IFN Working Paper No. 1111, 2016

What Prevents Female Executives from Reaching the Top?

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March 12, 2018

Abstract

Exceptionally rich data from Sweden makes studying the gender gap in executives' career progression and investigating its causes possible. In their 40s, female executives are about half as likely to be large-company CEOs and about one third less likely to be high earners than males. Abilities, skills, and education likely do not explain these gaps, because female executives appear better qualified than males. Instead, slow career progression in the five years after the first childbirth explains most of the female disadvantage. During this period, female executives work on average shorter hours than males and are more often absent from work. Their responses to childbirth are invariant to their career potential relative to their partners. These results suggest aspiring women may not reach the executive suite without trading off family life.

JEL-classification: G34; J16; J24; J31

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1. Introduction

Women are less represented than men in the upper echelons of corporations. In S&P 500 companies, women account for 45% of the work force but hold only 27% of the executive and senior-level official and manager positions. The fraction of women is even smaller at the very top of the organization: women account for 5% of the CEO positions (Catalyst, 2017). And when women are appointed to top executive positions, they tend to earn less than men. Bertrand and Hallock (2001) find that women earn 45% less than men among the highest-paid corporate executives.[1] What explains these patterns?

Some argue women are disadvantaged compared to men when it comes to leading corporations. Their preferences might make them shy away from competitive and risky environments.[2] The investments they have made to human capital and the career paths they have chosen might make them poorly equipped to reach the top.[3] Time spent with children can lead them to miss valuable opportunities, and standing by the family may prevent them being available when the firm needs them most.[4] Their gender might also make them unwilling to assume leadership positions that are inconsistent with the behavioral prescriptions of their identity.[5]

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[1] Albanesi, Olivetti, and Prados (2015) find significant gender differences in the structure of executive pay, which exposes female executives' earnings more to bad firm performance. Albrecht, Björklund, and Vroman (2003) and Boschini, Gunnarsson, and Roine (2017) document that gender gaps are particularly large at the top of the wage distribution. Blau and Kahn (2000, 2017) and Goldin (2014) offer reviews of the gender differences in pay.

[2] See, for example, Croson and Gneezy (2009), Bertrand (2011), and Niederle (2016) for reviews of the gender differences in preferences.

[3] Bertrand et al. (2010) show that female MBA students are less likely than men to take finance courses. Because of the large returns to finance education, this selection contributes to the gender gap in earnings.

[4] Bertrand et al. (2010) and Azmat and Ferrer (2017) document that male MBAs and lawyers work longer hours than their female peers.

[5] Akerlof and Kranton (2000) suggest gender identity influences economic outcomes because deviating from the behavioral prescriptions for one's gender is costly. Gender-identity roles influence marriage formation, women's labor

Others argue the lack of women in top positions reflects negative stereotypes that hamper the rise of females on the corporate ladder.[6] One version of this argument appeals to the fact that women who have reached the executive level (and are potentially just one step from the CEO position) are a highly selective group of individuals.[7] Their career success constitutes direct evidence of their talent, skills, and ambitions, and the income and career prospects that come with this success mean their opportunity costs of dropping out of the labor force or reducing work hours are exceptionally high (Adams and Funk, 2012; Wood, Corcoran, and Courant, 1993). These considerations speak against the possibility that substantial performance differences exist between male and female executives. The large gender differences in career progression and pay documented in the literature would thus be more likely to be an outcome of negative stereotyping than of gender-related performance differences.[8]

Using comprehensive data on top executives of Swedish firms, we evaluate the merits of these explanations. We follow the careers of future executives born between 1962 and 1971 in the 1990–2011 period and ask how their qualifications, career progression, and family matters explain their career success in 2011, that is. when they are in their forties. Our data cover the entire adult population of Sweden and all its firms, including private ones, resulting in an exceptionally large sample. We collect a comprehensive battery of characteristics of the executives and their family and

market participation, and the division of home production, among others (Bertrand, Kamenica, and Pan, 2015), and they are transmitted across generations (Fernández, Fogli, and Olivetti, 2004).

[6] Becker (1959) analyzes taste-based discrimination, whereas Phelps (1972) and Arrow (1973) study statistical discrimination based on characteristics of the average member of a group. Taste-based discrimination models predict that greater competition between employers will reduce discrimination. Consistent with this idea, Heyman, Norbäck, and Persson (2017) find a negative association between product market competition and gender gaps in managerial appointments and pay. Egan, Matvos, and Seru (2017) find evidence consistent with discrimination in the financial advisory industry.

[7] See Adams and Funk (2012) for a similar argument for board members.

[8] In some countries, policy makers have imposed quotas to balance the outcome differences between genders. Ahern and Dittmar (2012), Bertrand et al. (2017), Eckbo, Nygaard, and Thorburn (2016), Bagues and Campa (2017), Besley, Folke, Persson, and Rickne (2017), and Tyrefors Hinnerich and Jansson (2017) study the effects of imposing gender quotas in business and in politics.

relatives, which allows us to analyze a host of gender differences, including those related to child rearing and preferences. We complement the data set with survey responses on the time use of executives in 2000–15. Almost all of our data come from official government registries and thus are likely more reliable than the biographical and self-reported data used by many studies on top executives.

We find that family matters play a crucial role in the formation of gender gaps in top executive appointments. These gender gaps arise primarily during the five years following the birth of the first child, when female executives work on average shorter hours than male executives and are more often absent from work. Women's career paths are similar to men's prior to childbirth, but they earn substantially less than men five years after childbirth. This gender difference persists over the remaining course of the executives' careers.

Our results indicate family life puts a disproportionate burden on the careers of women. Female executives are less likely to marry and have children than male executives, and their marriages more often end in divorce. To gain a better understanding of executives' family dynamics, we analyze the role of their partners. Forward-looking couples should prioritize the career of the partner that has greater potential, regardless of the gender of that partner. This is not what we find: the career trajectories of executive women with less potential than their partners are similar to those of executive women with more potential, both before and after childbirth. The large differences in within-household career potential we observe in the data cast doubt on the idea that executive women favor their partners' careers for the concern of underperforming in the labor market. This evidence suggests child penalties do not arise from considerations of comparative advantage within households.

We also analyze the extent to which other characteristics of the executives can account for the gender gaps at age 40–49. Our specifications suggest a labor market that treats the basket of

attributes of each executive without regard to gender would generate a gender gap of the opposite sign than that observed in the data. For example, female executives tend to have much higher levels of education, which is one of the strongest predictors of reaching the top. They are more likely to receive their degrees from tracks that produce a large number of top executives. They have worked in a larger number of firms and are more likely to have acquired experience from consulting or investment banking, an indication of their taste for competition and willingness to work long hours. Their male siblings also attain higher cognitive-ability test scores in the military enlistment. These differences in qualifications go against the idea that female executives lack the necessary skills, training, and stamina to reach the top. The higher female bar for reaching the top suggests instead that aspiring women may have invested more in their basket of qualifications to prevent the adverse effects of child rearing.

To achieve a homogenous sample, we focus on individuals who have reached the executive level. The ex-post success of the women in our sample means their career setbacks following childbirth can be expected to be smaller and of a more temporary nature than those of talented women on average. To check the extent to which our results generalize to other talented professionals, we replicate our most important analyses for a sample of business, economics, and engineering graduates—the three most common fields of education for corporate executives—relaxing the requirement of an individual holding an executive position at the end of the sample period. We find that female university graduates enjoy a smaller qualification advantage over men than executives, because sample selection strips women of one of their key strengths: their higher level of education. This finding helps explain why the gender gaps in top executive appointments are as much as one third larger in the university-graduate sample than in the executive sample. In both samples, income development during the five years after the first childbirth accounts for about three quarters of the gender gaps in top executive appointments. Thus, selecting the sample based

on ex-post career success does not seem to have a tangible effect on how informative the setbacks associated with childbirth are of long-term career outcomes.

Our paper contributes to the literature on gender differences in labor-market outcomes, in particular at the top level of organizations, in the following ways. First, to our knowledge, we are the first to analyze gender gaps among top executives using comprehensive data on their careers.[9] The closest previous work to our paper, Bertrand, Goldin, and Katz (2010), survey Chicago MBA graduates, many of whom advance to holding top executive positions. Our register-based sample contains a wide spectrum of executives from varied educational backgrounds and allows us to observe attainment of top executive positions at the end of an annual two-decade panel. Our data that pinpoint the timing of childbirth exactly makes it possible to analyze short-run and long-run child penalties and their contribution to attainment of top executive positions. Information on working hours, absence from work, and the role of the executives' partners in child rearing provide evidence on underlying mechanisms. The Swedish context suggests executive gender gaps and their early-career origins arise even in an institutional setting with a long egalitarian tradition and family-friendly policies.

Second, the focus on executives, whose career aspirations and higher pay may make them willing and able to outsource child rearing, speaks to understanding the origins of gender gaps for the population at large. That the child penalties are large for executives and for the population (Adda, Dustmann, and Stevens, 2017; Angelov, Johansson, and Lindahl, 2016; Kleven, Landais, and Søgaard, 2018) indicate they do not arise from lack of financial resources or career aspirations.

[9] Smith, Smith, and Verner (2013) study gender differences in CEO appointments in Denmark, but do not follow executives' careers over time. Matsa and Miller (2011) focus on the role of female board representation in CEO appointment decisions. Azmat and Ferrer (2017) and Kunze and Miller (2017) use career data on professionals but not on top executives.

Third, we document gender differences in executive characteristics in much more detail than the previous literature and can directly address the assumption that male and female executives hold similar qualifications. Our exceptionally large battery of variables not only allows us to gain more insight into the differences between male and female executives, but also allows us to gain a better understanding of how various characteristics contribute to the gender gaps. Our result that female executives are more qualified than males and that these qualifications generate a counterfactual female advantage over males in executive appointments adds a new dimension to the literature.

Our paper proceeds as follows. The next section describes the data and the institutional setting. Section 3 analyzes gender differences in executives' qualifications and the extent to which these differences can explain differences in career outcomes. Section 4 studies gender differences in executives' family life and their contribution to working hours, absence from work, early career development, and later career outcomes. Section 5 concludes.

2. Data and institutional setting

2.1. Data

2.1.1. Main sample

The sample consists of individuals born between 1962 and 1971 who worked in 2011 as an executive in a Swedish limited-liability company with at least 10 employees and information on sales available. We follow the careers of these individuals in the 1990–2011 period and ask how their qualifications, career progression, and family matters explain their career success in 2011, that is, when they are in their 40s. For executives with children, we require that the first child was born in 1992–2001, that is, 10–19 years (on average, 15 years) before the time when we assess their career success. Executives that have no children enter the sample if their imputed childbirth, which

we assign based on the observed distribution of age at first childbirth, is in 1992–2001. These criteria trade off the sample subjects having made significant progress in their careers against our ability to observe their first childbirth. The average 15-year follow-up period after the first childbirth further avoids mixing temporary career setbacks associated with small children with long-term career outcomes. Our data set combines information on individuals and firms from three sources.[10]

Statistics Sweden. The bulk of these data come from the LISA database that covers the whole Swedish population of individuals who are at least 16 years old and reside in Sweden at the end of each year. This database integrates information from registers held by various government authorities and covers for most variables the years 1990–2011. We extract information on labor and total income, wealth, field and level of education, profession, career, and family relationships, complementing the LISA database with data from the Multigenerational Register and the Wealth Register. The family records allow us to map each individual to their partners, children, parents, and siblings. We use information on the brothers of the executives to impute variables that are not observable for the executives themselves or that may be contaminated by gender (e.g., school GPAs may reflect gender-biased grading). Except for the CEOs, whom Statistics Sweden separately classifies, we identify the executives based on their international ISCO-88 (COM) classification of occupations (codes 122 and 123).[11] The specialist managers further split into eight functions that

[10] The sensitive nature of the data necessitated an approval from the Ethical Review Board in Sweden and a data-secrecy clearance from Statistics Sweden. The identifiers for individuals, firms, and other statistical units were replaced by anonymized identifiers and the key that links the anonymized identifier to the real identifiers was destroyed. The data are used through Microdata Online Access service provided by Statistics Sweden.

[11] The ISCO-88 (COM) code 122 corresponds to "production and operations managers" and the code 123 to "other specialist managers." The occupation data available from the LISA database come mainly from the official wage-statistics survey (Lönestrukturstatistiken). Statistics Sweden also undertakes surveys of smaller firms (primarily with 2–19 employees) that are not included in the official wage survey. The sampling design in the supplementary surveys is a rolling panel and all eligible firms are surveyed at least once every five years. Occupation information is available for each year, but the information may not be accurate for each year. To ensure we have accurate occupation information for every year, we require that the information be collected in the relevant year or earlier and for the correct employer-employee link. Andersson and Andersson (2012) describe how Statistics Sweden identifies operative CEOs of firms. If

include finance and administration, personnel and industrial relations, sales and marketing, advertising and public relations, supply and distribution, computing services, research and development, and specialists not classified into the above categories.

The Swedish Companies Registration Office. The Swedish Companies Registration Office keeps track of all companies, both public and private, and their CEOs and directors. The firm data are available for all corporate entities that have a limited liability structure ("aktiebolag") and that have appointed a CEO ("verkställande direktör"), excluding financial firms that operate as banks or insurance companies. These data record various financial-statement items, including sales and the number of employees. By law, each firm has to supply this information to the registration office within seven months from the end of the fiscal year. Financial penalties and the threat of forced liquidation discourage late filing.

Military Archives. The Military Archives stores information on the service record, the health status, and the cognitive, non-cognitive, and physical characteristics of all conscripts. The purpose of the data collection is to assess whether conscripts are physically and mentally fit to serve in the military and suitable for training for leadership or specialist positions. The examination spans two days and takes place at age 18. Lindqvist and Vestman (2011) offer a comprehensive description of the testing procedure. These data are available for Swedish males drafted in 1970–1996. Military service was mandatory in Sweden during this period, so the test pool includes virtually all Swedish men born between 1951 and 1978.

an individual holds multiple executive positions, we assign the individual to the executive position in the firm with the highest sales.

Our main sample encompasses over 24,000 executives. Given the sample size, most of our results are highly significant. Therefore, our reporting generally focuses on coefficient values and patterns rather than on their statistical significance.

2.1.2. Additional and alternative samples

In addition to our main sample, we study the time use of 9,300 corporate executives as measured by the Labor Force Survey in 2000–15. The survey asks a randomly selected sample of respondents to report on the number of hours worked, contracted, and absent in the week preceding the survey. We merge the survey responses with administrative data from the LISA database on the number of days in which the respondent has claimed compensation for absence due to parental reasons, and on selected socioeconomic characteristics. Among these characteristics is information on the number of children in various age categories for each executive. Our Labor Force Survey sample does not link to the core executive sample, so we cannot track the Labor Force Survey executives before or after the survey.

We complement our analysis of future executives with an analysis of university graduates. We construct this sample using the selection criteria for the core executive sample except for requiring each individual to hold a degree in business, economics, or engineering, and relaxing the requirement of an individual holding an executive position in 2011.

2.2. Childcare system in Sweden

Sweden has a high-quality childcare system that has been in place since the mid-1960s. It guarantees each family 12 months of publicly paid parental leave amounting usually to 75% of prior income (before 1995, 90% of prior income), with an option of extending the leave with three months at a lower rate. Parents can use up to 90 days per year with publicly financed paid leave for care of

a sick child, and they have the option to work shorter hours while keeping their full-time job. Since 1995, both parents need to take one month of parental leave to qualify for the maximum paid leave. Day care is available at highly subsidized rates, although its service hours make it less flexible than the day care in the United States (Henrekson and Stenkula, 2009).

3. How do female and male executives differ from each other?

3.1. Gender gaps in top executive appointments

Table 1 Panel A characterizes the career progression of female and male executives by focusing on top-executive roles. We define these roles in three different yet overlapping ways, utilizing information on the executives' formal roles and on their pay. The three leftmost columns report on those executives who have become CEOs of large companies, defined here as companies with sales of at least SEK 500 million (SEK 1 ≈ USD 0.12). Just 0.77% of female executives make it this far, whereas the corresponding fraction among male executives is 1.41%. Despite a relatively small number of top-executive observations (of 300 large-company CEOs, 51 are women), the gender gap in the likelihood to attain a top position, −0.64 (= 0.77 − 1.41), is statistically highly significant with a *t*-value of –4.6. This gap reflects the fact women account for 17% large-firm CEOs as opposed to 27% of the executives in the full sample. The three middle columns represent a broader definition of large-firm top executives that adds the four highest-paid non-CEO executives. This group of people would typically coincide with the company's top management team. Women account for 21% of this group of executives; that is, the gender gap is relatively smaller among large-firm top executives than among CEOs. Finally, the three columns on the right report on an even broader definition of a top executive that does not explicitly factor in firm size but focuses on pay instead. The cutoff for a top executive here is having a labor income of at least SEK 1 million, which roughly

corresponds to the top decile in pay among all executives in Sweden. The fraction of women in this group is 20%, that is, about the same as among large-firm top executives.

Table 1 Panel B reports the mean and median executive labor income by gender and position. Our income measure includes all income taxed as labor income in a given year; base salaries, stock-option grants, bonus payments, and benefits received from the employer qualify as taxable labor income. The income measure does not include public benefits, providing a better proxy of the value of an executive's services to the company than a broader income measure. Tax authorities deem the taxable income to occur in the year when an employee or executive exercises her stock options or purchases her company's shares at a price that is less than their fair value.

The mean (median) large-firm CEO pay is SEK 2.1 million (1.7 million). On average, the sample executives make about one third, and large-firm executives about two thirds, of what large-firm CEOs make. Executive men earn more than women, but the pay gap is relatively small. For the top executive categories, the mean logged pay gap ranges from –3% (large-firm CEOs and highly paid executives) to –9% (large-firm top executives).

Table IA1 in the Internet appendix reports descriptive statistics on the 11,063 sample companies. The mean sales are SEK 385 million and the mean number of employees is 126. The vast majority of the firms are privately held: only 1% are listed and 4% are government owned.

3.2. Gender differences in executives' education, career, family background, and traits

Table 2 reports the means of all individual-level variables, separately for women, men, and the full sample. Of particular interest is the difference between women and men and the *t*-statistic for their difference. We report on 56 variables divided into nine different groups. Twenty-one of the variables are continuous and 35 are dummy variables. We use these variables in regressions as such except for the dummies on the level and field of education and the executive functions, where we

drop one of them. The variables for the first seven groups—level of education, educational specialization, career orientation and networks, career, functional experience, family background, and risk tolerance—are available for all sample subjects and are reported in Panels A, B, C, and D. Panel E reports on the remaining two groups of variables, parents' socioeconomic status and personal traits. They are available only for subsets of the sample and are reported as robustness checks (availability of parental variables depends on the parent being alive in 1990, and the personal traits can be imputed for executives whose brothers were enlisted to the military in 1970–1996).

Panel A reports on gender differences in the level of education, a classic predictor of pay (Mincer, 1958). We find that 48% of female corporate executives hold a degree from a university, whereas the corresponding fraction for men is 30%. Correspondingly, men are more likely to belong to any of the lower-education-level categories. For example, men are more than twice as likely as women to have an education level lower than high school.

Panel A further reports on the field of education, which measures differences in executives' skill sets and their propensity to specialize and remain specialists through their executive careers.[12] The field of education also correlates with competitiveness, in which large gender differences exist (Gneezy et al., 2003; Niederle and Westerlund, 2007). Buser, Niederle, and Oosterbeck (2014) find that competitive individuals are more likely to select the most prestigious study tracks, which tend to include more math and science classes. Kamas and Preston (2015) find competitive individuals are more likely to specialize in engineering, natural sciences, and business as opposed to the social sciences or humanities. We find men are much more likely to have an engineering degree (52% vs. 16%), whereas women are more likely to have a degree from all other backgrounds. For example,

[12] The opposite of becoming a specialist is to become a generalist, a job description commonly associated with CEOs. Murphy and Zábojník (2004) and Custódio, Ferreira, and Matos (2013) analyze generalist CEOs.

the fraction of female executives with a business degree is 43%, whereas the corresponding fraction for men is 24%.

Panel B shows women are more likely to have chosen one of the top-5 education tracks (top-5 high schools) that produce the highest proportion (number) of large-firm top executives. Attending these education tracks may help build careers through better networks: Hwang and Kim (2009), Kramarz and Thesmar (2013), and Engelberg, Gao, and Parsons (2013) report evidence of the usefulness of networks for executive careers. In addition, these education tracks may reveal executives' career orientation and inform of their competitiveness. Despite their greater likelihood of attending network-rich education tracks, female executives are less likely to select into the top-5 education tracks offering the highest income.

Panel B further studies gender differences in careers. The executives are on average 44 years old. Men are on average 0.3 years older than women but have two years longer labor-market experience. The fact that the gap in work experience is larger than the age gap is consistent with the idea that men have experienced fewer career interruptions than women. Despite their shorter career, women have experience from more companies and from more industries than men. This more varied experience helps build women's general human capital, whereas men's longer tenure in the firm helps build their firm-specific human capital.

Panel B also suggests men and women have different work experience. On the one hand, women have on average longer work experience from consulting and investment banking. Both industries frequently use tournament-type ("up or out") promotion structures and likely attract competitive individuals. Such experiences may also be valuable in building networks and acquiring generalist skills. On the other hand, women also have more experience from non-profit institutions. Work experience from a non-profit organization may accumulate a future executive's human capital in a different way than work experience from a company. In addition, working for not-for-profit

firms or for the public sector may be an indication of altruistic preferences (Benz, 2005; Delfgaauw and Dur, 2008), of which some evidence of gender differences exists.[13]

Finally, Panel B studies gender differences in unemployment. Male executives have on average 23 days less unemployment experience than female executives. This difference may matter because unemployed individuals may lose some of the value of their human capital due to unemployment (Pissarides, 1992) or be scarred by the unemployment experience (Arulampalam, 2001). The fact that female executives are more likely to have graduated during a recession may partly explain the difference in unemployment experience. Oyer (2008), Custódio, Ferreira, and Matos (2013), and Schoar and Zuo (2017) find that starting a career at the time of a recession has a lasting impact on career success and pay.

Panel C reports on gender differences in past work experience in different executive functions. Given that specialization in a given function is likely to require a considerable human capital investment, past functional experience is likely to affect future executive assignments (in anecdotal accounts of gender gaps in business, this explanation is referred to as the pipeline hypothesis). Women outnumber men in finance and administration, personnel and industrial relations, and advertising and public relations.

Panel D reports on gender differences in family backgrounds. Relatively small differences exist between male and female executives in their birth order, family size, number of male siblings, immigrant status, or whether they were born in a large city. The most important difference in background relates to female executives having a smaller propensity to work in their birth county (42% vs. 49%). Figure IA1 shows that the gender gap in executives' likelihood of living in their

[13] Women are sometimes assumed to be more altruistic and cooperative than men. Niederle (2016) reviews the experimental and field evidence on altruism and cooperation and concludes the evidence "is more mixed than what one might have expected."

home county becomes apparent as soon as in the early 20s, when they typically study at college. These results are consistent with the idea that female executives are, if anything, more prone than male executives to move to opportunity.

Panel D further reports gender differences in risk tolerance, which we measure by using an indicator for whether the executive is a stock-market participant. Jianakoplos and Bernasek (1998) and Sunden and Surette (1998) document that women typically hold lower proportions of risky assets than men. Reviews by Eckel and Grossman (2008) and Croson and Gneezy (2009) of the experimental literature come to the same conclusion: women tend to be more risk averse than men. Our results support the findings in this literature: 50% of women own stocks, whereas the corresponding fraction for men is 65%. These findings are at odds with the findings of Adams and Funk (2012), which suggest female directors are more risk tolerant than male directors.

Panel E reports gender differences in variables that are not available for the entire sample. We first report on parents' socioeconomic status. Being born to a well-educated and affluent family can help a child in at least two ways. First, parents are likely to pass their human capital on to their children. Second, wealthy parents are also in a better position to offer the monetary resources needed to develop their children's human capital. We separately include both parents' socioeconomic status by including variables measuring whether they are (or were) university educated. We also measure their employment in 1990 (i.e., at the beginning of our sample period) and their position in the income distribution among individuals of the same gender and cohort. We find that female executives appear to come from higher socioeconomic strata than male executives. Female executives' both parents are on average better educated and have higher earnings.

Panel E also reports on personal traits. Swedish military measures all personal trait variables, except for GPA. Military service is mandatory only for men, so we have very few traits observations for women. Nevertheless, the family links in our data enable us to impute these variables for an

executive from the test scores of her randomly selected brother (we randomly chose just one brother to avoid biases arising from family size). This imputation assumes the traits have a large family component, an assumption backed up by the evidence in Beauchamp, Cesarini, Johannesson, Lindqvist, and Apicella (2011) in Swedish data. We also impute the traits for men even though their traits are available.[14] Given that executives have done well in life, their traits likely are better than those of their brothers. Except for imputed officer rank, we express all trait variables as differences in terms of standard deviations relative to the test takers in the same cohort. Benchmarking each individual against the same cohort allows us to control for secular trends in measured cognitive ability and height (see, e.g., Flynn, 1984; Floud, Wachter, and Gregory, 1990).

We find that all trait variables except for the body-mass index are positive, which means the brothers of executives have a higher cognitive and non-cognitive ability, are taller, slimmer, and in better physical condition than the population. Consistent with Adams, Keloharju, and Knüpfer (2018), who review this literature, the differences relative to the population are small, at most 0.36 standard deviations. Four gender differences are statistically significant at the 1% level. Women's brothers have a higher cognitive ability (0.14-standard-deviation difference), are slimmer (0.08-standard-deviation difference), and are more likely to have achieved an officer rank than men's brothers. In addition, women's brothers have a 0.08-standard-deviation higher GPA than men's brothers. We use imputed GPAs to account for potential gender differences in grading.

[14] Table IA2 investigates the possibility that the imputation picks up women and men executives from families of different socioeconomic status, perhaps because of cross-sectional differences in parents' desire to balance their family's sex composition. The table shows no significant differences in parents' socioeconomic status by imputation status and gender.

3.3. Contribution of executive characteristics to gender gaps in top-executive appointments

Table 3 evaluates how much of the gender gap in large-firm top-executive appointments and pay can be attributed to gender differences in the executives' characteristics. The three leftmost columns of Table 3 Panel A report results from linear probability model regressions of the large-firm CEO dummy on the female dummy and controls. The first row represents a regression that includes the female dummy as the sole regressor. This regression corresponds to Table 1, which finds a coefficient on the female dummy of –0.64. The second row reports regressions that also control for the level and field of education. Given that women have on average better educational qualifications, the gender gap widens to –1.06. Adding career orientation and networks and career controls on the third row results in a gap of –0.98. Here, we use all the variables listed in Table 2 Panel B except for age, which is highly correlated with the length of labor-market experience. The fourth row adds dummies for past functional experience, which lowers the gap to –0.88. And finally, the fifth row adds family background and risk-tolerance variables, bringing the gap to –0.75, that is, relatively close to the unconditional gap in the first specification.

The three rightmost columns report on regressions where the left-hand-side variable is a dummy for earning at least one million SEK. The unconditional probability of an executive reaching this income is higher than that for being a large-firm CEO, 13.0% versus 1.2%. Here, the unconditional gender-gap coefficient is –4.7, that is, the same as in Table 1. As for CEOs, the gap widens to –8.7 once we control for education, and then narrows again when we control for the other attributes. In the regression with all controls, the gap continues to be larger than the unconditional gap (–6.9). The three columns in the middle, which look at large-firm top executives, mirror the patterns we observe for the highly paid executives. Overall, all our results point toward the conclusion that the gender gaps do not arise from female executives' poorer qualifications. The

higher female bar for reaching the top suggests instead that aspiring females may invest more in their basket of qualifications to prevent the adverse effects of child rearing.[15]

Panel B includes additional controls to the regression equation. Given that these regressors are not available for all of the executives, the number of observations and the unconditional and conditional gender gaps are different than in our main specification. We consider three groups of variables: parents' socioeconomic status, personal traits, and imputed GPA, which we include in the regression one by one in addition to all the variables used in Panel A. We find the gender gap widens with all of these variable groups in all specifications. If anything, these results strengthen our conclusion that the cumulative impact of all the characteristics we employ makes the gender gaps in top-executive appointments and pay larger than those observed in the data.

Apart from the female dummy, the regression coefficients on the predictors of top-executive appointments and pay are of interest. Table 3 Panel C reports on the large-firm CEO, large-firm top executive, and high-earner coefficients for the specification that includes controls for individual characteristics.

The specifications on the three definitions of top executives largely agree on how the predictors are associated with executives' labor-market success. The level of education has both a positive and significant relation with all three definitions of top executives. For example, executives with a university degree are more likely to become large-firm CEOs and tend to be better paid, but those with a degree in health, natural science, teaching, or services tend to be less well paid than the executives on average (the omitted category is executives with no known specialization). More career-oriented executives reach better labor market outcomes, as is witnessed by the large positive

[15] More generally, professionals facing greater barriers in their careers may need to outperform their peers to be promoted. Chuprinin and Sosyura (2017) find that mutual-fund managers originating from worse socioeconomic backgrounds deliver better performance than managers from better backgrounds.

coefficients for educational paths that are associated with high incomes. Longer labor market experience and experience from a larger number of companies are strongly positively related with a highly paid executive position, whereas longer unemployment spells are negatively related with labor market success. Functional experience from sales and marketing has the strongest association with high pay and future CEO appointments. Conditional on becoming executives and all the other controls, immigrants do better than native Swedes on average. Finally, stock-market participation is strongly positively associated with executives' job-market success.

Table IA3 performs a decomposition exercise that allows us to assess the joint contribution of all characteristics to executive gender gaps. This exercise offers identical estimates of unconditional and conditional gaps, as do the regression coefficients reported in Table 3, but it has the added benefit of offering information on the contribution of each variable subset to the gap. We report both the Blinder-Oaxaca (1973, 1973) and Fairlie (1999) decompositions. The former uses the linear probability model, whereas the latter takes into account the fact that the dependent variable is an indicator. The decompositions reveal that risk tolerance, functional experience, and family background help explain the gaps, whereas education, career orientation, and networks tend to widen them. The gaps decompose similarly into explained and unexplained parts in the two specifications, suggesting our results are robust to using a logit specification instead of a linear probability model.

4. Role of family life in explaining gender gaps in executive appointments

4.1. Gender differences in marital status and family formation

Table 4 reports gender differences in family characteristics. Consistent with Folke and Rickne (2016), who find promotions increase the risk of divorce for women (but not for men), female

executives are more likely to be divorced than male executives. Female executives also are less likely to have children than male executives, and they have fewer children. These results are consistent with the idea that the executive role puts more strain on the family life of women than men. As a general rule, these gender differences are higher for large-firm top executives and other high earners. For example, the gender difference in the likelihood of being divorced is four percentage points higher for the top-executive categories than for executives in general.

4.2. Contribution of children to early career development

Figure 1 depicts the labor-income development of executives from age 19 to 49 by gender. Both genders start from about the same average annual income; at age 20, women even earn slightly more than men. The incomes start to diverge noticeably in the late 20s, and by age 34, the average pay difference reaches its peak, 127,000 SEK in favor of men. After that, the pay difference decreases gradually, reaching 36,000 SEK (4%) at age 49.

The divergence in female and male pay coincides with the time people typically form their families. This observation motivates an analysis that explicitly considers the impact of childbirth on career progression of women and men. Figure 2 reports results from an event study that tracks executives' average annual labor income, labor-force participation, and the probability of attaining a new job relative to the birth year of the executive's first child. For each of these outcome measures, we separately compare women with children against men with children (labeled "Male benchmark" in the graphs) and against women without children ("Female benchmark").[16] When comparing female executives against male executives, we regress the outcome variables on indicators for females, each calendar year, each of the 15 years surrounding childbirth, and the interactions of the

[16] See Waldfogel (1998), Miller (2011), and Kleven et al. (2018) for analyses on the pay difference between women with and without children.

female indicator and the years surrounding childbirth. The figure reports the coefficient estimates along with their 95% confidence intervals for the interaction coefficients for each of the event years except for year $t - 5$, which serves as the omitted category. When comparing female executives with children against female executives without children, we replace the female indicator in the regression with an indicator for whether the executive has children. Because executives who never have children do not experience their first childbirth, we assign them an imputed childbirth by randomly drawing from future executives' observed age distribution within gender at first childbirth. This approach enables us to isolate the impact of childbirth from other possible gender-related income shocks that coincide with the typical timing of childbirth. The calendar-year dummies control for annual trends in the outcome variable. Kleven et al. (2018) and Lundborg, Plug, and Rasmussen (2017) use similar methods to estimate child penalties in the population of Danish workers.

Figure 2 Panel A shows that labor income of men and women develops very similarly until year $t - 1$. Then, in year 0, women's salary drops 126,000 SEK below that of men, likely because of reduced pay during maternity leave. The drop continues to 171,000 SEK in year $t + 1$ because of the uneven timing of childbirths throughout the calendar year. After picking up in year $t + 2$ up to SEK 114,000, another drop in pay occurs in year $t + 3$, to SEK 150,000. This drop appears to be driven by the birth of a second child, which tends to happen two years after the birth of the first child. Figure IA2 Panel A shows that female executives who only have one child do not experience a pay drop in year $t + 3$. Female pay starts to noticeably recover in year $t + 4$. Despite its continuing recovery and higher growth rate compared to men, female executives' income is still in year $t + 10$ about 80,000 SEK lower than that of male executives.

Figure 2 Panel B illustrates the salary development of female executives with children, using female executives without children as the benchmark. The coefficient pattern is similar to that

reported in Panel A, except that women with children appear to be on a higher salary trajectory both before the first childbirth and after year $t + 4$. Consistent with the better trajectory, Table IA4 finds a significantly higher probability of becoming a top executive for female executives with children than without children and that this difference is partly attributable to the better qualifications of women with children. Low statistical power in some of the specifications in the table is a result of a small number of observations in the top-executive categories. As a whole, these results suggest that, if anything, female executives with children have higher qualifications than female executives without children. This finding makes rejecting the null hypothesis of no outcome difference between these two groups after childbirth more difficult and explains why the long-run child penalty is smaller here than with the male benchmark.

Figure 2 Panels C and D show that female executives' labor-market participation rate is, if anything, greater than that of their benchmarks before first childbirth. After a plunge in years 0 and $t + 1$, the participation rate recovers slowly and reaches the male participation rate in year $t + 10$.

Figure 2 Panels E and F study the probability of attaining a new job around the first childbirth. Relative to their benchmark groups, female executives' probability of attaining a new job decreases significantly in year $t - 1$ (and further in year 0), suggesting they take the anticipated childbirth into account in their decision to search for a new job. The probability recovers quickly after that time and reaches the male benchmark in year $t + 5$.

To sum up, all panels in Figure 2 tell the same story: the careers of future female executives tend to suffer at the time of childbirth, and recovering from this career shock takes several years. Table 5 demonstrates this result formally in a regression table, whose specifications correspond to those of Figure 2 except for pooling the event years in four brackets (0–1, 2–5, and 6–10 years, and the omitted category of –5 – –1 years). Except for a dummy for 6–10 years in the probability of

attaining a new-job specification, all of the post-birth variables are significantly negative at the 5% level.

4.3. Role of family dynamics

The importance of childbirth for gender gaps motivates us to study the role dynamics within the executives' households play in female careers. By comparing the partners of executive women to those of male executives, Figure 3 shows that female partners assume a role very different from male partners. Panel A suggests that, compared to the male partners, female partners experience a permanent career setback following childbirth. The magnitude of this penalty, SEK 143,000 in year $t + 10$, is almost twice as large as the gender gap in pay for the executives themselves in Figure 2. Panel B shows women's labor-market participation rates take years to return to pre-birth levels. Despite starting from a higher level, female partners' participation rate stays below that of male partners for four years after childbirth. Panel C shows the gender gaps in partners' probability of attaining a new job are large immediately after childbirth (and a year before it) and largely disappear by year $t + 4$. Collectively, these results are consistent with the idea that partners of female executives invest less in child rearing than partners of male executives.

Why do female partners respond to childbirth so differently from male partners? They might not be in a position to put their career first, because their partners have a comparative advantage in advancing their careers.[17] We take the first look at the causes of partners' differing responses to childbirth in Table IA5. It compares the career prospects of future executives with those of their partners, by reporting on the likelihood that partners have a greater predicted probability of being a

[17] Becker (1991) finds that even small differences in productive capacities within household imply very different allocations of time in equilibrium. Manser and Brown (1980), McElroy and Horney (1981), Lundberg and Pollak (1993), and others study intra-household bargaining.

top executive or a top earner, separately for each gender, two years prior to first childbirth. The predicted probabilities are higher for future executives than their partners, which is consistent with the idea that future executives tend to "marry down" in a career sense. The likelihood of marrying down is slightly higher for future male executives than for female executives. For example, 59.1% of executive men's partners have a lower probability of becoming a CEO than the executive himself, whereas the corresponding probability for executive women is 57.3%. This greater tendency of male executives to marry down may explain why their partners take more responsibility in child rearing than the partners of executive women. However, this circumstantial evidence does not allow us to draw strong conclusions, and we therefore proceed with an analysis that directly speaks to the drivers of partners' differential responses to childbirth by gender.

Comparative advantage suggests forward-looking couples would prioritize the career of the partner that has greater potential, regardless of the gender of that partner. Figure 4 investigates this issue by repeating Figure 2 for executive women but now comparing the career trajectories of female executives with less career potential than their partners to the benchmark group of female executives with more potential. We measure career potential as the predicted probability of becoming a large-firm CEO, measured again two years prior to the first childbirth. Panel A reports on the difference in pay development of the two executive categories, whereas Panels B and C report on the difference in labor-force participation and the probability of attaining a new job.

The pay of executives with less potential than their partners is largely comparable to the benchmark group; only five of the 15 coefficients plotted in the figure reject the null of no difference. Most importantly for our analysis, childbirth affects this difference in no discernible way, nor does any noticeable change occur in the difference in labor-force participation or in the probability of attaining a new job around childbirth. Qualitatively similar results obtain in Figure

IA3, which assesses career potential using the predicted probability of other top-executive outcomes.

The patterns we observe in Figure 4 are inconsistent with comparative advantage driving our results. However, our measurement of career potential relies on observable characteristics prior to childbirth and may thus fail to account for executives' beliefs about their performance in the labor market. These beliefs would, however, need to generate substantial gender differences to account for our results, because the within-household differences in career potential in our sample are large. When an executive marries up, the partner's predicted probability of becoming a large-firm CEO is about twice as high as when the executive marries down. To further investigate this issue, Figure IA4 analyzes a sample of households where the executive-partner differences in career potential are at least one standard deviation away from the mean. These results paint a picture similar to that in Figure 4.

Collectively, our results show that female executives' responses to childbirth are largely unaffected by their career potential relative to their partners. This evidence suggests within-household comparative advantage unlikely drives our results. Remaining explanations, which our data do not allow us to disentangle, include gender identity that necessitates women to assume a greater role in child rearing, and discrimination that prevents women with children from advancing in the labor market.

4.4. Gender differences in working hours and absence from work

To gain a better understanding of the drivers of child penalties, we next study gender differences in parental investment reflected in executives' absence from work and in their working hours. We study these differences by using a sample of executives surveyed by the Labor Force Survey in

2000–15.[18] We separately regress four absence and working-hour variables on indicators for years 0, 1–2, 3–6, 7–10, 11–16, and 17–18 years following childbirth (17–18 is the omitted category), a female indicator, and their interactions, along with survey-wave dummies. We report the coefficients for the interactions along with their *t*-values (95% confidence intervals) in Table 6 (Figure 5).

The first specification in Table 6 (Figure 5 Panel A) reports on gender differences in the annual number of days absent from work for parental reasons. In year 0, female executives are on average away from work for parental reasons 106 more days than male executives. This gap narrows as the children grow up, but it remains statistically significant at 6.6 days even 7–10 years after the first childbirth.

The second specification (Figure 5 Panel B) reports on gender differences in weekly hours absent from work. In year 0, female executives are on average absent from work 24 more hours than their male counterparts. The gap drops to three hours in years 3–6 after the first childbirth and disappears thereafter. The third specification (Panel C) shows the gap in the number of working hours follows a similar but reverse pattern. This gap stems from actual hours, not from contracted hours. The fourth and final specification (Panel D) shows the gender gap in contracted hours does not differ statistically significantly in any of the years from the benchmark category of 17–18 years after childbirth.

These results suggest female executives are more absent from work and work shorter hours than male executives for many years after the birth of their first child. However, this gap largely fades away by the time the first child reaches school age.

[18] Table IA6 shows these executives are broadly similar to our main-sample executives in their characteristics. Our survey sample includes a set of characteristics narrower than the core sample.

4.5. Impact of early career development on top-executive appointments

The burden of child rearing on female careers motivates us to analyze whether the child penalties are large enough to generate the executive gender gaps observed at the age of 40–49. Table 7 studies this question by investigating the extent to which labor income five years after the first childbirth—an approximation of the impact of children on career progression—explains the top-executive gender gaps. In this analysis, we separately account for labor income prior to childbirth, which captures other gender differences in career development that do not coincide with the arrival of children. We measure childbirths in the 1991–2000 period, that is, on average 15 years before observing the top-executive positions.

The three leftmost columns report the specification that explains appointments to a large-firm CEO position. The first column serves as a benchmark and is identical to the specification with controls listed on the fifth row of Table 3 Panel A. The gender gap here is –0.77. Column 2 asks how the coefficient for the female dummy changes once we add income two years before the birth of the first child.[19] The gender gap decreases only slightly to –0.74, which is consistent with the results in Figure 2 that show men and women are on similar career trajectories prior to first childbirth. The income variable is highly significant, which implies strong persistence in the career paths of aspiring executives.

Column 3 further adds income five years after the first childbirth to the regression. The results in column 3 are strikingly different from those is column 2. Now both the female dummy and the income one year before birth become insignificant, whereas the coefficient for income five years after the first childbirth takes a highly significant value. This result suggests that for large-firm CEO

[19] We use income from year $t - 2$ in lieu of $t - 1$ to avoid any effects arising from pregnancy.

appointments, the career development in the five years following the first childbirth accounts for the entire gender gap.

We get qualitatively similar results also for the other top-executive definitions. In the three middle columns, where we regress appointment to one of the top-5 executive positions in large firms on the female dummy and controls, the gender gap is –3.0 both in the baseline specification in column 4 and in column 5, where we additionally control for income two years before the first childbirth. In column 6, where we further add income in year $t + 5$, the coefficient for the female dummy drops to –1.3, whereas the coefficient for income in $t + 5$ is highly significant. Here, over one half (1 – –1.3/–3.0) of the gender gap can be accounted for by the income development during the five years after first childbirth. This pattern repeats one more time in the three rightmost columns, where we regress a highly paid executive dummy on the female dummy and controls. In column 9, which includes both income controls, we can account for 77% of the gender gap by the early career development following first childbirth.

Table IA7 Panel A explores how doubling the total-assets cutoff to SEK 1 billion and the pay cutoff to SEK 2 million affects our results. The mean dependent variable at the bottom of the panel shows the number of top executives drops approximately to one half in the firm-size-based definitions (the six leftmost columns) and to one sixth in the pay-based definition (the three rightmost columns). The coefficient for the female dummy is negative and statistically significant in all specifications before controlling for income in year $t + 5$ but becomes insignificant or even reverses its sign once we add income in year $t + 5$.

Table IA7 Panel B explores the robustness of our results in a sample of executives in their 50s. It repeats the regressions in Table 7 but leaves out labor income at $t – 2$ because its measurement is not possible prior to 1990. The results for this subsample are qualitatively similar to those for the main sample. The coefficient for the female dummy is statistically significantly negative in all

specifications before controlling for income, and it drops on average by more than one half after controlling for income in year $t + 5$. In other words, income five years after the childbirth accounts for more than one half of the gender gaps in top-executive outcomes.

The ex-post success of the women in our future-executive sample means their career setbacks following childbirth can be expected to be smaller and of a more temporary nature than those of talented women on average. To check how our results generalize to other talented professionals, Table 8 analyzes a sample of business, economics, and engineering graduates—the three most common fields of education for corporate executives—relaxing the requirement of an individual holding an executive position in 2011. Female university graduates enjoy a smaller qualification advantage over men than executives, because sample selection strips women of one of their key strengths: their higher level of education. This finding helps explain why the gender gaps are one quarter to one third higher in the university-graduate sample. For example, comparing Table 8 Panel A with Table 1 Panel A suggests the fraction of women is one third larger in the university graduate than in the executive population, but about the same among large-firm CEOs. As Table 8 Panel B shows, education gives women an edge even in the university-graduate sample, because they are more likely to have a degree from business or economics, that is, the fields of education most highly correlated with appointment as a top executive.

Table 8 Panel C repeats the analyses of Table 7 using the university-graduate sample. The results of this analysis echo those of the main sample: on average, the income development during the five years after the first childbirth can account for about three quarters of the gender gaps in top-executive appointments. Thus, selecting the sample based on ex-post career success does not seem to have a tangible effect on how informative the setbacks associated with childbirth are of long-term career outcomes.

Figure IA5 repeats analyses in Figure 2 on career progression around childbirth for the university-graduate sample. The long-term child penalties in income (Panel A) and likelihood of working (Panel B) are larger for the university graduates, presumably because of the fact that the individuals in the future-executive sample are conditioned to be ex-post successful, whereas university graduates are not. For example, the gender difference in income in year $t + 10$ is SEK 120,000 in the graduate sample and SEK 90,000 in the future-executive sample.

All in all, these results are consistent with Figure 2, which suggests most of the gender gap in executive pay develops shortly after the birth of the first child. This pay gap is indicative of childbirth leading to a permanent setback to women's careers, because pay five years after the birth (but not before it) is a highly significant predictor of career outcomes years later.

5. Conclusion

Exceptionally rich data from Sweden enables us to study the gender gap in executives' career progression and to investigate its causes. We follow the careers of all future executives born between 1962 and 1971 in the 1992–2011 period and ask how their qualifications, career progression, and family matters explain their career success in 2011, that is, when they are 40–49 years old.

We find that child rearing plays a crucial role in the formation of gender gaps in top-executive appointments. Most of these gender gaps arise during the five years following the birth of the first child, a time when the gender gaps in executives' working hours and absence from work are at their largest. Women are on similar career paths prior to childbirth, but they earn substantially less than men five years after childbirth. This child penalty remains large over the remaining course of the executives' careers and is invariant to women's career potential relative to their partners. These results suggest aspiring women may not reach the executive suite without trading off family life.

References

Adams, Renée, and Patricia Funk, 2012, Beyond the Class Ceiling: Does Gender Matter? *Management Science* 58(2), 219–235.

Adams, Renée, Matti Keloharju, and Samuli Knüpfer, 2018, Are CEOs Born Leaders? Lessons from Traits of a Million Individuals, *Journal of Financial Economics*, forthcoming.

Adda, Jérôme, Christian Dustmann, and Katrien Stevens, 2017, The Career Costs of Children, *Journal of Political Economy* 25(2), 293–337

Ahern, Kenneth R., and Amy K. Dittmar, 2012, The Changing of the Boards: The Impact on Firm Valuation of Mandated Female Board Representation, *Quarterly Journal of Economics* 127(1), 137–197.

Akerlof, George A., and Rachel E. Kranton, 2000, Economics and Identity, *Quarterly Journal of Economics* 115(3), 715–753.

Albanesi, Stefania, Claudia Olivetti, and Maria Jose Prados, 2015, Gender and Dynamic Agency: Theory and Evidence on the Compensation of Female Top Executives, *Research in Labor Economics* 42, 1–60.

Albrecht, James, Björklund, Anders, and Susan Vroman, 2003, Is There a Glass Ceiling in Sweden? *Journal of Labor Economics* 21(1), 145–177.

Andersson, Fredrik W., and Jan Andersson, 2012, Företagsledarna i Sverige – En Algoritm för att Peka ut Företagens Operative Ledare i Näringslivet (Corporate Executives in Sweden – An Algorithm to Identify Chief Executive Officers, in Swedish), Fokus på Näringsliv och Arbetsmarknad Hösten 2012, Statistics Sweden.

Angelov, Nikolay, Per Johansson, and Erica Lindahl, 2016, Parenthood and the Gender Gap in Pay, *Journal of Labor Economics* 34(3), 545–579.

Arrow, Kenneth, 1973, The Theory of Discrimination, *Discrimination in Labor Markets* 3(10), 3–33.

Arulampalam, Wiji, 2001, Is Unemployment Really Scarring? Effects of Unemployment Experiences on Wages, *Economic Journal* 111(475), F585–F606.

Azmat, Ghazala, and Rosa Ferrer, 2017, Gender Gaps in Performance: Evidence from Young Lawyers, *Journal of Political Economy* 125(5), 1306–1355.

Becker, Gary S., 1959, *The Economics of Discrimination*, Chicago: University of Chicago Press.

Becker, Gary S., 1991, A Treatise on the Family, Cambridge, MA: Harvard University Press.

Benz, Matthias, 2005, Not for the Profit, but for the Satisfaction? Evidence on Worker Well-Being in Non-Profit Firms, *Kyklos* 58(2), 155–176.

Bertrand, Marianne, 2011, New Perspectives on Gender, *Handbook of Labor Economics* 4, 1543–1590.

Bertrand, Marianne, Sandra Black, Sissel Jensen, and Adriana Lleras-Muney, 2017, Breaking the Glass Ceiling? The Effect of Board Quotas on Female Labor Market Outcomes in Norway, *Review of Economic Studies*, forthcoming.

Bertrand, Marianne, Claudia Goldin, and Lawrence F. Katz, 2010, Dynamics of the Gender Gap for Young Professionals in the Financial and Corporate Sectors, *American Economic Journal: Applied Economics* 2(3), 228–255.

Bertrand, Marianne, and Kevin F. Hallock, 2001, The Gender Gap in Top Corporate Jobs, *Industrial & Labor Relations Review* 55(1), 3–21.

Bertrand, Marianne, Emir Kamenica, and Jessica Pan, 2015, Gender Identity and Relative Income within Households, *Quarterly Journal of Economics* 130(2), 571–614.

Bagues, Manuel, and Pamela Campa, 2017, Can Gender Quotas in Candidate Lists Empower Women? Evidence from a Regression Discontinuity Design, IZA discussion paper No. 10888.

Besley, Timothy, Olle Folke, Torsten Persson, and Johanna Rickne, 2017, Gender Quotas and the Crisis of the Mediocre Man: Theory and Evidence from Sweden, *American Economic Review* 107(8), 2204–2242.

Beauchamp, Jonathan, David Cesarini, Magnus Johannesson, Erik Lindqvist, and Coren Apicella, 2011, On the Sources of the Height–Intelligence Correlation: New Insights from a Bivariate ACE Model with Assortative Mating, *Behavior Genetics* 41(2), 242–252.

Blau, Francine D., and Lawrence M. Kahn, 2000, Gender Differences in Pay, *Journal of Economic Perspectives* 14(4), 75–99.

Blau, Francine D., and Lawrence M. Kahn, 2017, The Gender Wage Gap: Extent, Trends, and Explanations, *Journal of Economic Literature* 55(3), 789–865.

Blinder, Alan S., 1973, Wage Discrimination: Reduced Form and Structural Estimates, *Journal of Human Resources* 8, 436–455.

Boschini, Anne, Kristin Gunnarsson, and Jesper Roine, 2017, Women in Top Incomes: Evidence from Sweden 1974–2013, IZA discussion paper No. 10979.

Buser, Thomas, Muriel Niederle, and Hessel Oosterbeek, 2014, Gender, Competitiveness and Career Choices, *Quarterly Journal of Economics* 125, 1409–1447.

Catalyst, 2017, Pyramid: Women in S&P 500 Companies, August 22, http://www.catalyst.org/knowledge/women-sp-500-companies.

Chuprinin, Oleg, and Denis Sosyura, 2017, Family Descent as a Signal of Managerial Quality: Evidence from Mutual Funds, Arizona State University working paper.

Croson, Rachel, and Uri Gneezy, 2009, Gender Differences in Preferences, *Journal of Economic Literature* 47(2), 448−474.

Custódio, Cláudia, Miguel A. Ferreira, and Pedro Matos, 2013, Generalists versus Specialists: Lifetime Work experience and Chief Executive Officer Pay, *Journal of Financial Economics* 108(2), 471−492.

Delfgaauw, Josse, and Robert Dur, 2008, Incentives and Workers' Motivation in the Public Sector, *Economic Journal* 118.525, 171–191.

Eckbo, B. Espen, Knut Nygaard, and Karin S. Thorburn, 2016, How Costly is Forced Gender-Balancing of Corporate Boards? Dartmouth College working paper.

Eckel, Catherine C., and Philip J. Grossman, 2008, Men, Women and Risk Aversion: Experimental Evidence, *Handbook of Experimental Economics Results* 1, 1061–1073.

Egan, Mark, Gregor Matvos, and Amit Seru, 2017, When Harry Fired Sally: The Double Standard in Punishing Misconduct, NBER working paper No. 23242.

Engelberg, Joseph, Pengjie Gao, and Christopher A. Parsons, 2013, The Price of a CEO's Rolodex, *Review of Financial Studies* 26(1), 79−114.

Fairlie, Robert W., 1999, The Absence of the African-American Owned Business: An Analysis of the Dynamics of Self-Employment, *Journal of Labor Economics* 17(1), 80–108.

Fernández, Raquel, Alessandra Fogli, and Claudia Olivetti, 2004, Mothers and Sons: Preference Formation and Female Labor Force Dynamics, *Quarterly Journal of Economics* 119(4), 1249–1299.

Floud, Roderick, Kenneth Wachter, and Annabel Gregory, 1990, Height, Health and History: Nutritional Status in the United Kingdom, 1750−1980, Cambridge, England: Cambridge University Press.

Flynn, James R., 1984, The Mean IQ of Americans: Massive Gains 1932 to 1978, *Psychological Bulletin* 95(1), 29–51.

Folke, Olle, and Johanna Rickne, 2016, All the Single Ladies: Job Promotions and the Durability of Marriage, IFN working paper No. 1146.

Gneezy, Uri, Muriel Niederle, and Aldo Rustichini, 2003, Performance in Competitive Environments: Gender Differences, *Quarterly Journal of Economics* 118(3), 1049−1074.

Goldin, Claudia, 2014, A Grand Gender Convergence: Its Last Chapter, *American Economic Review* 104(4): 1091–1119.

Henrekson, Magnus and Mikael Stenkula, 2009, Why Are There So Few Female Top Executives in Egalitarian Welfare States? *Independent Review*, 14(2), 239−270.

Heyman, Fredrik, Pehr-Johan Norbäck, and Lars Persson, 2017, Gender Discrimination at the Top and Product Market Competition, IFN working paper No. 1169.

Hwang, Byoung-Hyoun, and Seoyoung Kim, 2009, It Pays to Have Friends, *Journal of Financial Economics* 93(1), 138–158.

Jianakoplos, Nancy A., and Alexandra Bernasek, 1998, Are Women More Risk Averse? *Economic Inquiry* 36(4), 620–630.

Kamas, Linda, and Anne Preston, 2015, Competing with Confidence: The Ticket to Labor Market Success for College-Educated Women, Santa Clara University working paper.

Kleven, Henrik J., Camille Landais, and Jacob E. Sogaard, 2018, Children and Gender Inequality: Evidence from Denmark, NBER working paper No. 24219.

Kramarz, Francis, and David Thesmar, 2013, Social Networks in the Boardroom, *Journal of the European Economic Association* 11(4), 780–807.

Kunze, Astrid, and Amalia R. Miller, 2017, Women Helping Women? Evidence from Private Sector Data on Workplace Hierarchies, *Review of Economics and Statistics* 99(5), 769–775.

Lindqvist, Erik, and Roine Vestman, 2011, The Labor Market Returns to Cognitive and Noncognitive Ability: Evidence from the Swedish Enlistment, *American Economic Journal: Applied Economics* 3(1), 101–128.

Lundberg, Shelly, and Robert A. Pollak, 1993, Separate Spheres Bargaining and the Marriage Market, *Journal of Political Economy* 101(6), 988–1010.

Lundborg, Petter, Erik Plug, and Astrid Würtz Rasmussen, 2017, Can Women Have Children and a Career? IV Evidence from IVF Treatments, *American Economic Review* 107(6), 1611–1637.

Manser, Marilyn, and Murray Brown, 1980, Marriage and Household Decision-Making: A Bargaining Analysis, *International Economic Review* 21(1), 31–44.

Matsa, David A., and Amalia R. Miller, 2011, Chipping Away at the Glass Ceiling: Gender Spillovers in Corporate Leadership, *American Economic Review Papers and Proceedings* 101(3), 635–639.

McElroy, Marjorie B., and Mary Jean Horney, 1981, Nash-Bargained Household Decisions: Toward a Generalization of the Theory of Demand, *International Economic Review* 22(2), 333–349.

Miller, Amalia R., 2011, The Effects of Motherhood Timing on Career Path, *Journal of Population Economics* 24(3), 1071–1100.

Mincer, Jacob, 1958, Investment in Human Capital and Personal Income Distribution, *Journal of Political Economy* 66(4), 281–302.

Murphy Kevin J., and Jan Zábojník, 2004, CEO Pay and Appointments: A Market-Based Explanation for Recent Trends, *American Economic Review Papers and Proceedings* 94(2), 192–196.

Niederle, Muriel, 2016, Gender, in: Handbook in Experimental Economics, Eds. John H. Kagel and Alvin E. Roth, 481–553, Princeton, NY: Princeton University Press.

Niederle, Muriel, and Lise Vesterlund, 2007, Do Women Shy away from Competition? Do Men Compete Too Much? *Quarterly Journal of Economics* 122(3), 1067–1101.

Oyer, Paul, 2008, The Making of an Investment Banker: Stock Market Shocks, Career Choice, and Lifetime Income, *Journal of Finance* 63(6), 2601-2628.

Phelps, Edmund S., 1972, The Statistical Theory of Racism and Sexism, *American Economic Review Papers and Proceedings* 62(4), 659–661.

Pissarides, Christopher A., 1992, Loss of Skill during Unemployment and the Persistence of Employment Shocks, *Quarterly Journal of Economics* 107(4), 1371−1391.

Oaxaca, Ronald, 1973, Male-Female Wage Differentials in Urban Labor Markets, *International Economic Review* 14, 693−709.

Schoar, Antoinette, and Luo Zuo, 2017, Shaped by Booms and Busts: How the Economy Impacts CEO Careers and Management Styles, *Review of Financial Studies* 30(5), 1425–1456.

Smith, Nina, Valdemar Smith, and Mette Verner, 2013, Why Are So Few Females Promoted into CEO and Vice President Positions? Danish Empirical Evidence, 1997–2007, *Industrial & Labor Relations Review* 66(2), 380–408.

Sunden, Annika E., and Brian J. Surette, 1998, Gender Differences in the Allocation of Assets in Retirement Savings Plans, *American Economic Review Papers and Proceedings* 88(2), 207–211.

Tyrefors Hinnerich, Björn, and Joakim Jansson, 2017, Gender Quotas in the Board Room and Firm Performance: Evidence from a Credible Threat in Sweden, IFN Working Paper No. 1165.

Waldfogel, Jane, 1998, Understanding the 'Family Gap' in Pay for Women with Children, *Journal of Economic Perspectives* 12(1), 137–156.

Wood, Robert G., Mary E. Corcoran, and Paul N. Courant, 1993, Pay Differences among the Highly Paid: The Male-Female Earnings Gap in Lawyers' Salaries, *Journal of Labor Economics* 11(3), 417–441.

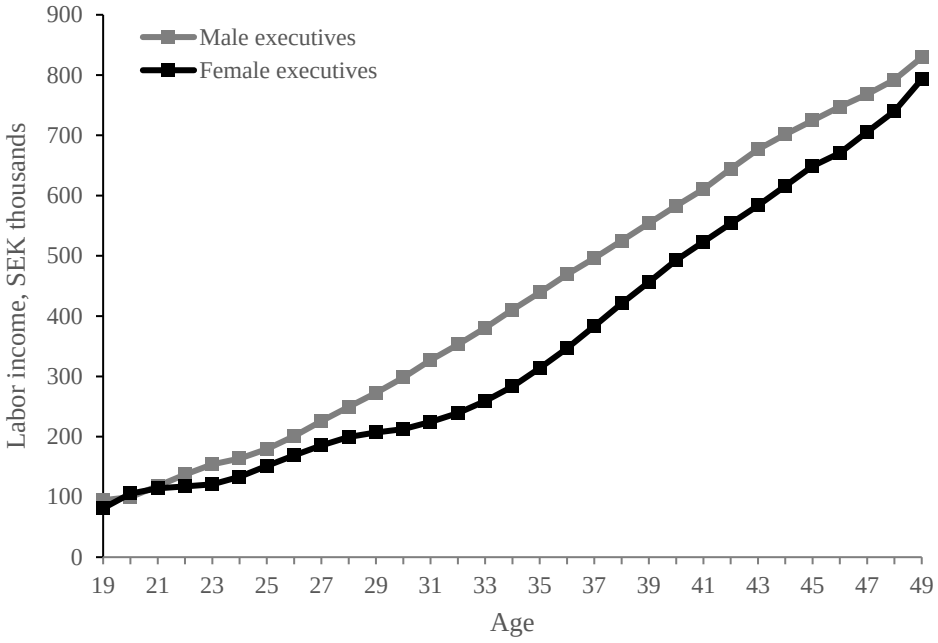

Figure 1. Female and male executives' labor income as a function of age
This graph depicts annual labor income of executives from age 19 to 49 stratified by gender. Each data point in the graph corresponds to the average annual labor income (in 1000 SEK, SEK 1 ≈ USD 0.12) at a particular age for the sample of executives born in 1962–71 and observed in 1990–2011.

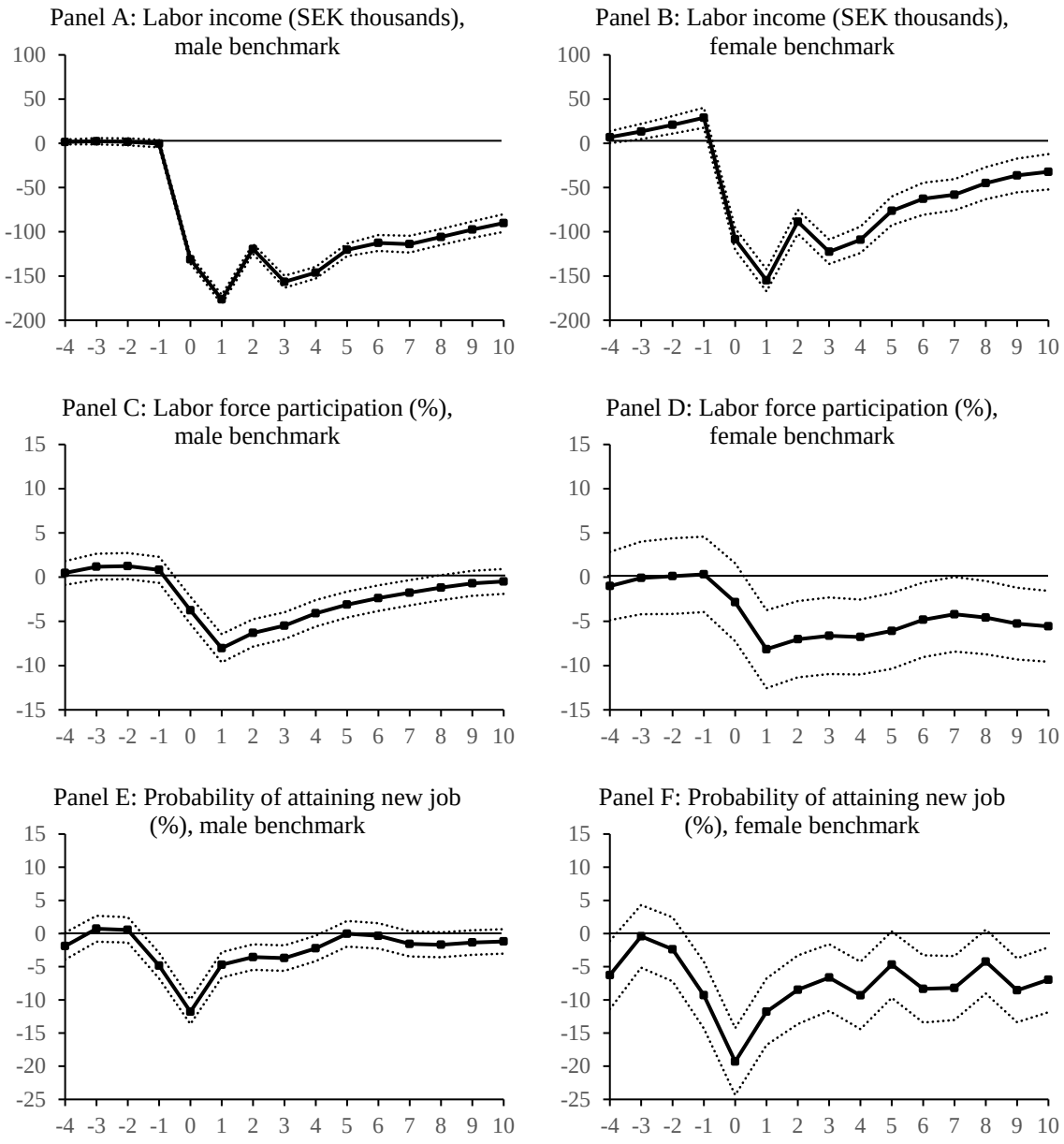

Figure 2. Impact of children on female executives' career progression

The panels in this graph plot annual labor income (Panels A and B), labor-force participation (C and D), and probability of attaining a new job (E and F) relative to the birth year of the executive's first child. The estimates (solid lines) and their 95% confidence intervals (dotted lines) are for the coefficients on interactions of female indicator with indicators for the 15 years surrounding the event of childbirth (–5 omitted). In addition, the regressions include a female dummy, dummies for each of the years surrounding the event, and dummies for each calendar year. The male benchmark compares female executives with male executives that have children, whereas the female benchmark consists of female executives with no children. The imputed year of childbirth for women with no children randomly draws from the observed age distribution at first childbirth. The sample consists of executives who are born in 1962–71 and whose first childbirth (actual or imputed) is in 1992–2001. Confidence intervals are based on standard errors that assume clustering at the individual level.

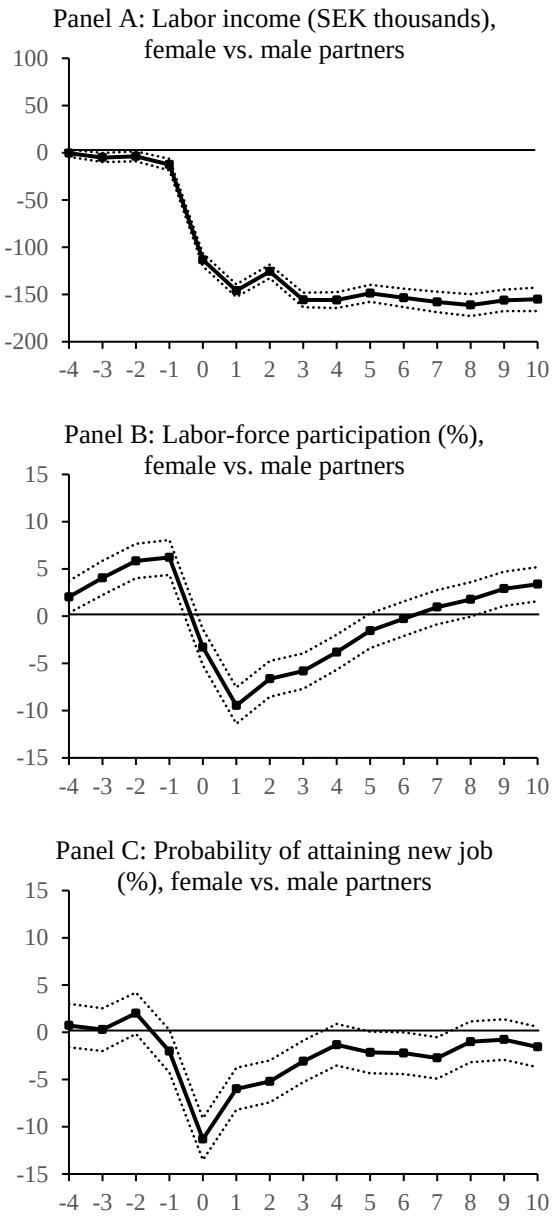

Figure 3. Career progression of executives' partners around childbirth
This figure repeats analyses in Figure 2 for executives' partners for labor income in Panel A, labor-force participation in Panel B, and probability of attaining a new job in Panel C. The estimates in each panel compare female partners of male executives with male partners of female executives. The sample consists of executives who are born in 1962–71 and whose first childbirth is in 1992–2001. Confidence intervals are based on standard errors that assume clustering at the individual level.

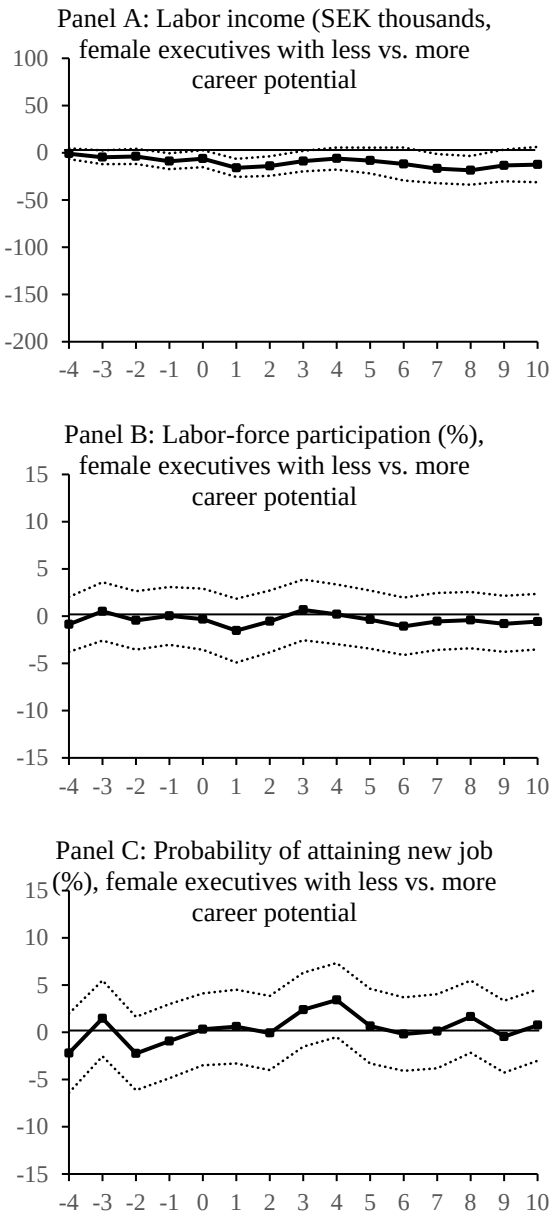

Figure 4. Career progression of female executives by their relative within-household career potential
This figure repeats analyses in Figure 2 for female executives as a function of their relative career potential compared to their partners. The benchmark group consists of executives with more career potential. Panel A reports on labor income, whereas Panels B and C depict labor-force participation and the probability of attaining a new job. The estimates in each panel measure career potential by the predicted probability of becoming a large-firm CEO, obtained from regressing the large-firm CEO indicator on variables measuring the level of education, educational specialization, career orientation and networks, and family background, as defined in Table 3. The sample consists of executives who are born in 1962–71 and whose first childbirth is in 1992–2001. Only executives with an identifiable partner enter the sample. Confidence intervals are based on standard errors that assume clustering at the individual level.

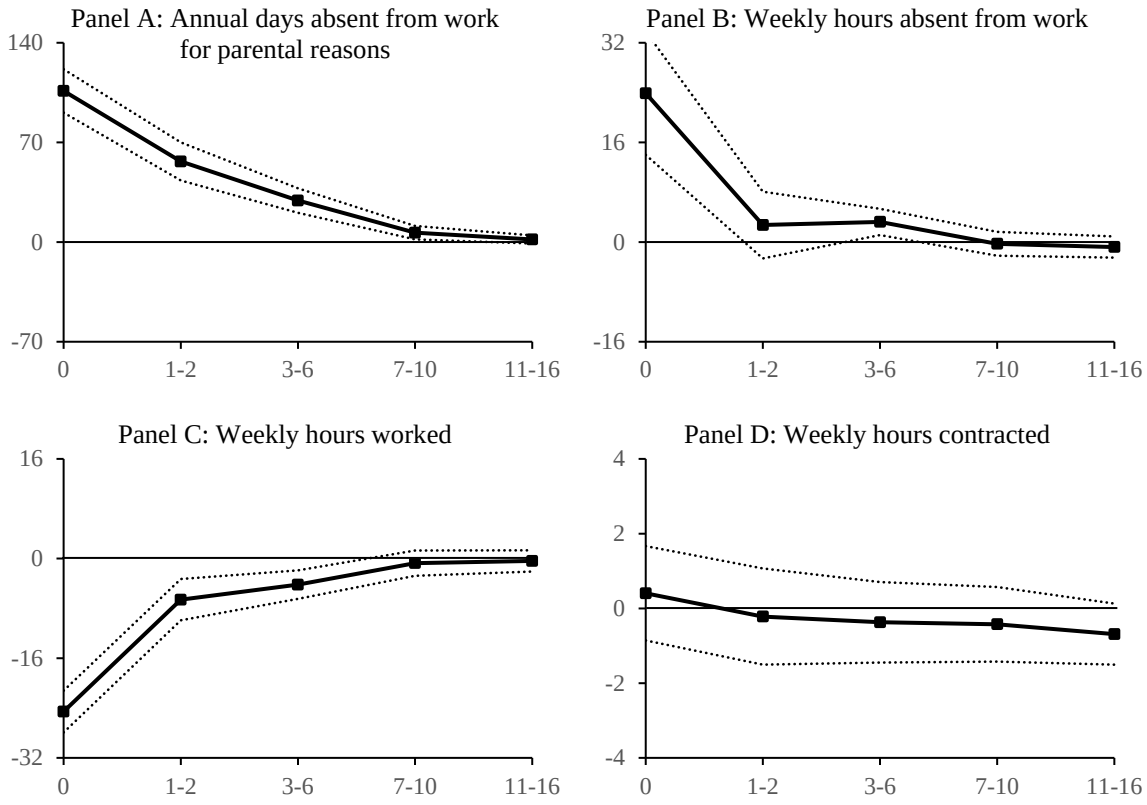

Figure 5. Impact of children on female executives' absence from work and working hours
The panels in this graph plot annual days absent from work for parental reasons (Panel A), weekly hours absent from work (B), weekly hours worked (C), and weekly hours contracted (D). The estimates (solid lines) and their 95% confidence intervals (dotted lines) are for the coefficients on interactions of female indicator with indicators for years 0, 1–2, 3–6, 7–10, 11–16, and 17–18 following childbirth (17–18 omitted). In addition, the regressions include a female dummy, dummies for each of the years surrounding the event, and dummies for each survey year. The sample consists of executives surveyed in the Labor Force Survey in 2000–15. The annual days absent from work records the total number of days in which the individual has claimed compensation for absence due to parental reasons. This variable comes from the LISA database. The absent and work hours are from the survey questions that report on the week preceding the survey. Confidence intervals are based on standard errors that assume clustering at the individual level.

Table 1
Gender gaps in top executive appointments and pay

The sample consists of executives of all Swedish limited-liability companies in 2011 with at least 10 employees and information on sales available. Panel A reports the gender gaps in the probability of attaining a top executive position. We define top executives in three different and partly overlapping ways. *Large-firm CEOs* hold the CEO position in firms with sales of at least SEK 500 million, whereas *large-firm top executives* are the CEO and the four highest-paid executives in these large firms. *Highly paid executives* have an annual labor income of at least SEK 1 million. The gender gap equals the female-male difference in the probability of attaining a top executive position and the robust *t*-statistic tests whether the gender gap differs from zero. Panel B reports mean and median pay for the three definitions of top executives and all executives. The log gender gap is the female-male difference in logged labor income, and the robust *t*-statistic tests whether the gender gap differs from zero. Labor income includes all income taxed as labor income in a given year; base salaries, stock option grants, bonus payments, and benefits received from the employer qualify as taxable labor income. Tax authorities deem the taxable income to occur in the year when an employee or executive exercises her stock options or purchases her company's shares at a price that is less than their fair value. The income is deflated to 2011 value and is expressed in million SEK.

Panel A: Probability of attaining a top-executive position

	Large-firm CEOs			Large-firm top executives			Highly paid executives		
	Top executives	Other executives	Fraction top executives, %	Top executives	Other executives	Fraction top executives, %	Top executives	Other executives	Fraction top executives, %
All	300	24,062	1.23	1,479	22,883	6.07	3,160	21,202	12.97
Women	51	6,591	0.77	317	6,325	4.77	634	6,008	9.55
Men	249	17,471	1.41	1,162	16,558	6.56	2,526	15,194	14.26
Frac. women, %	17.00	27.39		21.43	27.64		20.06	28.34	
Gender gap						−1.78			−4.71
t-value			(−4.59)			(−5.56)			(−10.56)

Panel B: Mean pay in SEK millions

	Large-firm CEOs		Large-firm top executives		Highly paid executives		All executives	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
All	2.08	1.72	1.34	1.09	1.55	1.29	0.69	0.58
Women	1.99	1.64	1.23	1.00	1.49	1.26	0.63	0.55
Men	2.10	1.78	1.37	1.11	1.56	1.30	0.72	0.59
Log gender gap, %	−3.29		−9.26		−3.20		−11.59	
t-value	(−0.40)		(−2.85)		(−2.16)		(−12.38)	

Table 2

Gender differences in executive attributes

This table reports gender differences in the sample executives' attributes. Panel A reports on the level of education and educational specialization. Panel B reports on career and networks. *Top income education track* takes the value of 1 if the combination of the level of education and educational specialization is among the top-5 specializations in 2011 in median total income and it has more than 100 graduates. *Top executive education* track takes the value of 1 if the combination of the level of education and educational specialization is among the top-5 specializations in 2011 in the number of large-firm top executives. *Top executive high school* takes the value of 1 if the high school is in the top-5 high schools in 2011 in terms of the fraction of graduates who become large-firm top executives and if it has more than 100 graduates. All the career variables except for unemployment are calculated using data from 1990 to 2011; the unemployment data are available from 1992. Unemployment is measured using information on the days the individual has collected unemployment benefits. *Consulting or IB experience* measures work experience from the following industries: Business and management consultancy activities (SNI2002, SNI1992=74140), Business and other management consultancy (SNI2007=70220), Security broking and fund management (SNI2002, SNI1992=67120), or Investment fund management activities (SNI2007=66301). *Graduated in recession* takes the value of 1 if the executive graduated in a year when Sweden experienced negative GDP growth (1977, 1991, 1992, or 1993). Panel C reports the means of indicators for having gained experience from different executive functions in 2004–9. Function is not observed for executives who did not hold a functional role during this period. Panel D reports on family background and risk tolerance. *Birth order* and *Number of siblings* have been calculated using data on all individuals of at least 16 years of age since 1990. *Born in top-3 city* takes the value of 1 if the individual was born in Stockholm, Göteborg, or Malmö. *Immigrant* takes the value of 1 if the individual was born outside of Sweden. *Work in birth county* indicates executives whose county of work is the same as their place of birth. *Stock market participant* uses data on direct stock holdings and indirect holdings via mutual funds. Panel E reports on parents' socioeconomic status and personal traits. Parents' socioeconomic status is measured using data from year 1990. Parent's rank in age-gender income distribution refers to their labor-income rank among all individuals of the same gender in a given cohort. Labor income includes all income taxed as labor income in a given year; base salaries, stock-option grants, bonus payments, and benefits received from the employer qualify as taxable labor income. Tax authorities deem the taxable income to occur in the year an employee or executive exercises her stock options or purchases her company's shares at a price that is less than their fair value. Personal traits come from enlistment tests conducted on male conscripts around age 18. These data cover individuals born between 1951 and 1978. The traits are imputed using test scores of an executive's randomly selected brother. Except for *Imputed officer rank*, a dummy for the reserve officer rank, a summary measure of aptitude and performance in the military, the variables are expressed as differences in standard deviations from the cohort mean. *Imputed cognitive ability* is based on four different subtests of inductive reasoning, verbal comprehension, spatial ability, and technical comprehension. The summary result of these tests is on a stanine scale. *Imputed non-cognitive ability* is assessed using psychological test results and semi-structured interviews. This test evaluates each conscript's social maturity, intensity, psychological energy, and emotional stability and its summary result is on a stanine scale. *Imputed physical fitness* comes from a cycle ergometry test, and *Imputed muscular strength* is a combination of knee extension, elbow flexion, and hand-grip tests. *Imputed body mass index* is the ratio of weight in kilograms and squared height in meters. *Imputed high school GPA* is the grade point average in the final year of high school.

Panel A: Level of education and educational specialization						
	All	Women	Men	Diff.	*t*-value	*N*
Level of education						
Basic	0.040	0.020	0.047	−0.027	(−11.65)	24,362
High school	0.390	0.326	0.415	−0.089	(−13.03)	24,362
Vocational	0.224	0.179	0.241	−0.061	(−10.76)	24,362
University	0.346	0.475	0.297	0.178	(25.30)	24,362
Educational specialization						
No specialization	0.105	0.101	0.107	−0.006	(−1.33)	24,362
Law	0.010	0.015	0.008	0.007	(4.08)	24,362
Business and economics	0.289	0.431	0.235	0.196	(28.57)	24,362
Health and medicine	0.027	0.070	0.011	0.059	(18.16)	24,362
Natural science	0.030	0.039	0.026	0.013	(4.92)	24,362
Teaching	0.016	0.036	0.008	0.029	(12.03)	24,362
Engineering	0.419	0.163	0.515	−0.351	(−59.66)	24,362
Social sciences	0.020	0.043	0.011	0.032	(12.10)	24,362
Services	0.019	0.031	0.014	0.017	(7.23)	24,362
Other specialization	0.066	0.070	0.064	0.006	(1.56)	24,362

Panel B: Career and networks						
	All	Women	Men	Diff.	*t*-value	*N*
Career orientation and networks						
Top income education track	0.089	0.061	0.099	−0.038	(−10.26)	24,362
Top executive education track	0.163	0.215	0.144	0.071	(12.42)	24,362
Top executive high school	0.094	0.119	0.084	0.035	(7.74)	24,362
Career						
Age (years)	44.43	44.22	44.51	−0.29	(−7.80)	24,362
# years of labor market experience	21.75	20.25	22.31	−2.06	(−23.55)	24,362
# years in firm	6.833	6.023	7.137	−1.114	(−13.38)	24,362
# industries worked in	3.102	3.271	3.038	0.232	(10.24)	24,362
# firms worked at	4.501	4.898	4.352	0.546	(16.20)	24,362
# years of consulting or IB experience	0.369	0.506	0.317	0.189	(8.33)	24,362
# years of non-profit experience	0.100	0.149	0.081	0.068	(5.43)	24,362
# days unemployed	138.0	154.7	131.7	23.0	(5.95)	24,362
Graduated in recession	0.236	0.296	0.213	0.083	(12.97)	24,362

Panel C: Executive functions						
	All	Women	Men	Diff.	*t*-value	*N*
Functional experience						
Production and operations	0.163	0.135	0.173	−0.038	(−7.53)	24,362
Finance and administration	0.054	0.084	0.043	0.041	(11.04)	24,362
Personnel and industrial relations	0.016	0.036	0.008	0.028	(11.88)	24,362
Sales and marketing	0.066	0.045	0.074	−0.028	(−8.83)	24,362
Advertising and public relations	0.004	0.010	0.002	0.008	(6.18)	24,362
Supply and distribution	0.022	0.015	0.024	−0.009	(−5.03)	24,362
Computing and R&D	0.028	0.018	0.032	−0.014	(−6.89)	24,362
Other executive	0.084	0.070	0.089	−0.018	(−4.88)	24,362
Function not observed	0.776	0.798	0.768	0.030	(5.07)	24,362

Panel D: Family background and risk tolerance						
	All	Women	Men	Diff.	*t*-value	*N*
Family background						
Birth order	1.673	1.664	1.676	−0.013	(−0.98)	24,362
Family size	2.312	2.287	2.322	−0.036	(−2.38)	24,362
# male siblings	0.699	0.681	0.705	−0.024	(−2.15)	24,362
Born in top-3 city	0.470	0.489	0.463	0.026	(3.57)	24,362
Immigrant	0.102	0.104	0.101	0.004	(0.85)	24,362
Work in birth county	0.470	0.424	0.487	−0.062	(−8.76)	24,362
Risk tolerance						
Stock market participant	0.610	0.495	0.654	−0.159	(−22.37)	24,362

Panel E: Additional characteristics						
	All	Women	Men	Diff.	*t*-value	*N*
Parents' socioeconomic status						
Mother is university educated	0.243	0.278	0.230	0.047	(7.26)	23,107
Mother is employed in 1990	0.898	0.900	0.897	0.003	(0.69)	23,107
Mother in age-gender inc. distr. in 1990	0.562	0.585	0.554	0.032	(7.64)	23,107
Father is university educated	0.179	0.215	0.166	0.049	(8.03)	21,988
Father is employed in 1990	0.885	0.887	0.885	0.002	(0.31)	21,988
Father in age-gender inc. distr. in 1990	0.603	0.618	0.598	0.020	(4.38)	21,988
Personal traits						
Imputed cognitive ability	0.285	0.384	0.248	0.135	(6.86)	11,504
Imputed non-cognitive ability	0.362	0.375	0.358	0.018	(0.88)	11,503
Imputed height	0.146	0.171	0.136	0.035	(1.69)	11,504
Imputed physical fitness	0.229	0.251	0.221	0.030	(1.43)	11,497
Imputed muscular strength	0.068	0.039	0.079	−0.040	(−1.92)	11,500
Imputed body mass index	−0.053	−0.107	−0.033	−0.075	(−4.02)	11,504
Imputed officer rank	0.172	0.201	0.161	0.040	(4.75)	11,044
Imputed high school GPA	0.024	0.082	0.002	0.079	(3.66)	11,093

Table 3

Gender gaps in top executive appointments

Panel A reports results from linear probability model regressions of top-executive dummies on female dummy and controls. Large-firm CEOs hold the CEO position in firms with sales of at least SEK 500 million, whereas large-firm top executives are the CEO and the four highest-paid executives in these large firms. Highly paid executives have an annual labor income of at least SEK 1 million. The first row reports the unconditional gender gap from regressions that include the female dummy as the sole regressor. The next three rows report conditional gender gaps from regressions that sequentially add the set of variables listed in each row. These sets of variables refer to variables listed in Table 2 Panels A, B, C, and D. Panel B reports the unconditional and conditional gender gaps in samples for which additional characteristics are available. The conditional gender gaps are based on regressions that include the controls in the last row of Panel A and the set of variables from Table 2 Panel E listed in each row. Panel C reports the coefficients and *t*-values of the regressions in the last row of Panel A. The *t*-values are based on robust standard errors. Coefficients and *R*-squareds are reported in percentage points.

Panel A: Gender gaps in top executive appointments

Dependent variable	Large-firm CEO			Large-firm top executive			Highly paid executive		
Independent variables	Coeff., %	*t*	R^2, %	Coeff., %	*t*	R^2, %	Coeff., %	*t*	R^2, %
Female dummy	−0.64	(−4.59)	0.06	−1.78	(−5.56)	0.11	−4.71	(−10.56)	0.39
+ Education	−1.06	(−6.30)	0.62	−3.47	(−9.36)	2.03	−8.67	(−17.29)	7.69
+ Career and networks	−0.98	(−5.83)	1.06	−3.31	(−8.94)	3.05	−8.15	(−16.54)	11.37
+ Executive functions	−0.88	(−5.27)	1.32	−3.21	(−8.68)	3.94	−7.68	(−15.64)	12.89
+ Family back. and risk toler.	−0.75	(−4.46)	1.55	−3.00	(−8.02)	4.06	−6.93	(−14.00)	14.01
Mean LHS, %	1.23			6.07			12.97		

Panel B: Including additional characteristics

Dependent variable	Large-firm CEO			Large-firm top executive			Highly paid executive		
Independent variables	Coeff., %	*t*	R^2, %	Coeff., %	*t*	R^2, %	Coeff., %	*t*	R^2, %
Female dummy (N = 21,564)	−0.65	(−4.42)	0.06	−1.74	(−5.09)	0.10	−4.63	(−9.73)	0.37
+ Parents' socioecon. status	−0.80	(−4.38)	1.52	−2.89	(−7.22)	3.95	−7.06	(−13.32)	14.42
Female dummy (N = 11,065)	−0.55	(−2.53)	0.04	−1.89	(−3.93)	0.11	−4.73	(−6.98)	0.37
+ Personal traits	−0.75	(−2.70)	1.59	−3.27	(−5.81)	4.37	−7.32	(−9.71)	14.68
Female dummy (N = 11,132)	−0.74	(−3.56)	0.08	−2.08	(−4.37)	0.14	−5.50	(−8.12)	0.49
+ High school GPA	−0.94	(−3.53)	1.52	−3.29	(−5.96)	4.19	−7.87	(−10.48)	14.54

Panel C: Regression coefficients from Panel A						
Dependent variable	Large-firm CEO		Large-firm top executive		Highly paid executive	
Independent variable	Coeff., %	*t*	Coeff., %	*t*	Coeff., %	*t*
Female	−0.75	(−4.46)	−3.00	(−8.02)	−6.93	(−14.00)
Level of education						
High school	0.94	(2.47)	2.77	(3.87)	5.08	(5.32)
Vocational	1.43	(3.38)	4.11	(4.83)	12.67	(11.06)
University	1.86	(3.87)	6.33	(6.58)	18.20	(14.02)
Educational specialization						
Law	−0.54	(−0.63)	0.54	(0.29)	2.95	(1.04)
Business and economics	−0.48	(−1.45)	0.40	(0.61)	0.26	(0.32)
Health and medicine	−1.19	(−2.80)	−3.92	(−4.49)	−5.72	(−4.31)
Natural science	−1.27	(−2.94)	−2.10	(−2.03)	−5.68	(−3.90)
Teaching	−0.92	(−1.74)	−4.05	(−3.84)	−8.87	(−6.28)
Engineering	−0.98	(−3.08)	−1.75	(−2.83)	−4.90	(−6.23)
Social sciences	−0.02	(−0.03)	2.21	(1.53)	0.64	(0.35)
Services	−1.01	(−2.79)	−1.50	(−1.55)	−6.34	(−6.73)
Other specialization	−0.74	(−1.91)	−0.91	(−1.12)	−5.00	(−5.01)
Career orientation and networks						
Top income education track	0.46	(1.10)	0.78	(0.97)	9.68	(8.09)
Top executive education track	1.50	(4.12)	3.24	(4.46)	3.66	(3.57)
Top executive high school	0.35	(1.24)	2.49	(4.03)	1.41	(1.86)
Career						
# years of labor market experience	0.04	(3.05)	0.08	(2.51)	0.44	(10.35)
# years in firm	−0.04	(−3.22)	−0.12	(−4.26)	−0.19	(−4.93)
# industries worked in	0.01	(0.19)	0.09	(0.74)	−0.12	(−0.72)
# firms worked at	0.08	(1.79)	0.28	(3.16)	0.85	(7.22)
# years of consulting or IB experience	−0.05	(−0.97)	−0.42	(−4.07)	1.61	(8.05)
# years of non-profit experience	0.09	(0.77)	−0.22	(−1.11)	−0.44	(−1.72)
# days unemployed	−0.002	(−10.64)	−0.005	(−10.62)	−0.01	(−17.09)
Graduated in recession	−0.05	(−0.22)	−0.39	(−0.83)	0.38	(0.59)
Functional experience						
Production and operations	0.68	(3.08)	2.94	(6.51)	2.91	(5.22)
Finance and administration	−0.98	(−2.85)	5.43	(5.73)	7.17	(6.05)
Personnel and industrial relations	−1.35	(−4.50)	6.09	(3.62)	5.76	(2.91)
Sales and marketing	1.50	(3.47)	6.38	(7.54)	14.60	(13.08)
Advertising and public relations	0.40	(0.30)	6.35	(2.01)	13.03	(3.20)
Supply and distribution	0.46	(0.76)	5.48	(4.03)	6.74	(4.15)
Computing and R&D	−1.22	(−4.31)	−0.49	(−0.52)	5.23	(3.37)
Other executive	−0.58	(−2.40)	−0.17	(−0.29)	2.72	(3.23)

Panel C continued						
Dependent variable	Large-firm CEO		Large-firm top executive		Highly paid executive	
Independent variable	Coeff., %	*t*	Coeff., %	*t*	Coeff., %	*t*
Family background						
Birth order	−0.30	(−3.04)	−0.53	(−2.30)	−0.95	(−3.22)
Family size	0.28	(2.72)	0.68	(2.82)	1.38	(4.61)
# male siblings	−0.04	(−0.29)	−0.25	(−1.00)	−0.19	(−0.55)
Born in top-3 city	0.32	(2.11)	0.23	(0.71)	3.20	(7.73)
Immigrant	1.35	(4.03)	2.11	(3.53)	8.90	(10.69)
Work in birth county	−0.05	(−0.30)	−1.38	(−4.19)	−2.90	(−6.79)
Risk tolerance						
Stock market participant	0.70	(5.48)	1.12	(3.71)	4.18	(10.66)
Adjusted R^2, %	1.55		4.06		14.01	
Number of observations	24,362		24,362		24,362	

Table 4

Gender differences in family-related characteristics

This table reports gender differences in the sample executives' attributes that relate to their family. Panel A reports the marital status, number of children, and number of children who live in the executive's household in 2011. The married category includes both legal marriages and registered partnerships. The number of children has been calculated using data on all individuals of at least 16 years of age since 1990.

	All executives	Women	Men	*N*	Women less men			
					All executives	Large-firm CEOs	Large-firm top executives	Highly paid executive
Married	0.700	0.658	0.716	24,362	−0.058	−0.185	−0.093	−0.099
					(−8.58)	(−2.70)	(−3.38)	(−5.20)
Divorced	0.075	0.104	0.063	24,362	0.041	0.085	0.083	0.042
					(9.80)	(1.69)	(4.11)	(3.24)
Single	0.225	0.238	0.221	24,362	0.017	0.100	0.011	0.057
					(2.78)	(1.78)	(0.49)	(3.58)
Has children	0.915	0.894	0.923	24,362	−0.029	0.000	−0.041	−0.065
					(−6.74)	(0.02)	(−2.47)	(−5.10)
# children	1.919	1.699	2.002	24,362	−0.303	−0.279	−0.376	−0.409
					(−23.87)	(−2.69)	(−7.44)	(−10.86)
# children at home	1.749	1.699	1.767	24,362	−0.068	−0.026	−0.144	−0.190
					(−5.27)	(−0.24)	(−2.78)	(−4.95)
First child born at age	29.62	29.48	29.68	22,287	−0.197	0.415	−0.015	−0.033
					(−4.09)	(1.19)	(−0.08)	(−0.26)

Table 5

Impact of children on female executives' career progression

This table reports career development following childbirth in the short term (0–1 years post childbirth), medium term (2–5 years), and long term (6–10 years). An indicator for each of the three periods and their interactions return the estimates and their associated *t*-statistics reported in the table. In addition, the regressions include a female dummy, dummies for each of the years surrounding the event, and dummies for each calendar year. The pre-birth period (–5 to –1 years) serves as the omitted category. The male benchmark in columns 1–3 compares female executives with male executives that have children, whereas the female benchmark in columns 4–6 consists of female executives with no children. The imputed year of childbirth for women with no children randomly draws from the observed age distribution at the first childbirth. The sample consists of executives who are born in 1962–71 and whose first childbirth (actual or imputed) is in 1992–2001. The *t*-statistics reported in parentheses are based on robust standard errors.

	Male benchmark			Female benchmark		
Dependent variable	Labor income	Labor force participation	Probability of obtaining a new job	Labor income	Labor force participation	Probability of obtaining a new job
Specification	(1)	(2)	(3)	(4)	(5)	(6)
0-1 years post childbirth	−153.66	−5.67	−6.81	−137.45	−3.38	−11.59
	(−95.33)	(−12.83)	(−14.04)	(−32.54)	(−2.65)	(−8.47)
2-5 years post childbirth	−135.22	−4.43	−0.93	−104.89	−4.50	−3.32
	(−57.38)	(−11.01)	(−2.29)	(−19.35)	(−3.70)	(−2.88)
6-10 years post childbirth	−103.51	−0.96	0.21	−52.64	−2.75	−3.30
	(−26.49)	(−2.62)	(0.56)	(−6.92)	(−2.42)	(−3.05)
Adjusted R^2	0.262	0.066	0.025	0.302	0.049	0.026
Number of observations	380,424	380,424	380,424	114,182	114,182	114,182

Table 6

Gender gaps in work absence and hours worked following childbirth

This table reports work absence and hours worked following childbirth in the short term (0–2 years post childbirth), medium term (3–10 years), and long term (11–16 years). The data source dictates the cutoffs of these periods and they thus differ from those in Table 5. An indicator for each of the three periods and their interactions return the estimates and the associated *t*-statistics reported in the table. In addition, the regressions include a female dummy, dummies for each of the years surrounding the event, and dummies for each survey year. The period from 17 to 18 years serves as the omitted category. The sample consists of executives who are surveyed in the Labor Force Survey in 2000–15 and who have at least one child living at her household at the time of taking the survey. The annual days absent from work records the total number of days in which the individual has claimed compensation for absence due to parental reasons. This variable emanates from the LISA database. The absent and work hours are from the survey questions that report on the week preceding the survey. The standard errors used to calculate the *t*-values reported in parentheses assume clustering at the individual level.

Dependent variable	Annual days absent from work for parental reasons	Weekly hours absent from work	Weekly hours worked	Weekly hours contracted
Specification	(1)	(2)	(3)	(4)
0 years post childbirth	106.17	23.89	−24.56	0.40
	(13.67)	(4.73)	(−14.36)	(0.63)
1-2 years post childbirth	56.64	2.74	−6.60	−0.22
	(8.27)	(1.00)	(−3.91)	(−0.33)
3-6 years post childbirth	29.18	3.23	−4.18	−0.37
	(6.64)	(3.00)	(−3.57)	(−0.68)
7-10 years post childbirth	6.62	−0.28	−0.74	−0.43
	(2.76)	(−0.29)	(−0.71)	(−0.84)
11-16 years post childbirth	1.84	−0.80	−0.38	−0.69
	(1.27)	(−0.92)	(−0.44)	(−1.65)
Adjusted R^2	0.292	0.037	0.093	0.049
Number of observations	9,285	9,285	9,285	9,285

Table 7

Role of children in explaining executive gender gaps

This table reports results from linear probability model regressions of top-executive dummies on female dummy and controls. Large-firm CEOs hold the CEO position in firms with total assets of at least SEK 500 million, whereas large-firm top executives are the CEO and the four highest-paid executives in these large firms. Highly paid executives have an annual labor income of at least SEK 1 million. Columns (1), (4), and (7) repeat the specifications from the last row of Table 3 Panel A and the additional columns add controls for the executive's logged labor income measured two years prior and five years after first childbirth. The results reported in this table differ slightly from the corresponding results in Table 3 Panel A because here we exclude executives who do not have children. The *t*-values are based on robust standard errors. Coefficients, mean dependent variables, and *R*-squareds are reported in percentage points.

Dependent variable	Large-firm CEO			Large-firm top executive			Highly paid executive		
Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Female dummy	−0.77	−0.74	0.03	−3.05	−2.97	−1.30	−7.56	−7.26	−1.64
	(−4.16)	(−4.00)	(0.12)	(−7.62)	(−7.42)	(−2.60)	(−14.36)	(−13.89)	(−1.74)
Income at child birth – 2		3.58	−0.76		9.66	0.20		33.44	1.42
		(3.85)	(−0.72)		(6.26)	(0.10)		(16.25)	(0.36)
Income at child birth + 5			5.49			11.95			40.45
			(4.73)			(5.03)			(6.74)
Mean LHS, %	1.32	1.32	1.32	6.30	6.30	6.30	13.44	13.44	13.44
Adjusted R^2, %	1.65	1.81	2.91	4.05	4.30	5.45	14.43	15.99	22.71
Number of observations	22,287	22,287	22,287	22,287	22,287	22,287	22,287	22,287	22,287

Table 8

Evidence from an alternative sample of university graduates

This table explores an alternative sample of university graduates from business, economics, and engineering (the three most common degrees in the executive sample) without conditioning on having an executive position in 2011. Panel A reports the gender gaps in the probability of attaining a top executive position. It follows the same structure as Table 1 Panel A. Panel B repeats the analyses of Table 3 Panel A, reporting results from linear probability model regressions of top-executive dummies on female dummy and controls. Panel C repeats the analyses of Table 8. The *t*-values are based on robust standard errors. Coefficients, mean dependent variables, and *R*-squareds are reported in percentage points.

Panel A: Probability of attaining a top executive position

	Large-firm CEOs			Large-firm top executives			Highly paid executives		
	Top executives	Other executives	Fraction top executives, %	Top executives	Other executives	Fraction top executives, %	Top executives	Other executives	Fraction top executives, %
All	160	23,870	0.67	669	23,361	2.78	2,415	21,615	10.05
Women	28	8,209	0.34	154	8,083	1.87	534	7,703	6.48
Men	132	15,661	0.84	515	15,278	3.26	1,881	13,912	11.91
Frac. women, %	17.50	34.39		23.02	34.60		22.11	35.64	
Gender gap			−0.50			−1.39			−5.43
t-value			(−5.13)			(−6.77)			(−14.50)

Panel B: Gender gaps in top executive appointments

Dependent variable	Large-firm CEO			Large-firm top executive			Highly paid executive		
Independent variables	Coeff., %	*t*	R^2, %	Coeff., %	*t*	R^2, %	Coeff., %	*t*	R^2, %
Female dummy	−0.50	(−5.13)	0.08	−1.39	(−6.77)	0.16	−5.43	(−14.50)	0.73
+ Education	−0.68	(−5.73)	0.17	−2.30	(−9.63)	0.69	−8.12	(−19.19)	2.15
+ Career and networks	−0.64	(−5.45)	0.76	−2.16	(−9.10)	1.92	−7.41	(−17.95)	7.03
+ Executive functions	−0.55	(−4.59)	1.33	−1.77	(−7.71)	4.95	−6.37	(−15.74)	11.67
+ Family back. and risk toler.	−0.51	(−4.31)	1.47	−1.72	(−7.43)	5.13	−6.17	(−15.16)	12.64
Mean LHS, %	0.67			2.78			10.05		

Panel C: Role of children in explaining executive gender gaps for university graduates

Dependent variable	Large-firm CEO			Large-firm top executive			Highly paid executive		
Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Female dummy	−0.58	−0.58	−0.09	−1.90	−1.89	−0.76	−6.98	−6.91	−1.29
	(−4.40)	(−4.39)	(−0.60)	(−7.54)	(−7.50)	(−2.50)	(−15.73)	(−15.71)	(−1.61)
Income at child birth – 2		0.86	−1.12		3.90	−0.71		23.97	1.09
		(1.64)	(−2.02)		(4.05)	(−0.71)		(12.91)	(0.57)
Income at child birth + 5			3.05			7.07			35.10
			(4.83)			(5.47)			(7.53)
Mean LHS,%	0.74	0.74	0.74	3.02	3.02	3.02	10.91	10.91	10.91
Adjusted R^2, %	1.55	1.56	2.20	5.08	5.18	6.05	12.92	14.09	20.58
Number of observations	21,233	21,233	21,233	21,233	21,233	21,233	21,233	21,233	21,233

Internet Appendix for

What Prevents Female Executives from Reaching the Top?

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March 12, 2018

Figure IA1. Likelihood of living in birth county by gender and age
This figure displays the fraction of female and male executives that live in their birth county as a function of their age. The sample consists of executives who are born in 1962–71.

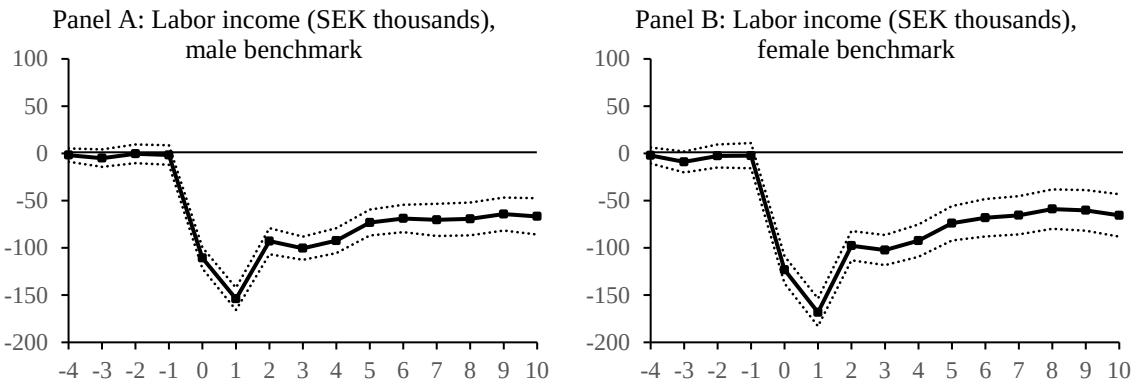

Figure IA2. Impact of children on female executives that have one child
The panels in this graph plot annual labor income relative to the birth year of the executive's first child. The estimates (solid lines) and their 95% confidence intervals (dotted lines) are for the coefficients on interactions of female indicator with indicators for the 15 years surrounding the event of childbirth (–5 omitted). The male benchmark compares female executives with male executives that have children, whereas the female benchmark consists of female executives with no children. The imputed year of childbirth for women with no children randomly draws from the observed age distribution at the first childbirth. The sample consists of executives who are born in 1962–1971 and whose first childbirth (actual or imputed) is in 1992–2001.

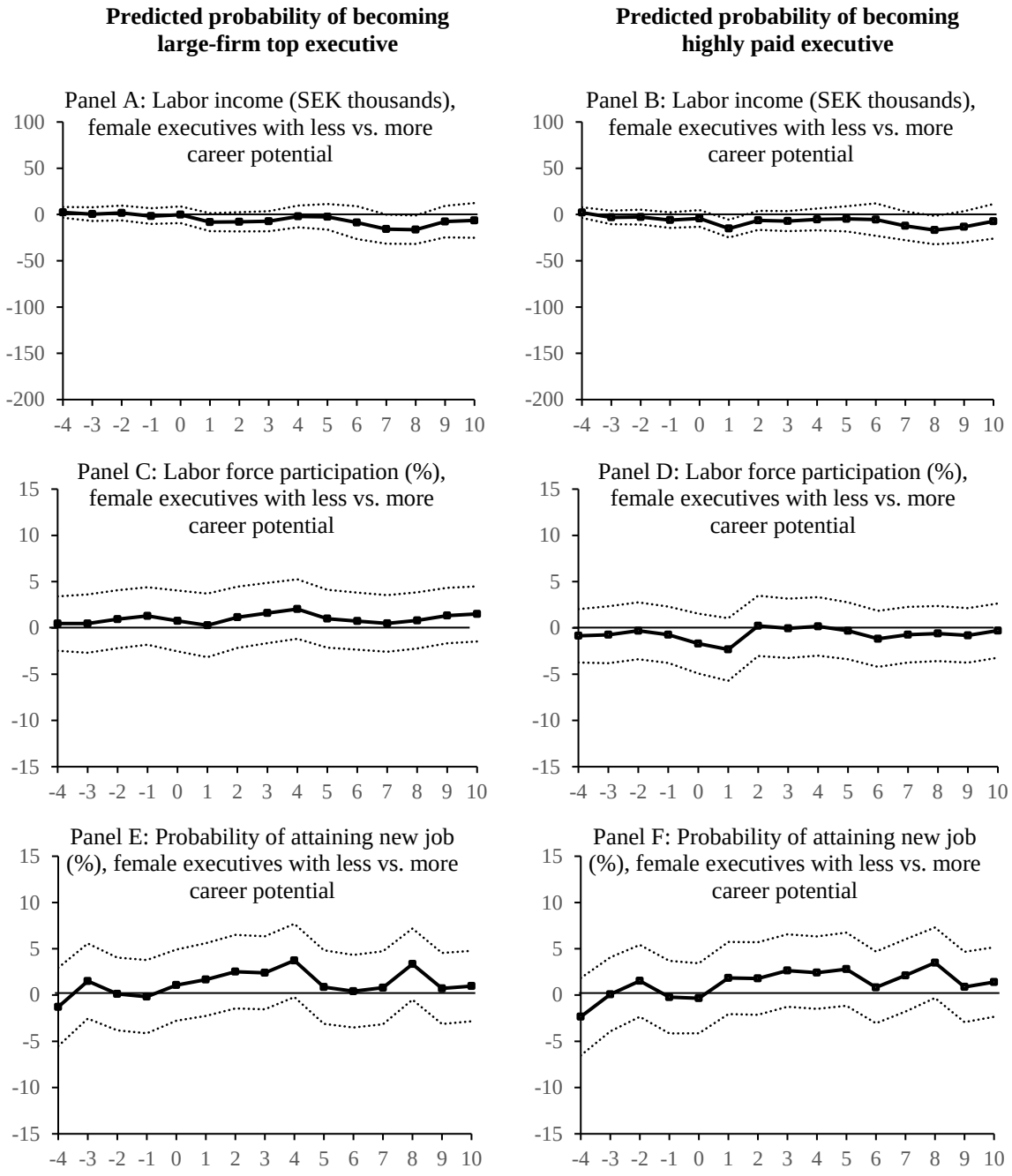

Figure IA3. Career progression of female executives by their relative within-household career potential using other top-executive indicators

This figure repeats analyses in Figure 4 for the indicators of large-firm and highly paid executives. Panels A and B report on labor income, Panels C and D on labor-force participation, and Panels E and F on the probability of attaining new job. The estimates in each panel measure career potential by the predicted probability of becoming a large-firm or highly paid executive, obtained from regressing the corresponding indicators on variables measuring the level of education, educational specialization, career orientation and networks, and family background, as defined in Table 3. The sample consists of executives who are born in 1962–71 and whose first childbirth is in 1992–2001. Only executives with an identifiable partner enter the sample. Confidence intervals are based on standard errors that assume clustering at the individual level.

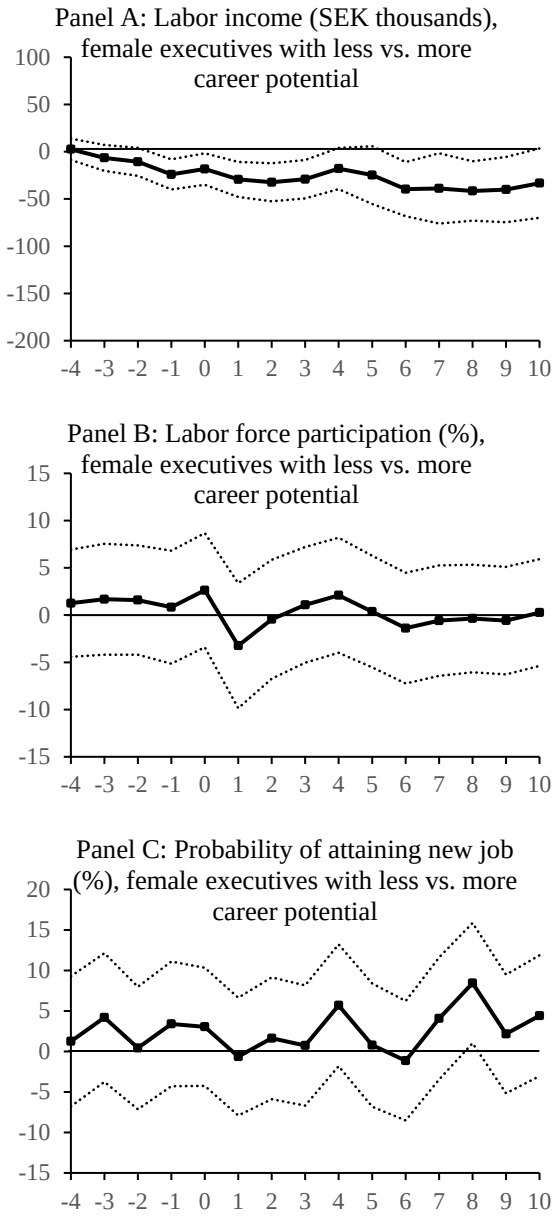

Figure IA4. Career progression of female executives by their relative within-household career potential using wider cutoffs

This figure repeats analyses in Figure 4 by widening the cutoff points that determine within-household career potential. The benchmark group consists of executives with more career potential. Panel A reports on labor income whereas Panels B and C depict labor force participation and probability of attaining new job. The estimates in each panel measure career potential by the predicted probability of becoming a large-firm CEO, obtained from regressing the corresponding indicator on variables measuring the level of education, educational specialization, career orientation and networks, and family background, as defined in Table 3. The cutoff point for female executives with less (more) career potential is based on the within-household difference in predicted probability of being at least one standard deviation larger (smaller) than the average difference. This definition puts the differences in partners' career potential roughly at the top and bottom quartiles of the career-potential-difference distribution. The sample consists of executives who are born in 1962–71 and whose first childbirth is in 1992–2001. Only executives with an identifiable partner enter the sample. Confidence intervals are based on standard errors that assume clustering at the individual level.

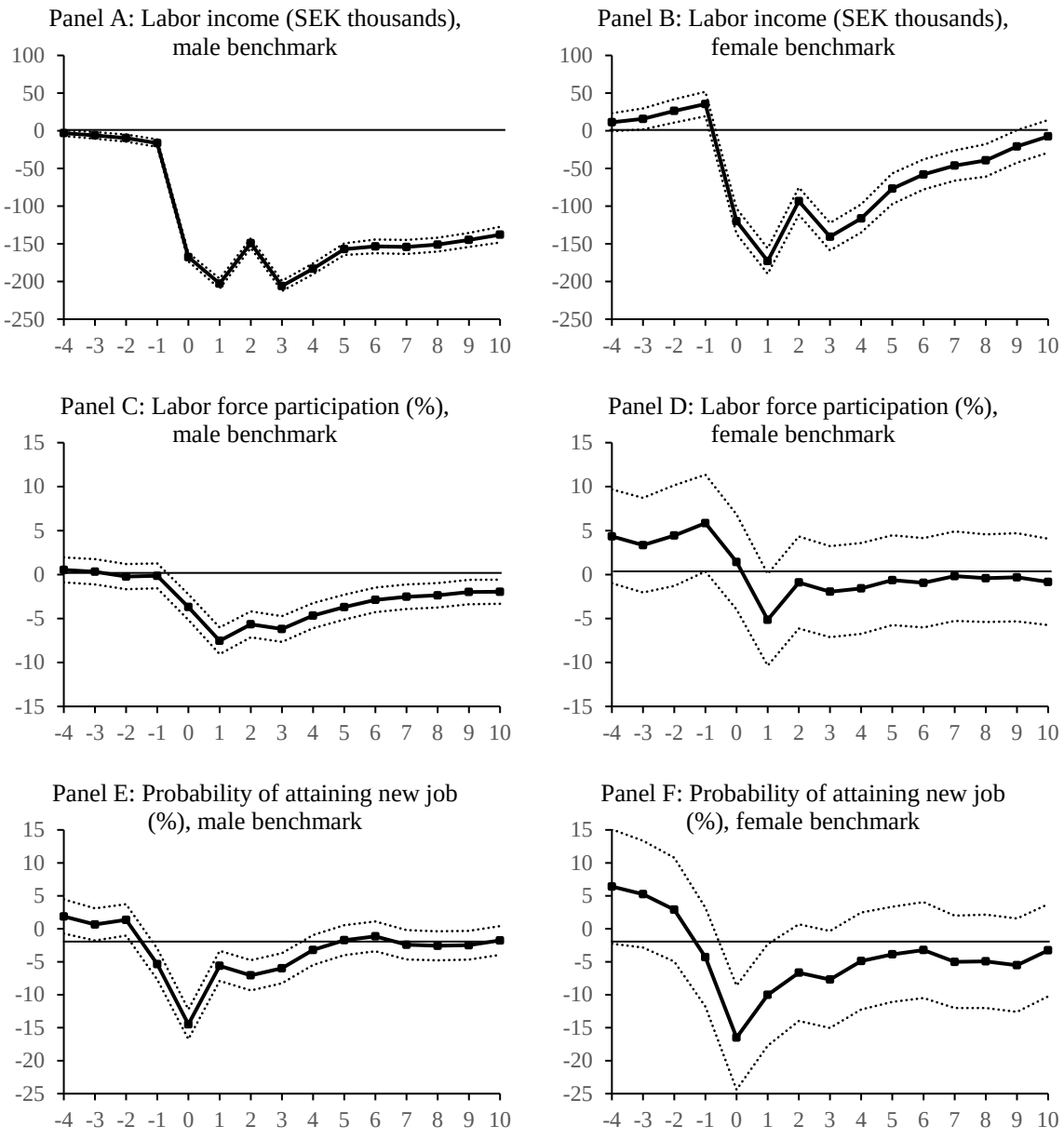

Figure IA5. Impact of children in sample of university graduates
This figure repeats the analyses in Figure 2 for university graduates from business, economics, or engineering who are born in 1962–71 and whose first childbirth is in 1992–2001. Confidence intervals are based on standard errors that assume clustering at the individual level.

Table IA1

Descriptive statistics on sample firms

This table reports descriptive statistics on characteristics of sample firms in 2011. *Age* is computed by taking the difference between the current year of operation and the maximum of 1990 and the year of incorporation. *Return on assets* is the ratio of earnings before interest and taxes to total assets. *Sales growth* is calculated relative to the past fiscal year and winsorized at the 10th and 90th percentile. *Industries* follow the international NACE Rev.1.1 classification. *Government owned* is a dummy variable that takes the value of 1 if Statistics Sweden classifies the firm as government owned. *Family firm* is a company whose shareholders and board members include at least two members from the same family.

	Mean	Sd	Median
Size, age, and profitability			
Sales (mil. SEK)	385	2,297	52
Number of employees	126	516	30
Age (from 1990)	14.2	6.9	16.0
Return on assets	0.052	0.475	0.044
5-year sd of return on assets	0.091	0.438	0.051
Sales growth	0.105	0.283	0.044
Industry			
Agriculture and fishing	0.010		
Mining, manufacturing, and utilities	0.243		
Construction	0.103		
Wholesale, retail, and repair	0.238		
Hotels and restaurants	0.048		
Transport, telecomm., and storage	0.061		
Business activities and financial intermediation	0.222		
Education	0.020		
Public administration, health, and social services	0.027		
Community, social, and personal activities	0.029		
Ownership structure			
Government owned	0.038		
Listed firm	0.013		
Family firm	0.333		
Number of firms		11,063	

Table IA2

Parents' socioeconomic status as a function of trait imputation

This table reports socioeconomic status of an executive's parents as a function of whether the executive's traits are imputable from brother's test scores. Parents' socioeconomic status is measured using data from year 1990. Parents' rank in income distribution refers to their labor income rank among all individuals of the same gender in a given cohort. The four rightmost rows report the gender differences in parents' socioeconomic status for imputed and non-imputed executives. The *t*-statistics are for the double difference by imputation status and gender.

	Imputed			Not imputed			Imputed	Not imputed	Difference	*t*-value
	Women	Men	*N*	Women	Men	*N*	Women less men	Women less men		
Mother										
University educated	0.902	0.901	11,230	0.898	0.893	11,877	0.001	0.005	−0.003	(−0.38)
Employed	0.584	0.551	11,230	0.587	0.556	11,877	0.033	0.031	0.001	(0.15)
Rank in income distr.	0.300	0.245	11,230	0.257	0.216	11,877	0.055	0.040	0.014	(1.11)
Father										
University educated	0.895	0.889	10,904	0.878	0.881	11,084	0.006	−0.003	0.009	(0.88)
Employed	0.625	0.602	10,904	0.610	0.594	11,084	0.023	0.017	0.006	(0.64)
Rank in income distr.	0.240	0.182	10,904	0.190	0.151	11,084	0.059	0.039	0.020	(1.65)

Table IA3

Blinder-Oaxaca and Fairlie decompositions of gender gaps in top-executive appointments

This table reports results from Blinder-Oaxaca (1973, 1973) and Fairlie (1999) decompositions of the gender gap in top-executive appointments. Top executive appointment dummies are decomposed using the individual characteristics listed in Table 2 Panels A, B, C, and D. The test statistics, reported in parentheses, are based on robust standard errors.

Dependent variable	Large-firm CEO		Large-firm top executive		Highly paid executive	
Specification	(1)		(2)		(3)	
Men	1.41		6.56		14.26	
Women	0.77		4.77		9.55	
Difference	0.64	(4.59)	1.78	(5.56)	4.71	(10.56)
Blinder-Oaxaca decomposition						
Total unexplained	0.75	(4.47)	3.00	(8.03)	6.93	(14.01)
Total explained	−0.11	(−1.54)	−1.22	(−6.69)	−2.22	(−7.80)
Level of education	−0.16	(−3.27)	−0.63	(−6.04)	−2.00	(−12.32)
Educational specialization	−0.11	(−1.78)	−0.36	(−2.59)	−1.01	(−5.16)
Career orientation and networks	−0.10	(−2.98)	−0.29	(−3.99)	0.06	(0.54)
Career	0.04	(1.00)	−0.01	(−0.07)	0.00	(0.01)
Functional experience	0.12	(4.18)	−0.11	(−1.32)	0.15	(1.38)
Family background	−0.01	(−0.95)	0.00	(−0.14)	−0.08	(−1.82)
Risk tolerance	0.11	(5.33)	0.18	(3.66)	0.66	(9.63)
Fairlie decomposition						
Total unexplained	0.99		3.03		6.65	
Total explained	−0.36	(−2.83)	−1.25	(−5.88)	−1.94	(−6.94)
Level of education	−0.55	(−2.72)	−0.94	(−4.38)	−3.83	(−11.85)
Educational specialization	−0.50	(−3.75)	−0.71	(−3.29)	−0.92	(−3.14)
Career orientation and networks	−0.23	(−2.00)	−0.43	(−2.44)	0.35	(1.80)
Career	0.09	(0.94)	0.16	(1.23)	0.64	(3.50)
Functional experience	0.39	(4.97)	0.29	(1.98)	0.55	(3.29)
Family background	0.17	(4.49)	0.09	(3.49)	0.25	(10.42)
Risk tolerance	0.28	(3.82)	0.29	(3.25)	1.01	(8.52)
Number of observations	24,362		24,362		24,362	

Table IA4

Attributes of women who have and have not children

This table reports the difference in the probability of attaining a top-executive position for women with and without children and decomposes it as in Table IA3 into the parts explained and unexplained by executive attributes.

Dependent variable	Large-firm CEO		Large-firm top executive		Highly paid executive	
Specification	(1)		(2)		(3)	
Women with children	0.84		4.90		9.57	
Women with no children	0.14		3.69		9.36	
Difference	0.70	(3.79)	1.21	(1.59)	0.21	(0.18)
Blinder-Oaxaca decomposition						
Total unexplained	0.64	(3.52)	0.79	(1.04)	−0.98	(−0.89)
Total explained	0.06	(0.93)	0.43	(2.24)	1.19	(2.91)
Level of education	0.01	(0.37)	0.20	(2.16)	0.56	(3.01)
Educational specialization	0.02	(0.70)	−0.08	(−1.05)	−0.10	(−0.91)
Career orientation and networks	0.07	(1.92)	0.18	(2.29)	0.48	(3.17)
Career	0.01	(0.24)	0.21	(1.90)	0.36	(1.59)
Functional experience	−0.05	(−1.41)	−0.14	(−1.46)	−0.24	(−1.29)
Family background	0.01	(0.55)	0.08	(1.32)	0.17	(1.85)
Risk tolerance	−0.009	(−0.63)	−0.010	(−0.59)	−0.056	(−0.64)
Number of observations	6,642		6,642		6,642	

Table IA5

Fraction of executives' partners who have greater career potential than the executives themselves

This table reports the fraction of executives' partners who have greater career potential than the executives themselves. Only executives with an identifiable partner enter the sample. Career potential is measured as the predicted probability of becoming a top executive from a regression of one of the three top-executive indicators on variables measuring the level of education, educational specialization, career orientation and networks, and family background, as defined in Table 3. Partners with more (less) career potential have a higher (lower) predicted probability than executives. The table reports the fraction of executives whose partners have greater career potential, the gender difference in the fraction, and the *z*-statistic for the difference.

	Partner's predicted probability of becoming top executive					
	Large-firm CEOs		Large-firm top executives		Highly paid executives	
	Female executives	Male executives	Female executives	Male executives	Female executives	Male executives
Fraction with more potential	0.427	0.409	0.400	0.396	0.429	0.401
Women less men	0.019		0.004		0.028	
z-value	(2.42)		(0.55)		(3.62)	
Number of observations	4,593	12,490	4,593	12,490	4,593	12,490

Table IA6

Comparison of the executives in the main sample and in the Labor Force Survey sample

This table compares selected executive characteristics in the core sample and in the Labor Force Survey sample. It reports the means of each characteristic, their difference, and the difference's robust *t*-statistic. The table covers annual waves of the survey in 2000–15.

	Core sample	Labor Force Survey	Diff.	*t*-value	*N* Core sample	*N* Labor Force Survey
Level of education						
Basic	0.040	0.053	−0.013	(−4.91)	24,362	9,275
High school	0.390	0.374	0.016	(2.74)	24,362	9,275
Vocational	0.224	0.233	−0.009	(−1.67)	24,362	9,275
University	0.346	0.341	0.005	(0.92)	24,362	9,275
Other characteristics						
Labor income (SEK millions)	0.694	0.607	0.087	(16.14)	24,362	9,285
Age (years)	44.43	42.31	2.12	(29.44)	24,362	9,285
Married	0.700	0.678	0.022	(3.91)	24,362	9,284

Table IA7

Robustness checks on impact of children on career progression

This table explores alternative definitions of top-executive positions and an alternative sample. Panel A replicates the results of Table 8 by doubling the total-assets cutoff to SEK 1 billion and the pay cutoff to SEK 2 million. Panel B uses a sample of executives who are 50–59 years old in 2011. Income measured two years prior to child birth drops out of these regressions because its measurement is not possible prior to 1990. The *t*-values are based on robust standard errors. Coefficients, mean dependent variables, and *R*-squareds are reported in percentage points.

Panel A: Doubling firm-size and pay cutoffs									
Dependent variable	Large-firm CEO			Large-firm top executive			Highly paid executive		
Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Female dummy	−0.30	−0.28	0.15	−1.63	−1.56	−0.34	−1.81	−1.70	0.87
	(−2.33)	(−2.17)	(0.98)	(−5.40)	(−5.17)	(−0.92)	(−7.77)	(−7.36)	(2.69)
Income at child birth – 2		2.42	0.01		7.85	0.93		12.02	−2.58
		(3.22)	(0.02)		(6.29)	(0.61)		(8.04)	(−1.53)
Income at child birth + 5			3.04			8.74			18.45
			(4.29)			(4.93)			(9.41)
Mean LHS, %	0.62	0.62	0.62	3.37	3.37	3.37	2.06	2.06	2.06
Adjusted R^2, %	0.86	1.01	1.73	2.75	3.05	4.17	3.69	4.86	12.94
Number of observations	22,287	22,287	22,287	22,287	22,287	22,287	22,287	22,287	22,287

Panel B: Sample of executives aged 50–59 years						
Dependent variable	Large-firm CEO		Large-firm top executive		Highly paid executive	
Specification	(1)	(2)	(3)	(4)	(5)	(6)
Female dummy	−1.07	−0.46	−3.39	−1.99	−7.80	−2.85
	(−3.15)	(−1.33)	(−4.44)	(−2.57)	(−7.00)	(−2.60)
Income at child birth + 5		5.54		12.74		44.89
		(5.75)		(8.62)		(19.22)
Mean LHS, %	1.58	1.58	7.43	7.43	17.72	17.72
Adjusted R^2, %	1.50	2.33	4.47	5.47	16.23	22.14
Number of observations	14,810	14,810	14,810	14,810	14,810	14,810