

Having obtained the average residuals (fixed effect) for each individual from (7), we create standardized z-scores for politicians in each party. We separate different parties, since they recruit both members and politicians from different social strata, which may not fully be captured by the control variables in the Mincer regression. Thus, our competence measure allow us to analyze selection within parties. Also, when standardizing the competence measure, we restrict the sample to elected politicians.

In the empirical analysis, we approximate the share of competent men by first dividing them into competent and mediocre types using zero as a cutoff score for the residual above which the politician is deemed to be competent. This corresponds to the dichotomous definition of competence in the theoretical model. We then use this classification to compute the share of competent men amongst the elected men not included in the party leadership.

Measuring leadership competence We measure the competence of the male party leadership in a continuous fashion, corresponding to the model definition of e. We compute the average income residual c_i across the top-three male politicians on each party ballot (the list is excluded if the first-ranked politician is not male). While a cutoff of three is somewhat arbitrary, it may be a good indicator of the senior party membership and hence a good proxy for the key decision-making group. Also, as mentioned above, the computation of the competence measure excludes the incomes of full-time politicians during their time in office and after they leave. For 1988, we thus remove the income of the chairman of the council board in (the many) municipalities where the Social Democrats are the largest party in the governing majority. Since the Social Democrats are key to our empirical results, we therefore need to measure leadership competence for more than

a single politician.

Validating the competence measure We use two strategies to validate our competence measure: we show that it predicts political success for the average politician, and that it correlates with the scores from ability tests conducted in the Swedish military draft system.

Political Success The first of three variables we use to gauge political success is the politician's share of all preferential votes on her party's ballot in that election (since 1998), a direct assessment of relative voter support. The second is a dummy variable for re-election (since 1991), which directly determines career advancements via the seniority system (see Folke and Rickne, 2012 for a motivation of this career measure). The third is a dummy variable for an appointment to a chair position (available in our data since 2006), on to either the municipal-council board or one of the committees. This measure captures strong support of the individual politician from the party group by the entrustment of leadership tasks. Using it for estimation, however, requires us to restrict the sample to party groups whose politicians are eligible for chair positions, namely those in the current majority.

Three simple regressions are estimated as:

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

where $x_{i,t+1}$ is the measure of political success. Note that political success is measured in the next election period (appointment as chair), after election $t+1$ (re-election), or after election t (preferential votes). Our parameter of interest, β, captures the correlation between our competence measure, c_i, a continuous z-score of the income residuals from equation (7), and the dependent variable. As we measure the outcomes after election t, we can compare specifications with and without fixed effects for list rank, $\phi_{i,t}$ on the ballot in election t. This control is particularly important in the case of the preferential votes, as voters may cast such votes for top-ranked candidates by default (Montabes and Ortega, 2002). This could conflate our estimate of β, because income residuals are positively correlated with list rank. The fixed effects are interacted with categorical variables for party-group size to ensure that a correlation between group size and the relative concentration of "default" preferential votes for the top-ranked candidates does not confound our estimates.

The results are presented in Table 1. They show strong positive correlations between our competence measure and all three dependent variables. For preferential votes in Columns (1) and (2), the estimate without the list-rank fixed effects shows that a one standard deviation higher competence score is associated with drawing close to 2 percentage points more of the party's preferential votes. Holding list rank constant, this estimate is reduced to 1 percentage point. This is still a strong indication that our competence measure predicts direct voter support as our model supposes. For re-election in Columns (3) and (4), our estimates show that candidates with one standard deviation higher competence have a 5 percentage point higher probability of re-election, less than half of which might be explained by list rank. Hence, our competence measure is a strong predictor of a continued political career. In Columns (5) and (6), we find that parties reward politicians with a higher competence measure with positions of greater political influence. A one standard deviation higher competence is associated with a 6 percentage point greater probability of becoming (or remaining) appointed to a chair position.

In sum, the correlations Table 1 allay a potential concern that our income residuals may define competence in a way that is only relevant for market returns, and not for politics.[14]

[Table 1 here]

Ability tests The second method for validation is to correlate our competence measure with the scores from ability tests conducted in the Swedish military draft system, a system that used to be mandatory for all Swedish 18-year old men.[15] Specifically, we use scores on two tests. The first and written test evaluates cognitive ability by combining scores on several subtests of logical, verbal and spatial abilities into a general score from 1 to 9.[16] This test is similar to the armed forced qualifying tests (AFQT) in the US and

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

[15] Until 2010, military service was mandatory for all Swedish men and prior to the late 1990s over 90 percent of each cohort enlisted. Exceptions were only made for the physically and mentally challenged recruits. In more recent years, the draft was still mandatory in the eyes of the law, but in practice it was largely optional.

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

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

The second test derives from an interview with a certified psychologist, who follows a specific (but secret) manual that suggests topics to be discussed and how to grade different responses. The aim is to determine a conscript's psychological capacity to deal with military duty and armed combat, principally his ability to cope with stress and to contribute to group cohesion. A conscript obtains a high score if he is considered to be emotionally stable, persistent, socially outgoing, willing to assume responsibility, and able to take initiatives. However, motivation for military service is explicitly not a factor to be evaluated. Grades are given on four different sub-scales which are transformed to a discrete 1 to 9 scale. Besides the interview, this score is also based on information about the conscript's results on the tests of cognitive ability, physical endurance, muscular strength, as well as grades from school and the answers on questions about friends, family, hobbies etc. Previous studies have shown that both these military test scores, the cognitive test and the non-cognitive test, are excellent predictors of labor market performance in several dimensions (see e.g., Lindqvist and Vestman, 2011).

Figure 7 shows scatter plots for the z-score of our own competence measure and the z-score transformations of the two military-draft tests. Both correlations are precisely estimated: the slope coefficient is 0.24 with a standard error of 0.01 for the non-cognitive measure (in the right graph), and 0.11 with a standard error of 0.01 for the cognitive measure (in the left graph).[17] The stronger correlation with non-cognitive skills in all likelihood reflects the fact that our Mincer regressions control for qualifications such as formal education. These correlations confirm that our income-based measure of competence captures key components of politician competence, which are specifically measured by the draft tests.

[Figure 7 here]

As a robustness check, we also compute the share of competent politicians from an average of the two military draft tests.

Measuring competition We noted that the cleanest way to study the model predictions in Section 3 is to limit the sample to municipalities with

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

little political competition. To measure competition, we use the fact that Swedish politics is centered around two stable political blocks: the left and the center-right.[18] We take the absolute difference in vote shares between these two blocks and average this over the past three elections.[19] Then, we define low competition municipalities as those in the bottom two thirds of the distribution.[20]

As a robustness check, we also define a municipality as having a low level of competition if either one the two blocks held a majority in each of the 5 election periods between 1974, when the current division of Swedish municipalities was established, and 1991. According to this definition, 182 out of the 284 municipalities formed in 1974 are defined has having low competition.[21]

Measuring preference biases The model predictions concern the shares of women and competent men, when the pre-quota equilibrium and the bite of the quota are driven by variation in leadership competence e rather than male preferences w^*. To control for the local taste heterogeneity between men and women, we use three sets of variables that measure the local economic and political context. These are: i) the municipality's gap in per-capita income between men and women (measured in 1991), ii) four categorical dummy variables for size of the municipal assembly, and iii) dummy variables for six municipality types.[22]

[18] In fact, the strength of the two blocks led Alesina et al. (1997) to classify Sweden as having a bipartisan political system.

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

[20] Previous research on Swedish municipalities has found a causal effect from majority positions of political blocks on policy outcomes (Pettersson-Lidbom, 2008).

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

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

5 Results

We now confront the predictions derived in Section 3 with the data discussed in Section 4. First, we study the initial (pre-quota) equilibrium, as represented by the 1991 election outcome. Then, we study the effect of the Social Democratic quota introduced in 1993. Following the model predictions, we do this only for the municipalities where political competition is classified as low.

5.1 Party Lists

According to Proposition 1, the shares of women w and of competent male followers c should both be increasing in leadership competence e. We check this in all party groups with more than eight elected representatives in each of the 1988 and 1991 elections and with a man on the ballot's first position in 1988. We also run the analysis separately for a sample that only includes the Social Democratic groups.

Graphical evidence First, we plot binned averages of w and c (measured in 1991) against e (measured in 1988) with ten party-group observations in each bin. Figure 8 shows a clear and positive relationship between e and w, as well as between e and c. This is true regardless of whether we consider all party groups or just the Social Democrats.

[Figure 8 here]

Regression evidence Next, we examine OLS regressions with and without the three sets of contextual controls, intended to proxy for variations in w^*. The results are in Table 2, without controls in odd-numbered columns and with controls in even-numbered columns. Column (1) shows a positive correlation between e and w – a one standard-deviation higher competence of the leadership is associated with a two percentage-point larger share of women. When we add the contextual controls in column (2) the magnitude of this association falls and becomes less precisely estimated, suggesting that our control variables independently affect w via the taste parameter w^*. Columns (3) and (4) look at the share of competent men. The positive correlation is strong and significant, with or without controls. Columns (5) through (8) repeat the same specifications, but only for the Social Democrats.

The results are broadly similar, with the results for male competence holding up when we include the controls intended to capture variation in w^*.

[Table 2 here]

As shown in the Web Appendix, Table W2, these results largely hold up when we use the alternative measure for competence based on military draft scores, although there is substantially less data to use for this estimation. The results wholly hold up for the alternative definition of low competition in Table W3 (based on uninterrupted one-block rule).

Overall, the results point to a strong correlation between the competence of male candidates on the list and a more competent leadership, as Proposition 1 predicts. For women's representation the results are somewhat more equivocal, but if the control variables indeed proxy for w^* they too are in line with the theory.

5.2 The Effects of the Quota

Our model ties the evidence in Table 2 to the competence constraint that drives Proposition 1. A possible criticism of these cross-sectional findings is that some common omitted factor may drive leadership competence, the fraction of competent men outside the leadership, and the fraction of women in the pre-quote equilibrium. The natural experiment from the quota provides a further opportunity to test the model. The comparative static in Proposition 2 predicts the share of competent men on the party list to go up by more in those municipalities where the bite of the quota is larger.

Econometric specification To test this, we use a difference-in-difference specification across all election periods, but with particular attention to the estimated effects in 1994, the first election after the quota. This approach also helps to check that our results are not driven by a general trend, due to other factors than the quota, in the selection of competent men. We can also assess the long term impact of the quota – while our model is static, its prediction is in the spirit of a permanent effect.

For our sample of Social Democratic party groups, we estimate:

$$c_{m,t} = \alpha + \beta_t \Delta w_{m,1991-1994} \cdot elec_t + X'_{m,pre-quota} \cdot elec_t + elec_t + mun_m + \varepsilon_{m,t} \ , \quad (8)$$

where $c_{m,t}$ is our measure of the share of competent men, and the quota bite is defined by $\Delta w_{m,1991-1994}$, the change in the share of women between 1991 and 1994 in percentage points. The specification includes dummy variables for each election year, denoted by $elec_t$, and for each municipality, denoted by mun_m. We include the same contextual controls as in Table 2 measured in the pre quota years, $X'_{m,pre-quota}$, but now interacted with the election-year dummies. The idea here is to purge the relationship between $c_{m,t}$ and $\Delta w_{m,1991-1994}$ from the influence that w^* might have on the quota bite. Our specification creates a heterogeneous treatment effect across municipalities. We focus on municipalities with a minimum of eight elected Social Democratic politicians and a male on the top of the ballot in 1991, but we also exclude from the sample, the 20 municipalities that did not comply with the quota (here defined as having fewer than 40% women in the party group in 1994).

The key coefficient is β_t which captures the relationship between the quota impact, Δw_m, and being in an election year after (or before) the quota was introduced. The 1991 pre-quota election year is the reference point, i.e., we normalize β_{1991} to 0. As the theory suggests that municipalities experiencing a large quota bite should not experience boosts in the share of competent men before the quota, we expect coefficient β_{1988} to be insignificant and close to zero. Coefficient β_{1994} is the impact effect of the quota, and we expect the coefficients β_t, for $t > 1994$, to be similar in sign and magnitude to β_{1994} if the zipper quota permanently affected the selection of men.

Evidence We present results for three different definitions of the party group. The first excludes the three-top ranked men from the computation of the share of competent men (as above). The second adds in the leadership into the competence measure to ensure that the results are not driven by the cut-off used to separate leaders from followers. The third holds the number of men in the party group constant between 1991 and 1994, to check that the quota effect is not driven by fewer men being elected as a consequence of the quota.[23]

[Table 3 here]

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

Table 3 shows the results. The coefficient for the immediate quota effect, β_{1994}, is positive and mainly significant regardless of which definition of the party group that is used or whether controls are included. The size of the estimates suggests that a 10 percentage point larger quota bite leads to a 4 percentage-point increase in the share of competent men. When we include the control variables for municipality characteristics measured in the pre-quota years, the point estimates increase in all of our specifications. This suggests that the estimated effect is indeed based on a larger quota bite due to mediocre leaders, rather than a preference for fewer women in political office. The estimates for β_{1988} are typically close to zero and statistically insignificant. The β_t coefficients for later elections than 1994 are similar in magnitude to β_{1994}, suggesting that the competence effect of the quota was permanent.

Figure 9 illustrates the first-difference relation by plotting the binned averages (10 observations in each bin) of the change in the share of competent men against the bite of the quota. This shows a positive relationship between the quota bite and the change in the share of competent men between 1991 and 1994.

The Web Appendix shows that the results are essentially the same when we use the alternative measure for competence based on the draft scores (Table W4), or the alternative definition of low competition based on uninterrupted one-block rule (Table W5).

[Figure 9 here]

Together, the results in Tables 2 and 3 support the prediction that a larger quota bite is associated with a larger hike in the selection of competent male representatives. That result would be difficult to explain by some omitted common factor driving the initial competence of the leadership as well as the fraction of women and competent men. If that were the explanation for the findings in Table 2, there would be no particular reason to expect an increase in male competence in those municipalities where the quote bite was larger as in Table 3. By contrast, our theory about the survival concerns among mediocre male leaders suggests a persuasive interpretation of this finding.

6 Additions

In this section, we discuss three additional issues. We first ask, theoretically and empirically, how our findings vary with the extent of political competition within a municipality. Second, we ask, theoretically and empirically, how the introduction of a quota in the Social Democratic party affects the behavior of other parties. Third, we briefly explore the empirical pattern when women are allowed to be mediocre as well as competent and check the quota impact on the selection of politicians of both genders.

6.1 Political Competition

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

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

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

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

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

Parties choose levels of swing-voter utility from a feasible range $\{v_s, v_b\} \in [\underline{v}(e_s), \bar{v}(e_s)] \times [\underline{v}(e_b), \bar{v}(e_b)]$, to form a Nash equilibrium. The party leadership trades off the probability of winning against a lower personal utility from winning. Given the solution to the previous list-composition problem for a given level of swing-voter utility in (4), we can then derive the general implications for the share of women and of competent men and, in particular, how these vary with the competence of the leadership.

When do the previous predictions hold? As shown in the Appendix, the predictions in Propositions 1 and 2 are all conditional on κ, a parameter

that reflects the competitiveness of the election. If κ is either very high or very low, i.e. when either one of the party has a large advantage in the share of committed voters, then there is no incentive for the parties to compete for swing voters. This is because the outcome of the election is basically known in advance – i.e., $P(\kappa + v_s - v_b)$ is either zero or one for all $\{v_s, v_b\}$. In such cases, party leaders might as well as pursue a strategy that minimizes v_s to maximize his own payoff $V(v, e_s)$. Proposition 1 and 2 apply exactly in this case.

For a middle range of κ, competition is more intense, making it optimal to offer more than the minimal swing-voter utility $v_k > \underline{v}(e_k)$. This is achieved either by raising the share of competent male candidates or by rasing the share of women above w^*. The comparative statics are essentially the same as in Proposition 1 and 2. However, there is one minor modification when simultaneously $v > \underline{v}(e_s)$, the competence constraint is binding, and $e \in [w^*, 1]$. In this part of the parameter space, an increase in leader competence relaxes the competence constraint such that the leader may reduce the fraction of women to satisfy the swing-voter utility constraint. This means that there is a range of parameters where the quota bite may be non-monotonic in e. However, the broad thrust of the comparative statics (provided that there is sufficient variation in e relative to w^* in the data) is preserved.

Data We now look at the same specifications as in Tables 2 and 3, when the sample consists of all municipalities, i.e., also including those with the highest levels of political competition.

[Table 4 here]

Table 4 parallels Table 2, and the results are largely similar. Including control variables weakens the positive relationship between leader competence and the fraction of women. However, the positive correlation between a competent male leadership and male follower competence continues to be strong. While the point estimates are largely similar in magnitude across the two tables, the results still hint at a more ambiguous relationship between c, w and e when political competition is an important factor. This is consistent with the theoretical model.

[Table 5 here]

Table 5 parallels Table 3. Here, the relationship between the quota bite and the selection of competent men is distinctly weaker than in Table 3, underlining the importance of focusing on less competitive municipalities to test Proposition 2. Where competition is strong, it is likely that electoral concerns rather than the tradeoff between male preferences and leadership survival dictated the pre-quota outcome.

6.2 Spillovers

Theory The model predicts (see the Appendix) that, if two conditions are jointly fulfilled a gender quota in party s will spill over to list composition in party b – the first condition being that political competition is high enough and the second that party b's leadership is middle-range competent ($e_b \in [w^*, 1]$). Moreover, we expect this effect to be larger, the greater the bite of the quota on party s. In particular, we expect the party s quota to push party b to raise its share of women. However, for given leadership competence in party b, these women will replace competent men when leaders seek to ensure their own survival, i.e., to fulfill the competence constraint.

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

We test for spillovers by regressing the fraction of women and the fraction of competent men in these other parties on the quota bite for the Social Democrats in the same municipality. The results are reported in Table 6 for the full sample of municipalities (columns 1 and 2), those of the top tercile of political competition (columns 3 and 4), and those in the two bottom terciles of competition (columns 5 and 6). The results do not show significant evidence of spill-overs, neither in the full sample nor in the sub-categories of municipalities with different levels of political competition.[24]

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

[**Table 6 here**]

6.3 Competence of women

Our model does not consider the selection of women since it assumes all women to be competent. Even though the female entrants did not crowd out competent men, we might be concerned that the female newcomers were even more mediocre than the mediocre men whom they replaced.

Difference-in-difference results To address the issue of mediocre "quota women", we use our income-based measure to gauge the impact of the quota on the competence of female representatives. One way to do so is to repeat the same difference-in-difference specification as in Table 3, to see how the share of competent women varied with the quota bite. We also look at competence at large by repeating this specification for a combined measure of male and female competence.

[**Table 7 here**]

The results are in Table 7. Columns (1) and (2) suggest that there is no association between the quota bite and the change in the fraction of competent women. Columns (3) and (4) show a strong association with overall competence, which is similar in magnitude to the one we already showed for men. A ten percentage-point larger bite of the quota is associated with an increase in the share of competent politicians in the party group of about three percentage points. This suggests that the introduction of the gender quota was indeed a crisis for mediocre politicians. Given, the initial complexion of the political elite in Sweden, this crisis was mostly felt by men.

Demand or supply? Our paper has focused on the demand for female candidates as the key driver of their underrepresentation. Observing the competence of male and female representatives before the quota – i.e., in 1991 – can potentially validate our approach. If the underrepresentation was instead due to a constraint on the supply of competent women, we would expect them to be equally or less competent than men in the party groups where women are more poorly represented. Table 8 presents a cross-tabulation of the shares of competent men and women before and after the introduction of the quota, when municipalities are split into two groups reflecting whether the quota bite in 1994 was above or below the median.

[Table 8 here]

Two interesting facts emerge. First, overall initial competence is higher where the quota (subsequently) had smaller impact. Second, in places with a greater quota impact, the pre-quota competence gap between men and women was larger – the share of competent women exceeding the share of competent men by 7 percentage points. But where the quota had smaller impact, we find virtually no difference between the shares of competent men and women before or after the quota. In sum, the fact that party delegations with fewer women have larger shares of competent women than competent men supports our focus on demand-based explanations of female underrepresentation prior to the quota.

7 Conclusions

Failures to recruit competent politicians and achieve gender equality in political representation remains a source of concern in many mature democracies. The academic and popular debate sometimes see the goals of diversity and competence as conflicting. In the specific debate about gender quotas, one often hears that supply constraints for women make a quota counterproductive, by replacing competent men with mediocre women. We have argued, to the contrary, that gender quotas can actually promote competence by reducing the share of mediocre men.

Our paper makes theoretical, as well as empirical, contributions. Theoretically, we propose a model which portrays low pre-quota representation of women as an equilibrium outcome that mainly reflects mediocre leaders who do not pick women (or competent men) due to fear for their own political careers. When the share of women is raised from the outside through the quota, mediocre leaders may shift attention from protecting their own survival (which may now inevitably be lost) to winning the election by raising the competence of male politicians.

Empirically, we find that the competence of party leaders correlates with a larger presence of both women and competent men in party groups. We then analyze a heterogeneous effect of a gender quota unilaterally imposed by Sweden's largest political party on its own party groups across the country's 290 municipalities. The empirical findings line up with the theoretical prediction that male competence increase more in municipalities with a larger

quota bite due to low leadership competence in the baseline equilibrium. This pattern is not the consequence of pre-trends in representation, nor is it just a temporary effect, and it reflects only to a minor degree the shrinkage of seats available for men.

In line with the theory, the findings are stronger where political competition is weak. Extending the analysis to the competence of female candidates, we find that female competence was not affected by the quota. In addition, a low share of women prior to the quota was associated with a large competence gap to women's favor. Rather than falling after the quota, the average competence of women and men converged.

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

Using equilibrium models of politics to inform the debate about gender quotas is useful not only for the conceptual clarity it brings. It is also a means of structuring the empirical work and interpreting the findings for Sweden. A similar approach can be used to analyze the effects of quotas in other settings.

8 Appendix

8.1 List Design in the General Model

Preliminaries The utility to voters when party s wins, is:

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

Define

$$\underline{c}\left(e\right), \underline{w}\left(e\right) = \arg\max_{c,w} \left\{\mu\left(1-w\right) + \beta\left[w + c(1-w)\right]\right\} \tag{9}$$
$$\text{subject to}$$
$$w + (1-w)c \leq e$$

and $\underline{v}\left(e\right) = \rho(\underline{w}\left(e\right)) + \beta\left[\underline{w}\left(e\right) + (1 - \underline{w}\left(e\right))\underline{c}\left(e\right)\right]$. Then

$$\underline{v}\left(e\right) = \begin{cases} \rho\left(e\right) + \beta e & \text{if } e \leq w^* \\ \rho\left(w^*\right) + \beta e & \text{if } w^* < e_k \leq 1 \\ \rho\left(w^*\right) + \beta & \text{if } 1 < e_k \leq \overline{e} \end{cases} \tag{10}$$

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

The solution to (4) can be described by a pair of functions $w\left(v, e_k\right), c\left(v, e_k\right)$ and a range of feasible swing voter utility $v \in \left[\underline{v}\left(e_k\right), \bar{v}\left(e_k\right)\right]$.

Lemma 1 *Let $w\left(v, e_k\right), c\left(v, e_k\right)$ solve (4) for party k with $e_k \in [0, \overline{e}]$. Then:*

$$\left(w\left(v, e_k\right), c\left(v, e_k\right)\right) = \begin{cases} \left(e_k, 0\right) & \text{if } \ e_k \leq w^* \\ \left(\widetilde{w}\left(v, e_k\right), \max\left\{0, \frac{e_k - \widetilde{w}(v,e_k)}{1-\widetilde{w}(v,e_k)}\right\}\right) & \text{if } \ w^* < e_k < 1 \\ \left(\widetilde{w}\left(v, 1\right), 1\right) & \text{if } \ 1 \leq e_k \leq \overline{e} \ . \end{cases}$$

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

Moreover, $V_v\left(v, e\right) \leq 0$, $V_e\left(v, e\right) \geq 0$, $V_{vv}\left(v, e\right) \leq 0$ and $V_{ve}\left(v, e\right) \geq 0$.

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

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

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

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

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

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

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

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

so

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

and $c = 1$.

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

$$\widetilde{w}(v, e_k) = \rho^{-1}\left(v - \beta\right),$$

then

$$\widetilde{w}_v(v, e_k) = \frac{1}{\rho'\left(v - \beta e_k\right)} \text{ and } \widetilde{w}_e(v, e_k) = -\frac{\beta}{\rho'\left(v - \beta e_k\right)}.$$

Now consider the other extreme where $e \geq 1$. In this case $V(v, e) = \mu\left(1 - \widetilde{w}(v, 1)\right) + \beta$. Thus,

$$V_v = -\mu'\left(1 - \widetilde{w}(v, 1)\right)\widetilde{w}_v(v, 1) \text{ and } V_e = 0.$$

Note that the only interesting case is

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

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

$$\widetilde{w}_v(v, e_k) = \frac{1}{\rho'\left(v - \beta\right)} > 0,$$

since $\rho'(v-\beta)>0$ for all v such that $\widetilde{w}(v,1)\in[w^*,1/2]$. So $V_v<0$ since $\mu'(1-w)>0$ for $w\in[w^*,1/2]$. Now observe that

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

The result follows now by noting that $\mu''(\cdot)<0$ and

$$\widetilde{w}_{vv}(v,e_k)=-\frac{1}{\rho''(v-\beta)}>0.$$

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

$$V(v,e)=\mu(1-\widetilde{w}(v,e))+\beta e$$

Thus,

$$V_v=-\mu'(1-\widetilde{w}(v,e))\widetilde{w}_v(v,e)\ \text{ and }\ -\mu'(1-\widetilde{w}(v,e))\widetilde{w}_e(v,e).$$

Note that the only interesting case is

$$\widetilde{w}(v,e)=\rho^{-1}(v-\beta e),$$

otherwise $\widetilde{w}_v(v,e)=\widetilde{w}_e(v,e)=0$. Now observe that:

$$\widetilde{w}_v(v,e_k)=\frac{1}{\rho'(v-\beta e)}>0 \text{ and } \widetilde{w}_e(v,e_k)=-\frac{\beta}{\rho'(v-\beta e)}<0 \qquad (11)$$

so $V_v<0$ and V_e in this case as claimed. Note finally that

$$\begin{aligned} V_{vv} &= \mu''(1-\widetilde{w}(v,e))(\widetilde{w}_v(v,e))^2-\mu'(1-\widetilde{w}(v,e))\widetilde{w}_{vv}(v,e)<0 \\ &\text{and} \\ V_{ve} &= \mu''(1-\widetilde{w}(v,e))\widetilde{w}_v(v,e)\widetilde{w}_e(v,e)-\mu'(1-\widetilde{w}(v,e))\widetilde{w}_{ve}(v,e)>0, \end{aligned}$$

since $\mu''(\cdot)<0$ and $\rho''(\cdot)<0$ and

$$\widetilde{w}_{vv}(v,e_k)=-\frac{1}{\rho''(v-\beta e)}>0 \text{ and } \widetilde{w}_{ve}(v,e_k)=\frac{\beta}{\rho''(v-\beta e)}<0.$$

This proves the result. ■

Observe that, using Lemma 1, the upper bound on swing-voter utility is now defined as

$$\bar{v}(e_k)=\begin{cases} \underline{v}(e_k) & \text{if } e_k\le w^* \\ \rho\left(\frac{1}{2}\right)+\beta e_k & \text{if } w^*<e_k<1 \\ \rho\left(\frac{1}{2}\right)+\beta & \text{if } 1\le e_k\le \overline{e}\,. \end{cases} \qquad (12)$$

8.2 Political Competition in the General Model

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

The probability of winning The behavior of swing voters is described by a conventional probabilistic voting model.[25] Thus, we suppose that a swing voter casts her ballot for party s over party b if:

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

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

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

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

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

$$\hat{\eta} = \kappa + \left[v_s - v_b\right] \ , \tag{13}$$

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

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

$$P\left(\kappa + v_a - v_b\right) = \begin{cases} 0 \ \text{ if } \ \xi\left[\kappa + v_a - v_b\right] \leq -\frac{1}{2} \\ 1 \ \text{ if } \ \xi\left[\kappa + v_a - v_b\right] \geq \frac{1}{2} \\ \frac{1}{2} + \xi\left[\kappa + v_a - v_b\right] \ \text{ otherwise } . \end{cases} \tag{14}$$

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

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

$$[Z + V(v, e_s) - V(v_b, e_b)] \frac{\partial P}{\partial v} + P(\kappa + v - v_b) V_v(v, e_a) \begin{cases} \geq 0 & v = \bar{v}(e_s) \\ = 0 & v \in (\underline{v}(e_s), \bar{v}(e_s)) \\ \leq 0 & v = \underline{v}(e_s) \end{cases}, \tag{15}$$

while for v_b we have

$$[Z + V(v, e_b) - V(v_s, e_s)] \frac{\partial P}{\partial v} + [1 - P(\kappa + v_s - v)] V_v(v, e_b) \begin{cases} \geq 0 & v = \bar{v}(e_b) \\ = 0 & v \in (\underline{v}(e_b), \bar{v}(e_b)) \\ \leq 0 & v = \underline{v}(e_b) \end{cases}. \tag{16}$$

It is straightforward to verify that the game is supermodular since $S^s_{v_s v_b}(v_s, v_b; e_s, e_b) \geq 0$ and $S^b_{v_s v_b}(v_s, v_b; e_s, e_b) \geq 0$ with strict inequality when the solution is interior. This follows by using Lemma 1 and observing that $V_v(v, e) \leq 0$.

Let $\{\hat{v}_s(e_s, e_b), \hat{v}_b(e_s, e_b)\}$ be a Nash equilibrium. Observe that there exists κ^+ and κ^- such for all $\kappa \geq \kappa^+$ we have $P(\kappa + \hat{v}_s - \hat{v}_b) = 1$ and $\kappa \leq \kappa^-$ $P(\kappa + \hat{v}_s - \hat{v}_b) = 0$. In this case, $\{\hat{v}_s(e_s, e_b), \hat{v}_b(e_s, e_b)\} = \{\underline{v}(e_s), \underline{v}(e_b)\}$. For $\kappa \in [\kappa^-, \kappa^+]$, then the solution has $\hat{v}_k > \underline{v}(e_k)$ for at least one party $k \in \{s, b\}$.

Proof of Proposition 1 Suppose that the solution indeed has $\hat{v}_s(e_s, e_b) = \underline{v}(e_s)$, because the level of competition is outside the range $\kappa \in [\kappa^-, \kappa^+]$. We need to show that $w(\underline{v}(e_k), e_k)$ and $c(\underline{v}(e_s), e_k)$ are weakly increasing in e. We need to show that:

$$\frac{dw(\underline{v}(e), e)}{de} \geq 0 \text{ and } \frac{dc(\underline{v}(e), e)}{de} \geq 0.$$

There are three ranges to consider:
(i) $e_s < w^*$: Then from Lemma 1:

$$\frac{dw(\underline{v}(e), e)}{de} = 1 \text{ and } \frac{dc(\underline{v}(e), e)}{de} = 0.$$

(ii) $e_s \in [w^*, 1]$: Then from Lemma 1, $\widetilde{w}(\underline{v}(e), e_k) = w^*$, so that:

$$\frac{dw(\underline{v}(e), e)}{de} = 0 \text{ and } \frac{dc(\underline{v}(e), e)}{de} = \frac{1}{1 - w^*} > 0.$$

(iii) $e_s > 1$, then

$$\frac{dw\left(\underline{v}\left(e\right),e\right)}{de} = 0 \text{ and } \frac{dc\left(\underline{v}\left(e\right),e\right)}{de} = 0. \blacksquare$$

Proof of Proposition 2 There are three ranges to consider:
(i) $e_s \leq 1/2$: Then the competence constraint cannot bind ex post ($e_s \leq 1/2$). Hence. the leader is removed for sure if the party wins and so it is optimal to set $\bar{c}_s = 1$. Thus, the fraction of competent men must increase. The bite of the quota is

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

using Lemma 1. Note that

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

(ii) $e_s \geq 1$: Then $c_s = 1$ with or without a quota so $\Delta c_s = 0$ and

$$\Delta w_s = \frac{1}{2} - w^* \leq \frac{1}{2} - \min\left\{e_s, w^*\right\}$$

using Lemma 1.
(iii) $e_s \in [1/2, 1]$: Now

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

The quota bite is

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

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

Correlation due to variation in w^* To see the limitation of this result, consider the middle range of competencies $e_s \in [1/2, 1]$, where both Δw_s and Δc_s depend on w^*. From the expressions in (iii), we have

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

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

Properties of the solution under political competition Now consider an interior solution, when the swing-voter constraint is no longer slack. We first show that $\hat{v}_s(e_s, e_b)$ is increasing in e_s (a parallel argument can be applied to party b). First note that, since the game is supermodular:

$$\begin{aligned} \frac{d\hat{v}_s(e_s, e_b)}{de_s} &\geq -\frac{\xi V_e + P(\cdot) V_{ve}}{2V_v\xi + P(\cdot) V_{vv}} = \beta \left[\frac{\xi V_v + P(\cdot) V_{vv}}{2V_v\xi + P(\cdot) V_{vv}} \right] \\ &= \beta\phi_1 > \beta > 0 \end{aligned}$$

using Lemma 1. Hence, we write

$$\frac{d\hat{v}_s(e_s, e_b)}{de_s} = \phi_0 + \beta\phi_1 \ ,$$

where $\phi_0 \geq 0$. Note, however, if $\widetilde{w}(\hat{v}_s(e_s, e_b), e) = \rho^{-1}(\hat{v}_s(e_s, e_b) - \beta e)$, then:

$$\frac{d\widetilde{w}(\hat{v}_s(e_s, e_b), e)}{de} = \frac{[\phi_0 + \beta\phi_1 - \beta]}{\rho'(\hat{v}_s(e_s, e_b) - \beta e)} \ .$$

Since $\phi_1 < 1$, we cannot rule out $\frac{d\widetilde{w}(\hat{v}_s(e_s,e_b),e)}{de} < 0$ in this range. However, in other ranges, it is straightforward to check that w, c are both increasing in e.

Spillover effects of the quota in party *s* to party *b* Spillovers will only occur where the outcome is sufficiently competitive so that $v_b > \underline{v}(e_b)$ and $v_s > \underline{v}(e_s)$. We know that v_s is always higher in political equilibrium when there is a gender quota. This follows since where e_s is low and the quality constraint cannot be satisfied, $c_s = 1$. If $e_s \geq 1/2$, then swing-voter utility is

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

This follows from (16) and the observation that the game is supermodular.

Now observe that $\widetilde{w}(v, e_s)$ is increasing in v from Lemma 1. Thus a quota for party s, which requires $w_s = 1/2$, (weakly) increases v_b^* in electoral equilibrium and leads party b to increase its fraction of women $\Delta w_b > 0$. What is the impact on the fraction of competent men in party b ? If $e_b < w^*$, there is no effect. But if $e_b \in [w^*, 1]$, we have

$$\frac{\partial c_b}{\partial v_b} = \frac{[e_b - 1]\,\widetilde{w}_v(v_b, e_b)}{[1 - \widetilde{w}(v_b, e_b)]^2} < 0\ .$$

Thus, a quota for s decreases its share of competent men $\Delta c_b < 0$ provided that elections are sufficiently competitive (i.e., κ close enough to zero) and party b's leadership is mid-range competent. If $e_b > 1$, there is no effect.

8.3 All women incompetent

What happens to Propositions 1 and 2, if we make the alternative assumption that all female candidates are incompetent? As before, we denote the shares of women and competent men fielded by party k, as w_k and c_k. The timing of the model is unchanged.

Leadership election At Stage 4, the leadership election we now have to take a stand on how threatened the male leadership is by incompetent women. We can write the competence constraint as $\alpha w + c(1 - w) \leq e$. Suppose we assume that $0 < \alpha < 1$, i.e., more incompetent women are still a threat to leadership survival, but less so than competent men (and less than in the baseline model where women are competent).

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

$$v^M = \mu(1 - w_k) + \beta c_k(1 - w_k),$$

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

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

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

$$\alpha w + (1 - w)c \leq e \ .$$

Suppose we are at the point $e = w = c = 0$ and e goes up by de. To satisfy the competence constraint, the leader can choose to (i) appoint $dc = de$ competent men, which gives a gain of βde, or (ii) appoint $dw = de/\alpha$ incompetent women, which gives a gain of $-\frac{\mu_z(1)}{\alpha} > \alpha\beta$. So the best choice is still to appoint more women. As e rises, the party leader will optimally continue appointing women until the break-even point $-\mu_z(1 - w^{**}) = \alpha\beta$. Note that $w^{**} < w^*$, since $-\mu_z(1-w^{**}) < -\mu_z(1-w^*) = 0$. After this point, the male leader will instead appoint competent men, as e goes up.

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

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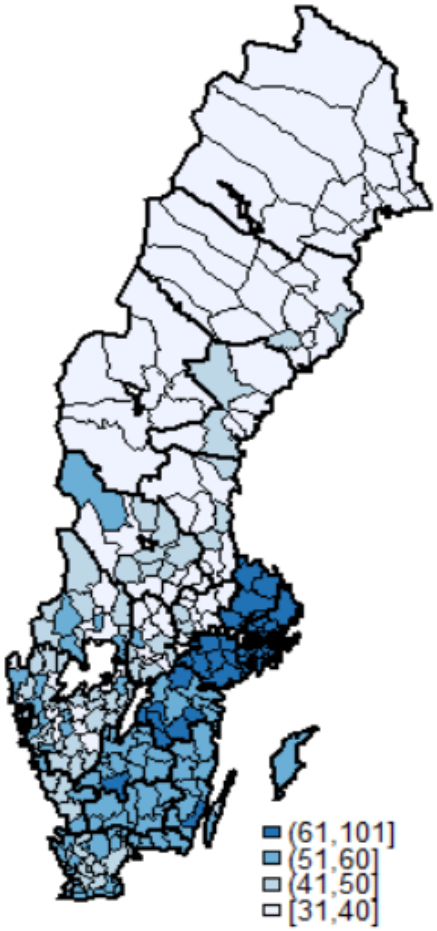
Figure 1 Swedish Counties and Municipalities



Notes: The map shows the 21 counties (thick borders) and 290 municipalities (thin borders) of Sweden. The latter are classified into four groups (marked by different shades of blue) depending on municipal council size, where the intervals reflect municipal population size.

Figure 2 Zipped Ballot from the Social Democrats

VAL TILL KOMMUNFULLMÄKTIGE

Arbetarepartiet-Socialdemokraterna

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

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

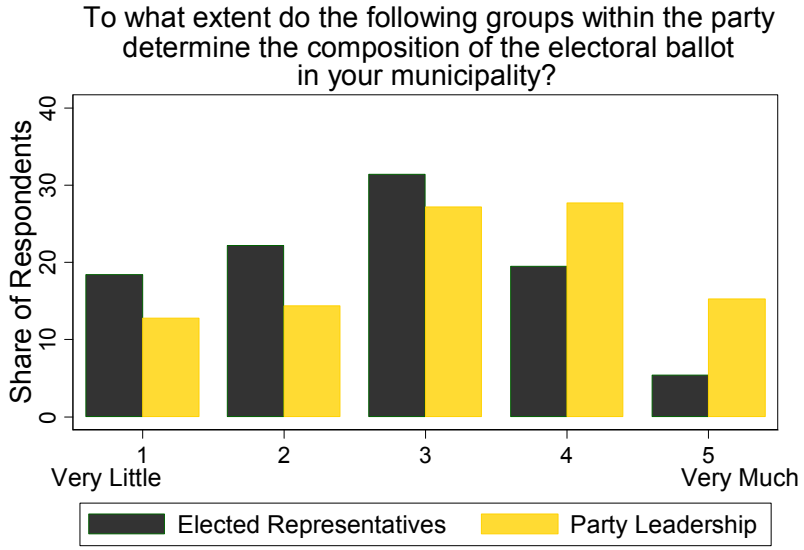
38. Margit Hammarström, 54,
39. Leif Bengtsson, 62, undersköterska, Väsby
40. Maj-Britt Johansson, 79, pensionär, Färentuna
41. Bengt Ward, 53, Skå

Ekerö

0002-01307

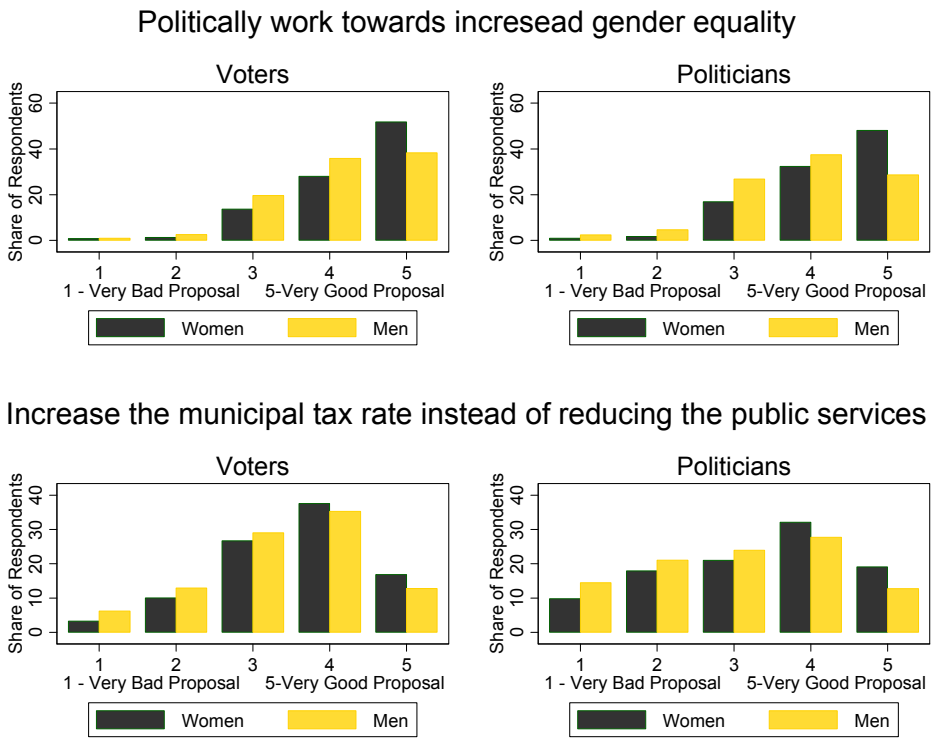
Notes: Excerpt from a zipped ballot for the Social Democratic party, from the 2006 election in the municipality of Ekerö (just west of Stockholm). Each name is followed by information on the candidate's age, profession, and city within the municipality. In the sixth position e.g., Elisabeth Palm, aged 54, is a dental nurse, living in the city of Stenhamra (the site of the municipal council).

Figure 3 Perceived Influence over the Composition of Electoral Ballots



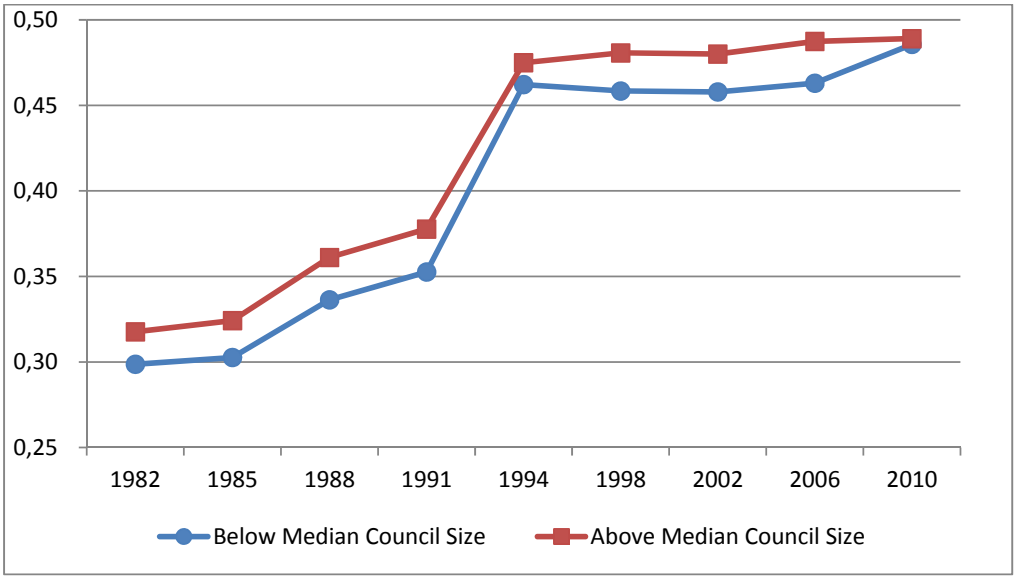
Notes: The responses to this question are from elected representatives and members of the party leadership in the Survey of Local Swedish Politicians from 2012, N=4,801 (Gilljam and Karlsson, 2009).

Figure 4 Political Preferences among Male and Female Voters and Politicians



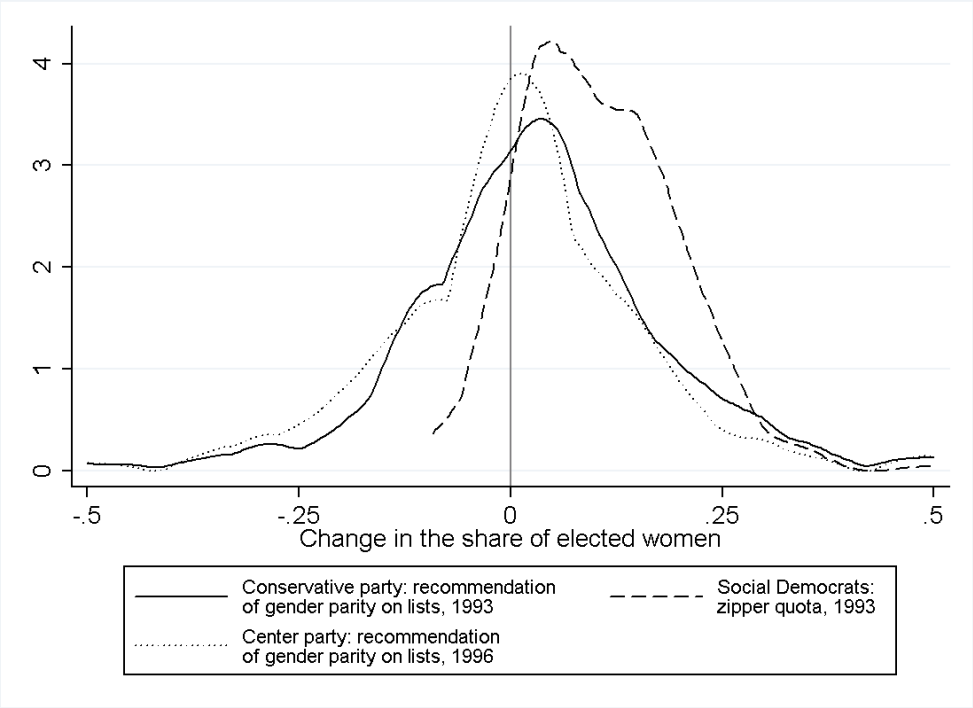
Notes: Distribution of views on political proposals that promote gender equality (top) and raise taxes rather than cut expenditures (bottom), according to polls of voters (left) and politicians (right). Data for the voters is from the 2009 Society Opinion Media (SOM) voter survey, with N=4,926 for the gender equality question and N=1,687 for the redistribution question (Gothenburg University, 2009). Data for the politicians is from the 2009 Survey of Swedish Local Politicians with N= 9,500 on both questions (Gilljam and Karlsson, 2009).

Figure 5 Shares of Elected Women in Social Democratic Party Groups



Notes: The figure shows the share of women in the Social Democratic party delegations elected to municipal councils above and below median size in every election from 1982 to 2010. The source is the authors' own data set.

Figure 6 Changes in Shares of Elected Women by Strategy for Female Representation



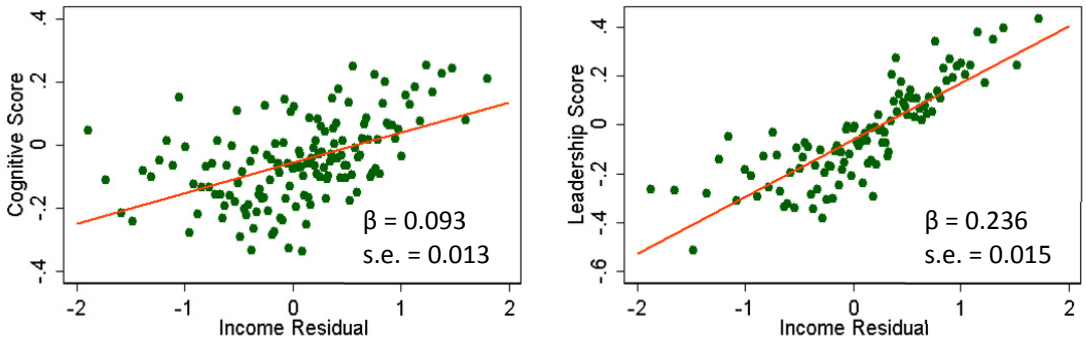
Notes: The figure shows the change in the share of women elected to Sweden's 290 municipal councils in the election immediately following three parties' adoption of a strategy for higher female representation: the zipper quota in the Social Democratic party, and recommendations of gender parity in the Conservative and Center parties. It is based on the authors' own data

Table 1 Correlations between Income Residuals and Political Success

	Preferential vote share		Re-election = 1		Chairpersonship = 1	
	(1)	(2)	(3)	(4)	(5)	(6)
Income residual	2.48***	0.77***	5.26***	2.90***	6.54***	2.17***
	(0.16)	(0.11)	(0.35)	(0.38)	(0.60)	(0.49)
List rank FE		yes		yes		yes
Observations	35,258	35,258	60,085	47,680	16,736	16,736
Sample	1998-2006		1991-2010	1991-2010	2006-2010	

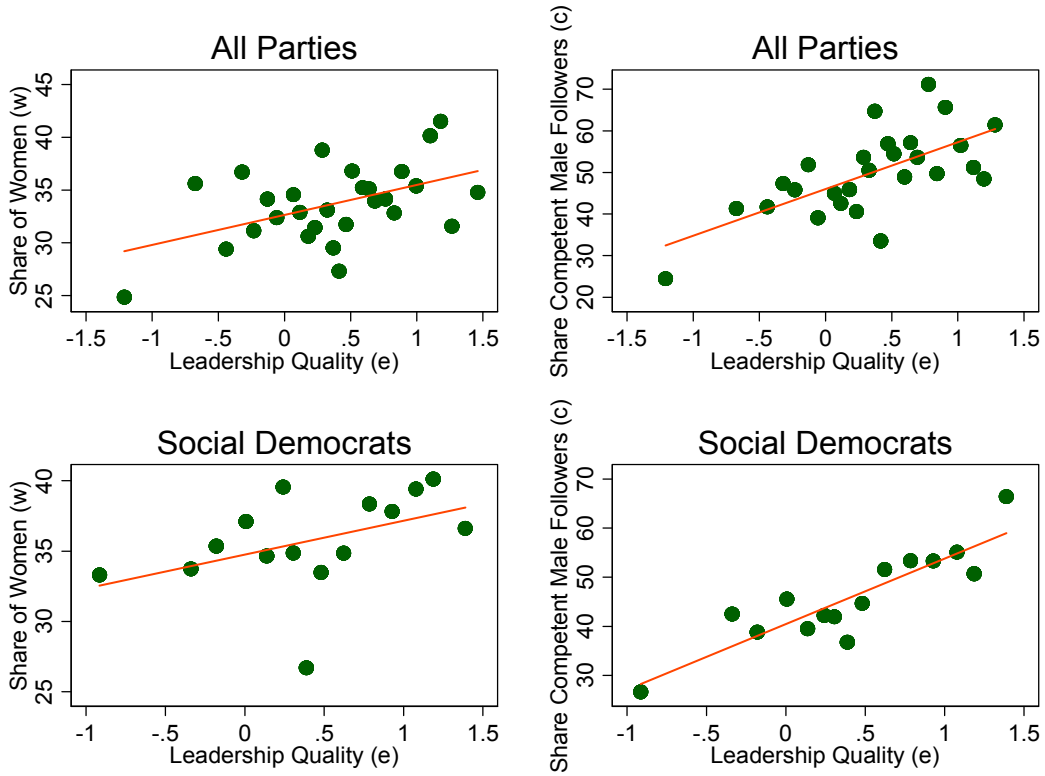
Notes: The income residual (z-score) is computed as described in the text. The dependent variable in columns 1 and 2 is the share of preferential votes cast for the individual politician, as a share of the total number of preferential votes cast for the party in the municipal election. The dependent variable in columns 5 and 6 includes the positions as chair of the municipal council board, the municipal council, or a committee. Fixed effects for the position on the list included as indicated. Standard errors in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%.

Figure 7 Correlations between Income Residuals and Military Draft Scores



Notes: The figures are based on the authors' own data, for all politicians elected to office at least one period during 1988-2010. Each point is a binned average of 250 individuals. The income residual (on the x-axes) is described in the text, as are the cognitive score (left) and leadership scores (right) from the military draft (on the y-axes). All these measures are in the form of z-scores.

Figure 8 Leadership Competence and Shares of Elected Women and Competent Politicians



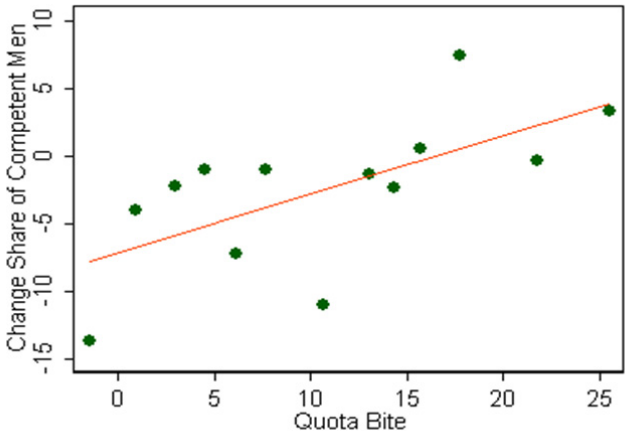
Notes: The figures shows the correlations between leadership competence in 1988 (x axis) and the shares of women and competent politicians in the municipal party group elected in 1991 (y-axes) for all parties (top row) and the Social Democrats (bottom row). They are based on the authors' own data. Each dot represents a binned average of 10 party groups. The sample is restricted to municipalities with competition in the two lowest terciles, where competition is based on the difference in vote shares between the left and the center-right political blocks in elections prior to 1991.

Table 2 Leadership Competence vs. Pre-quota Shares of Women (*w*) and Competent Men (*c*)

	ALL PARTIES				SOCIAL DEMOCRATS			
	w		*c*		*w*		*c*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Leadership Competence, *e*	2.60***	1.63*	12.67***	11.09***	2.77**	1.12	13.60***	8.85***
	(0.84)	(0.91)	(2.61)	(2.86)	(1.19)	(1.46)	(2.77)	(3.11)
Controls		yes		yes		yes		Yes
Obs	277	277	275	275	148	148	148	148

Notes: The sample is restricted to municipalities with competition in the two lowest terciles, where competition is the difference in vote shares between the left and the center-right political blocks in previous elections. Control variables are: 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 3) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, sparsely populated, rural, mid-size cities, industrial and mining. [Normalkommun, Stora Städer, Förortskommun, Glesbygdskommun, Bruksort, Mellanstora städer, Landsbygdskommun.] Robust standard errors clustered at the municipality level in parenthesis: * significant at 10%; ** significant at 5%; *** significant at 1%.

Figure 9 Quota Bite and the Change in the Share of Competent Men



Notes: The figure is based on the authors' own data, and shows the correlation between (on the x axis) the change in the share of elected women in Social Democratic party groups and (on the y-axis) the change in the share of competent men, both between 1991 and 1994. Each dot is a binned average of 10 party groups and the sample is restricted to municipalities with competition in the two lowest terciles, where competition is the difference in vote shares between the left and the center-right political blocks in previous elections.

Table 3 Difference-in-Difference Regressions of *c* on *Δw*, 1988-2010, Social Democrats

	Top 3 men excluded		*All elected Men*		*Constant number of men*	
	(1)	(2)	(3)	(4)	(5)	(6)
D1988*Δw	0.07	0.06	0.19	0.24	0.08	0.08
	(0.20)	(0.28)	(0.16)	(0.19)	(0.16)	(0.18)
D1991*Δw			*Reference year*			
D1994*Δw	**0.38***	**0.55****	**0.41*****	**0.54*****	**0.24**	**0.37****
	(0.21)	**(0.23)**	**(0.15)**	**(0.16)**	**(0.15)**	**(0.15)**
D1998*Δw	0.46	0.56	0.24	0.25	0.24	0.32*
	(0.29)	(0.35)	(0.20)	(0.22)	(0.16)	(0.17)
D2002*Δw	0.48	0.62	0.35	0.41	0.35*	0.43*
	(0.33)	(0.39)	(0.27)	(0.31)	(0.21)	(0.24)
D2006*Δw	0.16	0.10	0.24	0.31	0.22	0.26
	(0.31)	(0.40)	(0.21)	(0.22)	(0.19)	(0.20)
D2010*Δw	0.41	0.15	0.33	0.35	0.08	0.05
	(0.34)	(0.44)	(0.22)	(0.25)	(0.18)	(0.20)
Controls		yes		yes		Yes
Obs	916	898	921	903	921	903

Notes: The sample is restricted to municipalities with competition in the two lowest terciles, where competition is the difference in vote shares between the left and the center-right political blocks in previous elections. Control variables are interacted with election-year dummies, and include: 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 3) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, mid-size cities, sparsely populated areas, rural areas, and industrial and mining towns. Robust standard errors clustered at the municipality level in parenthesis: *significant at 10%; ** significant at 5%; *** significant at 1%.

Table 4 Leadership Competence vs. Shares of Women (*w*) and Competent Men (*c*), Full Sample

	ALL PARTIES				SOCIAL DEMOCRATS			
	w		*c*		*w*		*c*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Leadership Competence, *e*	2.07***	0.71	11.63*	9.99***	2.66**	0.32	14.48***	8.83**
	(0.76)	(0.80)	(1.95)	(2.06)	(1.03)	(1.20)	(2.09)	(2.36)
Controls		yes		yes		yes		Yes
Obs	474	474	470	470	241	241	241	241

Notes: Leadership competence is measured in 1988 and the shares of women and competent politicians in 1991. Control variables include: 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 3) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, mid-size cities, sparsely populated areas, rural areas, and industrial and mining towns. Robust standard errors clustered at the municipality level in parenthesis: * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5 Difference-in-Difference Regressions of *c* on *Δw*, 1988-2010, Social Democrats, Full Sample

	Top 3 men excluded		*All elected men*		*Constant number of men*	
	(1)	(2)	(3)	(4)	(5)	(6)
D1988*Δw	0.03	0.05	0.10	0.11	-0.02	-0.05
	(0.14)	(0.17)	(0.11)	(0.12)	(0.11)	(0.12)
D1991* Δw			*Reference year*			
D1994*Δw	0.14	0.27*	0.29***	0.37***	0.09	0.16
	(0.14)	(0.15)	(0.11)	(0.11)	(0.10)	(0.11)
D1998*Δw	0.27	0.37	0.23	0.26*	0.12	0.17
	(0.20)	(0.23)	(0.14)	(0.15)	(0.13)	(0.13)
D2002*Δw	0.33	0.35	0.34*	0.33*	0.27*	0.27
	(0.21)	(0.24)	(0.18)	(0.20)	(0.15)	(0.17)
D2006*Δw	0.15	0.05	0.33**	0.33*	0.14	0.12
	(0.21)	(0.25)	(0.16)	(0.17)	(0.14)	(0.16)
D2010*Δw	0.36	0.22	0.38**	0.38**	0.07	0.01
	(0.25)	(0.28)	(0.16)	(0.18)	(0.14)	(0.15)
Controls		yes		Yes		yes
Obs	1,532	1,514	1,537	1,519	1,537	1,519

Notes: Control variables are interacted with election-year dummies and include: 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 3) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, mid-size cities, sparsely populated areas, rural areas, and industrial and mining towns. Robust standard errors clustered at the municipality level in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6 Spill-Overs from the Social Democrats' Quota on *w* and *c* of Other Parties

	Full Sample		High Competition		Low Competition	
	w	*c*	*w*	*c*	*w*	*c*
Δ*w* in Social Democrats	0.10	0.01	0.02	-0.18	0.15	0.15
	(0.08)	(0.21)	(0.11)	(0.24)	(0.12)	(0.32)
Obs	157	148	79	75	78	73

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

Table 7 Difference-in-Difference Regressions of *c* on *Δw*, 1988-2006, Social Democrats, All Politicians

	c Women		*c* Women and men	
	(1)	(2)	(3)	(4)
Yearly				
D1988*Δ*w*	-0.06	-0.00	0.07	0.10
	(0.19)	(0.20)	(0.09)	(0.10)
D1991*Δ*w*		*Reference year*		
D1994*Δw*	**0.00**	**0.01**	**0.25*** **	**0.29*** **
	(0.18)	**(0.19)**	**(0.08)**	**(0.08)**
D1998*Δ*w*	0.12	0.09	0.22**	0.22**
	(0.20)	(0.21)	(0.11)	(0.11)
D2002*Δ*w*	0.34	0.36	0.40**	0.38**
	(0.22)	(0.23)	(0.16)	(0.15)
D2006*Δ*w*	0.01	0.10	0.27*	0.28*
	(0.25)	(0.27)	(0.14)	(0.15)
D2010*Δ*w*	-0.32	-0.27	0.17	0.18
	(0.25)	(0.26)	(0.15)	(0.15)
Controls*Election* Year fixed effects		yes		yes
Obs	1,536	1,518	1,537	1,519

Notes: Sample consists of all municipalities. Control variables are interacted with election-period dummies and include: 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 3) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, mid-size cities, sparsely populated areas, rural areas, and industrial and mining towns. Robust standard errors clustered at the municipality level in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 8 Competent Male and Female Social Democratic Representatives, 1991 and 1994

	Small Δ*w*		Large Δ*w*	
	Pre-quota 1991	Post-quota 1994	Pre-quota 1991	Post-quota 1994
Men				
Share of competent	55.6	55.0	47.5	50.0
Women				
Share of competent	56.4	53.6	54.2	49.9

Notes: Sample consists of all municipalities. The table shows the shares of competent men and competent women elected in 1991 and 1994, in municipality groups where the change in the share of elected women was below (left pane) and below (right pane) the median.

Web Appendix

Table W1 Hard and Soft Quotas in Swedish Political Parties

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

Notes: The table lists different measures towards raising female representation adopted by Sweden's seven main political parties. The classification into targets and mandates is the authors' own, based on Krook et al. (2006) and Freidenvall et al. (2006).

Table W2 Leadership Competence vs. Pre-quota Shares of Women (*w*) and Competent Men (*c*): Alternative Competence Measure

	ALL PARTIES				SOCIAL DEMOCRATS			
	w		*c*		*W*		*C*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Leadership quality, *e*	1.70*	0.86	11.23***	10.55***	2.54**	1.11	13.31***	8.59***
	(0.89)	(0.92)	(2.59)	(2.74)	(1.18)	(1.41)	(2.61)	(2.91)
Controls		yes		yes		yes		yes
Obs	290	290	288	288	152	152	152	152

Notes: The average of the cognitive and the non-cognitive z-score from the military draft, available only for the subset of male politicians in the sample, is used as an alternative measure of competence. As with the income-based competence measure, this z-score is normalized at the party level. A competent politician is defined as having a score above the median. Control variables are 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 2) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, sparsely populated, rural, mid-size cities, industrial and mining. [Normalkommun, Stora Städer, Förortskommun, Glesbygdskommun, Bruksort, Mellanstora städer, Landsbygdskommun]. Robust standard errors clustered at the municipality level in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%.

Table W3 Leadership Competence vs. Pre-quota Shares of Women (*w*) and Competent Men (*c*): Alternative Competition Measure

	ALL PARTIES				SOCIAL DEMOCRATS			
	w		*c*		*W*		*c*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Leadership quality, *e*	1.70*	0.86	11.23***	10.55***	2.54**	1.11	13.31***	8.59***
	(0.89)	(0.92)	(2.59)	(2.74)	(1.18)	(1.41)	(2.61)	(2.91)
Controls		yes		yes		yes		yes
Obs	290	290	288	288	152	152	152	152

Notes: A municipality is defined as having low competition if either of the two blocks held a majority in each of the 5 election periods between 1974, when the current division of Swedish municipalities was established, and 1991. Control variables are 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 2) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, sparsely populated, rural, mid-size cities, industrial and mining. [Normalkommun, Stora Städer, Förortskommun, Glesbygdskommun, Bruksort, Mellanstora städer, Landsbygdskommun.] Robust standard errors clustered at the municipality level in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%.

Table W4 Difference-in-Difference Regressions of *c* on *Δw*, 1988-2006, Social Democrats: Alternative Competence Measure

	Top 3 men excluded		*All elected Men*		*Constant number of men*	
	(1)	(2)	(3)	(4)	(5)	(6)
D1988**Δw*	-0.76	-0.65	-0.23	-0.02	-0.08	-0.08
	(0.49)	(0.70)	(0.43)	(0.64)	(0.50)	(0.73)
D1991**Δw*			*Reference year*			
D1994*Δw	**0.64**	**1.02**	**1.01****	**1.21****	**0.93****	**1.10****
	(0.60)	**(0.72)**	**(0.43)**	**(0.55)**	**(0.41)**	**(0.52)**
D1998**Δw*	1.10*	1.42**	1.02**	1.02**	0.56	0.81*
	(0.59)	(0.68)	(0.40)	(0.47)	(0.43)	(0.48)
D2002**Δw*	0.99*	1.39*	1.08**	1.43**	0.60	0.79
	(0.59)	(0.76)	(0.53)	(0.66)	(0.52)	(0.67)
D2006**Δw*	0.90*	0.58	0.63	0.70	0.33	0.43
	(0.53)	(0.66)	(0.43)	(0.53)	(0.46)	(0.56)
D2010**Δw*	0.74	0.39	0.88*	0.87	0.83	0.75
	(0.69)	(0.93)	(0.50)	(0.62)	(0.51)	(0.63)
Controls		yes		yes		yes
Obs	725	712	805	789	802	786

Notes: The average of the cognitive and the non-cognitive z-score from the military draft, available only for the subset of male politicians in the sample, is used as an alternative measure of competence. As with the income-based competence measure, this z-score is normalized at the party level. A competent politician is defined as having a score above the median. Control variables are interacted with election-period dummies, and include: 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 3) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, mid-size cities, sparsely populated areas, rural areas, and industrial and mining towns. Robust standard errors clustered at the municipality level in parentheses: *significant at 10%; ** significant at 5%; *** significant at 1%.

Table W5 Difference-in-Difference Regressions of *c* on *Δw*, 1988-2006, Social Democrats: Alternative Competition Measure

	Top 3 men excluded		*All elected Men*		*Constant number of men*	
	(1)	(2)	(3)	(4)	(5)	(6)
D1988**Δw*	0.11	0.10	0.21	0.23	0.06	0.04
	(0.19)	(0.25)	(0.14)	(0.15)	(0.14)	(0.15)
D1991**Δw*			*Reference year*			
D1994*Δw	**0.38***	**0.57*****	**0.40*****	**0.54*****	**0.23***	**0.36****
	(0.19)	**(0.20)**	**(0.14)**	**(0.13)**	**(0.14)**	**(0.14)**
D1998**Δw*	0.36	0.43	0.22	0.24	0.13	0.22
	(0.27)	(0.33)	(0.19)	(0.20)	(0.15)	(0.16)
D2002**Δw*	0.43	0.53	0.31	0.33	0.25	0.29
	(0.31)	(0.36)	(0.25)	(0.28)	(0.19)	(0.23)
D2006**Δw*	0.04	-0.04	0.10	0.16	0.02	0.02
	(0.27)	(0.34)	(0.19)	(0.21)	(0.19)	(0.20)
D2010**Δw*	0.30	0.10	0.25	0.25	0.03	-0.01
	(0.35)	(0.43)	(0.21)	(0.24)	(0.18)	(0.19)
Controls		yes		yes		yes
Obs	958	940	963	945	963	945

Notes: A municipality is defined as having low competition if either of the two blocks held a majority in each of the 5 election periods between 1974, when the current division of Swedish municipalities was established, and 1991. Control variables are interacted with election-period dummies, and include: 1) the gender ratio in average income per capita in the municipality, 2) municipal council size, and 3) dummy variables for six municipality types: average (benchmark) type, large cities, suburban cities, mid-size cities, sparsely populated areas, rural areas, and industrial and mining towns. Robust standard errors clustered at the municipality level in parentheses: *significant at 10%; ** significant at 5%; *** significant at 1%.