What Prevents Female Executives from Reaching the Top?*

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Abstract

Exceptionally rich data from Sweden makes it possible to study the gender gap in executives' career progression and to investigate its causes. In their forties, female executives are about one-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. These results suggest that aspiring women may not reach the executive suite without trading off family life.

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1. Introduction

Women are less represented in the upper echelons of corporations than men. 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 that 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]

[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.

Others argue that the lack of women in top positions reflects negative stereotypes that hamper the rise of females on the corporate ladder.[5] One version of this argument appeals to the fact that women who have made it to the executive level (and are potentially just one step from the CEO position) are a highly selective group of individuals.[6] Their career success constitutes direct evidence of their talent, skills, and ambitions, and the income and career prospects that come with this success mean that their opportunity costs of dropping out of the labor force or reducing work hours to care for children are exceptionally high (Adams and Funk, 2012, Wood et al., 1993). These considerations speak against the possibility that there would be substantial performance differences between male and female executives. The large gender differences in career progression and pay documented in the literature would thus be more likely an outcome of negative stereotyping than of gender-related performance differences.[7]

Using comprehensive data on top executives of Swedish firms, we evaluate the merits of these explanations. We follow the careers of all 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, i.e. 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 relatives, which allows us to analyze a host of gender differences, including those related to child

[5] 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.

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

[7] In some countries, policy makers have imposed quotas to balance the outcome differences between genders. Ahern and Dittmar (2012), Bertrand et al. (2014), Eckbo, Nygaard, and Thorburn (2016), Bagues and Campa (2017), Besley et al. (2017), and Tyrefors Hinnerich and Jansson (2017) study the effects of imposing gender quotas in business and in politics.

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. The gender gaps in top executive appointments arise primarily during the five years following the birth of the first child. During this period, female executives work on average shorter hours than male executives and are more often absent from work. Women are on similar career paths as men 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 are consistent with family life putting a disproportionate burden on the careers of women. Female executives are less likely to marry than male executives, and their marriages end more often in divorce. They are less likely to have children and have on average fewer children. They may also not be in a position to put their own career first: their partners tend to have higher career and earnings potential than the partners of male executives.

We also analyze the extent to which the gender gaps at age 40–49 can be accounted for by other characteristics of the executives. Our specifications suggest that 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 making it to 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 make it to 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 made it to the executive level. The ex post success of the women in our sample means that their career setbacks due to childbirth can be expected to be smaller and of 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 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 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 due to 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, we are to our knowledge

the first to analyze gender gaps among top executives using data on their careers.[8] Combining career information with data on childrearing allows us to identify the effect of family on an executive's career trajectory and later gender gaps. Information on working hours and absence from work provide evidence on underlying mechanisms. The focus on executives, whose career aspirations may make them willing to invest in easing the burden of child rearing, speaks to understanding how binding the family constraints are for the population at large. Adda, Dustmann, and Stevens (2017), Angelov, Johansson, and Lindahl (2016), and Kleven, Landais, and Søgaard (2017) analyze the impact of child rearing on the population gender gap. Second, 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.

[8] 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. Bertrand, Goldin, and Katz (2010), Azmat and Ferrer (2017), and Kunze and Miller (2017) use career data on professionals but not on top executives.

2. Data and institutional setting

2.1. Data

2.1.1. Main sample

The sample consists of all 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, i.e. when they are in their forties. For executives with children, we require that the first child was born in 1992–2001, i.e. 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 following the first childbirth further avoids mixing temporary career setbacks due to small children with long-term career outcomes. Our data set combines information on individuals and firms from three sources.[9]

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 resident 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, field and level of education, profession, career, and family relationships. The family

[9] 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.

records allow us to map each individual to their spouses, 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 (for example, 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).[10] The specialist managers further split into eight functions that 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 to 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.

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

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 1951−1978.

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 Labour 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 Labour 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 from 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 from the mid-1960s. It guarantees each family twelve 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 of working 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. This "daddy month" increased the use of paid parental leave by fathers, but reduced the use of the unpaid part, leading only to minor effects on labor supply (Ekberg et al. 2013). Day care is available at highly subsidized rates, although its service hours make it less flexible than the day care in the U.S. (Henrekson and Stenkula, 2009).

3. How do female executives differ from males?

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 column 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). 0.77% of female executives make it this far, while the corresponding fraction among male executives is 1.41%. Despite of a relatively small number

of top-executive observations (there are 300 large-company CEOs, of whom 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, i.e. 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%, i.e. 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% 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. 21 of the variables are continuous and 35 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 on in Panel 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, while 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.[11] The field of education also correlates with competitiveness, in which there are large gender differences (Gneezy et al., 2003 and 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 that competitive individuals are more likely to specialize in engineering, natural sciences, and business as opposed to majoring in social sciences or the humanities. We find that men are much more likely to have an engineering degree (52% vs. 16%), while women are more likely to have a degree from all other backgrounds. For example, the fraction of female executives with a business degree is 43%, while the corresponding fraction for men is 24%.

Panel B finds that 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 of 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

[11] 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.

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 of 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, while men's longer tenure in the firm helps build their firm-specific human capital.

Panel B also suggests that 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 of 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 and Delfgaauw and Dur 2008), of which there is some evidence of gender differences.[12]

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

[12] 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 that the evidence "is more mixed than what one might have expected."

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. There are relatively small differences 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 to live in their home county becomes apparent already 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 as to 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, while the corresponding fraction for men is 65%. These findings are at odds with the findings of Adams and Funk (2012), which suggest that 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 make it possible to impute these variables for an executive from the test scores of her randomly selected brother (we randomly choose just one brother to avoid biases arising from family size). This imputation assumes that the traits have a large family component, an assumption backed up by the evidence in Beauchamp et al. (2011) in Swedish data. We also impute the traits for men even though their traits are available.[13] 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

[13] 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.

to control for secular trends in measured cognitive ability and height (see, e.g. Flynn (1984) and Floud, Wachter, and Gregory (1990)).

We find that all trait variables except for the body mass index are positive. This means that 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 (2017), which reviews this literature, the differences relative to the population are relatively 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 they are more likely to have achieved an officer rank than men's brothers. In addition, women's brothers have a 0.08 standard deviations higher GPA than men's brothers. We use imputed GPAs to account for potential gender differences in grading.

3.3. Contribution of executive characteristics to gender gaps in 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 female dummy and controls. The first row represents a regression that includes female dummy as the sole regressor. This regression corresponds to Table 1 that 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, i.e. 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 for an executive to reach this income is higher than that for being a large-firm CEO, 13.0% vs. 1.2%. Here, the unconditional gender gap coefficient is –4.7, i.e. the same as in Table 1. Like 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 towards 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.[14]

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 to the regression one by one in addition to all the variables used in Panel A. We find that 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.

[14] 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 background deliver better performance than managers from better background.

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 a positive and significant relation both with all the 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 are executives with no known specialization). More career-oriented executives reach better labor market outcomes, as is witnessed by the large positive coefficients for educational paths that are associated with high incomes. A longer labor market experience and experience from a larger number of companies strongly positively relate with a highly paid executive position, while longer unemployment spells negatively relate 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 to 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 that 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 on gender differences in family characteristics. Consistent with Folke and Rickne (2016) who find that 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 to be 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 twenties, 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').[15] 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 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 makes it possible 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. (2017) uses a similar method to estimate child penalties in the population of Danish workers.

[15] See Waldfogel (1998), Miller (2011), and Kleven et al. (2017) for analyses on the pay difference between women with and without children.

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 the 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, there is another drop in pay 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 of 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 who do not have children. This makes it more difficult for us to reject the null hypothesis of no outcome difference between these two groups after childbirth, 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 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 that they plan the childbirth and take it into account in their decision to search for a new job. The probability recovers quickly after that 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 it takes several years for them to recover from this career shock. 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.

Figure 3 explores the role of the partners in sharing the responsibilities of child rearing by comparing the career trajectories of the executives' partners by gender. The female partners to male executives assume a role very different from the male partners to female executives. 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 that it takes years until women's labor market participation rates return to normal. Despite of starting from a higher level, future female executives' participation rate stays below that of their partners for four years after childbirth. Female partners to male executives have a lower participation rate still in year

$t + 10$. Panel C shows that the gender gaps in the probability of attaining a new job are about the same for all possible partner pairings. As in Figure 2, these gaps are large immediately after childbirth (and a year before it) but largely disappear by year $t + 5$.

Table 6 reports on the characteristics of the executives' partners. To gauge career pressure at home, we calculate the predicted probability of being a top executive or a top earner for the executive and the partner, separately for each gender. The predicted probability captures the effect of all of our predictors known 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, 59.2% of executive men's partners have a lower probability to become CEO than the executive himself, while the corresponding probability for executive women is 57.3%. The gender difference in the likelihood to marry down is statistically significantly at the 5% level in two of the three specifications. The flip side of this result is that female executives are more likely to belong to a dual-career family than male executives. This may have an effect on their own careers as well.

4.3. Gender differences in working hours and absence from work

Why does childbirth have an asymmetric effect on the career outcomes of the two genders? One plausible explanation for this asymmetry are gender differences in parental investment, which are likely to be reflected in executives' absence from work and in their working hours. We study these differences by using a sample of executives surveyed by the Labour Force Survey in 2000–15.[16] We separately regress four absence and working hour variables on indicators for years 0, 1–2, 3–6, 7–

[16] Table IA5 shows that 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.

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 7 (Figure 4).

The first specification in Table 7 (Panel A of Figure 4) reports on gender differences in the annual number of days absent from work for parental reasons. In year 0, female executives are on average 106 days more away from work for parental reasons 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 (Panel B of Figure 4) reports on gender differences in weekly hours absent from work. In year 0 female executives are on average 24 hours more absent from work than their male counterparts. The gap drops to three hours in years 3–6 after first childbirth, and disappears thereafter. The third specification (Panel C) shows that 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 that 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 that 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.

4.4. Impact of early career development on top executive appointments

The burden of child rearing on female careers motivates us to analyze how much of the executive gender gaps at the age of 40–49 can be attributed to child rearing. Table 8 studies this question by investigating the extent to which labor income five years after first childbirth—a direct

measure of the impact of children on career progression—explain 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 arise from childrearing. We measure childbirths in the 1991–2000 period, i.e. 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.[17] 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 itself is highly significant, which implies strong persistence in the career paths of aspiring executives.

Column 3 further adds income five years after 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, while the coefficient for income five years after first childbirth takes a highly significant value. This result suggests that for large-firm CEO appointments, the early career development in the five years following 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 first

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

childbirth. In Column 6, where we further add income in year $t + 5$, the coefficient for the female dummy drops to –1.3, while 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 IA6 Panel A explores how doubling the total assets cutoff to SEK 1 billion and the pay cutoff to SEK 2 million affect 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 IA6 Panel B explores robustness of our results in a sample of executives in their 50s. It repeats the regressions in Table 8 but leaves out labor income at $t – 2$ as 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 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 that their career setbacks due to childbirth can be expected to be smaller and of more temporary nature than those of talented women on average. To check how our results generalize to other talented professionals, we

analyze 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 helps explain why the gender gaps are one-quarter to one-third higher in the university graduate sample. For example, comparing Table 9 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 shown by Table 9 Panel B, education gives women an edge even in the university graduate sample, because they are more likely to have a degree from business or economics, i.e. the fields of education most highly correlated with appointment as a top executive.

Table 9 Panel C repeats the analyses of Table 8 using the university graduate sample. The results of this analysis echo those of the main sample: on average about three-quarters of the gender gaps in top executive appointments can be accounted for by the income development during the five years after first childbirth. Thus, selecting the sample based on ex post career success does not seem to have a tangible effect on how informative the setbacks due to childbirth are of long-term career outcomes.

Figure IA3 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 to work (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 while 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 that suggests that 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, as 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 makes it possible 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, i.e. 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. These results suggest that aspiring women may not reach the executive suite without trading off family life.

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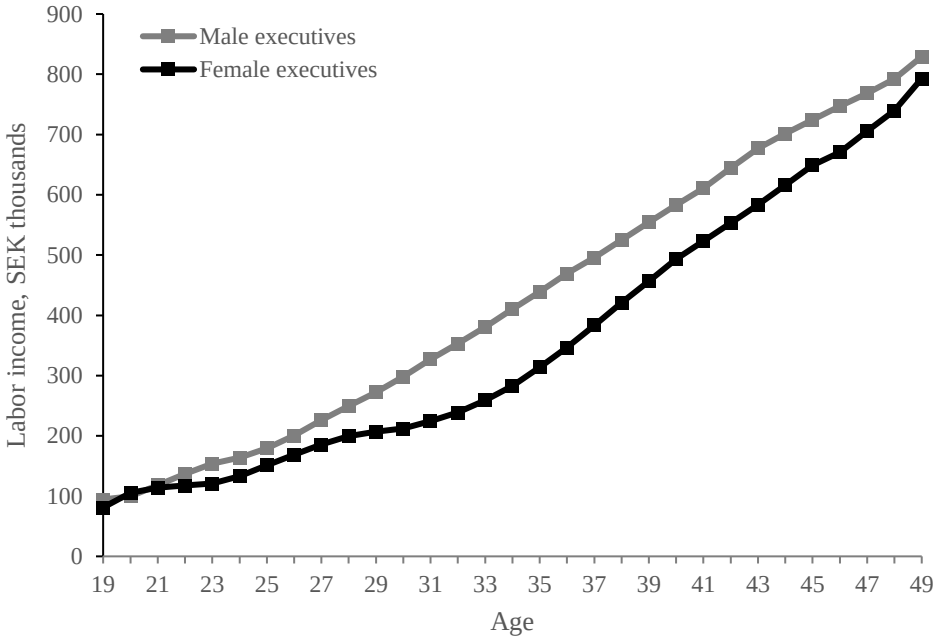

Figure 1. Female and male executives' labor income as a function of age
This graph depicts annual labor income of executives from age 19 to 49 stratified by gender. Each data point in the graph corresponds to the average annual labor income (in 1000 SEK, SEK 1 ≈ USD 0.12) at a particular age for the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

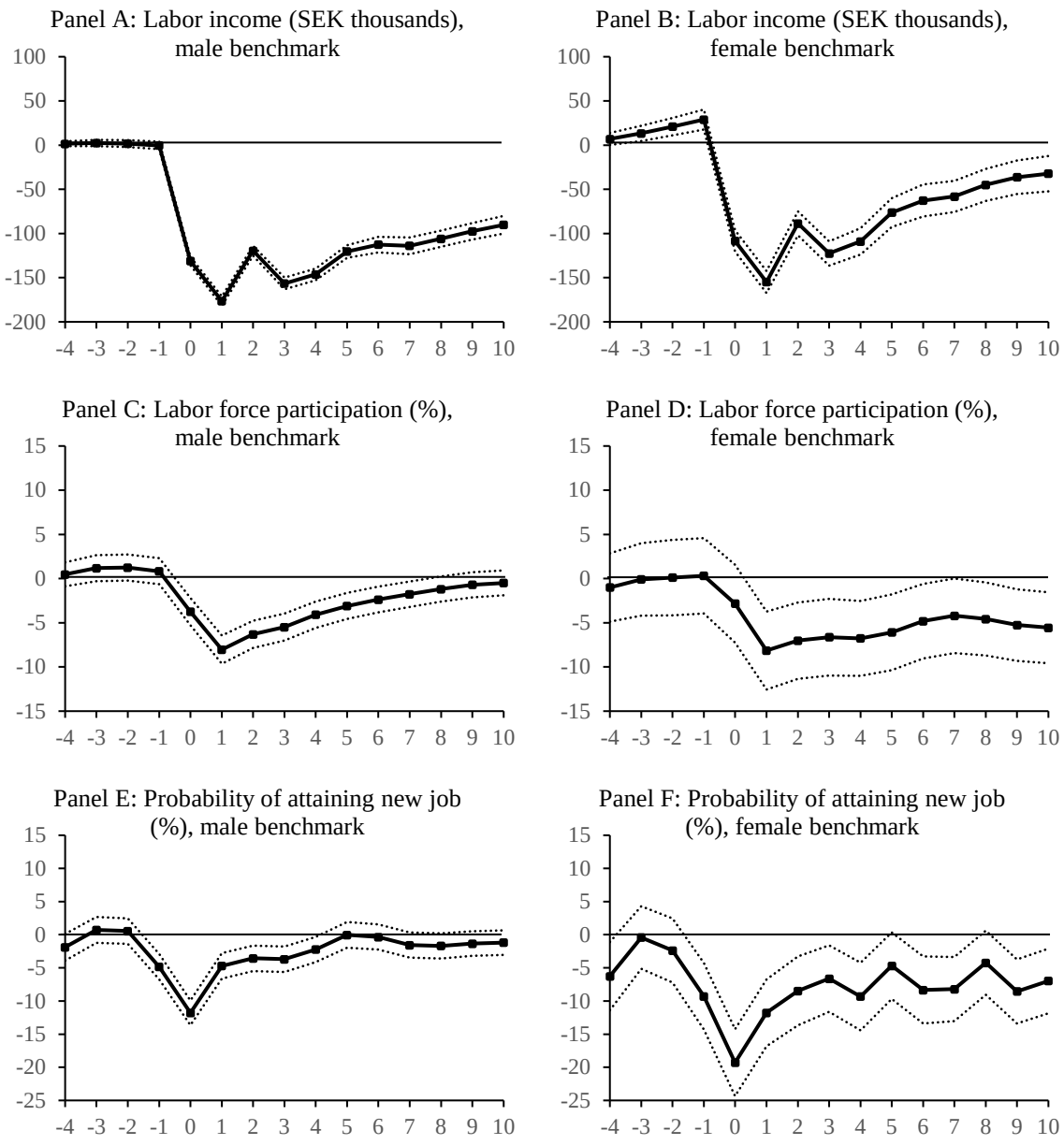

Figure 2. Impact of children on female executives' career progression

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.

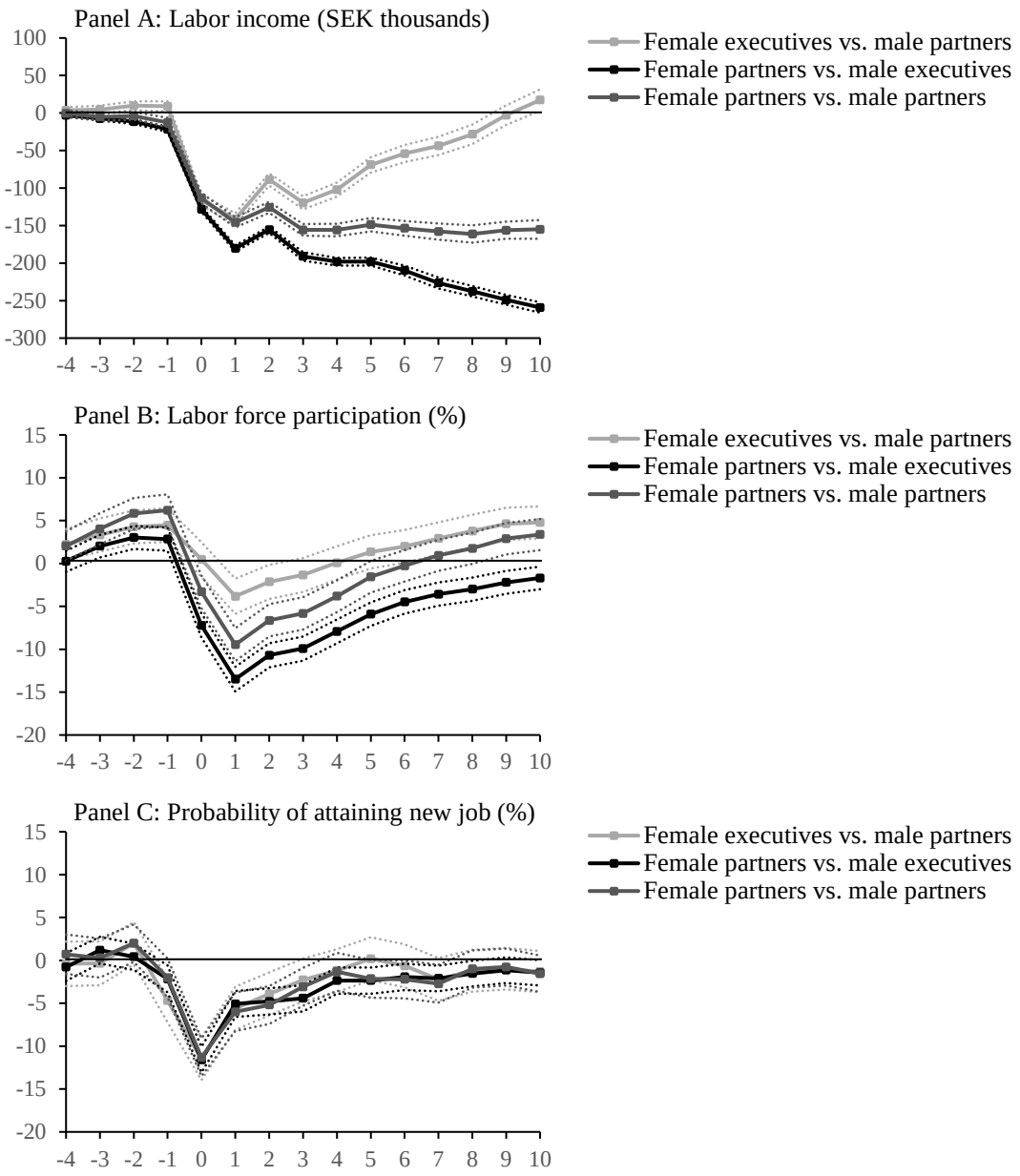

Figure 3. Career progression of executives' partners around childbirth
This figure repeats analyses in Figure 2 for combinations of an executive and her partner for labor income in Panel A, labor force participation in Panel B, and probability of attaining new job in Panel C. The three estimates in each panel compare female executives to their male partners, female partners to their male executive partners, or female partners of male executives to 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.

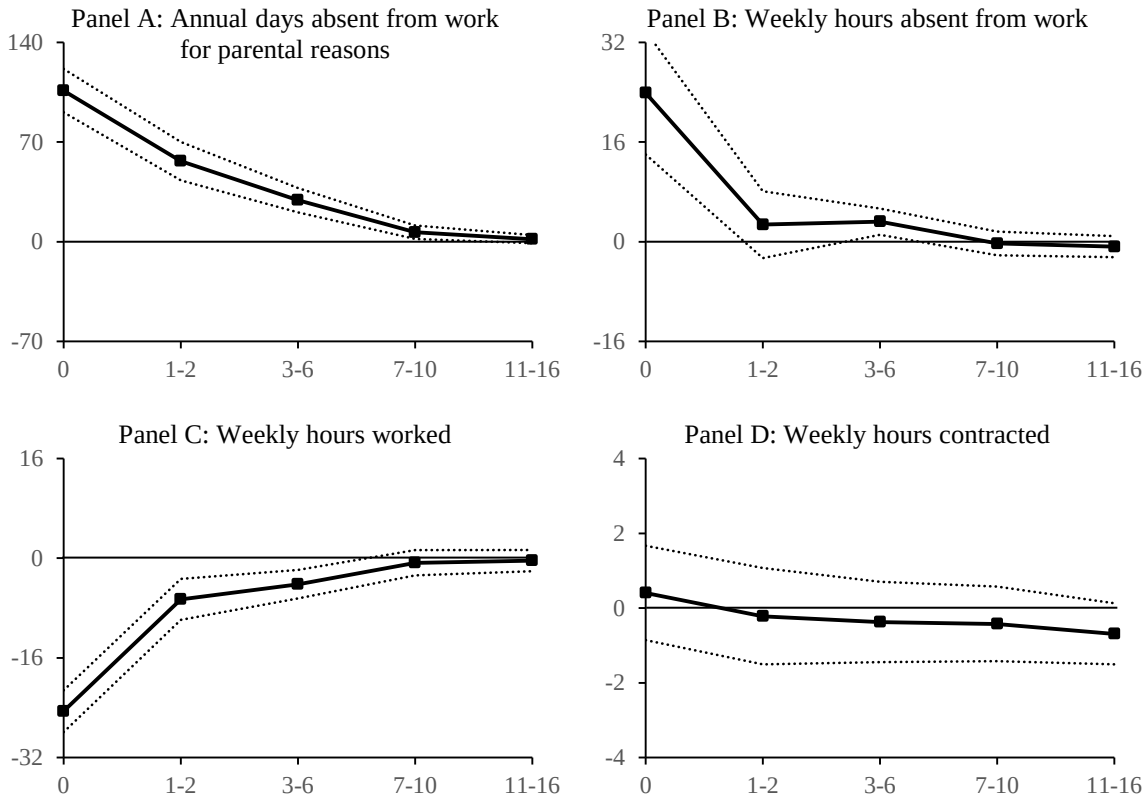

Figure 4. Impact of children on female executives' absence from work and working hours
The panels in this graph plot annual days absent from work for parental reasons (Panel A), weekly hours absent from work (B), weekly hours worked (C), and weekly hours contracted (D). The estimates (solid lines) and 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 child birth (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 Labour 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 in much extent 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			-0.64			-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 one 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 one 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 one if the high school is in the top-5 high schools in 2011 in terms of the fraction of graduates that 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 is 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 one 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 2004–09. 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 one if the individual has been born in Stockholm, Göteborg, or Malmö. *Immigrant* takes the value of one if the individual has been 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 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. 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 on each row. These sets of variables refer to variables listed in Table 2 Panel 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 on 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' sosioecon. 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 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

Attributes of executives and their partners prior to childbirth

This table reports gender differences in the sample executives' attributes relative to their partner prior to childbirth. Only executives with an identifiable partner enter the sample. The predicted probability of an executive or her partner becoming top executive comes 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. The table reports means and their associated *t*-values, stratified by executive status and gender. It also displays the fraction of executives whose partners have a lower predicted probability becoming top executive, and the gender difference and its associated *z*-statistic in this fraction.

	Predicted probability of becoming top executive					
	Large-firm CEOs		Large-firm top executives		Highly paid executives	
	Women	Men	Women	Men	Women	Men
Executives	1.49	1.26	7.05	6.03	15.15	12.82
Partners	1.29	1.00	6.04	4.99	13.48	10.30
Difference	0.20	0.25	1.01	1.05	1.67	2.52
t-value	(9.24)	(20.49)	(13.93)	(25.79)	(8.31)	(21.66)
Women less men	-0.05		-0.04		-0.85	
t-value	(-1.97)		(-0.48)		(-3.66)	
Fraction partner less qualified	0.573	0.592	0.600	0.604	0.571	0.600
Women less men	-0.019		-0.004		-0.028	
z-value	(-2.22)		(-0.50)		(-3.33)	
Number of observations	10,534	28,887	10,534	28,887	10,534	28,887

Table 7

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 Labour 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 8

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 9

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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Figure IA1. Likelihood to live 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.

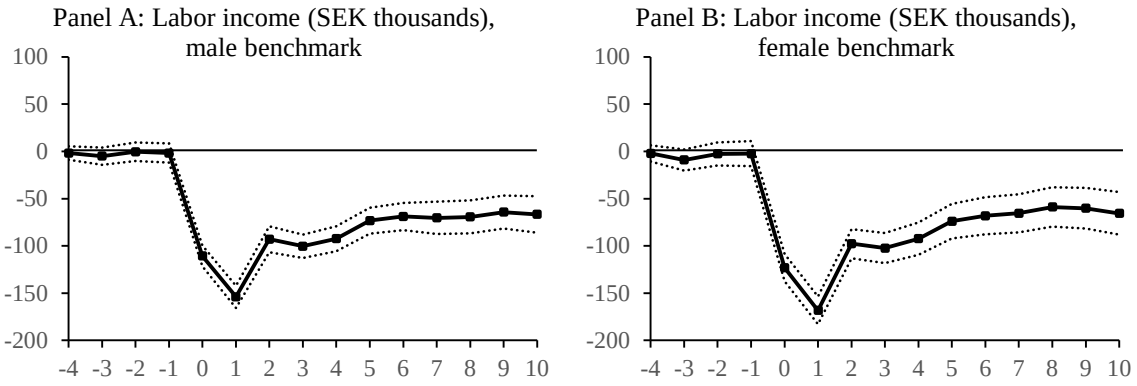

Figure IA2. Impact of children on female executives that have one child
The panels in this graph plot annual labor income relative to the birth year of the executive's first child. The estimates (solid lines) and their 95% confidence intervals (dotted lines) are for the coefficients on interactions of 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 first childbirth. The sample consists of executives who are born in 1962–1971 and whose first childbirth (actual or imputed) is in 1992–2001.

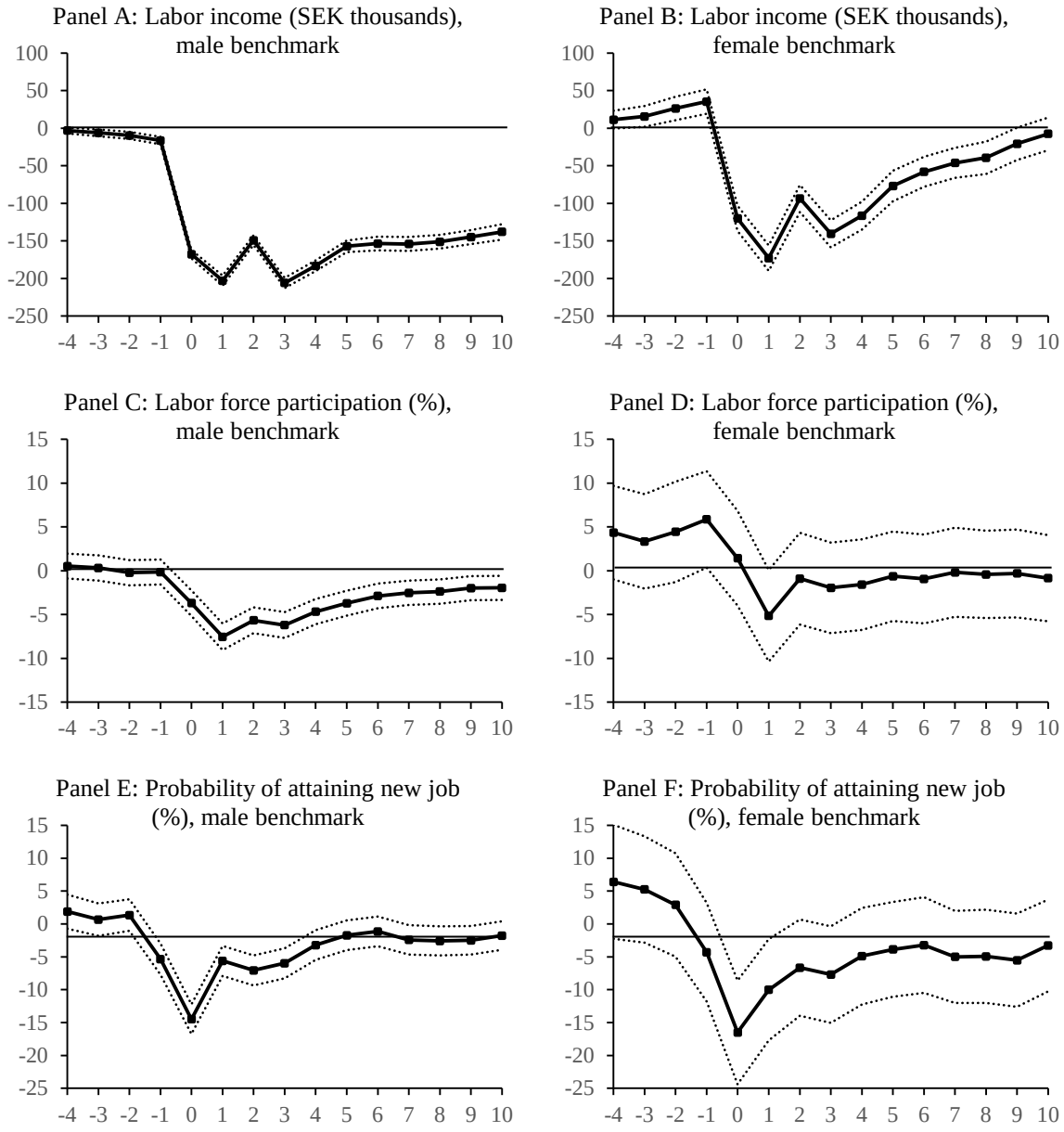

Figure IA3. Impact of children in sample of university graduates
This figure repeats the analyses in Figure 2 for university graduates from business, economics, or engineering who are born in 1962–71 and whose first childbirth is in 1992–2001. Confidence intervals are based on standard errors that assume 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 one if Statistics Sweden classifies the firm 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. Parent's 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 Panel 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

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

This table compares selected executive characteristics in the core sample and in the Labour 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	Labour Force Survey	Diff.	*t*-value	*N* Core sample	*N* Labour 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 IA6

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 as its measurement is not possible prior to1990. 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