CLOSING THE GENDER PAY GAP IN THE US FEDERAL SERVICE: THE ROLE OF NEW MANAGERS

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This paper estimates the causal effect of managerial homophily (getting a same-sex manager) on employee pay in the US Federal civil service. Using over 30 years of detailed payroll data, we exploit the appointment of new managers in an event study design. Same-sex managers are particularly important for female employees, whose pay increases by an additional 1.5 log points relative to their male counterparts. A novel finding shows that same-sex managers have the largest effect on employees in less routine jobs within education levels. Far from being an artifact of a bygone age, these effects are increasingly present across the four political eras we study. Managerial homophily operates through increases in pay grades and occupational changes. It has a larger impact on women's careers when there is a critical mass of women in the office. We conclude that even highly regimented pay systems are not immune to discretionary managerial actions. Female representation in managerial roles is a key determinant of women's career trajectories, likely enhanced by the decline in routine jobs.

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I. Introduction

The US gender pay gap considerably narrowed over the last forty years, albeit at a slower pace in the 2010s. However, the share of the pay gap unexplained by traditional employee characteristics has been growing overall (Blau and Kahn, 2017), and in the US Federal civil service (Figure 1).[1] Recent research has thus emphasized the role of firm-level factors, such as the under-representation of women in high-productivity firms (Card, Cardoso, and Kline, 2016). Women are also under-represented in management, lagging considerably behind the female labor forces they supervise (McKinsey, 2019). In the federal service, the female management share has increased steadily over time, yet it still under-represents its female workforce (Figure 1).[2] We look beneath the glass ceiling and focus on the impacts of managerial homophily on their employees. More precisely, we ask: What effect does a same-sex supervisor have on their employees' careers and pay trajectories?

Using over 30 years of rich longitudinal data from the US Federal civil service we estimate the effects of managerial homophily on employees' residual pay by exploiting the appointment of new same-sex managers at local offices in an event-study design.[3] The US government is often touted as a pay equity success story. It has highly regimented administrative pay scales with clearly defined progression criteria, which theoretically limit the scope for homophily and demographic characteristics to affect pay. The absence of a profit motive also mutes the potential effect of productivity differences between men and women, making it a neutral setting to study the effect of managerial homophily.

Even in this favorable setting, we find that female employees still benefit from the appointment of same-sex managers. In the years following the appointment of a new same-sex manager, female employees' residual pay increases by up to 1.5 log points more than they do for male employees following the appointment of a male manager (herein the "differential homophily" effect). These effects are economically significant and robust. Far from being an artifact of a bygone age, we document homophily effects across presidential eras. If anything the differential

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[1]Figure 1 plots the raw gender pay gap over time. It decreased from 22 to 11 log points between 1987 and 2014. Also shown is the pay gap adjusted for gender differences in observed human capital (education), occupation, and age. A sizeable gap, the vertical distance between the two curves (shaded area), remains unexplained. As the two curves evolve in parallel, the unexplained gap as a share of the raw gap increases over time: from 13% to 37% in Panel A and from 25% to 50% in Panel B. The precise samples are defined below.

[2]The female share of management in the US federal service increased from 24% in 1987 to 38% in 2014, while the female employee share remained fairly stable at around 48%. For comparison, women comprise 38% of middle managers in US corporations (McKinsey, 2019).

[3]We include traditional human capital variables as explanatory factors – age, tenure, education, and occupations. We also control for locality pay and offices. Pay grades and levels are excluded as we show they are a key mechanism through which same-sex managers affect disparate pay by gender.

homophily effect on women's pay became more important as the female workforce became more highly educated and moved from clerical jobs into administrative careers (Goldin, Katz, and Kuziemko, 2006), and into less routine jobs irrespective of education level. This novel finding links increasing returns to less routine tasks to the ability of female managers to reward employees' performance in these tasks. Indeed, we also show below that managerial homophily leads to higher promotion rates and occupational upgrading.

Our paper thus contributes to the broad literature on the role of managers in worker careers and the emerging literature on the effects of homophily in the workplace. Managers can impact workers' careers and compensation through several mechanisms, including direct effects on worker productivity (Adhvaryu, Nyshadham, and Tamayo, 2022), assignment of promotable tasks (Babcock et al., 2017), and managers' evaluation abilities and leniency (Frederiksen, Kahn, and Lange, 2020). Another important channel operates through workplace homophily – the tendency of individuals to gravitate towards those like themselves. When interacting with people like themselves, individuals update their beliefs faster (Golub and Jackson, 2012), are more likely to make professional referrals (Zeltzer, 2020), and are happier subordinates (Husain et al., 2021, and Grissom et al., 2012).[4]

The most closely related paper to our study is Cullen and Perez-Truglia (2023) which estimates the effect of managers using data from a Southeast Asian firm, where gender roles are likely more traditional. It uses an event-study design to document the promotion advantage of employees who are socially close to their immediate supervisors; such employees also tend to be of the same gender. That is consistent with Castilla's (2011) finding that workers' performance evaluations improve when they rotate to a manager of the same-sex. Managerial homophily may reduce biases in employees' performance evaluations or reduce cross group signal extraction challenges. Differential promotion rates, particularly early in one's career, are a key contributor to the gender pay gap (Bertrand, Goldin, and Katz, 2010; Bronson and Thoursie, 2022). Historically, female employees have encountered managerial homophily at lower rates than male employees. During the period under study, 65% of men's new managers were men while only 45% of women's new managers were women.

This paper also contributes to the growing literature on the conditions under which women in leadership are more or less successful at improving women's pay. High level "diversity" initia-

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[4]Homophily can occur along any dimension. Most of the empirical employment literature focuses on gender, likely due to its ready availability in administrative data sets.

tives, such as improving female representation on boards of directors, have been shown to have small, if any, trickle down effects on female employees' wages (e.g., Bertrand et al., 2019; Dalvit, Patel, and Tan, 2021; Maida and Weber, 2022). Nevertheless, in corporate settings across several countries, studies have found a general positive impact of female leadership on female employees' wages and promotion rates.[5] Recent lab and lab in the field experiments suggest that critical mass is a key factor for women in leadership (e.g., Born, Ranehill,and Sandberg, 2022) and could explain the mixed results in the literature. Our findings are consistent with larger differential homophily effects in settings where women have achieved a critical mass.

Finally, our central finding sounds a cautionary note for hopes that replacing performance pay and employee negotiations with algorithmic pay systems will close the gender pay gap. Our results show that administrative pay systems may simply provide the illusion of a cure. Management diversity, on the other hand, may improve pay equity across different pay-setting regimes. Consistent with this, Biasi and Sarsons (2022) show that moving from seniority pay to performance pay led to a re-emergence of the gender pay gap in Wisconsin teachers' salaries, an effect that was muted in schools with female principals or supervisors.

Unlike prior studies that focus on a single firm or industry, such as manufacturing (e.g., Flabbi et al., 2019), our setting allows us to estimate the effect of managers on pay gaps across a broad range of sectors, occupations, and eras. The US federal civil service employees over 1 million people in each year. These employees are spread geographically across the United States in close to 75,000 unique local offices.[6] They work in 500 different occupations with varying levels of female representation and include everyone from equipment operators earning $20,000 per year to aerospace engineers earning over $120,000 per year. We observe these employees over the course of their federal careers.

We exploit the appointment of new managers in an event study design.[7] Our event-study sample is employees experiencing their first managerial team change and we use those who have yet to experience such a change as controls.[8] Our event of interest is the appointment of a new manager at the office, and treatment occurs when the new manager is of the same-sex as the

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[5]See, for Portugal: Cardoso and Winter-Ebmer (2010), for Norway: Kunze and Miller (2017), for Italy: Flabbi et al. (2019), and for Germany: Bhide (2019).

[6]The OPM data include the employees agency, sub-agency, and duty stations – the physical locations where the employees work. We define a local office or workplace as the agency-sub-agency-duty station where the employee works.

[7]We have access to all quarters of data and observe managerial changes every quarter, something not available in the the synthetic data from the Office of Personnel Management obtained through the Barrientos et al. (2018) initiative.

[8]We focus our estimation on the effect of the first new manager who arrives at the office during each worker's tenure to avoid confounding it with the effects of subsequent managerial transitions.

employee. Note, the same managerial appointment will simultaneously treat some employees in an office with a same-sex manager and others in the same office with an opposite-sex manager. Our identifying assumption is that whether the first new manager is of the same-sex as the employee is conditionally exogenous. We condition on a host of fixed effects, including office fixed effects, individual fixed effects at the office level and quarter-year fixed effects, and find that this assumption is supported by parallel pre-event trends between female and male homophily effects.

If a new manager only impacts a portion of the offices employees, our estimates will correspond to an Intent-to-Treat (ITT) estimate for any individual employee. Our preferred estimates therefore focus on offices with up to 5 managers (approximately 3 managers and 25 employees, on average) and at least 10 employees. In those settings, a single managerial change represents a substantial change in office leadership and results in a sizeable share of employees experiencing a change in supervision. We complement our event-study analysis with a TWFE-DiD of log pay residuals and several other outcomes including: GS grade, office switches, and occupational changes.

Finally, we match our data on the share of same-sex managers with data from the 2008-2014 Federal Employee Viewpoint Surveys (FEVS), an annual survey of US federal employees. Our findings are in line with the self-reported perceptions of federal employees – female employees' pay satisfaction is increasing in the share of same-sex managers. These results are in keeping with recent studies finding a positive impact of female leadership on workplace climate (Tate and Yang, 2015; Lucifora and Vigani, 2022).

The remainder of the paper is organized as follows. In Section II, we provide background on the evolution of pay setting in the federal civil service and the role of managerial assessments. In Section III, we summarize the unique features of the longitudinal administrative data we use. In Section IV, we outline our estimation and identification strategy. Section V reports the event study and difference-in-differences estimates and discusses threats to identification and the robustness of the results. Section VI discusses potential confounding effects and section VII concludes.

II. Pay Setting in the US Federal Service

The Federal pay-setting system is codified in a series of bills. Because of the large number of employees involved, around 1.5 million, any pay increases also have considerable budgetary repercussions. As a result pay increases have involved direct Presidential intervention since the

1970s.[9] Below we provide a brief overview of key features of the Federal civilian employee pay-setting process partly based on Buckley (2009).

A. General Pay Schedule

The Pendleton Civil Service Act of 1883 created of a merit system for Federal employment. The Classification Acts of 1923 and 1949 linked salaries to duties and applied consistent standards across Federal agencies, creating the "General Schedule" (GS) of pay. It has been suggested that this bureaucratic system helps insulate the civil service from politics (Johnson and Libecap, 1989). Standardizing compensation should also limit the scope for demographic pay disparities.

The core of the GS classification system establishes 15 pay grades, which we observe. They are based on the position's difficulty, responsibility, and required qualifications (e.g. education). Some discretion in the assignment of initial grade at hiring can still be exercised through "superior qualification actions," which are more commonly given to men (OPM, 2014a). The base pay within each GS grade is set at one of 10 fixed levels, called steps, which we do not observe.[10] Employees with acceptable performance progress through the steps following statutory waiting periods (usually one to three years). Employees can also receive additional step increases, called Quality Step Increases (QSIs), as a reward for outstanding performance with a limit of one QSI per year. Employees in occupations with job ladders may advance non-competitively to higher steps and grades at fixed intervals, generally after at least a year. However, advancement to the highest grade that an employee is eligible for may be discretionary and competitive. Therefore one possible way for gender pay disparities to emerge is for men and women to be subject to different performance evaluations and associated discretionary pay increases. There are several alternative pay plans to the GS schedule. They primarily cover highly specialized workers (e.g. air traffic controllers). They have different salary grids, but otherwise function similarly. Around 20% of all federal employees are paid under non-GS plans (10% in our estimation sample). Our main estimates are unchanged when we focus only on GS employees.

Beyond job classification and career progression, the overall salary grid is also adjusted for the cost of living over time and across locations. The Federal Employees Pay Comparability Act (FEPCA) of 1990 introduced locality-based pay to address challenges in recruitment and retention in high-wage areas. It also set a timetable for making Federal pay more competitive

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[9]The Federal Pay Comparability Act of 1970 allowed for GS pay adjustments via executive action.

[10] Table A.1 in Appendix A displays the GS salary table for 2012 (rates frozen at 2010 levels) in the form of a matrix of 15 grades by 10 steps. It shows that increases along the steps (columns) range from 2.4% to 3.3%, while increases across the grades (rows) for step 1 range from 8.7% to 18.1%.

with private sector wages for employees doing comparable work in the same locality.[11] We begin our analysis by stripping locality-year fixed effects from employees' pay to absorb the yearly variation in locality pay adjustments as explained in Section III below.

FEPCA also set up a process for yearly general increases in Federal pay. These pay adjustments are reviewed annually by Congress, which may legislate a different adjustment from the one authorized by the President. Political attitudes towards federal compensation have varied over time. During most of Clinton and Bush 43, Congress generally exceeded the President's adjustment, but the Obama Era was marked by pay freezes and small (1%) adjustments.[12] We thus expect presidential cycles to influence the level of general pay increases, which may affect individual employees' abilities to seek and obtain personal adjustments.

In summary, federal civil service employees are paid according to an administrative pay system. Grade increases, QSIs, and statutory increases in the federal pay schedule and locality pay adjustments can all result in salary increases. In the analyses that follow we will control for the latter and other bureaucratic determinants to isolate the potential role of managers in helping employees move along the pay grid.

B. The Role of Managers

In addition to assigning tasks and providing supervision, managers evaluate their super-visees' performance and recommend them for step and grade increases. One component of this process is providing performance ratings. Contrary to popular belief, the federal service does link financial rewards to performance, not just tenure. Between 1988 and 2003 employees with "out-standing" performance ratings received raises that were two-thirds of a percentage point higher than those with "less than fully successful" ratings and these ratings had measurable effects up to two years later (Oh and Lewis, 2013).

There is no minimum time under a supervisor before an employee can receive a perfor-

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[11]Initially, there were just 29 locality areas; thirteen new locality areas were added in 2016, and there are currently 47 locality areas – regions where employees receive higher salaries. Beginning in January 1994, annual salary adjustments for most GS employees consisted of a general cost-of-living adjustment equal to the BLS Employment Cost Index (ECI) minus one-half percentage point and a local-specific adjustment of "no less than one-fifth of the amount needed to reduce the pay disparity with private industry salaried in the locality involved to 5 percent." Because some of the required locality adjustments exceeded 30 percent they were initially only partially implemented, and FEPCA plans extended into the 2000s (Table 1-1 of CRS (2010)).

[12]From 1994 to 2009 Congress approved amounts equal to or higher than the President's proposed adjustment. Alternative plans were submitted for pay increases effective in 1995-98, 2001, 2003-05, 2007, 2008, and from 2010 to 2017. In 2008, following a failed attempt at introducing pay-for-performance (PFP) President George W. Bush implemented a 3.5% pay increase for most federal employees via executive order. In contrast, under the "Campaign to Cut Waste," President Barack Obama implemented a 3–year pay freeze from 2011 to January 2014, with increases limited to 1% each year and again in 2015. GAO (2021) provides a comparison of pay locality increases proposed by the Federal Pay Council, the President's Agent and Congress' alternative plans for 2015 to 2019.

mance rating, but the appraisal programs establish a minimum appraisal period. It is typically a year, but can vary by agency.[13] Specifically, managers have to implement the five phases of the performance management cycle: "1) planning work and setting expectations; 2) continually monitoring performance; 3) developing the capacity to perform; 4) rating periodically to summarize performance; and 5) rewarding good performance" (OPM, 2017). This rigorous and analytical appraisal process should dampen the effects of homophily (see Blair-Loy et al. 2022).

Yet, despite relatively constrained pay setting procedures, Federal pay has varied by race, sex, and locality more than can be explained by observed measures of qualifications (e.g., Lewis and Oh, 2009). Droganova (2018) shows that the gender gap in federal employees' wages and promotions is correlated with the share of female managers in the office. Specifically, it favors men in offices where all the supervisors are male and women in offices where all the supervisors are women. Women also start at a higher initial grade and progress faster in offices with all female management teams. Instrumental variables estimates exploiting manager retirements provide suggestive evidence in the same direction; however, that analysis is limited by the instrument's strength.

III. Data

A. Employment Data

The primary data source for the paper is quarterly administrative payroll data made public by the US Office of Personnel Management (OPM) under the Freedom of Information Act (FOIA). We focus our analysis on civilian white-collar salaried permanent employees working for the federal government between 1982 and 2014.[14]

The OPM data provides details on each employee's federal employment history and pay, including their place of employment, given by agency, sub-agency, and duty station (office location). For brevity, we simply refer to the employee's agency-sub-agency-duty-station as their office.[15] The data also contains information on each employee's job, including their detailed occupation and employment type (e.g., full, part-time, salaried, or hourly). We follow employees over the course of their careers in the federal service, including any moves across roles, offices,

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[13]Off-cycle ratings can be given when a within-grade increase (WGI) decision is inconsistent with the employee's most recent rating.

[14]White collar workers form the overwhelming majority of employees in the Federal Civil Service, just under 10% were blue-collar workers in 2013.

[15]In the OPM data the "duty station" is the physical location of the office where the employee works. Multiple federal agencies or sub-agencies can be located in the same physical office building. As we are interested in the employee's immediate office environment, we code each agency-sub-agency-duty station combination as a unique duty station and refer to it as an office.

and agencies.

Importantly, the data includes a rarely available "supervisory status" variable (6 levels) that enables us to distinguish managers from employees. Finally, the data contains quarterly information on each employee's compensation, most notably the government pay schedule under which they are paid (herein called the pay plan), their grade in that pay plan, and their pay.[16]

We supplement the quarterly data with HR data collected at the time the employee was hired and when they separated from government employment. These data include the individual's age, education, and reason for separation from the federal government (e.g., retirement). These data also include information on prior federal service for employees returning to government service after a period in the private sector. Because the hiring data are only available beginning in 1982, we begin our sample then. Our aim is to follow workers as they progress through their careers. Therefore, we impose another cohort restriction and only keep workers born in or after 1955 – the post-Pill cohorts.[17] A data appendix provides additional details on the construction of the OPM data and each of the variables we use.[18]

The data released by OPM does not have employee race or gender but does include first and last names for most.[19] Therefore, we imputed gender based on employees' names. OPM redacted the names of all employees in sensitive occupations, primarily in law enforcement or security roles. We were unable to impute gender for those employees and therefore exclude law enforcement and regulatory agencies and sub-agencies (e.g., the Inspector General's office). We were able to successfully impute the gender of 70% of the employees whose full names were provided by OPM.[20] In our employee sample, we omit those whose gender we could not identify (see data appendix), but we include all managers irrespective of our ability to impute their gender.[21] The data appendix details the gender imputation and the excluded sub-agencies.

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[16]The workers in our data are paid under 112 separate pay schedules, but most workers (around 80% in the full data and 90% in the sample, which imposes the cohort, minimum office employee size, and minimum employee tenure outlined below) are paid under the GS schedule. Unfortunately, we do not observe at which step salaries sit within the pay grade and, therefore, can focus only on pay grade increases.

[17]The full sample encompassing all workers is used to calculate office characteristics (e.g. number of employees, gender mix of employees and managers, the appointment of new managers, etc).

[18]The data appendix is available upon request.

[19]The Fedscope [https://www.fedscope.opm.gov/] provides the agency-level make-up separately by race and gender without intersectionality. Among the 20 largest agencies, the correlation between Black employee shares and female employee shares is 0.37.

[20]We imputed gender based on the frequency of the first name in male and female babies born in the employee's birth cohort in the Social Security Name files. Names were coded as being indicative of gender if at least 85% of babies born in the employee's cohort with the name had the same gender. We cross-validated our gender imputation algorithm with an extract of the EHRI-SDM data from 1992-2012 from Vilhuber (2018), including information on employee gender. In the sub-sample contained in both data sets, our gender imputation algorithm accurately classifies 95.11% of males and 99.24% for female employees.

[21]Workers who become managers in the event window are excluded from the employee sample.

To ensure that we have enough observations to estimate office fixed effects, we restrict our sample to offices with at least 10 employees. We also restrict the sample to employees who work for the government for at least five years to ensure we observe them for multiple periods in the event study.[22] Both minimum office employee size and minimum employee tenure restrictions remove noise from the estimation but do not otherwise meaningfully affect the estimates below. We call the sample that imposes cohort, minimum office employee size, and minimum employee tenure restrictions, but does not impose restrictions of managerial size the "All Offices" sample, and refer to our preferred sub-sample of offices with at most 5 managers as the "Up to 5 managers" sample. For our event study, we further restrict the sample to employees who have experienced the appointment of a first new manager, as explained in section III.B.

The key variables and sample characteristics are summarized in Table 1 for the "Up to 5 managers" and event-study samples. The "All Offices" sample without managerial restrictions consists of approximately 18 million quarter-year observations from about 250,000 unique female employees and 200,000 unique male employees across more than 10,000 offices. Our preferred "Up to 5 managers" sample consists of 2 million quarter-year observations from approximately 80,000 unique female and male employees spread across almost 10,000 offices (Table 1C). Like in the broader labor market, there is a roughly 15% raw gender pay gap among the workers in our sample. The average female employee earns $50,000 per year and the average male employee earns roughly $7,000 more (Table 1A). However, a portion of the raw gender disparity can be explained by differences in human capital, such as education. The overwhelming majority of white-collar federal employees have at least some college education, but male employees are slightly more educated (Table 1B).[23]

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B. Managers

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Women's presence in management grew alongside their employment shares during our study period (Figure 1). By 2014, women were 38% of managers, up from 24% in 1987. Despite these increases, women remain under-represented in management: in our data, women make up 40% of employees but only about 26% of managers (Table 1C). In addition to the inter-temporal variation, there is substantial variation in female management shares across agencies and across

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[22] This last restriction implies that our data set corresponds to a continuously refreshed panel that omits high-frequency employee churning (those employed for less than five years). Thus, our gender gap measures will differ from the ones typically obtained from cross-sectional data.

[23]In our data, 86% of male workers have at least some college education compared with only 79% of female workers. Male workers are also more likely to have graduate degrees.

offices within agencies in each period, ranging from 0% to 100%.[24]

Our data on managers is extracted from the same archive of federal employee data used for workers but is a distinct extract and includes managers whose gender we could not identify (about 18% of the manager sample).[25] We identify the new managers in each office by comparing the list of all employees designated as having managerial responsibilities in each office in each quarter. We define a new manager as a new person appearing on the managerial list in an office for the first time. These new managers include employees who previously worked in the office in non-managerial roles (47%), those who have previously served as managers in other offices within the federal service (47%), and those hired from outside the federal service (6%). We refer to new managers that have not been employed in the office they are appointed to in the quarter prior to their appointment as "external hires".

The managers we study are close supervisors. As shown in Figure 2A (solid line), the vast majority of federal offices only have 5-10 employees per manager. We observe the management team at each office in each quarter, but we do not observe direct reporting lines and the divisions of management responsibilities within the office. We therefore focus our analysis on the 80% of offices that have smaller management teams (at most 5 managers) where the appointment of a new manager represents a supervisory change for a larger share of the office's employees. Figure 2B shows the percentage of offices with new managerial appointments in each year for this sub-sample. The share of new female new managers is commensurate with their management shares, roughly one-third over the period (Figure 2B).

To avoid the confounding effects of previous managerial changes, the main event of interest is the first managerial change an employee experiences during their employment spell in the federal service.[26] For the managerial transition to be a meaningful change, employees need sufficient time with their initial manager to be evaluated. We, therefore, only count an employee as having experienced a managerial transition if the employee worked in the federal service for at least 6 months prior to the transition.[27] The "new same-sex manager" variable is equal to 1

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[24]Appendix Figure A.1 displays the female management and employe shares for 12 large agencies in 1995 and 2014.

[25]Appendix Table A.2 summarizes the characteristics of managers. Managers and employees are defined using the supervisory status variable provided by the OPM. Employees are denoted with code 8, which includes all positions that do not meet definitions of Supervisor or Manager, Supervisor (CSRA), Management Official (CSRA), Leader, or Team Leader. We use the remaining codes to denote managers.

[26] We have also estimated event studies using arrival of the second manager as an event. The same-sex effects associated with the second manager, regardless of employee gender, are not substantial. The results can be found in Figure A.11 and Table A.16.

[27]Estimates are virtually indistinguishable if treatment is defined as the first new managerial appointment after 1 year of service.

if the employee and the first new manager at their office have the same sex, leaving opposite-sex managers and managers with unobserved sex in the base group. Under this definition, around 40% of female and male employees experience a first new manager over the course of the sample period and approximately 40% of women's and 60% of men's first new managers are of the same-sex.

IV.   Identification strategy

This section details the events we exploit and the rich specification our data allows us to estimate. Given the under-representation of women in management, our focus is the differential impact of managerial homophily on women's and men's pay. We leverage managerial turnover to estimate the changes in female employees' pay following the appointment of a new same-sex manager in comparison to the changes in pay in the male counterpart pairing. Our event of interest is the appointment of a first new manager, and the treatment applies to employees who are the same sex as their first new manager. The fully saturated model presented below allows us to estimate all four employee-manager pairings (two same-sex and two opposite-sex) simultaneously and derive any desired contrasts.

As explained in Section II above, federal pay setting involves several components that affect pay but are outside the scope of managers' control, such as locality pay premia. We therefore employ a conditional exogeneity estimation strategy similar to the covariate adjustment strategy suggested by Freyaldenhoven, Hansen, and Shapiro (2019) who advocate correcting for potential confounds by first residualizing outcomes using covariates unaffected by the event. Thus, we begin our estimation by constructing a log pay residual for each employee – the pay purged of the observable characteristics of employees, offices, and localities. We then conduct our event-study analysis using quarterly and yearly events. We also estimate managerial homophily effects across several sub-samples based on employee and office characteristics, and across presidential eras. In addition, we complement the event-study analysis with a two-way fixed-effects difference-in-differences (TWFE-DiD) analysis of the overall effect of the appointment of same-sex managers on residual log pay, promotions, retention (office moves), and occupational changes. We test the robustness of the estimates using the newly proposed estimators for staggered treatment effects (Borusyak et al., 2021).

A. Estimation of Unexplained Pay Variation

An important component of pay for many employees from 1994 onward comes from pay adjustment for living standards in different localities, which have become more granular over time. We therefore begin by regressing the individuals' annual log pay on localities of offices to purge this variation from the data.[28] These regressions are estimated separately for each year to fully account for the magnitude and yearly variation of the locality pay adjustments under FEPCA.

We then use the locality purged pay to estimate pay unexplained by observable characteristics, again estimating the regression separately by calendar year.[29]

$$(1) \qquad \hat{w}_{iqy} = X'_{iqy}\beta_y + \theta_{dy} + \omega_{iqy}, \;\; y = 1987, ..., 2014$$

where $\hat{w}_{iqy}$ is the residual stripped of locality pay for individual i in quarter q and year y, X_{iqy} are observable characteristics, including age, education, occupation, a part-time indicator, and tenure.[30] Office fixed effects, θ_{dy}, capture the common features of offices, such as size and the female employee share, that are shared by all employees at the office in a particular year y. We denote the resulting log pay residual as $\hat{\omega}_{iqy}$.

Figure 3 presents the residual pay from equation 1, averaged in each year by gender (solid symbols) for our sub-sample of offices with at most 5 managers. The distance between the average male and female residuals, which hovers between 1.9 and 3.1 log points, corresponds to the average unexplained pay gap each year. One potential mechanism behind these unexplained disparities is observationally equivalent male and female workers moving through the grid at different paces. Indeed, when we include the endogenous pay plans and grades (hollow symbols), the male and female residuals are much closer to each other. The endogenous pay grid hides the underlying gender pay gap. Thus, Figure 3 illustrates a key point: most (85%) of the unexplained pay gap over time operates through workers placement on the pay grid, a decision heavily influenced

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[28] Using the 'All Offices' sample, we estimate locality pay regressions: $W_{iqy} = \theta_{ly} + w_{iqy}, \;\; y = 1987, ..., 2014$, where W_{iqy} is log annual pay for an individual i in quarter q and year y, and θ_{ly} are locality fixed effects in a regression for year y.

[29] Out of an abundance of caution we estimated equation 1 on the full sample to ensure we would have meaningful samples for each office year. However, our point estimates and their precision are robust to performing the entire analysis on the event study sample (e.g. estimating 1) on the event study sample). See Figure 9 and Table A.5.

[30] The part-time indicator is equal to 1 in each quarter-year in which the employee worked less than full-time. OPM defines part-time permanent workers as those working between 16 and 32 hours a week. The salaries provided by OPM are annualized full-time salaries, not pay, and do not mechanically fluctuate with hours worked. OPM notes a number of circumstances in which employees may choose to work part time including illness and "to balance routine and/or unexpected work and family demands" (https://www.opm.gov/policy-data-oversight/hiring-information/part-time-and-job-sharing/). 16% of federal employees in the 'All Offices' sample work part time at some point in their careers.

by their managers. Below we present evidence that new managers help employees move up the grid, therefore illustrating that placement in the grid has a discretionary component. Conversely, Aneja and Guo (2022) show, in the case of race, that employment segregation in the Wilson Era was effectively implemented through downward placement in the occupational grid.

B. Event study DiD

We restrict the event study-sample to employees who receive a first new manager in an office with at most 5 managers prior to the managerial appointment. Employees who have yet to receive their first new manager act as controls.[31] We estimate the differential (DiD) event-study effects of a new manager of the same-sex as the employee, NSM_{idt}, on the log pay residuals, $\hat{\omega}_{itq}$, obtained from equation 1 in an event study design with fixed effects for year-quarter and individual-office (TWFE), that is, we allow each individual's fixed effect to vary when they switch offices.[32] Specifically, we estimate:

$$
\begin{aligned}
\hat{\omega}_{itq} = {}& \delta_k \cdot \mathbb{I}^{Event} \cdot NSM_{idt} + \delta_k^f \cdot \mathbb{I}^{Event} \cdot F_i \cdot \ NSM_{idt} \\
& + \alpha_k \cdot \mathbb{I}^{Event} + \alpha_k^f \cdot \mathbb{I}^{Event} \cdot F_i + \gamma_i + \lambda_q + \varepsilon_{itq},
\end{aligned}
$$

(2)

where $\hat{\omega}_{itq}$ denotes the pay residual from equation 1 for an individual i in event time t and calendar year-quarter q and where $\mathbb{I}^{Event}$ is a vector of event times.[33] The indicator variable F_i denotes female employees and is used in interactions (the first-order coefficients are absorbed by the individual fixed effects). Thus α_k and α_k^f capture the pay dynamics around a new manager's appointment. The indicator variable NSM_{idt} is equal to one when the new manager is of the same sex as the employee, thus δ_k and δ_k^f capture managerial homophily effects at event time $k = t$. The fixed effects γ_i and λ_q denote individual fixed effects that vary with office moves and the calendar year-quarter fixed effects, respectively. The event study residual is denoted by ε_{itq}.

An important advantage of this specification is that it allows us to easily recover the

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[31] In the 14% of cases where more than 1 manager arrives in the same quarter, we consider both new managers. It is possible, therefore, that both male and female employees could see a new same-sex manager arrive in their office at the same time, although this is rare. The estimates are robust to excluding all employees who receive multiple new managers in close succession, as shown in section V.B.

[32] About 40% of employees switch offices at some point in the event study sample. Estimates are robust to restricting each individual to a single fixed effect (see section V.B).

[33] The vector of event times includes 16 event-quarter indicators before and after the event in event studies with quarterly event times and four event-year indicators before and after the event in event studies with yearly even times. The event time prior to treatment, $k = -1$ is our base period and its coefficient is set to zero. Event-quarter indicator $k = -17$ and event-year indicator $k = -5$ are absorbing indicators equal to one for periods preceding quarter $k = -16$ and year $k = -4$. Event-quarter indicator $k = +15$ and event-year indicator $k = +4$ are absorbing indicators equal to one for periods following quarter $k = +15$ and year $k = +3$. We report estimates for event quarters from -16 to $+15$ and event years from -4 to $+3$ and omit the lower and upper absorbing event times in the figures.

dynamics of all four possible pairings on log pay residuals. The total effects of a new female manager on female employees' residual pay are the sum of all coefficients: $\delta_k + \delta_k^f + \alpha_k + \alpha_k^f$ (the female homophily effects). The analogous effects for male employees are $\delta_k + \alpha_k$ (the male homophily effects).[34] The differential effects of homophily on female employees is the difference in the homophily effects on female employees minus the effects on male employees: $\delta_k^f + \alpha_k^f$.[35]

As explained earlier, we focus on each employee's first managerial transition to obtain as clean and comparable an estimate as possible. Because we do not observe the manager each employee reports to, the same-sex manager effects correspond to the effect of the appointment of a same-sex manager at the employee's office. Given that the offices we focus on have relatively small management teams (5 or fewer managers), changes in their composition could affect the office as a whole. Therefore, one could also think of these effects as "Intent-To-Treat" estimates of the effect of a particular employee receiving a new same-sex manager. One advantage of this event definition is that it excludes any reshuffling of individual supervision assignments within an office due to manager-employee match quality, productivity, or similar confounding sorting.

V.   Event-study DiD Results

We begin by presenting our main results for our preferred event-study sample. We then investigate heterogeneity in treatment effects in order to understand when and for whom same-sex managers might have larger impact on pay. This is followed by a thorough discussion of robustness and potential threats to identification including balance of the observed characteristics of employees and offices by sex of the new manager and analyses of the sensitivity of the estimates to key specification and sample choices.

A.   Main Results

Figure 4 depicts our main event study results: the top panels display event study estimates using the more detailed quarterly event times, and the bottom panels use yearly event times, our preferred more concise specification.[36] The solid orange line plots the residual pay of female

[34]The opposite sex effects on female employees omit the same-sex coefficients and are $\alpha_k + \alpha_k^f$, while those on male employees also omit the female interaction coefficients leaving α_k.

[35]We can also compute the effect of female managers on the gender pay gap as: $\alpha_k^f + \delta_k + \delta_k^f$, and the effects of male managers on the gender pay gap as: $\alpha_k^f - \delta_k$. Thus the differential effect of female versus male managers on the gender pay gap is: $2 \cdot \delta_k + \delta_k^f$. The intuition behind the expression is that when the female managers' effect on male pay is turned on the homophily effect is absent. The total effects of new managers on the gender pay gap would account for all four cases, weighted by their relative frequency, which varies over time.

[36]Figure A.3A graphs the raw coefficients. Figure A.3B provides the resulting estimates for the two same-sex cases and Figure A.3C contains the analogous estimates for the two opposite-sex cases. Female managers get larger raises for all their employees than male managers.

employees before and after the appointment of a new same-sex manager $(\delta_k + \delta_k^f + \alpha_k + \alpha_k^f)$. The blue line depicts the analogous residual pay curve for male employees whose receive a new same-sex manager $(\delta_k + \alpha_k)$.[37] Table 2 reports the corresponding point estimates with standard errors (clustered at the office level). All employees, male and female, are on an upward pay trajectory early in their careers when new managers arrive (Table 2, column 3). The residual growth in pay (the new manager coefficients) in the pre-period is the same for male and female employees and is independent of the new manager being of the same-sex. In the period prior to the new manager's arrival, the α^f, δ, and δ^f coefficients are negligible and insignificant (Figure A.3A and Table 2). The differential homophily effect is the vertical distance between the two curves (plotted in Figures 4B and 4D with standard errors). It nets out any pay growth around the arrival of new managers (event time effects) and is a cleanly identified treatment effect.[38]

Our first novel finding is that women benefit from the appointment of a new same-sex manager at their workplace (Figure 4A and 4C) and that new same-sex managers are more important for their pay trajectories than for men's. Following the appointment of a new same-sex manager, female employees' pay grows 1.5 log points more than male employees' (Figure 4B and D).[39] It is important to note that this differential homophily effect arises because female managers are more successful than male managers at improving the pay trajectories of all employees. This result contrasts with the often feared negative impacts of female managers on male pay. This is in contrast to Cullen and Perez-Trugia (2023) on the impact of managers on the pay grades of their employees in a Southeast Asian banking firm. They find that "male employees do better under male managers than under female managers" (p. 1728), which they argue come from male managers favoring the careers of male employees.

Educational attainment is a key factor in employees' initial GS grades and promotion ceilings.[40] Figure 5A and 5B present the event-study estimates for employees with less than a Bachelor's degree and those with at least a Bachelor's degree, respectively. The differential impact

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[37]The pay growth following the appointment of these new managers is sizeable, hovering around 8 to 10 log points in the 2 to 4 years following the appointment. These pay increases are consistent with grade increases, as shown in Table A.1, particularly for highly educated workers. However, the event-time indicators, the α_k, capture a pre-existing pay growth pattern common to male and female employees. The homophily gender gaps we focus on display no such pre-trends.

[38]A new same-sex manager is also a new manager. We, therefore, focus on the total effect that includes the differential effect on female employees of both new managers (α^f) and same-sex managers (δ^f). This is a conservative choice. The estimates are more than twice as large if one only considers the same-sex female employee interaction, δ^f (Table 2 column 2). A positive estimate indicates the homophily effect on employee residual pay is larger for female employees.

[39]These estimates are nearly identical if one limits the sample to the 90% of workers paid within the GS pay plan (Figure 4C and 4D).

[40]Individuals with a high school diploma and no additional experience typically qualify for GS-2 positions, those with a Bachelor's degree – for GS-5 positions, and those with a Master's degree – for GS-9 positions.

of a new same-sex manager appears to be driven by their effect on more educated employees, who may benefit from larger pay increases by moving up a grade (e.g., 16 to 18 log points for each grade increase from GS-12 to GS-15) (Table B.2, columns 2 and 6).

Female employees with at least a Bachelor's degree have a same-sex manager effect that is roughly 3 log points higher than male employees' same-sex effect. There is no difference in the same-sex effect across employee genders for employees with less education and the male employee homophily effect is similar across education groups. This could reflect that highly educated employees are eligible for a wider range of pay grades and it is also possible discretion plays a larger role in their duties and evaluation. To gain insight into these competing mechanisms, we estimate the effect of same-sex manager appointments for workers in positions involving more or less routine cognitive tasks. We use Acemoglu and Autor's (2011) "routine cognitive" scores. They are implemented through a custom occupational cross-walk between the 4-digit federal service occupation codes and the 7-digit O*NET occupation codes. We coded occupations in the federal service with median or above-median routine cognitive scores as being more routine jobs, and those below-median were coded as being less routine jobs.[41] Figure 5C and 5D show less routineness amplifies the education results: the differential homophily effect on women comes from those in jobs with less routine tasks. Our second substantive finding is that, within education groups, the differential homophily effects are driven by women in jobs with less routine tasks (Figure 6), even among employees with less than a Bachelor's degree.

Over the period we study, women's education has increased considerably (Black and Juhn, 2000) as did the share of non-routine cognitive occupations (Acemoglu and Autor, 2011). The female management share has also increased. During the Reagan-Bush Era, 72% of men's new managers were men, while only 39% of women's new managers were women. By the Obama Era, male employees still received disproportionately more new male managers, but the gap had narrowed to 65% and 47%, respectively. To study the potential impacts of these mechanisms, Figure 7, presents our estimates by presidential cycles: Reagan and Bush 41 (1987–1992), Clinton (1993-2000), Bush 43 (2001–2008), and the first six years of Obama (2008-2014).[42] At first blush, the effects of female homophily seem to steadily increase across the eras, but they have to be

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[41]White-collar occupations in the federal service have routine cognitive scores ranging from -2.7 (e.g., occupational therapists) to 2.1 (e.g., bulk money handling), with a median of zero (e.g., library technician or research laboratory mechanic). Note we do not observe within-occupation changes in cognitive routineness; changes over time arise as the share of non-routine occupations increases. For example, when clerical jobs are replaced by administrative support positions.

[42]The Reagan and Bush era runs into the seam of our data and has a smaller sample compared to the later presidential eras: 4,205 compared with 6,670 in Clinton, 14,823 in Bush 43 and 8,593 in Obama.

distinguished from the above demographic and employment changes.

The differential effect of having a same-sex manager on female and male employees evolves over eras alongside female employees' places in the federal workforce, linked to changes in women's education and jobs (Figure 7). In the earliest era (Reagan-Bush 41) estimates are noisier, likely due to the initial seam of our sample. Male employees appear to benefit relatively more than female employees from having a same-sex manager. The homophily effects converge in Clinton Era and then are significantly stronger for women in the Bush 43 Era. They remain positive in the Obama Era, but the overall effects are dampened for everyone, likely due to a pay freeze during most of that period (2011-2014) that severely constrained managerial discretion.

To distinguish the changing time effects arising from changes in the composition of the female workforce and their roles, Figure 7 also includes the presidential era estimates for workers in occupations that involve less routine tasks, the group driving the earlier homophily effect estimates. Appendix Figure A.9 similarly singles out employees with at least a college degree. Among those in less routine jobs, the overall and differential homophily effects are fairly stable before 2001 but show larger increases in the Bush era. This result is consistent with Deming (2017) who finds increasing returns to non-cognitive skills, in particular social skills, in the 2000s. It also suggests that the growth in the differential homophily effects across eras reflects composition and job changes among female employees rather than changes in managerial homophily effects.

Next we ask if the effects of same-sex managers vary with the composition of the office (Figure 8). As with education and tasks, we find that the female homophily effects are far more affected by the office composition than male homophily effects. We first split the sample into employees with an above and below median share of same-sex employees (47%) in the first two quarters of employees' tenure in the federal service. The male homophily effects are unaffected by the employee composition of their offices. In contrast, the same-sex employee share in the office has a large effect on the female homophily effects. The female homophily effects are largest in offices with above median initial same-sex (female) employee shares. The resulting differential homophily effects are positive in above-median same-sex share offices and negative in below-median same-sex share offices. A similar but less stark pattern emerges when one compares the homophily effects across offices with above and below-median initial same-sex manager shares (46%). New same-sex managers increase female employees' pay the most when they are appointed

in offices with above-median initial same-sex (female) manager shares. Once again, the effects are largest for those in jobs with less routine tasks (Figure A.8). These results are consistent with the previous research (e.g., Flabbi et al. 2019) finding that female managers are relatively more effective at improving women's pay in more female friendly environments.

The analyses above show that the same-sex manager effects are robust to employee type and exist across presidential eras. In order to gain more insight into the mechanisms underlying our results we next ask whether the effects vary with the type of manager appointed. One might wonder, for example, whether younger generations are more immune to homophily. Gender norms, particularly around women's role in the workplace, have shifted across cohorts. While we did not find substantial differences in effects across presidential eras above, we nonetheless reproduce our estimates by manager age. We compare those who are 35 or younger when they first become managers (the first quartile) to those who are older than 35 (Figure 9B).[43] While the estimates for the former are much less precise, the point estimates across the groups are indistinguishable, suggesting that generational change will not eliminate the gender pay gaps.[44] This also suggests younger managers in the federal civil service are likely different from "fast track" managers in the private sector (Minni, 2022).

Finally, we compare the effects of new same-sex managers who are new to both the role and the office (external appointments) to those who worked at the office prior to their managerial appointment (internal appointments). Roughly half of the new managers we observe are external appointments. Those new to the office may, at least initially, be more at arms length and have fewer social ties with their employees. Consistent with recent studies demonstrating the importance of social ties in the workplace (Cullen and Perez-Truglia, 2022), our estimates of differential homophily effects are noticeably smaller when the new manager is an external hire (Figure 9A), although the differences are not statistically significant.

B. Threats to Identification and Sensitivity of Estimates

Our estimation strategy uses management turnover as a natural experiment. It is natural to ask whether the offices where male and female managers are appointed are comparable before their appointment. If, for example, women were more likely to be appointed as managers as part of a remediation scheme in offices with worsening gender gaps, our estimates would conflate the

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[43]The average and median new manager is approximately 45 years old.
[44]We failed to find any statistically significant differences across a number of manager age splits including those that isolated the oldest managers.

effect of same-sex managers on women with the circumstances of their appointment. Fortunately, that does not appear to be the case. The gender pay gaps are stable before a new manager and a new same-sex manager is appointed (the coefficients on the female employee interactions are 0 in the pre-event period, Table 2). It is also reassuring that external hires are not driving our results, as one might choose to bring in new leadership from outside the office when attempting to correct a problematic workplace culture or environment (Figure 9A).

Another possible concern is that the appointment of female managers was part of some higher level un-targeted gender initiative that also led to improvements in women's career trajectories. If that were the case, we might expect to see systemic effects from all female managers on all female employees. Instead, our effects are driven by those in offices that already have a critical mass of female managers and employees (Figures 8) and by employees in occupations where managerial attention and support are likely to be most important – those with less routine tasks.

One can never prove the absence of relevant unobserved variables, but both employees and offices that receive new male and new female managers and the workers who receive new same and opposite-sex managers appear comparable in the preceding year (Table 3). Female employees who receive new female managers have the same salaries, unexplained pay gaps, education levels, and federal job tenure as female employees who receive new male managers (Table 3, columns 1 and 2, and columns 5 and 6). The only notable exception is the share of female employees in the office – female managers are appointed at offices that have more female employees. This is, however, a fixed and stable difference that should be absorbed by the office fixed effects and not affect the event-study estimates. Additionally, while the stock of existing male and female managers differs modestly on observables, most notably education and birth cohort, newly appointed male and female managers have indistinguishable observable characteristics (Table A.2).

Consistent with the appointment of new male and female managers being independent of trends in their offices, our estimates are robust to numerous combinations of controls and fixed effects. Panel A of Figure 9 reproduces our main estimate from Figure 4B (the difference in the effect of same-sex managers on female and male employees: $\delta_k^f + \alpha_k^f$) alongside estimates from specifications that include individual fixed effects in lieu of individual fixed effects that vary when individuals change office and estimates that exclude office fixed effects in estimation of the residuals that are the dependent variables in event studies. The overall pattern of results is

unchanged across the specifications and the estimates are similar.

Roughly 40% of employees in the event-study sample change offices at some point in their government service. While getting a new manager may be a motivation for changing jobs our results are not driven by office moves. The effects are largely indistinguishable when the sample is restricted to employees who only work at one office during their careers (Figure 9D), and as shown below, the arrival of same-sex managers has at most a negligible effect on the rate of office moves. The estimates are also robust to excluding part-time workers and those with any part-time spells during their careers.[45] The estimates are similar, but notably smaller in magnitude when one expands the sample to include offices with up to 20 managers (Figure 9D). This is what one would expect as the treatment provided by the arrival of a new same-sex manager in a larger office is likely diluted. [46] Finally, the estimates are also robust to using the event-study sample for the entire estimation.

C. Mechanisms: Grades and Occupations

Compensation is an aggregate measure of workers' advancement. We next examine the direct effect of same-sex managers on the components directly affecting employee pay. In the highly structured system, managers can impact pay through merit increases in pay steps and expedited grade increases (our proxy for promotions). Managers may expend effort directly obtaining pay step or grade increases for their subordinates or direct them to the occupational upgrades required for such increases. They could also indirectly increase pay through performance evaluations (e.g., Oh and Lewis, 2013). We next test whether employees receive more pay grade increases and experience more occupational changes following the appointment of a new same-sex manager at their office.

Step increases can occur in consecutive years, but occupation and pay grade changes are less frequent. The average GS-pay-plan employee in our sample experiences just over three pay grade increases and 0.75 occupational changes during the observation period (Table 1). We therefore estimate the cumulative effect of same-sex managers on promotions using a two-way fixed effects difference-in-differences (TWFE-DiD) approach. Because each government pay scale has a different number and spacing of pay grades, we focus this analysis on the 90% of employees

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[45]The incidence of spells of part-time work is a notable difference between male and female employees: 12% of employees have at least one spell part-time work during their federal careers in the event-study sample (16% of female employees compared with only 7% of male employees). The estimates are virtually identical when the sample is restricted to employees who only work full-time throughout their entire federal careers.

[46]It is a smaller change in the overall management team and it is likely a smaller share of employees sees a change in their evaluator(s).

in our estimation sample under the GS pay scale. As in the event studies, we limit the sample to those receiving a new manager during the observation period and use residualized pay and GS grades as dependent variables.[47] For example, we estimate the impact of same-sex managers on residualized pay grade, P_{itq}, in TWFE-DiD among employees under the GS-schedule:

$$P_{itq} = \delta Post_{it} \cdot NSM_{idt} \cdot + \delta^f Post_{it} \cdot F_i \cdot NSM_{idt} + \alpha^f Post_{it} \cdot F_i$$
$$+ \gamma_i + \lambda_t + \epsilon_{itq},$$

(3)

where F_i is an indicator that equals 1 if the employee is female and NSM_{idt} is an indicator that equals 1 if the employee's first new manager is the same-sex as them and 0 otherwise. $Post_{it}$ takes on the value 1 after the new manager arrives and 0 before (replacing the event time indicators). The individual and time-fixed effects, γ_i and λ_t, absorb the first-order effects of F_i and $Post_{it}$, respectively.

Table 4 presents the resulting estimates for six outcomes of interest among employees at offices with up to 5 managers. In addition to the estimated coefficients of the arrival of a first new manager, α and α^f, and the estimated coefficients of the same-sex manager treatment, δ and δ^f, we present the sum of estimates (with standard errors) of female managerial homophily, $\alpha + \alpha^f + \delta + \delta^f$, male managerial homophily, $\alpha + \delta$, and of the difference between the two – differential homophily, $\alpha^f + \delta^f$. We confirm the robustness of our estimates to the recently identified issues with parallel pre-trend assumptions in staggered TWFE-DiDs (see, for example, Callaway and Sant'Anna, 2021 and Borusyak, 2021).[48] We use the heterogeneous effects version of the Borusyak (2021) estimator which computes estimates separately by sub-groups. Specifically we compute the same-sex manager effect separately for male and female employees. We report the resulting estimates and their difference in Table 4, columns 3, 6 and 9.

For reference and comparability with our earlier estimates, we begin by providing estimates for the GS pay scale employee sub-sample using the pay residual variable used in the earlier event study analysis (Panel A). Mirroring the event study results, the TWFE-DiD estimates show that female employees' residual pay increases roughly 1.5 log points more than male employees' pay following the appointment of a new same sex manager (1.4 log points with TWFE and

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[47] For comparability, the log pay residual is the remainder after controlling for location, age, education, tenure, part-time status, occupation, and office FEs in yearly regressions. The residualized GS grade is estimated using same regressions as the log pay residual.

[48] Borusyak (2021) proposes a new DiD estimator that is unbiased and efficient in staggered DiD settings in which two-way fixed effects may be biased, particularly those in which the already treated observations serve as problematic controls in two-way fixed effect estimation.

1.6 log points with Borusyak's heterogeneous treatment effects estimator (Table 4, columns 2 and 3). Next, we turn to the effect of new same-sex managers on pay grade.[49] Once again, female employees see faster progression following the appointment of a new same-sex manager – female employees see their residual GS grade increase by 0.15 more (roughly 10% of a standard deviation) than male employees who receive a same-sex manager (Table 4B). Once again, TWFE and Borusyak's heterogeneous effects method produce virtually identical estimates.

One way employees can increase their pay grades is to move into new roles with additional responsibilities or upgrade their skills. Next, we look at occupational changes. Managers could provide guidance about such opportunities and favorable assessments could facilitate such moves. We cannot observe the exact tasks of each worker, but we observe their occupational hierarchical rank.[50] In addition, changes in their detailed occupational codes will also reflect if their roles are evolving. To that end, we estimate Equation 3 using as dependent variable an indicator equal to one when the worker's occupational code changes.[51] We find that female employees experience significantly more occupation code changes overall and in comparison to male employees following the appointment of new same-sex managers. Female employees experience 0.07 more 4-digit occupation changes and 0.06 2-digit occupation changes after the appointment of a new same-sex manager than men (the average number of 4-digit and 2-digit occupation changes observed in our data are 0.33 and 0.20, respectively). These changes do not appear to be associated with office moves. There is no meaningful increase in office moves following the appointment of new same-sex managers, all the point estimates are less than 0.01 on a mean of 0.32 (Table 4C).

D.   Employee Sentiment

Managers' roles in workplaces extend beyond formal employee performance reviews. We seek to test whether employees' subjective views align with our objective finding that women's presence on management teams improves women's career trajectories. The Federal Employee Viewpoint Survey (FEVS) is administered by OPM and is designed to provide a representative snapshot of employee experiences and perceptions of agency management (OPM, 2014).[52] It

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[49]We residualize pay grade in a similar manner to pay using the same controls and equations as discussed in Section IV.A.

[50]We observe the following broad occupation categories: Professional, Administrative, Technical, Clerical, Other white collar occupations. Moves from a clerical to an administrative jobs would present opportunities for further increases in pay.

[51]Occupation codes can change for a number of reasons including systemic re-coding of a whole employee group. However, these should affect all workers and not be systemically correlated with the arrival of a new same-sex manager.

[52]The FEVS takes an annual probability sample from the population of permanent federal employees. Each year's sampling frame is designed to produce results that are representative of the federal workforce overall, and at the agency and sub-agency levels. Originally administered as the Federal Human Capital Survey (FHCS) in 2002, it was administered bi-annually until 2010, when it became an annual survey. Additional information on the FEVS is available at: https://www.opm.gov/fevs/about/

is regularly used by the government to evaluate human resource policies and programs. Each iteration of the survey contains demographic information on the respondents along with their responses to questions about their workplaces and their experiences in them.[53]

We link data on women's presence in management teams to employee survey data to examine the relationship between women's presence in management and employees' experiences in the workplace. Because the FEVS is an anonymous survey, we cannot link individual respondents to their payroll data. Instead, we link each employee's survey responses to the characteristics of the management teams at their agencies. For comparability with the preceding event-study analysis, we restrict the sample to the 29 agencies that appear in that sample and in the OPM survey.[54] The FEVS Public Release Data Files begin in 2006. We use the 2006-2014 surveys in the analysis that follows.

Table 5 presents OLS estimates of employee sentiment regressed on indicators for the respondent being a female employee, the majority of her agency's management being of the same sex, their interaction and agency and year fixed-effects. The dependent variables are employees' stated views on job satisfaction, pay satisfaction, recognition, promotion of diversity, no tolerance for discrimination, and trust in supervisor. Employees respond on a 5 point scale with 5 indicating the most satisfaction or agreement. The regression estimates show a significant female disadvantage across the survey areas with the notable exception of pay satisfaction. As in the event studies, the estimates show a differential homophily effect for female employees. Having a high share of same-sex managers is more important for female employees than for men. This is consistent with our event-study estimates showing that same-sex managers matter more for women's careers, particularly when they are a critical mass.

VI. Discussion

In this paper, we estimate the causal effect of differential managerial homophily on the pay of men and women, purged from deterministic (e.g., locality adjustments) and human capital (e.g., education) considerations. We argue that for any particular employee in the office, whether this new manager is of the same sex as the employee or not is as good as random. This assumption is supported by the parallel trends in the pay trajectories of female and male employees prior to the arrival of their new manager and the balance in observed characteristics of the employees

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[53]The 98-item survey covers eight topic areas: personal work experiences, work unit, agency, supervisor, leadership, satisfaction, work/life, and demographics. It includes questions of the form: "How satisfied are you with....."'
[54]We use the survey weights provided by OPM (OPM, 2014).

who received same and opposite-sex managers. We also show that female and male managers are comparable and that the offices they come from are similar (Table A.2 and Table 3).

These tests help alleviate concerns that new managers could be appointed as part of a remediation scheme targeting problematic workplaces. Indeed, the gender pay gaps are found to be stable prior to the appointment of new same-sex managers, as evidenced by the zero coefficients on the female employee interactions (Table 2). The parallel pay trajectories prior to the event also do not show any sign of an Ashenfelter dip. Further, the treatment effect heterogeneity we observe is inconsistent with any potential remediation scheme. We do not find that managers appointed from outside of the office, or in offices with few female managers, or who are younger give higher raises to female employees. Pay raises appear larger when managers are internally promoted (Figure 9A), when there is a critical mass of employees or managers in the office (Figure 8), but not when they are relatively young (Figure 9B). Instead, our results are more consistent with the social closeness hypothesis which we propose at the outset. In addition, employees whose jobs are less routine benefit from larger pay increases across education levels (Figure 6) and Presidential eras (Figure 7). This suggests that managers can exercise more discretion in these cases.

The range of the effects of managerial homophily on residualized pay appears large but is consistent with pay grade increases. Indeed when we explore the mechanisms by which new managers raise pay, our TWFE-DID analysis confirms not only larger pay grade increases for women getting new same-sex managers, but also increases in the probability of occupational upgrading (Table 4). We do not know what motivates new managers to expend effort to improve their employees' pay. An important issue in the literature on the US federal service is employee retention. Here, our analysis shows no meaningful effect of managerial changes on office switching (Table 4). Admittedly, it is limited by the fact that we do not follow workers leaving the federal service (unlike Foster *et al.*, 2020). We have chosen to assess the impact of immediate supervisors and, thus, cannot speak to the potential effects of higher-level management initiatives, which are beyond the scope of the paper. Nevertheless, many expected larger effects during the more progressive Obama Era. We did not find that to be the case, but that may be due to the pay freezes implemented during that era.

Some statistical theories of discrimination emphasize the noisiness or bias in the productivity signal of the minority group by comparison with the majority group to explain the pay or

promotion differentials between the majority and minority groups. These theories would be compatible with the fact that female managers are able to get higher pay increases for their employees irrespective of their gender and thus sort through the noisiness of the signal for all workers better than male managers (Figure A.3). This differential result is heightened when employees work in less routine jobs (Figure 5). By comparison with the private sector, the federal civil service has more uniform control for qualifications and performance measurement, and skills unobserved by the econometrician appear neutralized in the parallel pre-event trends in residualized pay.

VII.   Conclusion

The US Federal civil service provides a unique environment to study the potentially gendered impact of new managers on the pay of white-collar subordinates. The US Government is a large employer with over 1 million civilian employees spread throughout the country, covering a wide range of occupations and sectors whose levels of pay and pay differentials echo those found in the broader economy. A wide-ranging and well-documented set of rules and legislation constrains the federal service pay setting, with compliance closely monitored by a strong union and large bureaucracy. Yet, federal pay varies more with gender and race than can be explained by observed qualifications (Olson et al, 2000; Lewis and Oh, 2009; Oh and Lewis, 2013). We show that the demographic diversity of managers plays a role in these disparities.

We bring over thirty years of rich longitudinal data from this setting to the task of identifying the causal effects of managerial homophily on employees' career trajectories. The movement of women into managerial roles over the last 30 years has reduced the homophily imbalance: 48% of female employees' new managers were women at the end of our period up from only 36% at the beginning. We exploit over 15,000 employees' first managerial team changes in an event-study design to estimate the same-sex manager effect. These estimates are robust to alternate samples, specifications, controls, fixed effects, and treatment definitions. We find that the appointment of same-sex managers has larger effects on the career trajectories of women. The differential homophily effect on residual pay is approximately 1.5 log points. For comparison, this roughly equivalent to half a step increase within a pay grade, and is close to half the average residual gender gap of 2.7 log points (Table 1, row 3).

We find substantial treatment effects heterogeneity by education and routineness of the employees' occupations. We find the largest effects for women in occupations with less routine tasks – a group where there is potentially more scope for discretionary evaluation. Effects are

also larger when newly appointed managers come from internal appointments, who may have more established social ties with their workers.

We confirm the differential promotion (pay grade) mechanism behind these effects by directly estimating the effect of homophily on pay grade increases. In the years following the appointment of a new manager, female employees receive significantly more pay grade increases if that new manager is of the same sex. The actions through which female managers speed the progression of female employees are beyond the scope of this paper and are a fruitful topic for future research. Such actions could include the assignment of "promotable" tasks, making them more likely to be eligible for performance-related pay increases. It is also possible that female employees are more effective at self-promotion or more likely to pursue pay increases when they have a female manager.

These findings sound a cautionary note for studies that estimate pay disparities conditional on pay grade or algorithmic score or job title. When the inputs into an algorithmic or deterministic pay setting are the product of discretionary decisions by human actors, the adoption of algorithmic or deterministic pay settings will formally incorporate these biased disparities. Then the adoption of these schemes will mask and deceptively rationalize disparities instead of eliminating them. That is indeed the case here. Figure 3 plots the unexplained pay gap with and without accounting for workers' potentially endogenous pay grades. It shows that the assignment of men and women to pay plan grades appears to "close the gender pay". Most (85%) of the unexplained pay gap over time operates through workers' placement on the pay grid – a decision heavily influenced by their managers and their gender.

Our findings also provide insights into the effects of policy innovations aimed at reducing the gender gap. Policies such as bans on asking about salary history at hiring and pay transparency initiatives (Baker et al., 2019) have focused on giving employees the knowledge to improve their salary position. This could close gender gaps among men and women in the same roles, but will not address gender gaps that arise due to similarly situated men and women rising through the ranks at different rates and ending up in different boxes. Similarly, salary history bans may prevent past pay disparities at previous employers from propagating to new positions, but they will not prevent disparities in promotions and roles from influencing future pay. This is consistent with initial research on these initiatives, which finds they modestly (1%) reduce the gender gap, primarily among new hires (Hansen and McNichols, 2020; Davis et al., 2021).

Our results show the critical role managers play in their employees' progress through career and salary ladders, particularly early in their careers.

While the federal service encompasses a wide range of occupations and industries, we can only speculate as to the effects of female managers in the private sector. The civil service's pay system is, on average, more highly regulated and deterministic than many of those found in the private sector. Gender gaps in managers' assessments of subordinates are larger on more subjective measures (e.g. employee's potential) than on more concrete measures such as past productivity (Benson, Li and Shue, 2022). It is thus likely that, if anything, direct supervisors plays an even larger role in career progression in the private sector.

A disheartening aspect of the narrowing of the US gender pay gap over the last forty years is the fact that the share of the pay gap unexplained by traditional employee-based characteristics has been increasing, particularly at the upper end of the wage distribution (Fortin et al., 2017). Given the historical under-representation of women in management, our findings suggest managers are a key hidden factor in the previously unexplained gender gap. As the Presidential eras analyses illustrate, managerial homophily has grown in importance in women's career trajectories as they have gained more education and occupations with less routine tasks have become more prevalent.

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Figures and Tables
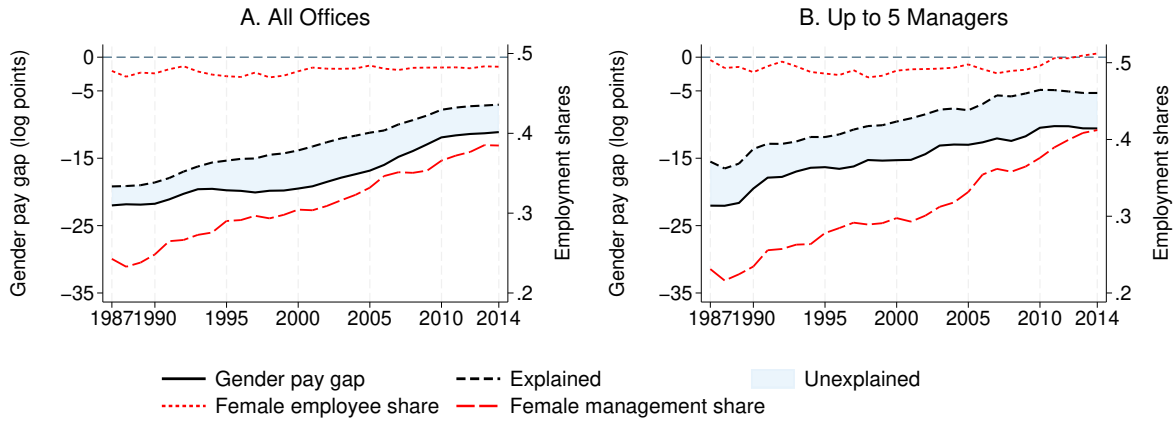
FIGURE 1. GENDER PAY GAP AND FEMALE EMPLOYMENT

Note: The "All offices" sample in Panel A is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees, and born in the year starting 1955. Panel B further restricts the sample to offices with no more than 5 managers. The "Explained" pay gap is the gender pay gap that can be explained by locality FE, education, occupation, age, and age^2. Both female management share and female employee share are based on the managers and employees whose gender we were able to identify.

A. Distribution of Managers (All Offices)

B. Arrival of New Managers (Up to 5 Managers)
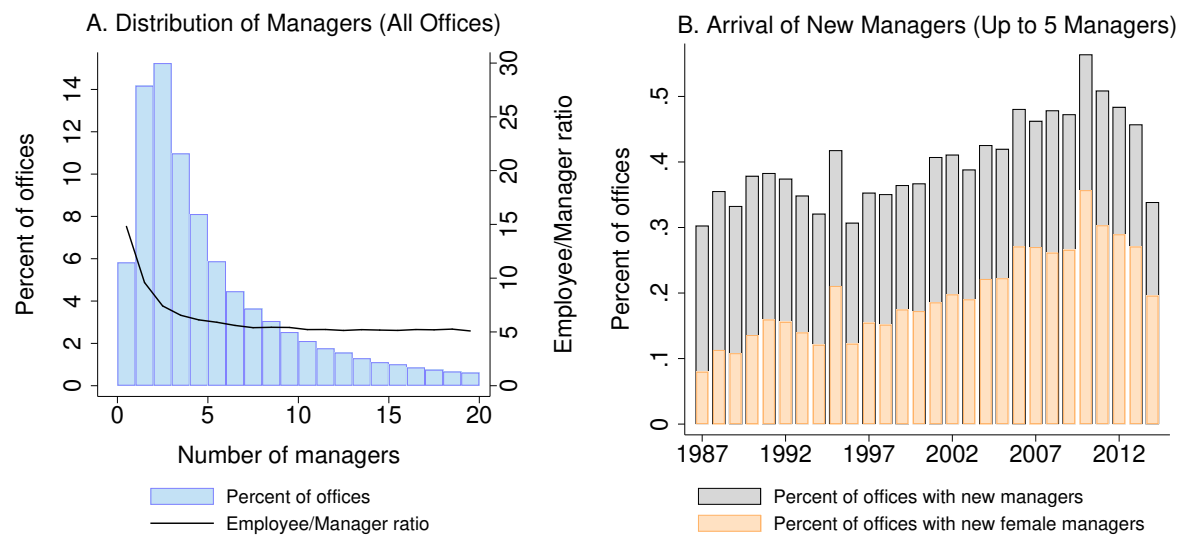
FIGURE 2. MANAGERS ACROSS OFFICES

Note: The samples are defined as in Figure 1. The display in Panel A however omits offices with more than 20 managers. There are 11,964 offices in the "All offices" sample: 1,791 offices have more than 20 managers in at least one year while 11,177 offices have 20 managers or less in at least one year.
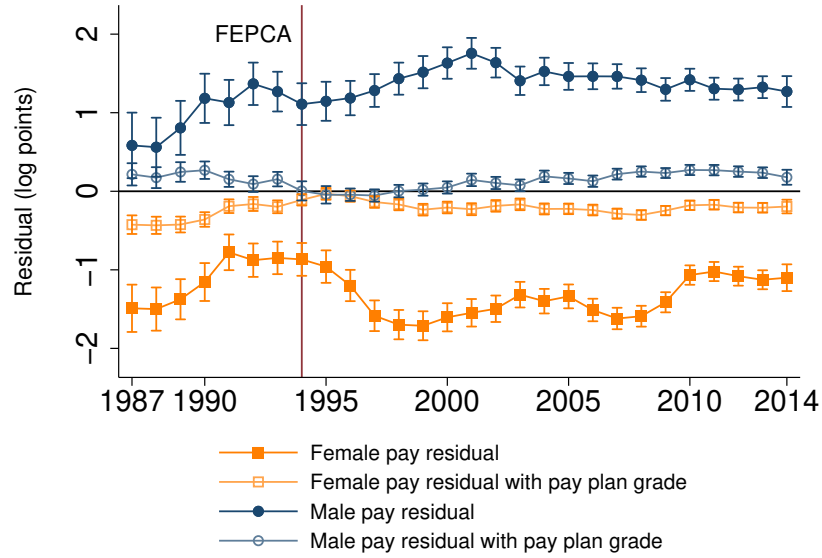
FIGURE 3. PAY RESIDUALS BY GENDER

Note: The sample is the "Up to 5 managers" as defined in Figure 1B. Female and male pay residuals are from yearly regressions of individuals' log pay on localities of offices, birth year bins, education, tenure, occupation, and office FEs. Vertical bars represent 95% confidence intervals with standard errors clustered by office.

Quarterly Event Time

A. Same−Sex Manager Effects by Gender

Female emp & mngr — Male emp & mngr

B. Differential Same−Sex Manager Effects

Female − male same−sex mngr ($\delta^t + \alpha^t$)

Yearly Event Time

C. Same−Sex Manager Effects by Gender

Female emp & mngr — Male emp & mngr

D. Differential Same−Sex Manager Effects

Female − male same−sex mngr ($\delta^t + \alpha^t$)
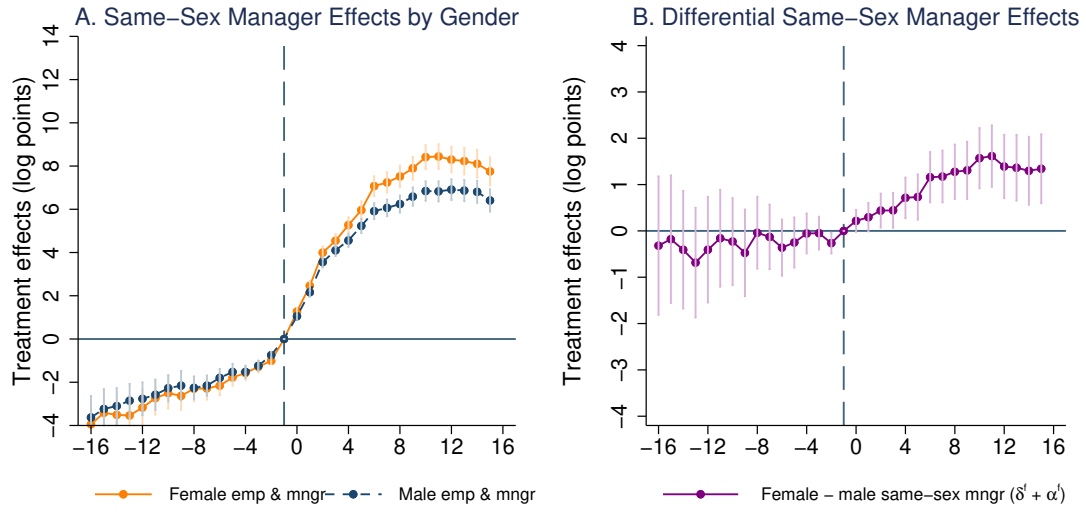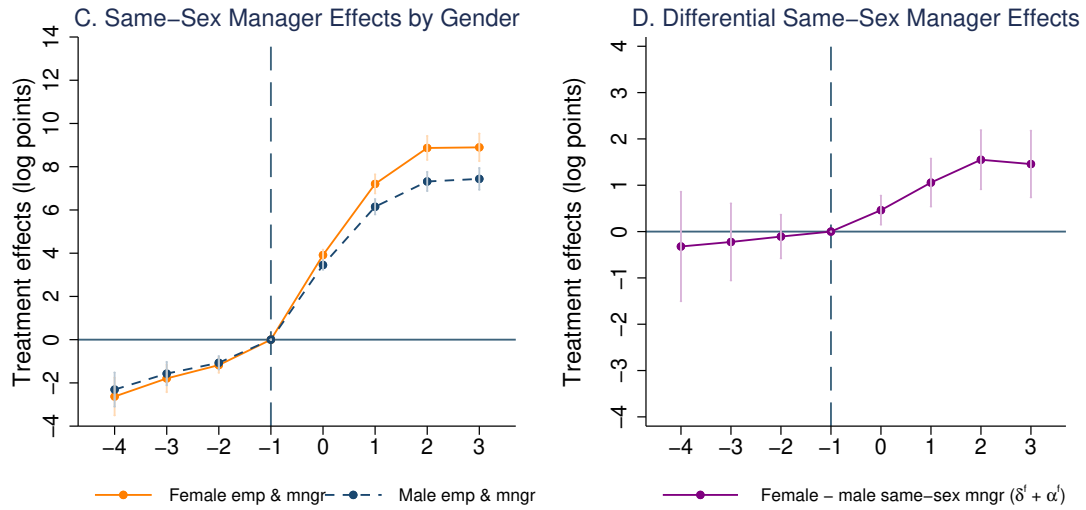
FIGURE 4. EVENT STUDY ESTIMATES: EFFECTS OF FIRST NEW MANAGERS

Note: The event-study sample is the sub-sample of employees in the "Up to 5 managers" sample who receive a first new manager. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Point estimates and standard errors are reported in Tables 2 and B.1. Vertical bars represent 95% confidence intervals with standard errors clustered by office.
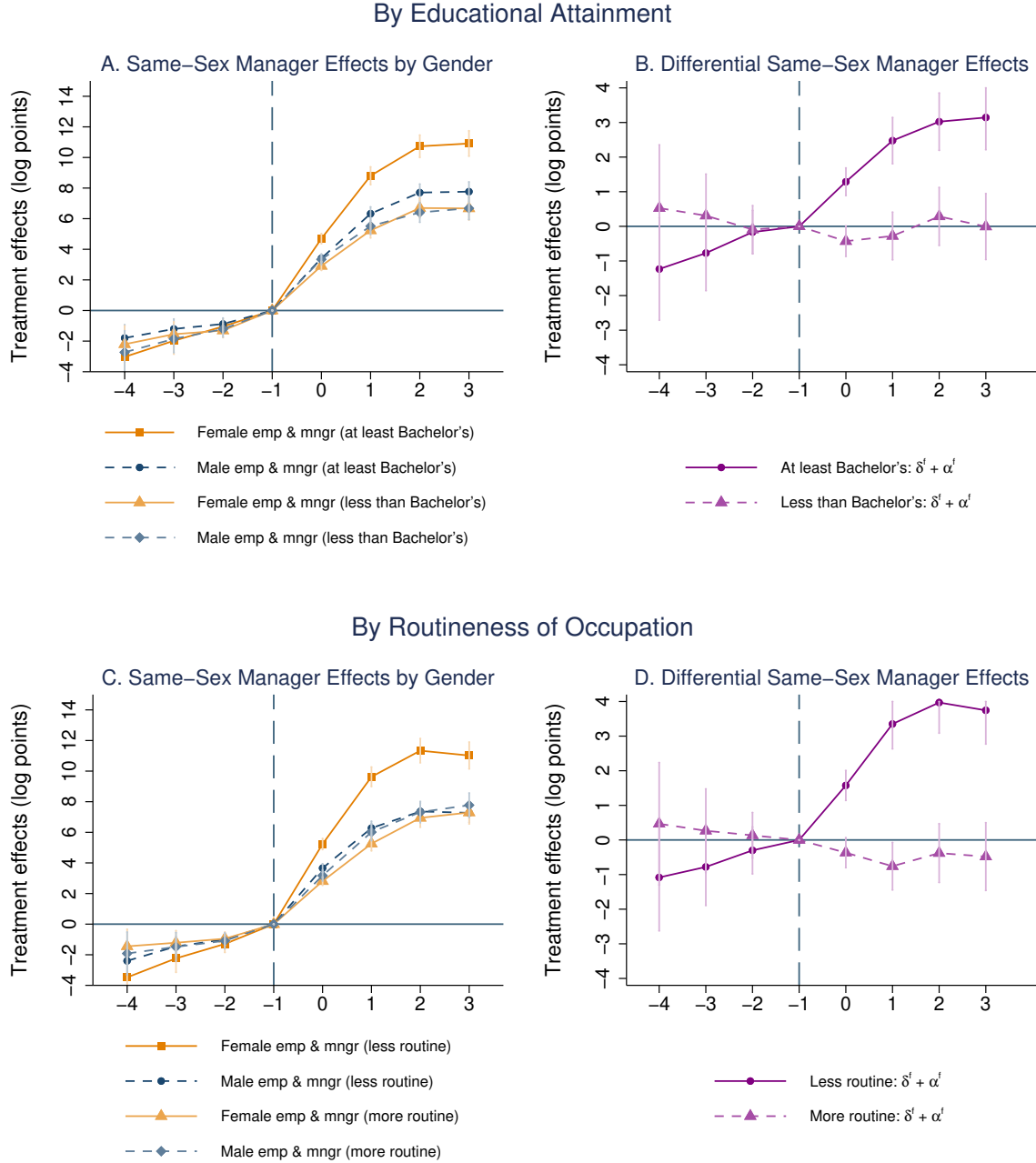
FIGURE 5. EVENT STUDY ESTIMATES BY EDUCATIONAL ATTAINMENT AND OCCUPATIONAL ROUTINENESS

Note: Treatments effects and specification are defined as in Figure 4. Panels A and B split the sample from Figure 4 into employees with at least a Bachelor's degree and those with less than a Bachelor's degree. Panels C and D split the sample from Figure 4 into employees by routineness of occupations, defined by below-median and above-median routine cognitive score (see footnote ?? for details). Point estimates and standard errors are reported in Tables B.2 and B.3. Vertical bars represent 95% confidence intervals with standard errors clustered by office.
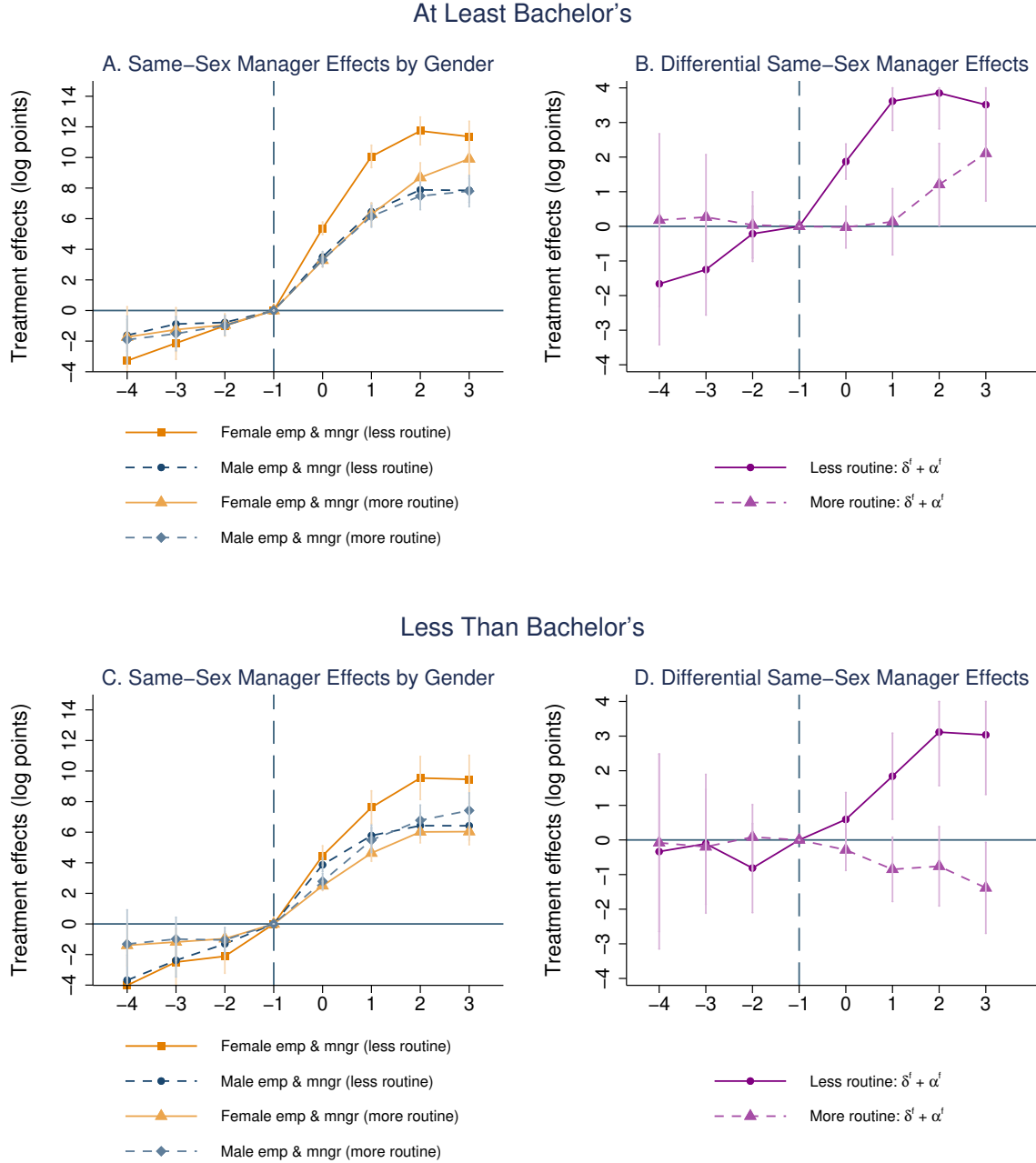
FIGURE 6. HETEROGENEITY OF OCCUPATIONAL ROUTINENESS ESTIMATES BY EDUCATIONAL ATTAINMENT

Note: Treatments effects and specification are defined as in Figure 4. Panels A and B split employees with at least a Bachelor's degree from Figure 5 into employees with less routine and more routine occupations. Panels C and D split employees with less than a Bachelor's degree from Figure 5 into employees with less routine and more routine occupations. Less routine and more routine occupations are as defined in Figure 5. Point estimates and standard errors are reported in Tables B.4 and B.4. Vertical bars represent 95% confidence intervals with standard errors clustered by office.
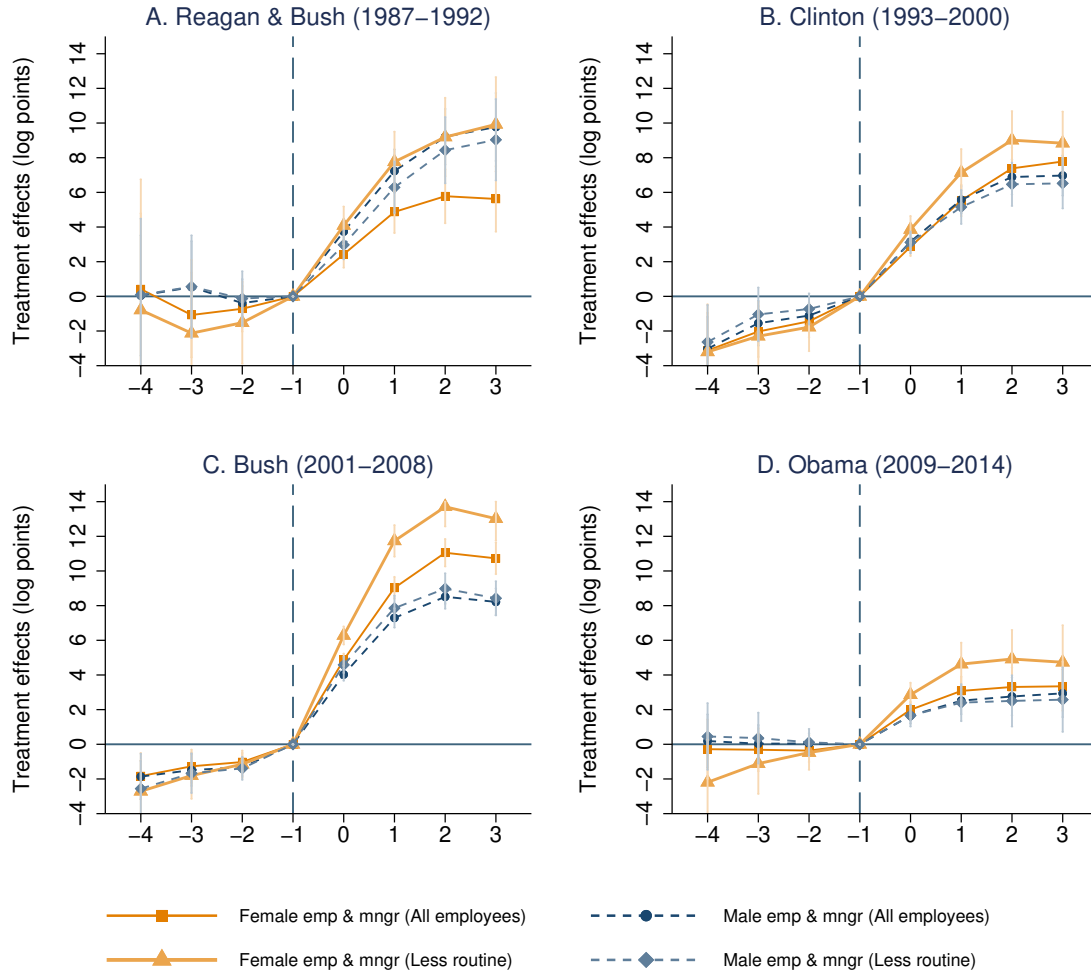
FIGURE 7. EVENT STUDY ESTIMATES BY PRESIDENTIAL ERAS

Note: Treatments effects and specification are defined as in Figure 4. The Figure displays estimates for each presidential era. Employees are assigned to the era they received their first new manager. There are 4,205 employees in the Reagan and Bush (1987-1992) sample, 6,670 employees in the Clinton (1993-2000) sample, 14,823 employees in the Bush (2001-2008) sample, and 8,593 employees in the Obama (2009-2014) sample. The subsample of employees with less routine occupations is defined in Figure 5. There are 2,223 employees in the Reagan and Bush (1987-1992) era, 3,872 employees in the Clinton (1993-2000) era, 8,495 employees in the Bush (2001-2008) era, and 4,651 employees in the Obama (2009-2014) era. Point estimates and standard errors are reported in Tables B.6, B.7, B.8, and B.9. Vertical bars represent 95% confidence intervals with standard errors clustered by office.

By Share of Same–Sex Employees

A. Same–Sex Manager Effects by Gender

B. Differential Same–Sex Manager Effects

Legend (Panel A):
- Female emp & mngr (above median)
- Male emp & mngr (above median)
- Female emp & mngr (below median)
- Male emp & mngr (below median)

Legend (Panel B):
- Above median: $\delta^t + \alpha^t$
- Below median: $\delta^t + \alpha^t$

By Share of Same–Sex Managers

C. Same–Sex Manager Effects by Gender

D. Differential Same–Sex Manager Effects

Legend (Panel C):
- Female emp & mngr (above median)
- Male emp & mngr (above median)
- Female emp & mngr (below median)
- Male emp & mngr (below median)

Legend (Panel D):
- Above median: $\delta^t + \alpha^t$
- Below median: $\delta^t + \alpha^t$

FIGURE 8. EVENT STUDY ESTIMATES BY INITIAL SHARE OF SAME-SEX MANAGERS AND EMPLOYEES

Note: Treatments effects and specification are defined as in Figure 4. Panels A and B split the sample from Figure 4 into employees with an above and below median share of same-sex employees (i.e. 47.45%) in the first two quarters of employees' tenure. Panels C and D split the sample from Figure 4 into employees with an above and below median share of same-sex managers (i.e. 45.65%) in the first two quarters of employees' tenure. Point estimates and standard errors are reported in Tables B.10 and B.11. Vertical bars represent 95% confidence intervals with standard errors clustered by office.
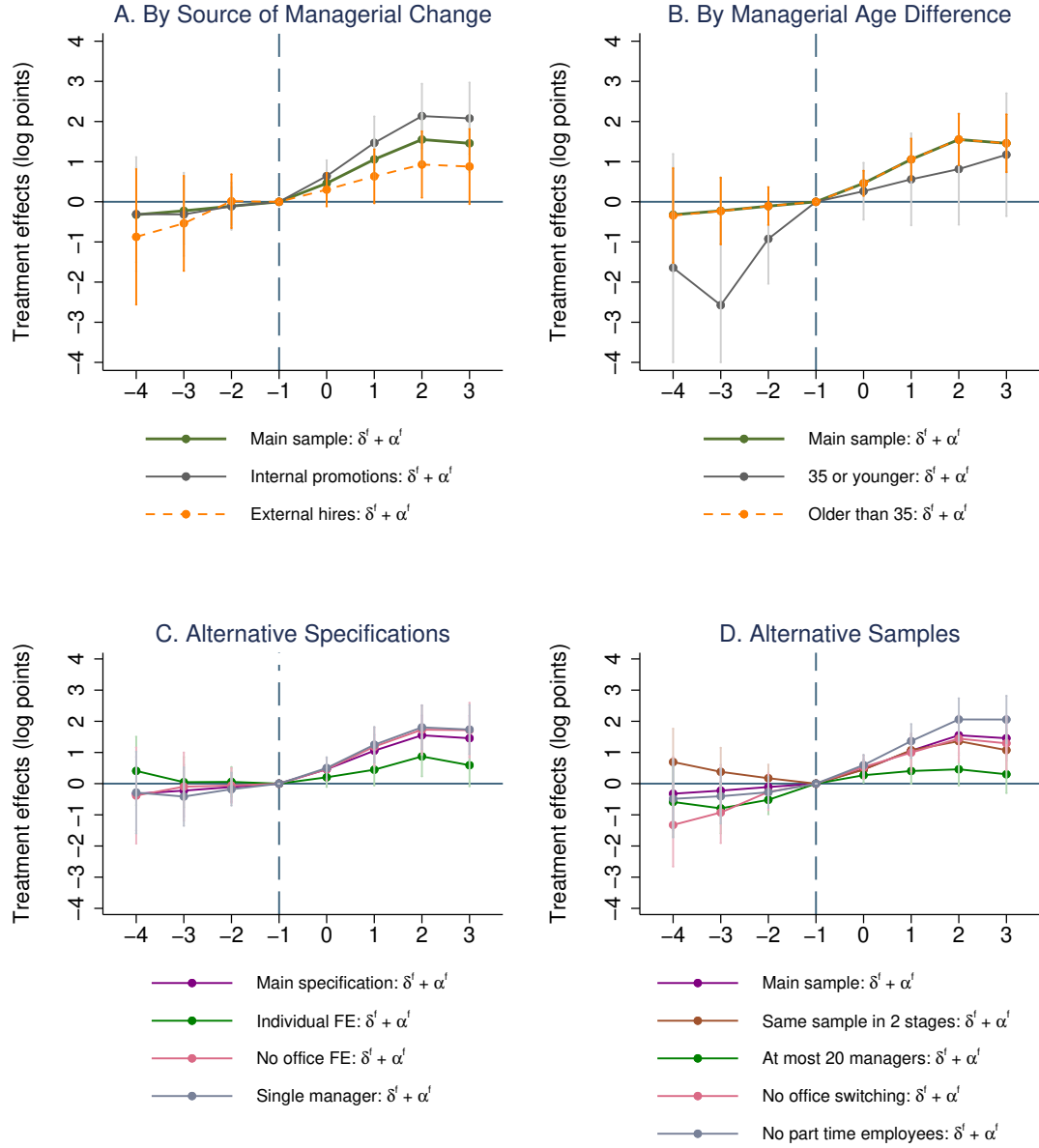
FIGURE 9. EVENT STUDY ESTIMATES HETEROGENEITY: MANAGERIAL CHANGE AND SENSI-TIVITY ANALYSIS

Note: Treatments effects and specification are defined as in Figure 4. Each line plots differential homophily effect estimates from a separate regression using equation 2. "Main Sample" is the event-study sample and reproduces the differential homophily effect from Figure 4B for reference. Panel A splits the event study sample by the manager's previous location of employment. The "external hires" estimates are from employees whose new manager had not previously worked at the office, and "internal hires" are from employees whose new managers had previously worked at the office as employees. Panel B splits the event study sample by the age of the new manager at appointment. The "35 or younger" and "older than 35" estimates are from the subsamples of employees whose new manager was that age at appointment. Panel C uses "individual FE" instead of individual-office FEs. "No office FEs" estimates exclude office FEs in the first stage, but include individual-office FEs in the second stage. "Single manager" only includes employees treated with a single first new manager. In Panel D, "same sample in 2 stages" uses the event study sample in both the first and second stages. The "At most 20 managers" sample includes all employees working in offices with at most 20 managers in the quarter prior to getting a first new manager. "No office switching" excludes 40% of employees that switch offices at any point in the sample. "No part-time employees" excludes the 8% of employees who have a part-time spell during their federal service. Point estimates and standard errors are reported in Table B.12. Vertical bars represent 95% confidence intervals with standard errors clustered by office.

TABLE 1—DESCRIPTIVE STATISTICS – OFFICES UP TO 5 MANAGERS

Sample	Female employees		Male employees	
	All employees (1)	Event study (2)	All employees (3)	Event study (4)
Panel A: Outcomes				
Salary	50,633	50,051	57,781	57,142
	(23,654)	(22,949)	(26,090)	(25,714)
Log salary	10.72	10.72	10.86	10.85
	(0.48)	(0.47)	(0.47)	(0.46)
Unexplained log salary (x100)[a]	-1.32	-1.66	1.38	1.10
	(17.48)	(17.49)	(18.35)	(18.49)
N pay plan changes	0.02	0.01	0.03	0.02
	(0.29)	(0.14)	(0.23)	(0.22)
N grade changes (GS sample)	2.98	3.05	2.78	2.91
	(1.96)	(1.93)	(1.84)	(1.82)
Panel B: Individual characteristics				
Birth year 1955-1960	0.22	0.19	0.23	0.20
	(0.42)	(0.39)	(0.42)	(0.40)
Birth year 1960-1965	0.24	0.21	0.25	0.23
	(0.43)	(0.41)	(0.43)	(0.42)
Birth year 1965-1970	0.21	0.21	0.21	0.21
	(0.41)	(0.41)	(0.41)	(0.41)
Birth year 1970-1975	0.14	0.16	0.14	0.16
	(0.35)	(0.37)	(0.35)	(0.37)
Birth year 1975-1980	0.10	0.12	0.09	0.11
	(0.30)	(0.33)	(0.29)	(0.31)
Birth year 1980+	0.08	0.10	0.07	0.09
	(0.27)	(0.30)	(0.26)	(0.28)
Education: High school or less	0.21	0.20	0.14	0.14
	(0.41)	(0.40)	(0.35)	(0.35)
Education: Some college	0.30	0.29	0.21	0.19
	(0.46)	(0.45)	(0.40)	(0.39)
Education: Bachelor's degree	0.36	0.40	0.48	0.49
	(0.48)	(0.49)	(0.50)	(0.50)
Education: Graduate degree	0.12	0.12	0.18	0.18
	(0.33)	(0.32)	(0.38)	(0.38)
Tenure (years)	8.69	7.29	9.09	7.87
	(6.60)	(5.93)	(6.73)	(6.24)
Panel C: Workplace characteristics				
Female employee share at office	0.44	0.46	0.37	0.38
	(0.22)	(0.21)	(0.22)	(0.21)
Female management share at office	0.28	0.30	0.25	0.26
	(0.31)	(0.31)	(0.30)	(0.29)
N offices	9,890	6,925	9,280	6,457
N unique individuals	43,663	16,852	39,350	14,265
N individuals with part time spell	5,521	2,770	1,877	987
N treated individuals	16,852	16,852	14,265	14,265
N person quarters	1,178,351	723,911	990,484	594,845

Note: The "Up to 5 managers" sample has the same tenure, office size, and cohort restrictions as in Figure 1B. The event study sample further restricts the sample to employees who experienced an appointment of a first new manager, as explained in section III.B. Panel C is at the office–quarter level. Standard deviations are in parentheses.

[a] Unexplained log pay is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details.

Table 2—Event Study Estimates: Effects of First New Managers

Event year	New same-sex mngr (δ)	New same-sex mngr*female (δ^f)	New mngr (α)	New mngr*female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)
-4	-0.09	-0.69	-2.22***	0.36	-0.32
	(0.63)	(0.88)	(0.50)	(0.62)	(0.60)
-3	-0.06	-0.74	-1.51***	0.51	-0.22
	(0.47)	(0.64)	(0.38)	(0.46)	(0.42)
-2	-0.03	-0.57	-1.04***	0.46*	-0.11
	(0.25)	(0.35)	(0.20)	(0.25)	(0.24)
0	-0.62***	1.16***	4.07***	-0.70***	0.46***
	(0.17)	(0.24)	(0.14)	(0.16)	(0.16)
1	-1.29***	2.62***	7.44***	-1.56***	1.06***
	(0.27)	(0.39)	(0.23)	(0.25)	(0.26)
2	-1.93***	3.67***	9.25***	-2.12***	1.55***
	(0.33)	(0.48)	(0.29)	(0.32)	(0.33)
3	-2.08***	3.77***	9.52***	-2.31***	1.46***
	(0.37)	(0.54)	(0.34)	(0.36)	(0.37)
N offices	8,377	8,377	8,377	8,377	8,377
N unique individuals	31,117	31,117	31,117	31,117	31,117
N person-qtrs	1,318,756	1,318,756	1,318,756	1,318,756	1,318,756

Note: The event-study sample is the sub-sample of employees in the "Up to 5 managers" sample who receive a first new manager. All event study specifications include quarter-year and individual-office FEs, see event-study equation 2. Estimates are event-year treatment effects reported in log points. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details.
Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

TABLE 3—BALANCE: PRE-EVENT YEAR EMPLOYEE AND WORKPLACE CHARACTERISTICS

Sample average	Female employees		Male employees	
	New female mngr	New male mngr	New female mngr	New male mngr
	(1)	(2)	(3)	(4)
Panel A: Outcomes				
Log salary	10.45	10.42	10.58	10.58
	(0.44)	(0.46)	(0.43)	(0.46)
Unexplained log	-7.86	-7.81	-7.25	-5.68
salary (x100)[a]	(18.78)	(18.90)	(20.73)	(20.31)
GS grade [b]	7.13	7.22	8.08	8.40
(GS sample)	(2.63)	(2.75)	(2.72)	(2.84)
Panel B: Individual characteristics				
Birth year	0.14	0.16	0.14	0.16
1955-1960	(0.34)	(0.37)	(0.35)	(0.37)
Birth year	0.17	0.18	0.17	0.19
1960-1965	(0.38)	(0.39)	(0.37)	(0.39)
Birth year	0.19	0.19	0.19	0.19
1965-1970	(0.39)	(0.39)	(0.39)	(0.39)
Birth year	0.17	0.17	0.18	0.18
1970-1975	(0.38)	(0.38)	(0.39)	(0.38)
Birth year	0.16	0.15	0.15	0.15
1975-1980	(0.37)	(0.36)	(0.36)	(0.35)
Birth year	0.17	0.15	0.17	0.14
1980+	(0.37)	(0.35)	(0.38)	(0.35)
Education:	0.18	0.19	0.12	0.16
High school or less	(0.38)	(0.39)	(0.33)	(0.37)
Education:	0.29	0.27	0.21	0.21
Some college	(0.46)	(0.45)	(0.40)	(0.41)
Education:	0.4	0.39	0.49	0.45
Bachelor's degree	(0.49)	(0.49)	(0.50)	(0.50)
Education:	0.12	0.15	0.18	0.18
Graduate degree	(0.33)	(0.35)	(0.39)	(0.38)
Tenure (years)	1.97	2.19	2.56	2.92
	(2.79)	(3.06)	(3.57)	(3.77)
N unique individuals	7,066	8,325	4,228	8,285
N person quarters	24,648	28,705	14,682	28,586

	Panel C: Workplace characteristics	
	New female mngr	New male mngr
Female employee share at office	0.54 (0.21)	0.38 (0.22)
Female management share at office	0.35 (0.35)	0.24 (0.31)
N offices	3,235	4,446

Note: The sample is the event-study sample from Table 2. Columns (1) and (3) include female and male employees who receive new female managers and columns (2) and (4) include employees who receive new male managers. Workplace characteristics are at the office-quarter level. Standard deviations are in parentheses.
[a] Unexplained log pay is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details.
[b] GS grade is summarized at the time of arrival of the first new manager for the subsample of employees working under the GS schedule, which includes 90% of workers in the event-study sample.

TABLE 4—DID ESTIMATES OF SAME-SEX MANAGER EFFECTS ON PAY, GRADE, AND OCCUPATION SWITCHING (GS SAMPLE)

	TWFE (1)	TWFE (2)	Borusyak (3)	TWFE (4)	TWFE (5)	Borusyak (6)	TWFE (7)	TWFE (8)	Borusyak (9)
	Panel A: Log pay residual (X100)			Panel B: Residualized GS Grade			Panel C: Office Switching		
Same-sex manager		-1.148***			-0.105***		-0.005*	-0.005*	
(δ)		(0.320)			(0.030)		(0.003)	(0.003)	
Same-sex manager*female		3.157***			0.298***		0.006	0.006	
(δ^f)		(0.464)			(0.044)		(0.004)	(0.004)	
New manager		7.657***			0.632***		0.008***	0.006***	
(α)		(0.266)			(0.025)		(0.002)	(0.002)	
New manager*female		-1.782***			-0.148***		-0.003	-0.004	
(α^f)		(0.311)			(0.030)		(0.003)	(0.003)	
Female employee and manager		7.884***	8.137***		0.677***	0.709***	0.007***	0.003	0.001
($\delta + \delta^f + \alpha + \alpha^f$)		(0.242)	(0.259)		(0.024)	(0.026)	(0.002)	(0.002)	(0.003)
Male employee and manager		6.509***	6.536***		0.527***	0.542***	0.003*	0.001	0.002
($\delta + \alpha$)		(0.212)	(0.240)		(0.019)	(0.022)	(0.002)	(0.002)	(0.002)
Female - male same-sex manager		1.375***	1.601***		0.150***	0.167***	0.004	0.002	0.001
($\delta^f + \alpha^f$)		(0.311)	(0.324)		(0.029)	(0.031)	(0.003)	(0.003)	(0.003)
	Panel D: Occupation category change			Panel E: 4-Digit Occupation change			Panel F: 2-Digit Occupation change		
Same-sex manager	-0.009	-0.008		-0.029***	-0.024***		-0.032***	-0.020***	
(δ)	(0.007)	(0.007)		(0.008)	(0.006)		(0.006)	(0.005)	
Same-sex manager*female	0.018	0.014		0.035***	0.020**		0.062***	0.036***	
(δ^f)	(0.011)	(0.011)		(0.011)	(0.009)		(0.010)	(0.007)	
New manager	0.022***	0.011**		0.053***	0.045***		0.022***	0.016***	
(α)	(0.005)	(0.005)		(0.006)	(0.005)		(0.005)	(0.004)	
New manager*female	0.091***	0.089***		0.053***	0.021***		0.047***	0.019***	
(α^f)	(0.007)	(0.007)		(0.008)	(0.006)		(0.007)	(0.005)	
Female employee and manager	0.013***	0.106***	0.111***	0.113***	0.063***	0.075***	0.098***	0.051***	0.065***
($\delta + \delta^f + \alpha + \alpha^f$)	(0.004)	(0.006)	(0.007)	(0.006)	(0.005)	(0.005)	(0.006)	(0.004)	(0.005)
Male employee and manager	0.122*	0.003	-0.002	0.024***	0.021***	0.020***	-0.011***	-0.004*	-0.004
($\delta + \alpha$)	(0.006)	(0.004)	(0.005)	(0.005)	(0.004)	(0.005)	(0.003)	(0.003)	(0.004)
Female - male same-sex manager	0.109***	0.103***	0.113***	0.089***	0.042***	0.055***	0.109***	0.055***	0.070***
($\delta^f + \alpha^f$)	(0.008)	(0.007)	(0.008)	(0.008)	(0.006)	(0.006)	(0.007)	(0.005)	(0.005)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes

Note: The sample is the event-study sample from Table 2 employed under the GS schedule. The estimation specification from equation 3 includes year-quarter, locality, and individual-office fixed effects. In panel A and B, the dependent variables are residualized as in the main event-study. In Panels C, D, E, and F, individual controls include age, age^2, and in Panels C, E, and F they also include occupational controls. Average values with standard deviations in parentheses for dependent variables are: log pay residual -1.21 (17.56); residualized GS grade -0.07 (1.47); office switching 0.32 (0.47); occupation category change 0.26 (0.44); 2-digit occupation change 0.20 (0.40); 4-digit occupation change 0.33 (0.47). Each regression is comprised of 28,376 of unique individuals and 1,044,056 person-quarters. Standard errors clustered at the office level in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

TABLE 5—FEDERAL EMPLOYEE VIEWPOINT SURVEY: FEMALE MANAGEMENT SHARES AND EMPLOYEE ATTITUDES

Dependent variable: answers to questions on the scale 1-5	(1) Job satisfaction[a]	(2) Pay satisfaction[a]	(3) Recognition[a]	(4) Diversity promoted[b]	(5) Discrimination not tolerated[b]	(6) Trust in supervisor[b]
Average Response	3.74	3.58	3.34	3.59	3.75	3.80
Female	-0.0462***	-0.0066	-0.1053***	-0.2026***	-0.1601***	-0.1595***
	(0.0091)	(0.0123)	(0.0050)	(0.0223)	(0.0119)	(0.0027)
Same-sex management share $\geq$ 0.5	-0.0142	-0.0175	-0.0626***	-0.0118	-0.0268	-0.0690***
	(0.0132)	(0.0411)	(0.0164)	(0.0256)	(0.0192)	(0.0134)
Same-sex management share $\geq$ 0.5 * Female	-0.1080***	0.1157**	0.1458***	0.0790	0.0899***	0.0940***
	(0.0209)	(0.0461)	(0.0186)	(0.0461)	(0.0277)	(0.0141)
N	448,424	448,937	448,437	422,019	409,931	449,042

Note: All specifications include year and agency fixed effects. Same-sex management share $\geq$ 0.5 is an indicator equal to 1 when at least 50% of the management at the employee's agency are the same sex as the employee. Female is an indicator variable of the employee self-identifying as female. The sample is restricted to the subset of agencies whose female respondent shares in FEVS are within 15 percentage points of their shares in OPM. Standard errors clustered by agency are in parentheses. * $p<0.10$ ** $p<0.05$ *** $p<0.01$.
[a] Each question asks the worker to rate how satisfied they are with that aspect of their employment with 1 being the least satisfied and and 5 being the most satisfied.
[b] Each question asks the respondent to use a 1-5 scale to indicate how much she agrees with a statement with 5 indicating strong agreement. The text of the statements are: Diversity Promoted: "Policies and programs promote diversity in the workplace (e.g. recruiting minorities and women, training in awareness of diversity issues, mentoring." Discrimination not tolerated: "Prohibited personnel practices (e.g. illegally discriminating for or against any employee/applicant, obstructing a person's right to compete for employment, knowingly violating veterans' preference requirements) are not tolerated." Trust in supervisor: "I have trust and confidence in my supervisor."

NOT FOR PUBLICATION

Appendices

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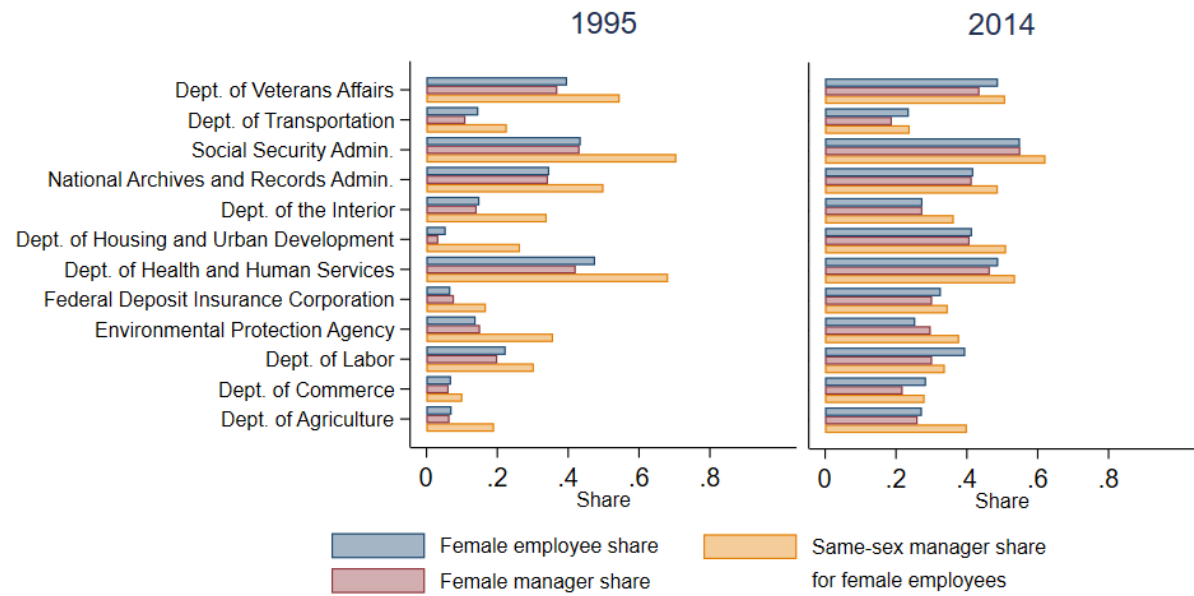
FIGURE A.1. FEMALE MANAGEMENT AND EMPLOYEE SHARES FOR SELECT AGENCIES

Note: The sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 managers, and are born in the year starting 1955.
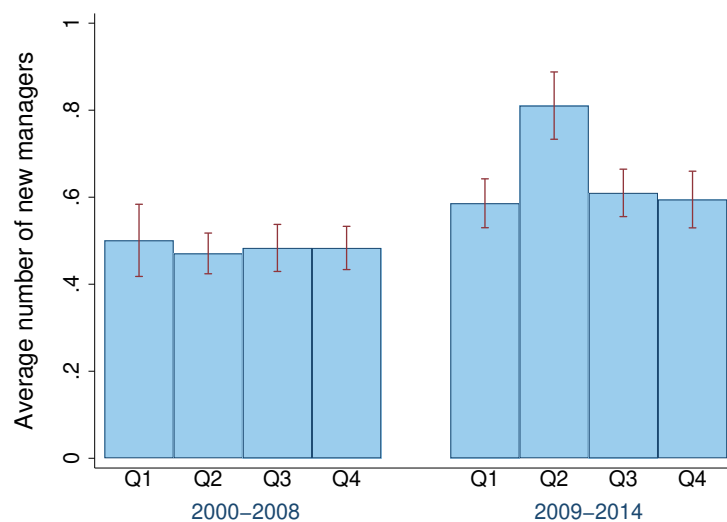
FIGURE A.2. NEW MANAGERS BY QUARTER

Note: The sample is restricted to offices in the "Up to 5 managers" sample as defined in Figure 1B. Bars denote the average number of new managers in quarters 1-4 for two time periods – 2000-2008 and 2009-2014. Vertical bars represent 95% confidence intervals.

FIGURE A.3. EVENT STUDY ESTIMATES: EFFECTS OF FIRST NEW MANAGERS

Note: Treatments effects, and specification are defined as in Figure 4. Panels A and B are for all employees and occupations in the event-study sample as defined in Figure 4. Panels C and D are for a subsample of employees with less routine occupations, as defined in Figure 5. Point estimates and standard errors are reported in Tables 2 and B.3. Vertical bars represent 95% confidence intervals with standard errors clustered by office.

	A. Annual Rates by Grade and Step									
Grade	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	Step 9	Step 10
1	17,803	18,398	18,990	19,579	20,171	20,519	21,104	21,694	21,717	22,269
2	20,017	20,493	21,155	21,717	21,961	22,607	23,253	23,899	24,545	25,191
3	21,840	22,568	23,296	24,024	24,752	25,480	26,208	26,936	27,664	28,392
4	24,518	25,335	26,152	26,969	27,786	28,603	29,420	30,237	31,054	31,871
5	27,431	28,345	29,259	30,173	31,087	32,001	32,915	33,829	34,743	35,657
6	30,577	31,596	32,615	33,634	34,653	35,672	36,691	37,710	38,729	39,748
7	33,979	35,112	36,245	37,378	38,511	39,644	40,777	41,910	43,043	44,176
8	37,631	38,885	40,139	41,393	42,647	43,901	45,155	46,409	47,663	48,917
9	41,563	42,948	44,333	45,718	47,103	48,488	49,873	51,258	52,643	54,028
10	45,771	47,297	48,823	50,349	51,875	53,401	54,927	56,453	57,979	59,505
11	50,287	51,963	53,639	55,315	56,991	58,667	60,343	62,019	63,695	65,371
12	60,274	62,283	64,292	66,301	68,310	70,319	72,328	74,337	76,346	78,355
13	71,674	74,063	76,452	78,841	81,230	83,619	86,008	88,397	90,786	93,175
14	84,697	87,520	90,343	93,166	95,989	98,812	101,635	104,458	107,281	110,104
15	99,628	102,949	106,270	109,591	112,912	116,233	119,554	122,875	126,196	129,517

	B. Percentage increases from previous step/grade									
Grade	Grade Increase	Step 2 Increase	Step 3 Increase	Step 4 Increase	Step 5 Increase	Step 6 Increase	Step 7 Increase	Step 8 Increase	Step 9 Increase	Step 10 Increase
1	9.787	0.033	0.032	0.031	0.030	0.017	0.028	0.028	0.001	0.025
2	0.117	0.024	0.032	0.026	0.011	0.029	0.028	0.027	0.027	0.026
3	0.087	0.033	0.032	0.031	0.030	0.029	0.028	0.027	0.027	0.026
4	0.116	0.033	0.032	0.031	0.030	0.029	0.028	0.027	0.027	0.026
5	0.112	0.033	0.032	0.031	0.030	0.029	0.028	0.027	0.027	0.026
6	0.109	0.033	0.032	0.031	0.030	0.029	0.028	0.027	0.027	0.026
7	0.105	0.033	0.032	0.031	0.030	0.029	0.028	0.027	0.027	0.026
8	0.102	0.033	0.032	0.031	0.030	0.029	0.028	0.027	0.027	0.026
9	0.099	0.033	0.032	0.031	0.030	0.029	0.028	0.027	0.027	0.026
10	0.096	0.033	0.032	0.031	0.030	0.029	0.028	0.027	0.027	0.026
11	0.094	0.033	0.032	0.031	0.030	0.029	0.028	0.027	0.027	0.026
12	0.181	0.033	0.032	0.031	0.030	0.029	0.028	0.027	0.027	0.026
13	0.173	0.033	0.032	0.031	0.030	0.029	0.028	0.027	0.027	0.026
14	0.167	0.033	0.032	0.031	0.030	0.029	0.028	0.027	0.027	0.026
15	0.162	0.033	0.032	0.031	0.030	0.029	0.028	0.027	0.027	0.026

Note: Amounts are in USD. The usual progression is 52 weeks (one year) between steps 1-2, 2-3, and 3-4, then 104 weeks (two years) between steps 4-5, 5-6, and 6-7, and finally 156 weeks (three years) between steps 7-8, 8-9, and 9-10. It normally takes 18 years to advance from step 1 to step 10 within a single GS grade if an employee remains in that single grade. See https://www.opm.gov/policy-data-oversight/pay-leave/pay-administration/fact-sheets/within-grade-increases/

TABLE A.2—MANAGERIAL DESCRIPTIVE STATISTICS

	All managers			First new managers		
	Female (1)	Male (2)	Unidentified (3)	Female (4)	Male (5)	Unidentified (6)
Salary	89,459 (38,136)	95,265 (42,251)	84,496 (39,229)	68,124 (26,170)	71,545 (29,087)	59,234 (26,497)
Log salary	11.31 (0.45)	11.37 (0.45)	11.24 (0.47)	11.05 (0.42)	11.09 (0.42)	10.89 (0.45)
GS grade (GS sample)	12.36 (2.29)	12.80 (2.11)	12.41 (2.31)	11.78 (1.96)	12.14 (1.96)	11.68 (2.18)
Birth year 1955-	0.42 (0.49)	0.51 (0.50)	0.63 (0.48)	0.36 (0.48)	0.41 (0.49)	0.63 (0.48)
Birth year 1955-1960	0.17 (0.37)	0.14 (0.35)	0.10 (0.29)	0.17 (0.37)	0.14 (0.35)	0.10 (0.31)
Birth year 1960-1965	0.13 (0.34)	0.10 (0.31)	0.06 (0.24)	0.15 (0.36)	0.13 (0.34)	0.07 (0.26)
Birth year 1965-1970	0.09 (0.29)	0.07 (0.26)	0.05 (0.21)	0.12 (0.33)	0.11 (0.31)	0.06 (0.23)
Birth year 1970-1975	0.05 (0.23)	0.04 (0.20)	0.03 (0.16)	0.07 (0.26)	0.08 (0.27)	0.04 (0.18)
Birth year 1975-1980	0.03 (0.17)	0.02 (0.15)	0.01 (0.12)	0.05 (0.22)	0.04 (0.20)	0.02 (0.13)
Birth year 1980+	0.11 (0.31)	0.11 (0.31)	0.13 (0.34)	0.07 (0.26)	0.09 (0.29)	0.09 (0.28)
Education: High school or less	0.15 (0.35)	0.10 (0.30)	0.13 (0.33)	0.16 (0.37)	0.09 (0.29)	0.15 (0.36)
Education: Some college	0.22 (0.41)	0.16 (0.37)	0.16 (0.37)	0.25 (0.43)	0.16 (0.36)	0.14 (0.35)
Education: Bachelor's degree	0.33 (0.47)	0.36 (0.48)	0.34 (0.47)	0.37 (0.48)	0.43 (0.50)	0.34 (0.47)
Education: Graduate degree	0.31 (0.46)	0.37 (0.48)	0.36 (0.48)	0.21 (0.41)	0.30 (0.46)	0.34 (0.47)
Total tenure (years)	18.78 (9.84)	19.56 (10.07)	19.67 (10.31)	14.74 (9.72)	13.89 (9.29)	13.84 (10.64)
Managerial tenure (years)	8.01 (7.14)	9.27 (7.42)	8.54 (6.78)	2.90 (5.42)	3.31 (5.82)	3.21 (5.48)
N unique individuals	85,253	127,380	46,502	4,814	7,936	2,872
N unique individuals (GS sample)	62,974	78,067	24,201	4,095	6,073	1,920
N offices	6,643	7,845	5,547	2,914	3,995	1,924

Note: Managerial characteristics are provided for offices in the event-study sample as defined in Table 1. Standard deviations are in parentheses.

TABLE A.3—MANAGERIAL TRANSITIONS (EVENT STUDY SAMPLE)

	Female managers		Male managers		Unidentified managers	
Total managerial changes	N (1)	Share (2)	N (3)	Share (4)	N (5)	Share (6)
By source of managerial change						
Appointments within Federal service	4,984	96%	8,031	94%	2,769	90%
Appointments within offices	2,656	51%	3,971	47%	1,334	44%
By type of managerial change						
Managerial additions	4,232	81%	6,929	81%	2,535	83%
Managerial replacements	985	19%	1,590	19%	525	17%
By increasing managerial share						
Increasing female management share	3,696	71%	837	10%	263	9%
Increasing male management share	326	6%	4,383	51%	294	10%
By age of new managers						
At least 5 years younger	1,475	28%	2,046	24%	561	18%
At least 5 years older	1,737	33%	3,344	39%	1,476	48%
Total managerial changes	5,217		8,519		3,060	
N unique individuals	4,814		7,936		2,872	
N offices	2,914		3,995		1,924	

Note: Managerial transitions are provided for first new managers in the event-study sample as defined in Table 1. Appointments within Federal service are when an incoming manager has worked within the US Federal service in the quarter prior to being appointed as a new manager, whereas appointments within offices are when new managers have been employed at the same offices. Managerial additions denote appointments that increase the number of managers at the office, while managerial replacements are appointments after which the number of managers at the office decreases or remains the same. Increasing female/male management share appointments include managerial changes after which the female/male managerial share increses at the time of managerial change relative to the previous quarter. At least 5 years older/younger appointments denote new managers that are older/younger than the average manager at the office by at least 5 years. Standard deviations are in parentheses.
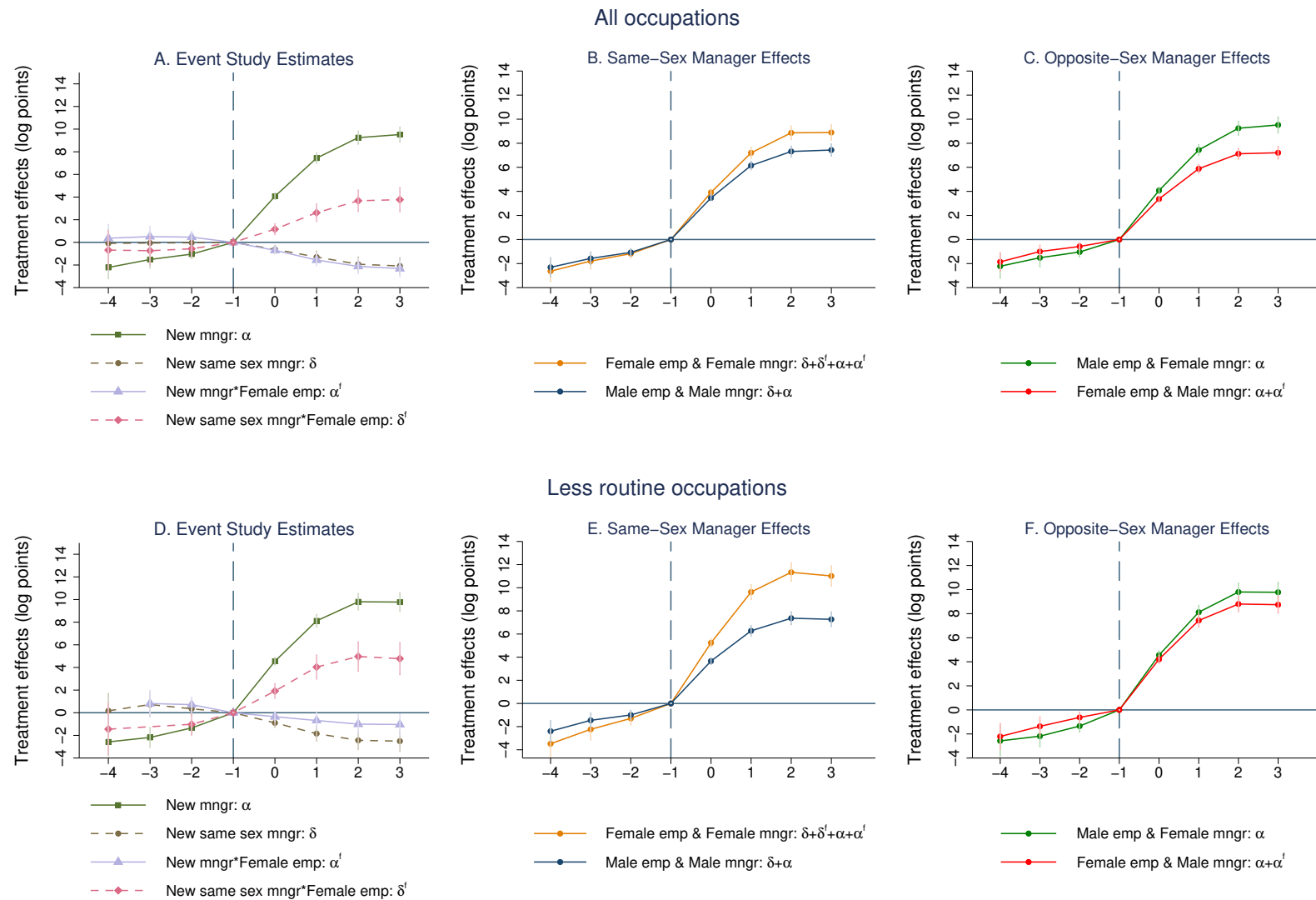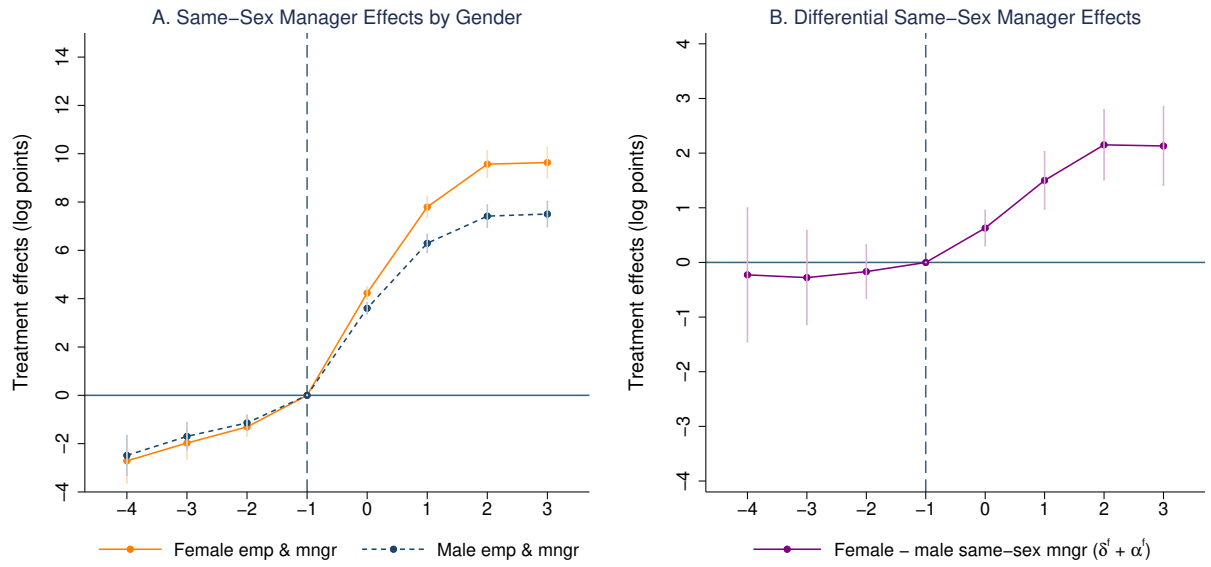
FIGURE A.4.   EVENT STUDY ESTIMATES: EFFECTS OF FIRST NEW MANAGERS FOR GS
SUBSAMPLE

Note: Treatments effects and specification are defined as in Figure 4. The sample includes employees that work under the GS schedule from the event-study sample. Point estimates and standard errors are reported in Table A.4. Vertical bars represent 95% confidence intervals with standard errors clustered by office.

TABLE A.4—EVENT STUDY ESTIMATES: EFFECTS OF FIRST NEW MANAGERS FOR GS SUB-SAMPLE

Event year	New same-sex mngr (δ)	New same-sex mngr*female (δ^f)	New mngr (α)	New mngr*female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)
-4	-0.27 (0.65)	-0.58 (0.91)	-2.22*** (0.52)	0.36 (0.65)	-0.23 (0.62)
-3	-0.02 (0.46)	-0.99 (0.64)	-1.68*** (0.37)	0.72 (0.46)	-0.28 (0.44)
-2	-0.05 (0.27)	-0.68* (0.37)	-1.09*** (0.22)	0.51* (0.27)	-0.17 (0.25)
0	-0.76*** (0.18)	1.42*** (0.25)	4.36*** (0.14)	-0.79*** (0.17)	0.63*** (0.17)
1	-1.50*** (0.28)	3.07*** (0.41)	7.80*** (0.24)	-1.57*** (0.27)	1.50*** (0.27)
2	-2.08*** (0.35)	4.15*** (0.50)	9.50*** (0.32)	-2.00*** (0.34)	2.15*** (0.33)
3	-2.06*** (0.39)	4.11*** (0.56)	9.56*** (0.36)	-1.98*** (0.38)	2.13*** (0.37)
N unique individuals	28,385	28,385	28,385	28,385	28,385
N person-qtrs	1,172,730	1,172,730	1,172,730	1,172,730	1,172,730

Note: The sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, are employed under the GS schedule, and experienced an appointment of a first new manager, as explained in section III.B. Employees in the GS subsample are spread over 7,799 offices. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.
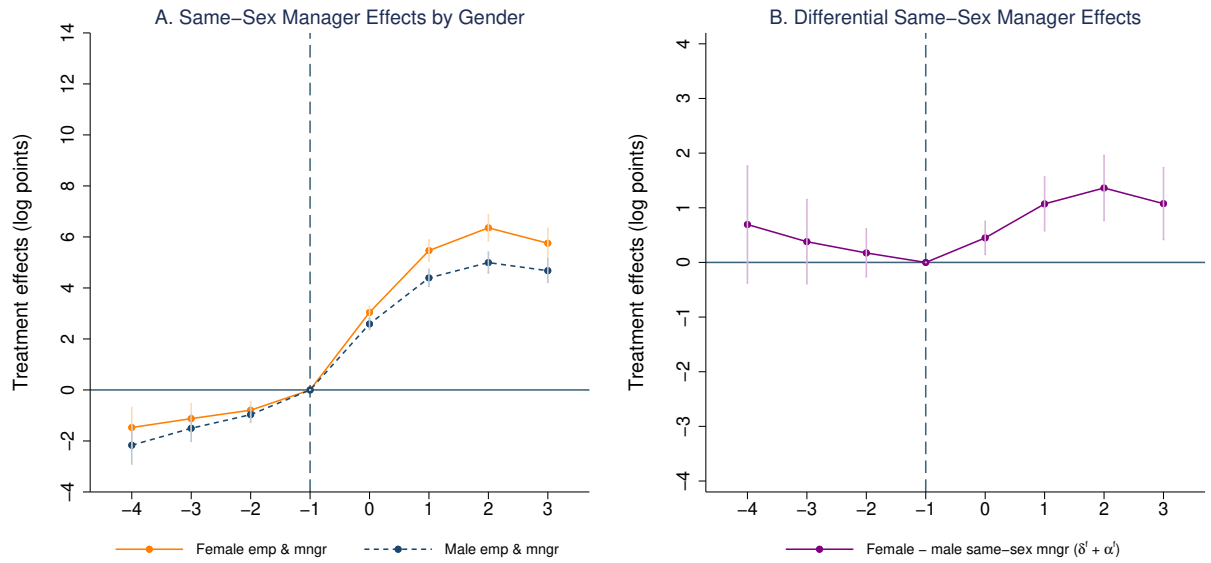
FIGURE A.5. EVENT STUDY ESTIMATES: EFFECTS OF FIRST NEW MANAGERS (SAME SAMPLE IN STAGES 1 AND 2)

Note: Treatments effects and specification are defined as in Figure 4. Estimates are obtained using the event-study sample in both first and second stages. Point estimates and standard errors are reported in Table A.5. Vertical bars represent 95% confidence intervals with standard errors clustered by office.

TABLE A.5—EVENT STUDY ESTIMATES: EFFECTS OF FIRST NEW MANAGERS (SAME SAMPLE IN STAGES 1 AND 2)

Event year	New same-sex mngr (δ)	New same-sex mngr*female (δ^f)	New mngr (α)	New mngr*female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)
-4	-0.87	0.23	-1.30***	0.47	0.69
	(0.57)	(0.78)	(0.44)	(0.56)	(0.55)
-3	-0.44	-0.22	-1.06***	0.60	0.38
	(0.40)	(0.55)	(0.32)	(0.39)	(0.39)
-2	-0.12	-0.30	-0.85***	0.48**	0.17
	(0.23)	(0.32)	(0.19)	(0.23)	(0.22)
0	-0.70***	1.06***	3.29***	-0.61***	0.45***
	(0.16)	(0.22)	(0.13)	(0.15)	(0.16)
1	-1.52***	2.53***	5.92***	-1.45***	1.07***
	(0.25)	(0.36)	(0.22)	(0.23)	(0.25)
2	-2.08***	3.33***	7.08***	-1.96***	1.36***
	(0.30)	(0.44)	(0.28)	(0.29)	(0.30)
3	-2.11***	3.23***	6.79***	-2.16***	1.08***
	(0.34)	(0.49)	(0.31)	(0.33)	(0.34)
N unique individuals	31,117	31,117	31,117	31,117	31,117
N person-qtrs	1,318,756	1,318,756	1,318,756	1,318,756	1,318,756

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees in the sample are spread over 8,377 offices. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Estimates are obtained using the event-study sample in both first and second stages. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.
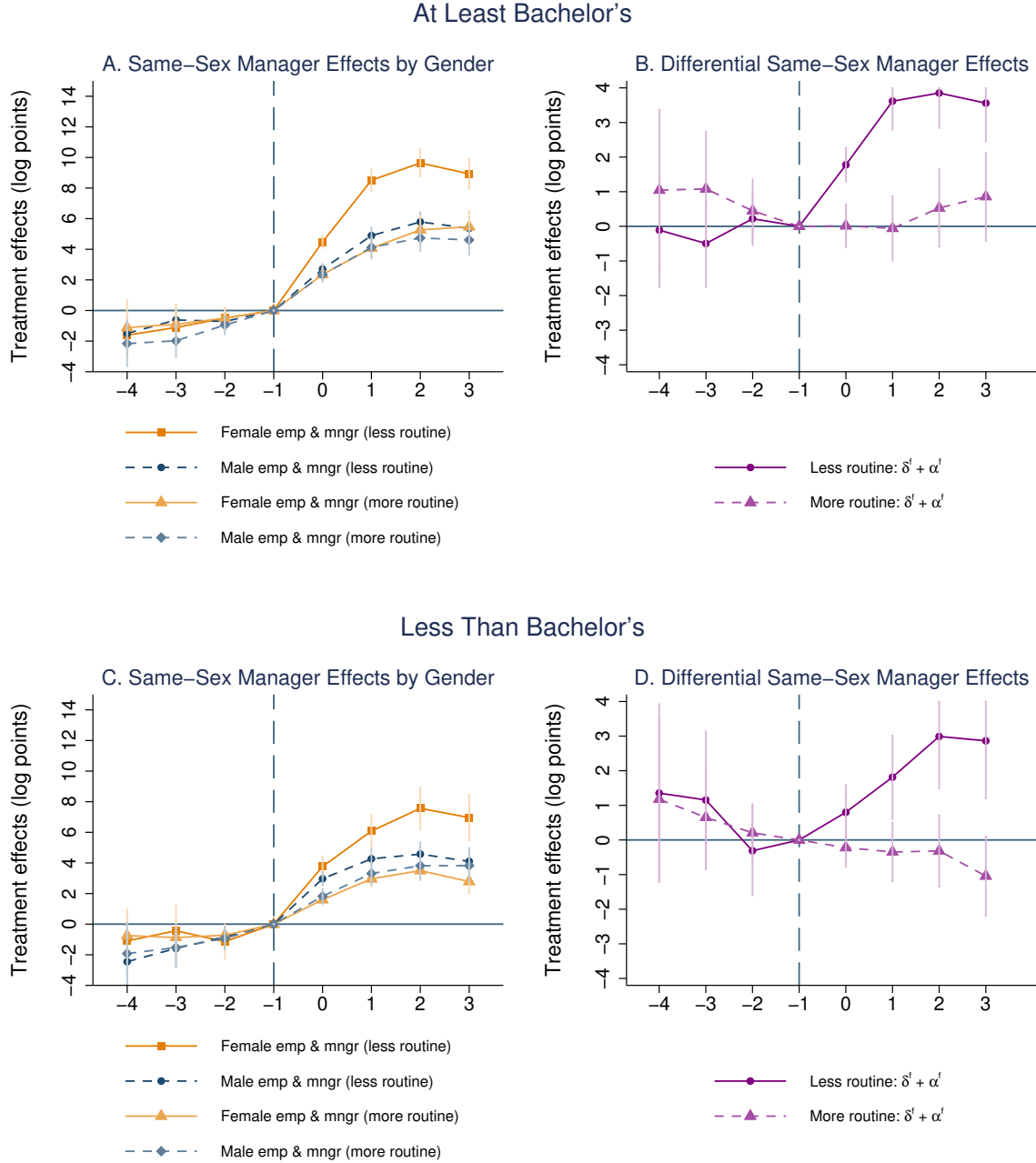
FIGURE A.6. EVENT STUDY ESTIMATES BY EDUCATIONAL ATTAINMENT AND OCCUPATIONAL ROUTINENESS (SAME SAMPLE IN STAGES 1 AND 2)

Note: Treatments effects and specification are defined as in Figure 4. Estimates are obtained using the event-study sample in both first and second stages. Panels A and B split the subsample of employees with at least a Bachelor's degree from Figure 5 into employees with less routine and more routine occupations. Panels C and D split the subsample of employees with less than a Bachelor's degree from Figure 5 into employees with less routine and more routine occupations. Less routine and more routine occupations are as defined in Figure 5. Point estimates and standard errors are reported in Tables A.6 and A.7. Vertical bars represent 95% confidence intervals with standard errors clustered by office.

TABLE A.6—EVENT STUDY ESTIMATES BY EDUCATIONAL ATTAINMENT (SAME SAMPLE IN STAGES 1 AND 2)

Event year	At least Bachelor's				Less than Bachelor's				At least Bachelor's	Less than Bachelor's
	New same-sex mngr (δ)	New same-sex mngr*female (δ^f)	New mngr (α)	New mngr*female (α^f)	New same-sex mngr (δ)	New same-sex mngr*female (δ^f)	New mngr (α)	New mngr*female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	-0.70	0.10	-1.01*	-0.07	-0.87	-0.01	-1.58**	1.25	0.03	1.25
	(0.68)	(1.02)	(0.55)	(0.72)	(0.96)	(1.20)	(0.74)	(0.87)	(0.71)	(0.84)
-3	0.09	-0.44	-1.25***	0.39	-1.20*	0.08	-0.56	0.71	-0.05	0.78
	(0.49)	(0.73)	(0.39)	(0.51)	(0.67)	(0.85)	(0.51)	(0.61)	(0.53)	(0.57)
-2	0.03	-0.12	-0.87***	0.36	-0.24	-0.59	-0.75**	0.59*	0.24	0.00
	(0.30)	(0.43)	(0.24)	(0.30)	(0.38)	(0.49)	(0.30)	(0.35)	(0.30)	(0.33)
0	-0.98***	1.62***	3.55***	-0.38**	-0.14	0.15	2.62***	-0.55**	1.24***	-0.40*
	(0.19)	(0.29)	(0.16)	(0.19)	(0.25)	(0.31)	(0.20)	(0.23)	(0.20)	(0.22)
1	-1.97***	3.38***	6.58***	-0.97***	-0.49	1.00**	4.30***	-1.21***	2.41***	-0.21
	(0.31)	(0.48)	(0.27)	(0.31)	(0.38)	(0.48)	(0.30)	(0.34)	(0.33)	(0.33)
2	-2.50***	4.08***	7.87***	-1.30***	-0.95**	1.81***	5.14***	-1.72***	2.79***	0.09
	(0.38)	(0.58)	(0.34)	(0.38)	(0.45)	(0.58)	(0.37)	(0.41)	(0.41)	(0.40)
3	-2.59***	4.17***	7.60***	-1.40***	-0.77	1.42**	4.74***	-1.84***	2.76***	-0.42
	(0.43)	(0.65)	(0.39)	(0.42)	(0.50)	(0.65)	(0.41)	(0.46)	(0.45)	(0.45)
N unique individuals	18,033	18,033	18,033	18,033	13,311	13,311	13,311	13,311	18,033	13,311
N person-qtrs	753,475	753,475	753,475	753,475	575,061	575,061	575,061	575,061	753,475	575,061

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 6,875 offices in the at least Bachelor's sample and 6,372 offices in the less than Bachelor's sample. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Estimates are obtained using the event study sample in both first and second stages. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

TABLE A.7—EVENT STUDY ESTIMATES BY OCCUPATIONAL ROUTINENESS (SAME SAMPLE IN STAGES 1 AND 2)

Event year	Less routine				More routine				Less routine	More routine
	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	-0.56 (0.71)	-0.18 (1.05)	-1.34** (0.57)	0.57 (0.74)	-1.24 (0.94)	0.91 (1.17)	-1.12 (0.69)	0.65 (0.84)	0.39 (0.74)	1.56* (0.83)
-3	0.25 (0.50)	-0.73 (0.76)	-1.25*** (0.41)	0.77 (0.53)	-1.28* (0.66)	0.55 (0.82)	-0.74 (0.48)	0.59 (0.59)	0.04 (0.55)	1.14** (0.57)
-2	0.28 (0.31)	-0.71 (0.45)	-1.07*** (0.24)	0.83*** (0.31)	-0.74** (0.36)	0.44 (0.45)	-0.31 (0.29)	-0.05 (0.35)	0.12 (0.33)	0.39 (0.31)
0	-0.96*** (0.20)	1.76*** (0.32)	3.77*** (0.17)	-0.23 (0.21)	-0.17 (0.25)	0.24 (0.31)	2.36*** (0.19)	-0.54** (0.21)	1.53*** (0.22)	-0.31 (0.22)
1	-1.94*** (0.32)	3.85*** (0.52)	6.64*** (0.28)	-0.55* (0.33)	-0.70* (0.38)	1.17** (0.48)	4.59*** (0.30)	-1.68*** (0.33)	3.30*** (0.36)	-0.51 (0.33)
2	-2.51*** (0.38)	4.69*** (0.62)	7.84*** (0.35)	-0.82** (0.40)	-1.08** (0.46)	1.78*** (0.58)	5.54*** (0.40)	-2.14*** (0.42)	3.87*** (0.44)	-0.36 (0.40)
3	-2.57*** (0.42)	4.57*** (0.68)	7.41*** (0.40)	-0.91** (0.44)	-0.99* (0.51)	1.63** (0.65)	5.40*** (0.43)	-2.41*** (0.47)	3.66*** (0.48)	-0.78* (0.44)
N unique individuals	17,516	17,516	17,516	17,516	13,793	13,793	13,793	13,793	17,516	13,793
N person-qtrs	729,190	729,190	729,190	729,190	596,980	596,980	596,980	596,980	729,190	596,980

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 6,543 offices in the sample with less routine employees and 6,130 offices in the sample with more routine employees. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Estimates are obtained using the event study sample in both first and second stages. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

FIGURE A.7. HETEROGENEITY OF OCCUPATIONAL ROUTINENESS ESTIMATES BY INITIAL SHARE OF SAME-SEX EMPLOYEES

Note: Treatments effects, sample, and specification are defined as in Figure 4. Panels A and B split the employees with an above median share of same-sex employees in office (i.e. 47.45%) in the first two quarters of employees' tenure into employees with less routine and more routine occupations (i.e. occupations with a below median routine cognitive score, see footnote ?? for details). Panels C and D split employees with a below median share of same-sex employees into employees with less routine and more routine occupations. Point estimates and standard errors are reported in Tables A.8 and A.9. Vertical bars represent 95% confidence intervals with standard errors clustered by office.

TABLE A.8—HETEROGENEITY OF OCCUPATIONAL ROUTINENESS ESTIMATES FOR EMPLOYEES WITH ABOVE MEDIAN SHARE OF SAME-SEX EMPLOYEES IN OFFICE

| | Less routine | | | | More routine | | | | Less routine | More routine |
| | New same-sex mngr (δ) | New same-sex mngr* female (δ^f) | New mngr (α) | New mngr* female (α^f) | New same-sex mngr (δ) | New same-sex mngr* female (δ^f) | New mngr (α) | New mngr* female (α^f) | Female-male same-sex mngr ($\delta^f + \alpha^f$) | Female-male same-sex mngr ($\delta^f + \alpha^f$) |
Event year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	-2.07*	1.02	-1.49	-1.98	-0.85	0.01	-1.55	0.59	-0.96	0.60
	(1.24)	(1.65)	(1.05)	(1.33)	(1.72)	(1.97)	(1.44)	(1.58)	(0.98)	(1.19)
-3	-1.38	0.79	-1.20	-1.15	-1.41	0.40	-0.58	0.13	-0.36	0.53
	(0.88)	(1.19)	(0.78)	(0.99)	(1.23)	(1.41)	(1.01)	(1.11)	(0.70)	(0.81)
-2	-0.63	0.23	-0.78	-0.41	-0.82	0.13	-0.44	0.07	-0.17	0.20
	(0.54)	(0.71)	(0.48)	(0.60)	(0.71)	(0.80)	(0.64)	(0.69)	(0.41)	(0.44)
0	-0.33	0.92**	3.87***	1.50***	-0.11	0.22	3.66***	-0.86*	2.42***	-0.63**
	(0.35)	(0.46)	(0.33)	(0.40)	(0.48)	(0.53)	(0.41)	(0.44)	(0.28)	(0.30)
1	-0.68	1.68**	6.49***	3.56***	-0.03	0.57	6.65***	-1.64**	5.24***	-1.07**
	(0.51)	(0.72)	(0.46)	(0.60)	(0.75)	(0.83)	(0.68)	(0.73)	(0.46)	(0.47)
2	-1.31**	2.49***	8.07***	3.76***	-0.67	1.52	8.56***	-1.99**	6.25***	-0.47
	(0.62)	(0.88)	(0.56)	(0.73)	(0.94)	(1.05)	(0.87)	(0.94)	(0.57)	(0.58)
3	-1.86***	2.95***	8.61***	2.92***	-0.55	1.35	8.88***	-1.85*	5.87***	-0.50
	(0.71)	(1.00)	(0.66)	(0.83)	(1.03)	(1.18)	(0.95)	(1.04)	(0.63)	(0.66)
N unique individuals	8,425	8,425	8,425	8,425	7,988	7,988	7,988	7,988	8,425	7,988
N person-qtrs	321,259	321,259	321,259	321,259	332,225	332,225	332,225	332,225	321,259	332,225

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B.Employees are spread over 4,631 offices in the sample with less routine employees and 4,005 offices in the sample with more routine employees. Median initial share of same-sex employees is 47.45%. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * $p<0.10$ ** $p<0.05$ *** $p<0.01$.

TABLE A.9—HETEROGENEITY OF OCCUPATIONAL ROUTINENESS ESTIMATES FOR EMPLOYEES WITH BELOW MEDIAN SHARE OF SAME-SEX EMPLOYEES IN OFFICE

Event year	Less routine				More routine				Less routine	More routine
	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	1.45	-1.71	-2.88***	1.63*	0.29	0.49	-1.72*	0.28	-0.07	0.77
	(0.98)	(1.68)	(0.76)	(0.98)	(1.21)	(1.83)	(0.89)	(1.19)	(1.34)	(1.42)
-3	1.98***	-2.11*	-2.43***	1.82***	-0.37	0.16	-0.46	0.06	-0.29	0.22
	(0.70)	(1.20)	(0.53)	(0.69)	(1.04)	(1.43)	(0.86)	(1.00)	(0.96)	(1.02)
-2	0.89**	-1.35*	-1.48***	1.36***	-0.40	0.21	-0.47	-0.00	0.01	0.20
	(0.43)	(0.78)	(0.30)	(0.41)	(0.50)	(0.77)	(0.35)	(0.46)	(0.63)	(0.60)
0	-0.87***	0.77*	4.74***	-1.47***	-0.19	0.49	2.97***	-0.78**	-0.70**	-0.29
	(0.28)	(0.46)	(0.20)	(0.27)	(0.35)	(0.49)	(0.28)	(0.32)	(0.35)	(0.37)
1	-1.63***	1.93***	8.59***	-3.24***	-0.72	1.40*	6.10***	-2.49***	-1.31**	-1.09*
	(0.44)	(0.74)	(0.34)	(0.43)	(0.52)	(0.77)	(0.39)	(0.46)	(0.59)	(0.61)
2	-2.01***	2.51***	10.26***	-3.87***	-1.23*	2.19**	7.99***	-3.57***	-1.35*	-1.38*
	(0.55)	(0.92)	(0.44)	(0.52)	(0.63)	(0.94)	(0.49)	(0.56)	(0.75)	(0.75)
3	-1.90***	2.55**	10.01***	-3.46***	-1.48**	2.72**	8.74***	-4.26***	-0.91	-1.54*
	(0.62)	(1.01)	(0.49)	(0.58)	(0.70)	(1.08)	(0.56)	(0.64)	(0.83)	(0.86)
N unique individuals	9,091	9,091	9,091	9,091	5,805	5,805	5,805	5,805	9,091	5,805
N person-qtrs	407,931	407,931	407,931	407,931	264,755	264,755	264,755	264,755	407,931	264,755

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B.Employees are spread over 5,069 offices in the sample with less routine employees and 4,364 offices in the sample with more routine employees. Median initial share of same-sex employees is 47.45%. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

FIGURE A.8. HETEROGENEITY OF OCCUPATIONAL ROUTINENESS ESTIMATES BY INITIAL SHARE OF SAME-SEX MANAGERS

Note: Treatments effects, sample, and specification are defined as in Figure 4. Panels A and B split the employees with an above median share of same-sex managers in office (i.e. 45.65%) in the first two quarters of employees' tenure into employees with less routine and more routine occupations (i.e. occupations with a below median routine cognitive score, see footnote ?? for details). Panels C and D split employees with a below median share of same-sex managers into employees with less routine and more routine occupations. Point estimates and standard errors are reported in Tables A.8 and A.9. Vertical bars represent 95% confidence intervals with standard errors clustered by office.

TABLE A.10—HETEROGENEITY OF OCCUPATIONAL ROUTINENESS ESTIMATES FOR EMPLOYEES WITH ABOVE MEDIAN SHARE OF SAME-SEX MANAGERS IN OFFICE

	Less routine				More routine				Less routine	More routine
Event year	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	-0.13	-1.30	-2.57***	-0.12	-0.32	-0.61	-1.68*	1.29	-1.42	0.68
	(0.98)	(1.70)	(0.83)	(1.32)	(1.26)	(1.71)	(1.02)	(1.29)	(1.09)	(1.16)
-3	0.37	-0.95	-2.12***	0.06	-0.65	0.25	-1.22*	0.97	-0.89	1.22
	(0.69)	(1.22)	(0.58)	(0.94)	(0.91)	(1.25)	(0.72)	(0.94)	(0.80)	(0.82)
-2	-0.03	-0.91	-1.09***	-0.11	-0.47	-0.04	-0.70*	0.49	-1.03**	0.46
	(0.40)	(0.72)	(0.33)	(0.54)	(0.52)	(0.72)	(0.41)	(0.55)	(0.49)	(0.45)
0	-0.92***	1.70***	4.49***	0.59*	-0.00	0.19	3.18***	-0.63*	2.30***	-0.44
	(0.26)	(0.45)	(0.22)	(0.33)	(0.34)	(0.44)	(0.28)	(0.33)	(0.31)	(0.28)
1	-1.86***	3.55***	7.86***	1.52***	-0.09	0.68	6.14***	-1.57***	5.06***	-0.89**
	(0.41)	(0.74)	(0.35)	(0.53)	(0.54)	(0.69)	(0.46)	(0.54)	(0.53)	(0.44)
2	-2.56***	4.43***	9.55***	1.70***	-0.66	1.78**	7.86***	-1.95***	6.13***	-0.17
	(0.50)	(0.91)	(0.44)	(0.66)	(0.68)	(0.90)	(0.60)	(0.72)	(0.65)	(0.56)
3	-2.94***	4.19***	9.80***	1.33*	-0.91	2.01*	8.63***	-2.29***	5.52***	-0.28
	(0.56)	(1.01)	(0.50)	(0.72)	(0.76)	(1.03)	(0.68)	(0.82)	(0.72)	(0.65)
N unique individuals	8,784	8,784	8,784	8,784	6,859	6,859	6,859	6,859	8,784	6,859
N person-qtrs	341,427	341,427	341,427	341,427	270,930	270,930	270,930	270,930	341,427	270,930

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 4,968 offices in the sample with less routine employees and 3,996 offices in the sample with more routine employees. Median initial share of same-sex managers is 45.65%. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.
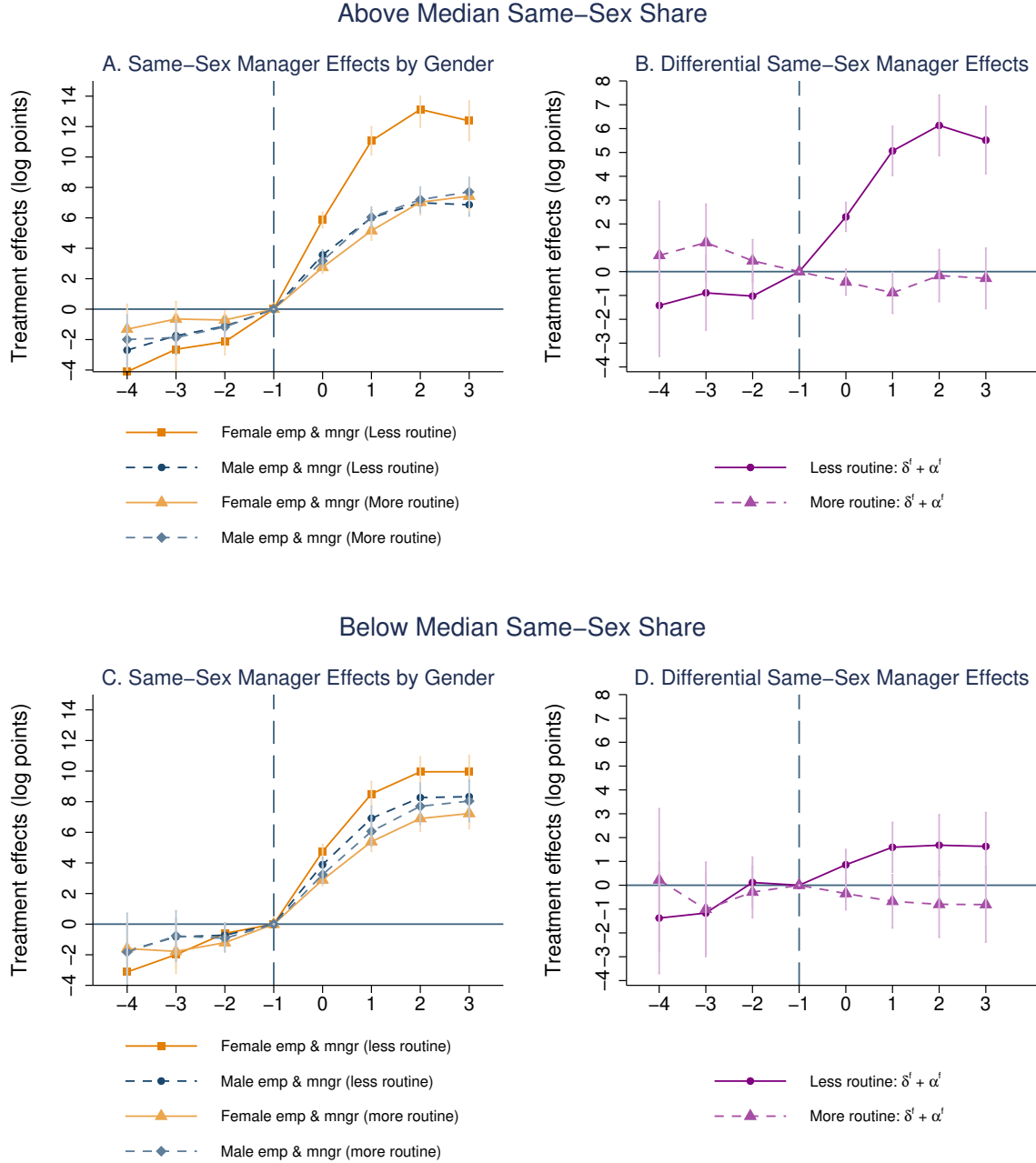
Table A.11—Heterogeneity of Occupational Routineness Estimates for Employees with Below Median Share of Same-Sex Managers in Office

	Less routine				More routine				Less routine	More routine
Event year	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	0.99	-1.98	-2.74***	0.60	-0.28	0.22	-1.55	0.01	-1.38	0.23
	(1.25)	(1.64)	(0.97)	(1.12)	(1.69)	(2.04)	(1.15)	(1.35)	(1.19)	(1.53)
-3	1.55*	-2.39**	-2.38***	1.22	-1.23	-0.03	0.46	-0.98	-1.17	-1.01
	(0.91)	(1.19)	(0.70)	(0.81)	(1.51)	(1.69)	(1.26)	(1.34)	(0.88)	(1.01)
-2	1.03*	-1.22*	-1.75***	1.34***	-0.73	0.11	-0.19	-0.40	0.12	-0.29
	(0.56)	(0.72)	(0.42)	(0.49)	(0.62)	(0.73)	(0.45)	(0.51)	(0.54)	(0.55)
0	-0.74**	1.68***	4.63***	-0.82***	0.01	0.31	3.23***	-0.66	0.86***	-0.35
	(0.34)	(0.45)	(0.25)	(0.30)	(0.49)	(0.54)	(0.39)	(0.41)	(0.33)	(0.35)
1	-1.44***	3.41***	8.36***	-1.82***	-0.53	1.52*	6.60***	-2.20***	1.59***	-0.67
	(0.54)	(0.72)	(0.44)	(0.50)	(0.69)	(0.80)	(0.49)	(0.54)	(0.53)	(0.57)
2	-1.72**	4.01***	10.00***	-2.33***	-1.10	2.40**	8.80***	-3.20***	1.68**	-0.80
	(0.69)	(0.89)	(0.57)	(0.63)	(0.80)	(0.95)	(0.57)	(0.62)	(0.65)	(0.71)
3	-1.29*	3.66***	9.62***	-2.03***	-1.35	2.76**	9.39***	-3.57***	1.63**	-0.81
	(0.77)	(0.98)	(0.64)	(0.70)	(0.89)	(1.07)	(0.64)	(0.70)	(0.72)	(0.80)
N unique individuals	8,732	8,732	8,732	8,732	6,934	6,934	6,934	6,934	8,732	6,934
N person-qtrs	387,763	387,763	387,763	387,763	326,050	326,050	326,050	326,050	387,763	326,050

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 5,023 offices in the sample with less routine employees and 4,707 offices in the sample with more routine employees. Median initial share of same-sex managers is 45.65%. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

FIGURE A.9. EVENT STUDY ESTIMATES BY PRESIDENTIAL ERAS FOR ALL EMPLOYEES AND
THOSE WITH AT LEAST A BACHELOR'S DEGREE

Note: Treatments effects and specification are defined as in Figure 4. The Figure displays estimates for each presidential era. Employees are assigned to the era they received their first new manager. There are 4,205 employees in the Reagan and Bush (1987-1992) sample, 6,670 employees in the Clinton (1993-2000) sample, 14,823 employees in the Bush (2001-2008) sample, and 8,593 employees in the Obama (2009-2014) sample. The subsample of employees with at least Bachelor's degree is defined in Figure 5. There are 2,194 employees in the Reagan and Bush (1987-1992) sample, 3,711 employees in the Clinton (1993-2000) sample, 8,705 employees in the Bush (2001-2008) sample, and 5,172 employees in the Obama (2009-2014) sample. Point estimates and standard errors are reported in Tables A.12, A.13, A.14, and A.15. Vertical bars represent 95% confidence intervals with standard errors clustered by office.
* The female employee and manager effect estimate for employees with at least Bachelor's degree in the panel A for event year t = -4 is at the seam of the data. For clarity of the figure, we omit this unusually low estimate and report it here. The estimate is -8.92(4.78).

A.19
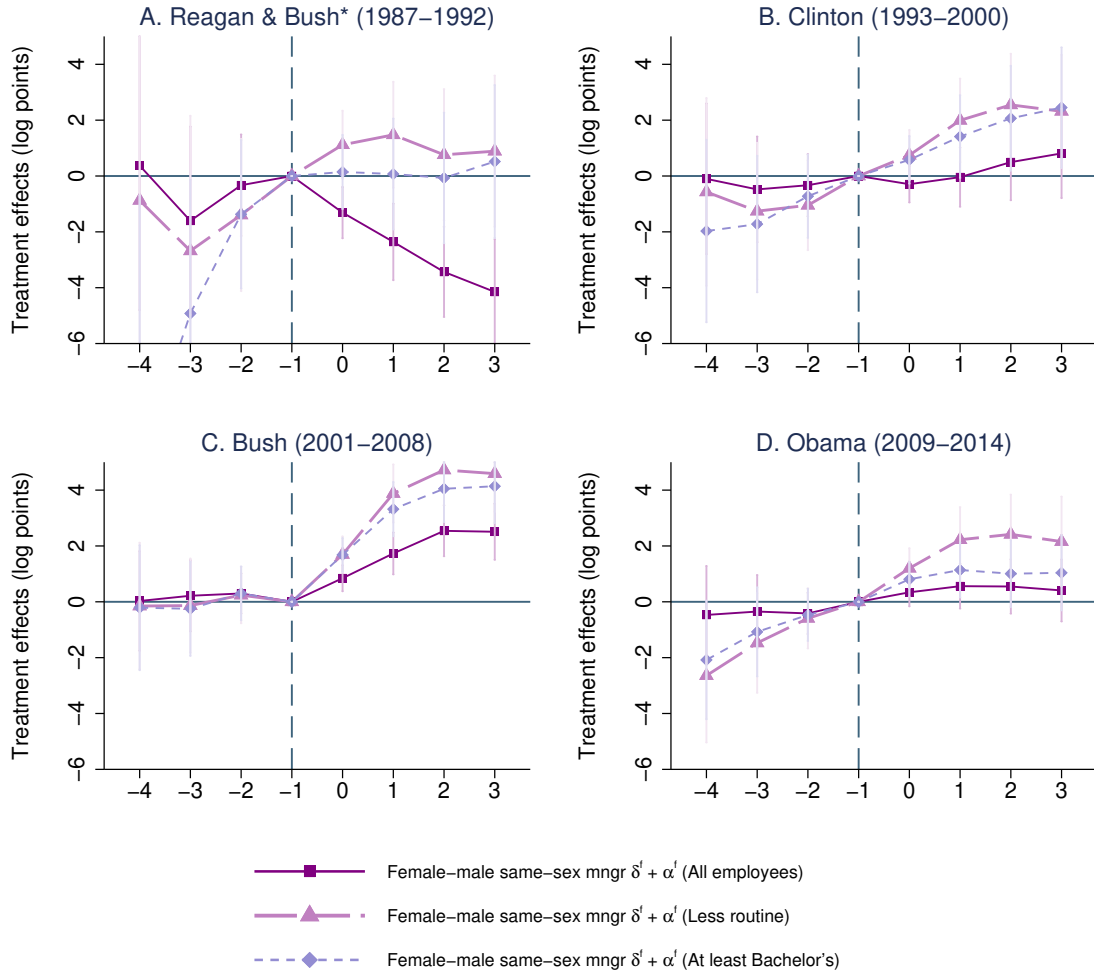
FIGURE A.10. EVENT STUDY ESTIMATES BY PRESIDENTIAL ERAS

Note: Treatments effects and specification are defined as in Figure 4. The Figure displays estimates for each presidential era. Employees are assigned to the era they received their first new manager. There are 4,205 employees in the Reagan and Bush (1987-1992) sample, 6,670 employees in the Clinton (1993-2000) sample, 14,823 employees in the Bush (2001-2008) sample, and 8,593 employees in the Obama (2009-2014) sample. The subsample of employees with at least Bachelor's degree is defined in Figure 5. There are 2,194 employees in the Reagan and Bush (1987-1992) sample, 3,711 employees in the Clinton (1993-2000) sample, 8,705 employees in the Bush (2001-2008) sample, and 5,172 employees in the Obama (2009-2014) sample. The subsample of employees with less routine occupations is defined in Figure 5. There are 2,223 employees in the Reagan and Bush (1987-1992) sample, 3,872 employees in the Clinton (1993-2000) sample, 8,495 employees in the Bush (2001-2008) sample, and 4,651 employees in the Obama (2009-2014) sample. Point estimates and standard errors are reported in Tables A.12, A.13, A.14, and A.15. Vertical bars represent 95% confidence intervals with standard errors clustered by office.
* The estimate for employees with at least a Bachelor's degree in panel A for event year -4 is at the seam of the data. For clarity of the figure, we omit this unusually low estimate and report it here. The estimate is -10.46(4.98).

A.20

Table A.12—Event Study Estimates by Presidential Eras For All Employees And Those With At Least A Bachelor's Degree: Reagan and Bush (1987-1992)

Event year	All employees				At least Bachelor's				All employees	At least Bachelor's
	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	-2.32	1.99	2.36	-1.61	0.17	-15.07**	1.37	4.61	0.37	-10.46**
	(2.38)	(3.57)	(1.88)	(2.26)	(3.02)	(6.44)	(2.45)	(3.65)	(2.64)	(4.98)
-3	0.21	-1.98	0.32	0.37	0.15	-5.15	1.39	0.23	-1.60	-4.92**
	(1.85)	(2.38)	(1.42)	(1.51)	(2.20)	(3.51)	(1.64)	(2.17)	(1.72)	(2.44)
-2	-0.27	-0.50	-0.11	0.17	-0.38	-0.54	0.55	-0.83	-0.33	-1.37
	(0.92)	(1.20)	(0.65)	(0.72)	(1.14)	(1.77)	(0.79)	(1.06)	(0.93)	(1.36)
0	0.68	-0.75	3.06***	-0.56	0.72	-0.03	2.90***	0.18	-1.31***	0.15
	(0.45)	(0.62)	(0.40)	(0.39)	(0.57)	(0.89)	(0.50)	(0.53)	(0.47)	(0.68)
1	0.89	-0.42	6.35***	-1.94***	0.83	0.48	6.47***	-0.41	-2.36***	0.07
	(0.69)	(0.92)	(0.61)	(0.56)	(0.86)	(1.34)	(0.79)	(0.78)	(0.70)	(1.01)
2	0.21	0.14	9.00***	-3.57***	-0.34	1.81	9.39***	-1.88*	-3.43***	-0.07
	(0.87)	(1.12)	(0.82)	(0.69)	(1.13)	(1.66)	(1.08)	(1.01)	(0.82)	(1.19)
3	-0.34	0.17	10.11***	-4.32***	-1.53	2.87	10.59***	-2.35*	-4.15***	0.52
	(1.05)	(1.34)	(1.03)	(0.85)	(1.39)	(1.99)	(1.34)	(1.23)	(0.96)	(1.40)
N unique individuals	4,205	4,205	4,205	4,205	2,194	2,194	2,194	2,194	4,205	2,194
N person-qtrs	275,353	275,353	275,353	275,353	139,537	139,537	139,537	139,537	275,353	139,537

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 4,340 offices in the sample with all employees and 2,757 offices in the sample with employees that have at least a Bachelor's degree. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

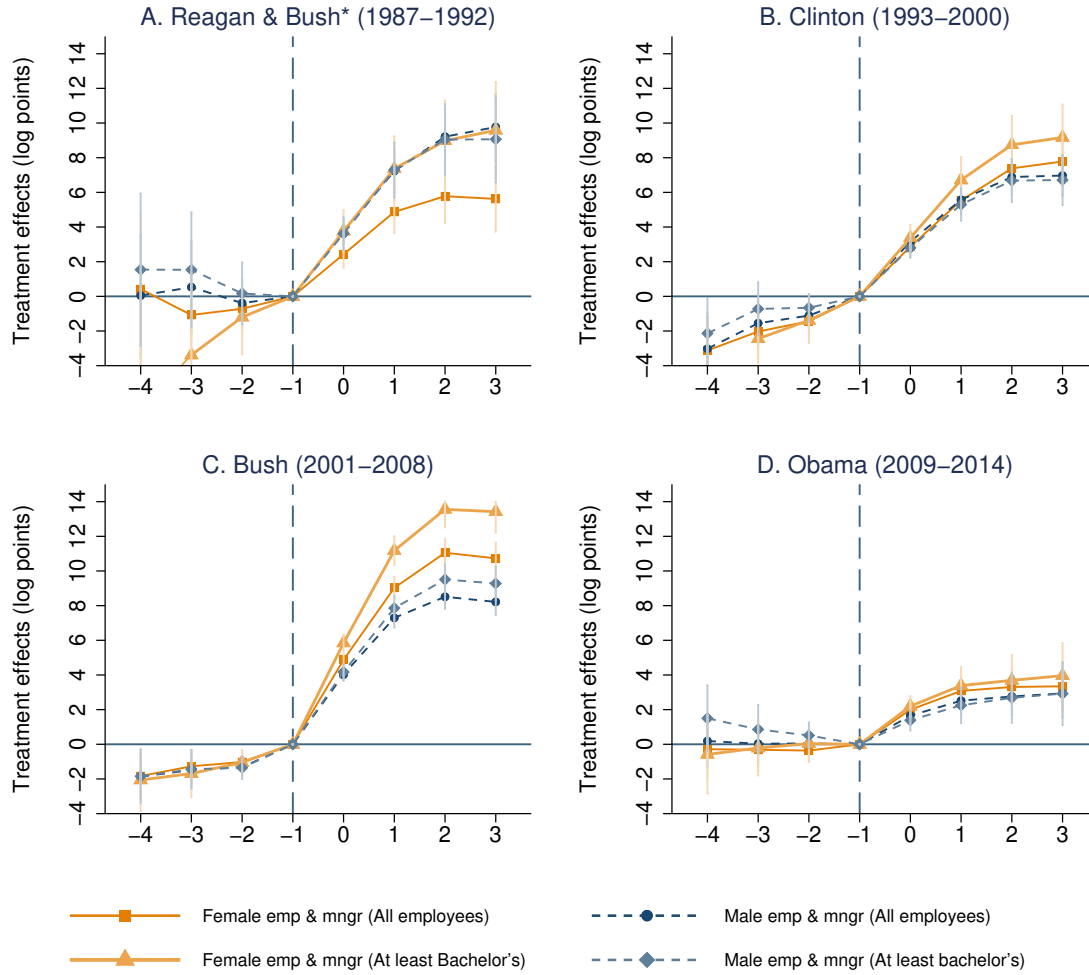TABLE A.13—EVENT STUDY ESTIMATES BY PRESIDENTIAL ERAS FOR ALL EMPLOYEES AND THOSE WITH AT LEAST A BACHELOR'S DEGREE: CLINTON (1993-2000)

Event year	All employees				At least Bachelor's				All employees	At least Bachelor's
	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	0.70	-1.13	-3.72***	1.03	-0.16	-1.66	-1.98	-0.31	-0.10	-1.97
	(1.31)	(1.93)	(1.05)	(1.27)	(1.56)	(2.43)	(1.28)	(1.62)	(1.38)	(1.67)
-3	0.22	-1.15	-1.77**	0.67	-0.05	-0.91	-0.67	-0.81	-0.48	-1.72
	(1.06)	(1.44)	(0.88)	(1.04)	(1.38)	(1.90)	(1.16)	(1.39)	(0.97)	(1.25)
-2	0.63	-1.49**	-1.74***	1.16**	0.54	-1.72*	-1.20**	0.99	-0.33	-0.72
	(0.52)	(0.75)	(0.41)	(0.49)	(0.64)	(1.01)	(0.51)	(0.66)	(0.57)	(0.76)
0	-0.16	0.39	3.31***	-0.68**	-0.26	0.97	3.07***	-0.39	-0.29	0.58
	(0.37)	(0.48)	(0.30)	(0.34)	(0.48)	(0.66)	(0.40)	(0.49)	(0.33)	(0.44)
1	-0.63	1.37*	6.21***	-1.41***	-0.75	1.65	6.05***	-0.24	-0.04	1.41*
	(0.55)	(0.74)	(0.44)	(0.49)	(0.67)	(1.01)	(0.56)	(0.67)	(0.54)	(0.76)
2	-0.82	2.50***	7.71***	-2.00***	-1.00	2.71**	7.68***	-0.65	0.50	2.07**
	(0.66)	(0.92)	(0.53)	(0.59)	(0.80)	(1.25)	(0.65)	(0.79)	(0.70)	(0.96)
3	-0.67	2.81***	7.64***	-2.00***	-1.06	3.11**	7.77***	-0.66	0.81	2.45**
	(0.75)	(1.07)	(0.61)	(0.67)	(0.92)	(1.43)	(0.73)	(0.90)	(0.82)	(1.10)
N unique individuals	6,670	6,670	6,670	6,670	3,711	3,711	3,711	3,711	6,670	3,711
N person-qtrs	372,435	372,435	372,435	372,435	212,195	212,195	212,195	212,195	372,435	212,195

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 4,942 offices in the sample with all employees and 3,599 offices in the sample with employees that have at least a Bachelor's degree. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

TABLE A.14—EVENT STUDY ESTIMATES BY PRESIDENTIAL ERAS FOR ALL EMPLOYEES AND THOSE WITH AT LEAST A BACHELOR'S DEGREE: BUSH (2001-2008)

Event year	All employees				At least Bachelor's				All employees	At least Bachelor's
	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	-0.84	0.57	-1.03	-0.54	-0.18	0.79	-1.67*	-1.00	0.03	-0.21
	(0.93)	(1.27)	(0.74)	(0.88)	(1.13)	(1.65)	(0.95)	(1.16)	(0.91)	(1.14)
-3	-0.24	-0.18	-1.25**	0.40	0.98	-0.96	-2.42***	0.71	0.22	-0.25
	(0.68)	(0.92)	(0.54)	(0.64)	(0.83)	(1.21)	(0.69)	(0.84)	(0.65)	(0.86)
-2	-0.62	0.05	-0.70**	0.25	-0.26	0.17	-1.09***	0.14	0.30	0.30
	(0.40)	(0.53)	(0.31)	(0.38)	(0.49)	(0.70)	(0.38)	(0.48)	(0.37)	(0.49)
0	-0.82***	1.74***	4.85***	-0.89***	-1.34***	2.47***	5.51***	-0.79***	0.85***	1.68***
	(0.25)	(0.35)	(0.21)	(0.23)	(0.31)	(0.45)	(0.25)	(0.29)	(0.24)	(0.31)
1	-1.41***	3.40***	8.70***	-1.67***	-2.33***	4.68***	10.19***	-1.36***	1.73***	3.32***
	(0.41)	(0.58)	(0.35)	(0.38)	(0.50)	(0.74)	(0.43)	(0.48)	(0.38)	(0.50)
2	-1.99***	4.43***	10.50***	-1.89***	-2.82***	5.44***	12.33***	-1.39**	2.54***	4.05***
	(0.51)	(0.72)	(0.46)	(0.48)	(0.62)	(0.92)	(0.55)	(0.60)	(0.46)	(0.61)
3	-2.35***	4.62***	10.57***	-2.11***	-3.07***	5.60***	12.35***	-1.46**	2.51***	4.14***
	(0.56)	(0.80)	(0.52)	(0.53)	(0.68)	(1.01)	(0.62)	(0.66)	(0.51)	(0.67)
N unique individuals	14,823	14,823	14,823	14,823	8,705	8,705	8,705	8,705	14,823	8,705
N person-qtrs	584,746	584,746	584,746	584,746	343,564	343,564	343,564	343,564	584,746	343,564

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 5,244 offices in the sample with all employees and 4,299 offices in the sample with employees that have at least a Bachelor's degree. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

Table A.15—Event Study Estimates by Presidential Eras For All Employees And Those With At Least A Bachelor's Degree: Obama (20019-2014)

Event year	All employees				At least Bachelor's				All employees	At least Bachelor's
	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	1.31	-2.70*	-1.13	2.23*	1.18	-4.51**	-0.73	1.87	-0.47	-2.64**
	(1.10)	(1.49)	(1.07)	(1.16)	(1.42)	(2.08)	(1.44)	(1.62)	(0.89)	(1.22)
-3	0.55	-1.84	-0.51	1.49*	0.86	-3.04*	-0.50	1.56	-0.35	-1.47
	(0.79)	(1.15)	(0.74)	(0.85)	(1.08)	(1.70)	(1.05)	(1.30)	(0.67)	(0.91)
-2	0.66	-1.53**	-0.60	1.12**	0.84	-1.87**	-0.72	1.28*	-0.42	-0.59
	(0.45)	(0.64)	(0.41)	(0.48)	(0.61)	(0.95)	(0.57)	(0.71)	(0.38)	(0.55)
0	-0.68**	0.82*	2.34***	-0.48	-1.15***	1.44**	2.81***	-0.24	0.34	1.20***
	(0.31)	(0.44)	(0.29)	(0.31)	(0.41)	(0.66)	(0.40)	(0.48)	(0.26)	(0.37)
1	-1.41***	1.72**	3.93***	-1.16**	-2.30***	2.95***	4.70***	-0.73	0.56	2.22***
	(0.48)	(0.69)	(0.49)	(0.50)	(0.66)	(1.03)	(0.70)	(0.75)	(0.41)	(0.60)
2	-1.83***	2.05**	4.59***	-1.50**	-3.22***	3.69***	5.72***	-1.27	0.55	2.42***
	(0.60)	(0.87)	(0.67)	(0.64)	(0.81)	(1.24)	(0.92)	(0.91)	(0.50)	(0.73)
3	-1.91***	2.04**	4.85***	-1.64**	-3.13***	3.25**	5.71***	-1.09	0.41	2.16***
	(0.68)	(0.99)	(0.82)	(0.72)	(0.91)	(1.39)	(1.13)	(1.00)	(0.57)	(0.82)
N unique individuals	8,593	8,593	8,593	8,593	5,172	5,172	5,172	5,172	8,593	5,172
N person-qtrs	247,914	247,914	247,914	247,914	131,864	131,864	131,864	131,864	247,914	131,864

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 3,841 offices in the sample with all employees and 3,032 offices in the sample with employees that have at least a Bachelor's degree. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.
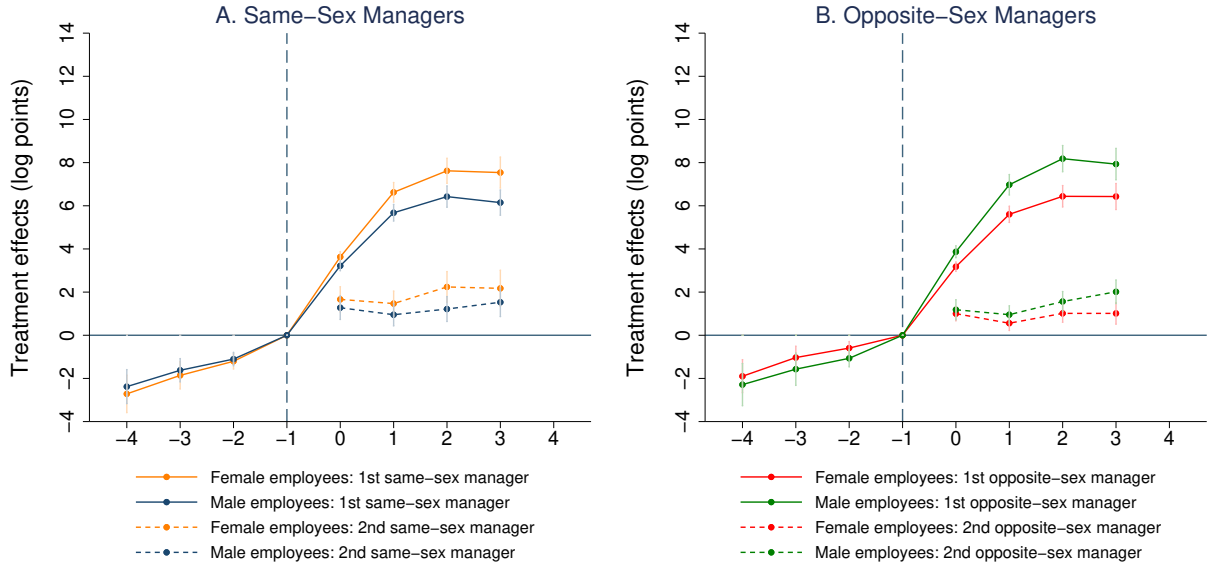
FIGURE A.11. EVENT STUDY ESTIMATES: EFFECTS OF FIRST AND SECOND NEW MANAGERS

Note: Treatments effects, sample, and specification are defined as in Figure 4. The estimated equation is given by:

$\hat{\omega}_{itq} = \delta_k^1 \cdot \mathbb{I}^{Event_1} \cdot NSM_{idt} + \delta_k^{f1} \cdot \mathbb{I}^{Event_1} \cdot F_i \cdot NSM_{idt} + \alpha_k^1 \cdot \mathbb{I}^{Event_1} + \alpha_k^{f1} \cdot \mathbb{I}^{Event_1} \cdot F_i +$

$\delta_k^2 \cdot \mathbb{I}^{Event_2} \cdot NSM_{idt} + \delta_k^{f2} \cdot \mathbb{I}^{Event_2} \cdot F_i \cdot NSM_{idt} + \alpha_k^2 \cdot \mathbb{I}^{Event_2} + \alpha_k^{f2} \cdot \mathbb{I}^{Event_2} \cdot F_i + \gamma_i + \lambda_q + \varepsilon_{itq}$,

where $Event_1$ denotes the arrival of a first manager and $Event_2$ denotes the arrival of a second manager. The remaining notation is the same as in event study equation 2. Point estimates and standard errors are reported in Table A.16. Vertical bars represent 95% confidence intervals with standard errors clustered by office.

A.25

TABLE A.16—EVENT STUDY ESTIMATES: EFFECTS OF FIRST AND SECOND NEW MANAGERS

	First new mngr				Second new mngr			
Event year	New same-sex mngr (δ^1) (1)	New same-sex mngr*female (δ^{f1}) (2)	New mngr(α^1) (3)	New mngr*female (α^{f1}) (4)	New same-sex mngr (δ^2) (5)	New same-sex mngr*female (δ^{f2}) (6)	New mngr (α^2) (7)	New mngr*female (α^{f2}) (8)
-4	-0.09 (0.63)	-0.72 (0.88)	-2.29*** (0.50)	0.39 (0.62)				
-3	-0.05 (0.47)	-0.77 (0.64)	-1.57*** (0.38)	0.54 (0.46)				
-2	-0.04 (0.25)	-0.58 (0.35)	-1.07*** (0.20)	0.47* (0.25)				
0	-0.65*** (0.17)	1.10*** (0.24)	3.87*** (0.14)	-0.69*** (0.16)	0.09 (0.37)	0.57 (0.51)	1.18*** (0.24)	-0.18 (0.28)
1	-1.30*** (0.28)	2.31*** (0.40)	6.97*** (0.24)	-1.37*** (0.28)	-0.00 (0.33)	0.91* (0.47)	0.95*** (0.21)	-0.40 (0.26)
2	-1.76*** (0.35)	2.94*** (0.50)	8.18*** (0.31)	-1.74*** (0.37)	-0.35 (0.35)	1.57*** (0.53)	1.56*** (0.24)	-0.55* (0.29)
3	-1.78*** (0.40)	2.90*** (0.57)	7.93*** (0.37)	-1.50*** (0.44)	-0.48 (0.38)	1.65*** (0.59)	2.02*** (0.28)	-1.00*** (0.35)
N unique individuals	31,117	31,117	31,117	31,117	31,117	31,117	31,117	31,117
N person-qtrs	1,318,756	1,318,756	1,318,756	1,318,756	1,318,756	1,318,756	1,318,756	1,318,756

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 8,377 offices. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs. The estimated equation is given by:

$\hat{\omega}_{itq} = \delta_k^1 \cdot \mathbb{I}^{Event_1} \cdot NSM_{idt} + \delta_k^{f1} \cdot \mathbb{I}^{Event_1} \cdot F_i \cdot NSM_{idt} + \alpha_k^1 \cdot \mathbb{I}^{Event_1} + \alpha_k^{f1} \cdot \mathbb{I}^{Event_1} \cdot F_i +$

$\delta_k^2 \cdot \mathbb{I}^{Event_2} \cdot NSM_{idt} + \delta_k^{f2} \cdot \mathbb{I}^{Event_2} \cdot F_i \cdot NSM_{idt} + \alpha_k^2 \cdot \mathbb{I}^{Event_2} + \alpha_k^{f2} \cdot \mathbb{I}^{Event_2} \cdot F_i + \gamma_i + \lambda_q + \varepsilon_{itq}$, where $Event_1$ denotes the arrival of a first manager and $Event_2$ denotes the arrival of a second manager. The remaining notation is the same as in event study equation 2.

The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

**APPENDIX B   Tables Underlying Figures**

TABLE B.1—QUARTERLY EVENT STUDY ESTIMATES: EFFECTS OF FIRST NEW MANAGERS

Event quarter	New same-sex mngr (δ)	New same-sex mngr*female (δ^f)	New mngr (α)	New mngr*female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)
-16	-0.17	-0.69	-3.46***	0.37	-0.32
	(0.80)	(1.12)	(0.64)	(0.80)	(0.76)
-15	-0.15	-0.44	-3.08***	0.26	-0.18
	(0.72)	(1.02)	(0.58)	(0.72)	(0.70)
-14	0.32	-1.04	-3.42***	0.63	-0.41
	(0.68)	(0.95)	(0.54)	(0.67)	(0.65)
-13	0.27	-1.22	-3.12***	0.53	-0.69
	(0.63)	(0.90)	(0.51)	(0.63)	(0.61)
-12	0.12	-0.77	-2.89***	0.37	-0.41
	(0.65)	(0.89)	(0.52)	(0.63)	(0.58)
-11	0.00	-0.64	-2.58***	0.48	-0.16
	(0.60)	(0.82)	(0.49)	(0.59)	(0.53)
-10	0.10	-0.87	-2.38***	0.64	-0.23
	(0.53)	(0.75)	(0.44)	(0.54)	(0.48)
-9	0.27	-1.35*	-2.42***	0.87*	(0.47)
	(0.50)	(0.76)	(0.36)	(0.49)	(0.48)
-8	0.14	-0.78	-2.40***	0.74*	(0.04)
	(0.42)	(0.59)	(0.33)	(0.41)	(0.40)
-7	-0.07	-0.40	-2.09***	0.27	(0.13)
	(0.38)	(0.53)	(0.31)	(0.38)	(0.36)
-6	0.29	-0.98**	-2.09***	0.62*	(0.36)
	(0.34)	(0.47)	(0.27)	(0.34)	(0.31)
-5	0.26	-0.92**	-1.78***	0.67**	(0.25)
	(0.29)	(0.43)	(0.22)	(0.29)	(0.28)
-4	0.34	-0.59*	-1.86***	0.54**	(0.06)
	(0.24)	(0.33)	(0.19)	(0.23)	(0.22)
-3	0.28	-0.22	-1.52***	0.17	(0.05)
	(0.20)	(0.27)	(0.16)	(0.19)	(0.18)
-2	0.23*	-0.16	-0.98***	-0.11	-0.26**
	(0.13)	(0.18)	(0.10)	(0.12)	(0.11)
0	-0.25*	0.56***	1.30***	-0.35***	0.22*
	(0.13)	(0.18)	(0.10)	(0.12)	(0.12)
1	-0.37**	0.74***	2.54***	-0.45***	0.30*
	(0.17)	(0.24)	(0.13)	(0.16)	(0.16)
2	-0.51**	1.17***	4.06***	-0.74***	0.44**
	(0.21)	(0.29)	(0.17)	(0.20)	(0.19)
3	-0.58***	1.33***	4.68***	-0.88***	0.44**
	(0.21)	(0.30)	(0.18)	(0.20)	(0.19)
4	-0.88***	1.92***	5.44***	-1.20***	0.72***
	(0.25)	(0.35)	(0.22)	(0.24)	(0.22)
5	-0.87***	2.00***	6.10***	-1.27***	0.73***
	(0.28)	(0.38)	(0.24)	(0.26)	(0.25)

Continued on next page

B.1

TABLE B.1 CONTINUED

Event quarter	New same-sex mngr (δ)	New same-sex mngr*female (δ^f)	New mngr (α)	New mngr*female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)
6	-1.23***	2.74***	7.14***	-1.58***	1.16***
	(0.29)	(0.42)	(0.25)	(0.27)	(0.28)
7	-1.45***	3.00***	7.52***	-1.83***	1.17***
	(0.30)	(0.43)	(0.26)	(0.28)	(0.29)
8	-1.50***	3.07***	7.74***	-1.79***	1.28***
	(0.30)	(0.45)	(0.27)	(0.29)	(0.30)
9	-1.59***	3.24***	8.18***	-1.94***	1.31***
	(0.32)	(0.47)	(0.29)	(0.31)	(0.32)
10	-1.93***	3.75***	8.78***	-2.18***	1.57***
	(0.34)	(0.50)	(0.30)	(0.33)	(0.33)
11	-1.99***	3.82***	8.82***	-2.20***	1.61***
	(0.35)	(0.51)	(0.31)	(0.34)	(0.34)
12	-1.88***	3.53***	8.79***	-2.14***	1.39***
	(0.36)	(0.53)	(0.32)	(0.35)	(0.35)
13	-1.89***	3.57***	8.76***	-2.21***	1.36***
	(0.38)	(0.54)	(0.33)	(0.36)	(0.36)
14	-1.92***	3.50***	8.73***	-2.20***	1.30***
	(0.38)	(0.56)	(0.34)	(0.37)	(0.38)
15	-1.93***	3.67***	8.34***	-2.33***	1.34***
	(0.39)	(0.56)	(0.35)	(0.38)	(0.38)
N unique individuals	31,117	31,117	31,117	31,117	31,117
N person-qtrs	1,318,756	1,318,756	1,318,756	1,318,756	1,318,756

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 8,377 offices in the sample. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

TABLE B.2—EVENT STUDY ESTIMATES BY EDUCATIONAL ATTAINMENT

	At least Bachelor's				Less than Bachelor's				At least Bachelor's	Less than Bachelor's
Event year	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	-0.04	-0.87	-1.75***	-0.37	0.18	-0.95	-2.91***	1.48	-1.23	0.53
	(0.76)	(1.13)	(0.63)	(0.81)	(1.04)	(1.32)	(0.77)	(0.93)	(0.75)	(0.93)
-3	0.35	-0.91	-1.56***	0.14	-0.52	-0.59	-1.34**	0.90	-0.77	0.31
	(0.59)	(0.84)	(0.50)	(0.61)	(0.70)	(0.91)	(0.53)	(0.64)	(0.55)	(0.61)
-2	0.08	-0.38	-0.96***	0.21	-0.03	-0.93*	-1.18***	0.84**	-0.17	-0.09
	(0.32)	(0.47)	(0.26)	(0.33)	(0.41)	(0.52)	(0.31)	(0.37)	(0.32)	(0.35)
0	-0.87***	1.72***	4.28***	-0.43**	-0.09	0.26	3.43***	-0.69***	1.29***	-0.43*
	(0.22)	(0.31)	(0.18)	(0.21)	(0.26)	(0.33)	(0.21)	(0.23)	(0.20)	(0.23)
1	-1.76***	3.43***	8.09***	-0.95***	-0.18	1.06**	5.70***	-1.34***	2.48***	-0.28
	(0.33)	(0.51)	(0.29)	(0.33)	(0.39)	(0.51)	(0.31)	(0.35)	(0.34)	(0.35)
2	-2.41***	4.35***	10.11***	-1.32***	-0.65	2.12***	7.06***	-1.83***	3.02***	0.29
	(0.41)	(0.63)	(0.36)	(0.41)	(0.48)	(0.63)	(0.39)	(0.44)	(0.42)	(0.43)
3	-2.65***	4.57***	10.42***	-1.43***	-0.52	1.93***	7.20***	-1.94***	3.14***	-0.01
	(0.47)	(0.70)	(0.41)	(0.46)	(0.54)	(0.71)	(0.44)	(0.49)	(0.47)	(0.49)
N unique individuals	18,033	18,033	18,033	18,033	13,311	13,311	13,311	13,311	18,033	13,311
N person-qtrs	753,475	753,475	753,475	753,475	575,061	575,061	575,061	575,061	753,475	575,061

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 6,875 offices in the at least Bachelor's sample and 6,372 offices in the less than Bachelor's sample. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

TABLE B.3—EVENT STUDY ESTIMATES BY OCCUPATIONAL ROUTINENESS

| Event year | Less routine | | | | More routine | | | | Less routine | More routine |
| | New same-sex mngr (δ) | New same-sex mngr* female (δ^f) | New mngr (α) | New mngr* female (α^f) | New same-sex mngr (δ) | New same-sex mngr* female (δ^f) | New mngr (α) | New mngr* female (α^f) | Female-male same-sex mngr $(\delta^f + \alpha^f)$ | Female-male same-sex mngr $(\delta^f + \alpha^f)$ |
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	0.18 (0.77)	-1.45 (1.15)	-2.57*** (0.63)	0.37 (0.81)	-0.31 (1.00)	-0.02 (1.31)	-1.60** (0.77)	0.49 (0.94)	-1.08 (0.79)	0.47 (0.90)
-3	0.73 (0.55)	-1.60* (0.82)	-2.18*** (0.45)	0.82 (0.58)	-1.01 (0.83)	0.20 (1.02)	-0.47 (0.68)	0.07 (0.78)	-0.78 (0.57)	0.27 (0.62)
-2	0.35 (0.33)	-1.02** (0.49)	-1.34*** (0.26)	0.72** (0.34)	-0.63 (0.39)	0.11 (0.50)	-0.45 (0.31)	0.02 (0.37)	-0.30 (0.35)	0.13 (0.34)
0	-0.89*** (0.21)	1.92*** (0.33)	4.55*** (0.17)	-0.34 (0.22)	-0.03 (0.29)	0.29 (0.35)	3.21*** (0.24)	-0.66*** (0.26)	1.58*** (0.22)	-0.37* (0.22)
1	-1.84*** (0.33)	4.04*** (0.54)	8.12*** (0.29)	-0.68** (0.34)	-0.34 (0.42)	1.17** (0.53)	6.36*** (0.34)	-1.93*** (0.37)	3.35*** (0.37)	-0.76** (0.35)
2	-2.44*** (0.41)	4.97*** (0.66)	9.80*** (0.37)	-1.00** (0.42)	-0.98* (0.51)	2.26*** (0.65)	8.30*** (0.43)	-2.64*** (0.46)	3.97*** (0.45)	-0.38 (0.43)
3	-2.51*** (0.46)	4.78*** (0.72)	9.78*** (0.42)	-1.03** (0.47)	-1.20** (0.57)	2.56*** (0.75)	8.98*** (0.48)	-3.03*** (0.52)	3.75*** (0.50)	-0.48 (0.50)
N unique individuals	17,516	17,516	17,516	17,516	13,793	13,793	13,793	13,793	17,516	13,793
N person-qtrs	729,190	729,190	729,190	729,190	596,980	596,980	596,980	596,980	729,190	596,980

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 6,543 offices in the sample with less routine employees and 6,130 offices in the sample with more routine employees. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

TABLE B.4—HETEROGENEITY OF OCCUPATIONAL ROUTINENESS ESTIMATES FOR EMPLOYEES WITH LESS THAN A BACHELOR'S DEGREE

	Less routine				More routine				Less routine	More routine
Event year	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	Female-male same-sex mngr $(\delta^f + \alpha^f)$	Female-male same-sex mngr $(\delta^f + \alpha^f)$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	-0.46	-1.37	-3.23***	1.03	0.93	-1.54	-2.25*	1.46	-0.33	-0.08
	(1.24)	(1.89)	(0.95)	(1.23)	(1.60)	(1.88)	(1.15)	(1.32)	(1.44)	(1.31)
-3	-0.43	-1.08	-1.95***	0.97	-0.28	-0.87	-0.71	0.68	-0.11	-0.20
	(0.88)	(1.36)	(0.70)	(0.90)	(1.09)	(1.30)	(0.79)	(0.91)	(1.02)	(0.85)
-2	0.35	-2.04**	-1.65***	1.23**	-0.45	-0.27	-0.60	0.36	-0.81	0.09
	(0.52)	(0.88)	(0.42)	(0.55)	(0.62)	(0.71)	(0.44)	(0.50)	(0.66)	(0.48)
0	-0.23	0.84	4.10***	-0.25	0.17	0.16	2.61***	-0.44	0.59	-0.29
	(0.33)	(0.54)	(0.29)	(0.35)	(0.39)	(0.44)	(0.27)	(0.30)	(0.40)	(0.30)
1	-0.50	2.15**	6.28***	-0.31	0.37	0.66	5.11***	-1.51***	1.84***	-0.85*
	(0.52)	(0.85)	(0.43)	(0.53)	(0.59)	(0.69)	(0.44)	(0.48)	(0.64)	(0.47)
2	-1.07*	3.70***	7.50***	-0.58	0.28	1.20	6.50***	-1.96***	3.12***	-0.76
	(0.63)	(1.04)	(0.53)	(0.65)	(0.74)	(0.87)	(0.58)	(0.62)	(0.79)	(0.58)
3	-0.80	3.41***	7.23***	-0.38	0.40	0.93	7.02***	-2.32***	3.04***	-1.38**
	(0.69)	(1.13)	(0.58)	(0.70)	(0.85)	(1.00)	(0.67)	(0.72)	(0.88)	(0.67)
N unique individuals	5,663	5,663	5,663	5,663	7,827	7,827	7,827	7,827	5,663	7,827
N person-qtrs	236,990	236,990	236,990	236,990	345,225	345,225	345,225	345,225	236,990	345,225

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 3,587 offices in the sample with less routine employees and 4,887 offices in the sample with more routine employees. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

TABLE B.5—HETEROGENEITY OF OCCUPATIONAL ROUTINENESS ESTIMATES FOR EMPLOYEES WITH AT LEAST A BACHELOR'S DEGREE

Event year	Less routine				More routine				Less routine	More routine
	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	0.71	-1.76	-2.33***	0.10	-0.89	0.61	-1.02	-0.43	-1.66*	0.18
	(0.95)	(1.39)	(0.80)	(1.02)	(1.18)	(1.82)	(0.97)	(1.28)	(0.90)	(1.27)
-3	1.48**	-2.03**	-2.36***	0.78	-1.28	0.91	-0.24	-0.64	-1.25*	0.27
	(0.67)	(1.00)	(0.55)	(0.72)	(1.16)	(1.49)	(1.03)	(1.16)	(0.67)	(0.92)
-2	0.45	-0.72	-1.23***	0.51	-0.59	0.31	-0.39	-0.27	-0.21	0.04
	(0.40)	(0.59)	(0.32)	(0.41)	(0.51)	(0.72)	(0.42)	(0.53)	(0.41)	(0.49)
0	-1.13***	2.17***	4.64***	-0.29	-0.24	0.53	3.55***	-0.55	1.87***	-0.02
	(0.25)	(0.39)	(0.20)	(0.26)	(0.41)	(0.51)	(0.35)	(0.39)	(0.26)	(0.31)
1	-2.27***	4.26***	8.72***	-0.64	-0.89	1.63**	7.05***	-1.50***	3.61***	0.13
	(0.40)	(0.65)	(0.35)	(0.42)	(0.56)	(0.75)	(0.47)	(0.53)	(0.43)	(0.49)
2	-2.74***	4.83***	10.62***	-0.98*	-1.92***	3.22***	9.41***	-2.02***	3.85***	1.21**
	(0.50)	(0.79)	(0.44)	(0.51)	(0.67)	(0.93)	(0.57)	(0.65)	(0.53)	(0.61)
3	-2.87***	4.59***	10.72***	-1.08*	-2.34***	4.31***	10.15***	-2.20***	3.51***	2.11***
	(0.57)	(0.87)	(0.50)	(0.57)	(0.74)	(1.05)	(0.63)	(0.72)	(0.59)	(0.70)
N unique individuals	11,944	11,944	11,944	11,944	6,059	6,059	6,059	6,059	11,944	6,059
N person-qtrs	498,687	498,687	498,687	498,687	255,386	255,386	255,386	255,386	498,687	255,386

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 5,699 offices in the sample with less routine employees and 3,745 offices in the sample with more routine employees. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

TABLE B.6—EVENT STUDY ESTIMATES BY PRESIDENTIAL ERAS: REAGAN AND BUSH (1987-1992)

	All employees				Less routine employees				All employees	Less routine
									Female-male	Female-male
Event year	New same-sex mngr (δ)	New same-sex mngr*female (δ^f)	New mngr (α)	New mngr*female (α^f)	New same-sex mngr (δ)	New same-sex mngr*female (δ^f)	New mngr (α)	New mngr*female (α^f)	same-sex mngr ($\delta^f + \alpha^f$)	same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	-2.32	1.99	2.36	-1.61	-4.43	1.97	4.52**	-2.84	0.37	-0.87
	(2.38)	(3.57)	(1.88)	(2.26)	(2.74)	(5.03)	(2.04)	(2.62)	(2.64)	(4.19)
-3	0.21	-1.98	0.32	0.37	0.16	-2.98	0.39	0.29	-1.60	-2.68
	(1.85)	(2.38)	(1.42)	(1.51)	(2.06)	(3.22)	(1.63)	(1.91)	(1.72)	(2.47)
-2	-0.27	-0.50	-0.11	0.17	0.52	-2.34	-0.64	0.95	-0.33	-1.40
	(0.92)	(1.20)	(0.65)	(0.72)	(1.03)	(1.74)	(0.75)	(0.97)	(0.93)	(1.39)
0	0.68	-0.75	3.06***	-0.56	-0.27	0.86	3.24***	0.26	-1.31***	1.12*
	(0.45)	(0.62)	(0.40)	(0.39)	(0.51)	(0.80)	(0.48)	(0.49)	(0.47)	(0.62)
1	0.89	-0.42	6.35***	-1.94***	-0.03	1.32	6.32***	0.16	-2.36***	1.47
	(0.69)	(0.92)	(0.61)	(0.56)	(0.79)	(1.24)	(0.74)	(0.73)	(0.70)	(0.97)
2	0.21	0.14	9.00***	-3.57***	-0.48	1.50	8.91***	-0.74	-3.43***	0.76
	(0.87)	(1.12)	(0.82)	(0.69)	(1.06)	(1.57)	(1.02)	(0.91)	(0.82)	(1.20)
3	-0.34	0.17	10.11***	-4.32***	-0.52	1.37	9.55***	-0.48	-4.15***	0.89
	(1.05)	(1.34)	(1.03)	(0.85)	(1.29)	(1.82)	(1.25)	(1.08)	(0.96)	(1.38)
N unique individuals	4,205	4,205	4,205	4,205	2,223	2,223	2,223	2,223	4,205	2,223
N person-qtrs	275,353	275,353	275,353	275,353	145,142	145,142	145,142	145,142	275,353	145,142

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 4,340 offices in the sample with all employees and 2,672 offices in the sample with employees that have less routine occupations. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

TABLE B.7—EVENT STUDY ESTIMATES BY PRESIDENTIAL ERAS: CLINTON (1993-2000)

Event year	All employees				Less routine employees				All employees	Less routine
	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	0.70	-1.13	-3.72***	1.03	0.88	-1.93	-3.51***	1.36	-0.10	-0.57
	(1.31)	(1.93)	(1.05)	(1.27)	(1.50)	(2.37)	(1.23)	(1.50)	(1.38)	(1.72)
-3	0.22	-1.15	-1.77**	0.67	1.32	-2.64	-2.36***	1.38	-0.48	-1.26
	(1.06)	(1.44)	(0.88)	(1.04)	(1.04)	(1.67)	(0.80)	(1.06)	(0.97)	(1.25)
-2	0.63	-1.49**	-1.74***	1.16**	0.97	-2.19**	-1.70***	1.15*	-0.33	-1.05
	(0.52)	(0.75)	(0.41)	(0.49)	(0.62)	(1.02)	(0.47)	(0.61)	(0.57)	(0.82)
0	-0.16	0.39	3.31***	-0.68**	-0.35	1.06*	3.46***	-0.32	-0.29	0.75
	(0.37)	(0.48)	(0.30)	(0.34)	(0.40)	(0.61)	(0.31)	(0.38)	(0.33)	(0.46)
1	-0.63	1.37*	6.21***	-1.41***	-1.08*	2.62***	6.24***	-0.62	-0.04	1.99***
	(0.55)	(0.74)	(0.44)	(0.49)	(0.63)	(0.97)	(0.50)	(0.60)	(0.54)	(0.76)
2	-0.82	2.50***	7.71***	-2.00***	-0.71	3.21***	7.18***	-0.66	0.50	2.55***
	(0.66)	(0.92)	(0.53)	(0.59)	(0.78)	(1.20)	(0.62)	(0.74)	(0.70)	(0.93)
3	-0.67	2.81***	7.64***	-2.00***	-0.35	2.78**	6.87***	-0.46	0.81	2.32**
	(0.75)	(1.07)	(0.61)	(0.67)	(0.89)	(1.35)	(0.71)	(0.84)	(0.82)	(1.03)
N unique individuals	6,670	6,670	6,670	6,670	3,872	3,872	3,872	3,872	6,670	3,872
N person-qtrs	372,435	372,435	372,435	372,435	213,602	213,602	213,602	213,602	372,435	213,602

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 4,942 offices in the sample with all employees and 3,517 offices in the sample with employees that have less routine occupations. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

TABLE B.8—EVENT STUDY ESTIMATES BY PRESIDENTIAL ERAS: BUSH (2001-2008)

Event year	All employees				Less routine employees				All employees	Less routine
	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	-0.84	0.57	-1.03	-0.54	-0.32	0.91	-2.24**	-1.06	0.03	-0.15
	(0.93)	(1.27)	(0.74)	(0.88)	(1.19)	(1.66)	(0.97)	(1.19)	(0.91)	(1.16)
-3	-0.24	-0.18	-1.25**	0.40	0.67	-0.53	-2.34***	0.40	0.22	-0.13
	(0.68)	(0.92)	(0.54)	(0.64)	(0.86)	(1.21)	(0.70)	(0.85)	(0.65)	(0.86)
-2	-0.62	0.05	-0.70**	0.25	-0.16	-0.21	-1.23***	0.45	0.30	0.24
	(0.40)	(0.53)	(0.31)	(0.38)	(0.52)	(0.74)	(0.41)	(0.51)	(0.37)	(0.51)
0	-0.82***	1.74***	4.85***	-0.89***	-0.92***	2.29***	5.50***	-0.60*	0.85***	1.70***
	(0.25)	(0.35)	(0.21)	(0.23)	(0.32)	(0.48)	(0.26)	(0.31)	(0.24)	(0.33)
1	-1.41***	3.40***	8.70***	-1.67***	-1.90***	4.83***	9.76***	-0.95*	1.73***	3.88***
	(0.41)	(0.58)	(0.35)	(0.38)	(0.52)	(0.79)	(0.45)	(0.51)	(0.38)	(0.53)
2	-1.99***	4.43***	10.50***	-1.89***	-2.55***	5.80***	11.53***	-1.07*	2.54***	4.72***
	(0.51)	(0.72)	(0.46)	(0.48)	(0.64)	(0.97)	(0.58)	(0.63)	(0.46)	(0.64)
3	-2.35***	4.62***	10.57***	-2.11***	-2.94***	5.88***	11.36***	-1.28*	2.51***	4.59***
	(0.56)	(0.80)	(0.52)	(0.53)	(0.70)	(1.06)	(0.65)	(0.69)	(0.51)	(0.70)
N unique individuals	14,823	14,823	14,823	14,823	8,495	8,495	8,495	8,495	14,823	8,495
N person-qtrs	584,746	584,746	584,746	584,746	327,915	327,915	327,915	327,915	584,746	327,915

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 5,244 offices in the sample with all employees and 4,126 offices in the sample with employees that have less routine occupations. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

TABLE B.9—EVENT STUDY ESTIMATES BY PRESIDENTIAL ERAS: OBAMA (20019-2014)

Event year	All employees				Less routine employees				All employees	Less routine
	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	New same-sex mngr (δ)	New same-sex mngr* female (δ^f)	New mngr (α)	New mngr* female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	1.31 (1.10)	-2.70* (1.49)	-1.13 (1.07)	2.23* (1.16)	1.18 (1.42)	-4.51** (2.08)	-0.73 (1.44)	1.87 (1.62)	-0.47 (0.89)	-2.64** (1.22)
-3	0.55 (0.79)	-1.84 (1.15)	-0.51 (0.74)	1.49* (0.85)	0.86 (1.08)	-3.04* (1.70)	-0.50 (1.05)	1.56 (1.30)	-0.35 (0.67)	-1.47 (0.91)
-2	0.66 (0.45)	-1.53** (0.64)	-0.60 (0.41)	1.12** (0.48)	0.84 (0.61)	-1.87** (0.95)	-0.72 (0.57)	1.28* (0.71)	-0.42 (0.38)	-0.59 (0.55)
0	-0.68** (0.31)	0.82* (0.44)	2.34*** (0.29)	-0.48 (0.31)	-1.15*** (0.41)	1.44** (0.66)	2.81*** (0.40)	-0.24 (0.48)	0.34 (0.26)	1.20*** (0.37)
1	-1.41*** (0.48)	1.72** (0.69)	3.93*** (0.49)	-1.16** (0.50)	-2.30*** (0.66)	2.95*** (1.03)	4.70*** (0.70)	-0.73 (0.75)	0.56 (0.41)	2.22*** (0.60)
2	-1.83*** (0.60)	2.05** (0.87)	4.59*** (0.67)	-1.50** (0.64)	-3.22*** (0.81)	3.69*** (1.24)	5.72*** (0.92)	-1.27 (0.91)	0.55 (0.50)	2.42*** (0.73)
3	-1.91*** (0.68)	2.04** (0.99)	4.85*** (0.82)	-1.64** (0.72)	-3.13*** (0.91)	3.25** (1.39)	5.71*** (1.13)	-1.09 (1.00)	0.41 (0.57)	2.16*** (0.82)
N unique individuals	8,593	8,593	8,593	8,593	4,651	4,651	4,651	4,651	8,593	4,651
N person-qtrs	247,914	247,914	247,914	247,914	115,055	115,055	115,055	115,055	247,914	115,055

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 3,841 offices in the sample with all employees and 2,866 offices in the sample with employees that have less routine occupations. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

TABLE B.10—EVENT STUDY ESTIMATES BY INITIAL SHARE OF SAME-SEX EMPLOYEES

Event year	Above median				Below median				Above median	Below median
	New same-sex mngr (δ)	New same-sex mngr*female (δ^f)	New mngr (α)	New mngr*female (α^f)	New same-sex mngr (δ)	New same-sex mngr*female (δ^f)	New mngr (α)	New mngr*female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	-1.66	0.78	-1.49*	-0.84	0.88	-0.83	-2.46***	0.92	-0.05	0.09
	(1.03)	(1.28)	(0.85)	(1.01)	(0.78)	(1.24)	(0.60)	(0.77)	(0.79)	(0.97)
-3	-1.54**	0.76	-0.85	-0.58	0.93	-1.17	-1.70***	1.04*	0.18	-0.12
	(0.73)	(0.91)	(0.62)	(0.74)	(0.59)	(0.92)	(0.47)	(0.58)	(0.54)	(0.71)
-2	-0.80*	0.23	-0.58	-0.21	0.41	-0.75	-1.17***	0.81***	0.01	0.06
	(0.43)	(0.52)	(0.39)	(0.45)	(0.34)	(0.55)	(0.24)	(0.31)	(0.30)	(0.44)
0	-0.26	0.60*	3.79***	0.13	-0.68***	0.69**	4.12***	-1.32***	0.74***	-0.63**
	(0.28)	(0.34)	(0.25)	(0.29)	(0.22)	(0.34)	(0.17)	(0.21)	(0.21)	(0.26)
1	-0.34	1.11**	6.48***	0.68	-1.37***	1.74***	7.66***	-3.10***	1.79***	-1.35***
	(0.43)	(0.54)	(0.39)	(0.46)	(0.35)	(0.54)	(0.27)	(0.32)	(0.34)	(0.43)
2	-0.92*	1.96***	8.17***	0.60	-1.88***	2.47***	9.46***	-4.01***	2.56***	-1.53***
	(0.53)	(0.67)	(0.49)	(0.58)	(0.43)	(0.67)	(0.35)	(0.40)	(0.42)	(0.54)
3	-1.24**	2.21***	8.68***	0.19	-1.93***	2.82***	9.61***	-4.09***	2.40***	-1.27**
	(0.61)	(0.77)	(0.56)	(0.66)	(0.48)	(0.75)	(0.40)	(0.45)	(0.48)	(0.60)
N unique individuals	16,217	16,217	16,217	16,217	14,900	14,900	14,900	14,900	16,217	14,900
N person-qtrs	646,512	646,512	646,512	646,512	672,244	672,244	672,244	672,244	646,512	672,244

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 6,116 offices in the sample with above median initial same-sex employee share and 6,764 offices in the sample with below median initial same-sex employee share. Median initial share of same-sex employees is 47.45%. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

TABLE B.11—EVENT STUDY ESTIMATES BY INITIAL SHARE OF SAME-SEX MANAGERS

Event year	Above median				Below median				Above median	Below median
	New same-sex mngr (δ)	New same-sex mngr*female (δ^f)	New mngr (α)	New mngr*female (α^f)	New same-sex mngr (δ)	New same-sex mngr*female (δ^f)	New mngr (α)	New mngr*female (α^f)	Female-male same-sex mngr ($\delta^f + \alpha^f$)	Female-male same-sex mngr ($\delta^f + \alpha^f$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
-4	0.71	-1.76	-2.33***	0.10	-0.89	0.61	-1.02	-0.43	-1.66*	0.18
	(0.95)	(1.39)	(0.80)	(1.02)	(1.18)	(1.82)	(0.97)	(1.28)	(0.90)	(1.27)
-3	1.48**	-2.03**	-2.36***	0.78	-1.28	0.91	-0.24	-0.64	-1.25*	0.27
	(0.67)	(1.00)	(0.55)	(0.72)	(1.16)	(1.49)	(1.03)	(1.16)	(0.67)	(0.92)
-2	0.45	-0.72	-1.23***	0.51	-0.59	0.31	-0.39	-0.27	-0.21	0.04
	(0.40)	(0.59)	(0.32)	(0.41)	(0.51)	(0.72)	(0.42)	(0.53)	(0.41)	(0.49)
0	-1.13***	2.17***	4.64***	-0.29	-0.24	0.53	3.55***	-0.55	1.87***	-0.02
	(0.25)	(0.39)	(0.20)	(0.26)	(0.41)	(0.51)	(0.35)	(0.39)	(0.26)	(0.31)
1	-2.27***	4.26***	8.72***	-0.64	-0.89	1.63**	7.05***	-1.50***	3.61***	0.13
	(0.40)	(0.65)	(0.35)	(0.42)	(0.56)	(0.75)	(0.47)	(0.53)	(0.43)	(0.49)
2	-2.74***	4.83***	10.62***	-0.98*	-1.92***	3.22***	9.41***	-2.02***	3.85***	1.21**
	(0.50)	(0.79)	(0.44)	(0.51)	(0.67)	(0.93)	(0.57)	(0.65)	(0.53)	(0.61)
3	-2.87***	4.59***	10.72***	-1.08*	-2.34***	4.31***	10.15***	-2.20***	3.51***	2.11***
	(0.57)	(0.87)	(0.50)	(0.57)	(0.74)	(1.05)	(0.63)	(0.72)	(0.59)	(0.70)
N unique individuals	15,577	15,577	15,577	15,577	15,540	15,540	15,540	15,540	15,577	15,540
N person-qtrs	610,866	610,866	610,866	610,866	707,890	707,890	707,890	707,890	610,866	707,890

Note: The event study sample is restricted to workers who were employed by the US Federal service for at least 5 years, work in offices with at least 10 employees and no more than 5 mangers, born in the year starting 1955, and experienced an appointment of a first new manager, as explained in section III.B. Employees are spread over 6,569 offices in the sample with above median initial same-sex manager share and 6,805 offices in the sample with below median initial same-sex manager share. Median initial share of same-sex managers is 45.65%. Event year treatment effects are reported in log points. All event study specifications include quarter-year and individual-office FEs, see event study equation 2. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses. * p<0.10 ** p<0.05 *** p<0.01.

TABLE B.12—FEMALE-MALE SAME-SEX MANAGER EFFECTS: SENSITIVITY ANALYSIS

	Alternative specifications				Alternative samples		
Event year	Main specification	Individual FE	No office FE	Single manager	At most 20 managers	No office switching	No part time employees
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
-4	-0.32	0.41	-0.38	-0.29	-0.59	-1.32*	-0.49
	(0.60)	(0.56)	(0.79)	(0.67)	(0.57)	(0.68)	(0.63)
-3	-0.22	0.05	-0.10	-0.41	-0.79*	-0.92*	-0.40
	(0.42)	(0.41)	(0.56)	(0.48)	(0.41)	(0.50)	(0.45)
-2	-0.11	0.06	-0.06	-0.18	-0.52**	-0.27	-0.28
	(0.24)	(0.24)	(0.29)	(0.27)	(0.24)	(0.30)	(0.26)
0	0.46***	0.20	0.46**	0.50***	0.27**	0.53***	0.60***
	(0.16)	(0.16)	(0.18)	(0.18)	(0.12)	(0.19)	(0.17)
1	1.06***	0.45*	1.19***	1.25***	0.41*	1.00***	1.37***
	(0.26)	(0.26)	(0.31)	(0.29)	(0.21)	(0.32)	(0.28)
2	1.55***	0.87***	1.73***	1.81***	0.46*	1.44***	2.06***
	(0.33)	(0.33)	(0.40)	(0.36)	(0.27)	(0.39)	(0.35)
3	1.46***	0.59*	1.72***	1.74***	0.30	1.29***	2.06***
	(0.37)	(0.35)	(0.45)	(0.40)	(0.31)	(0.43)	(0.39)
N unique individuals	31,117	31,117	31,117	25,913	59,681	318,713	27,815
N person-qtrs	1,318,756	1,318,756	1,318,756	1,118,488	2,530,586	800,027	1,176,878

Note: The estimates in the table show female-male same-sex manager effects ($\delta^f + \alpha^f$) following equation 2. Event year treatment effects are reported in log points. "Main Sample" is the event-study sample and reproduces the differential homophily effect from Figure 4B for reference. Panel A splits the event study sample by the manager's previous location of employment. The "external hires" estimates are from employees whose new manager had not previously worked at the office, and "internal hires" are from employees whose new managers had previously worked at the office as employees. Panel B splits the event study sample by the age of the new manager at appointment. The "35 or younger" and "older than 35" estimates are from the subsamples of employees whose new manager was that age at appointment. Panel C uses "individual FE" instead of individual-office FEs. "No office FEs" estimates exclude office FEs in the first stage, but include individual-office FEs in the second stage. "Single manager" only includes employees treated with a single first new manager. In Panel D, "same sample in 2 stages" uses the event study sample in both the first and second stages. The "At most 20 managers" sample includes all employees working in offices with at most 20 managers in the quarter prior to getting a first new manager. "No office switching" excludes 40% of employees that switch offices at any point in the sample. "No part-time employees" excludes the 8% of employees who have a part-time spell during their federal service. Employees are spread over 8,377 offices in the main sample with at most 5 managers at the office in a quarter prior to the arrival of the new manager and 9,589 offices in the sample with offices with at most 20 managers in the quarter prior to arrival of the new manager. In the main sample, employees that do not switch offices during the event study period are employed in 6,004 offices. Employees without part-time spells are employed in 7,968 offices. When limiting treatment definition to a single manager, employees are employed in 7,781 offices. The dependent variable is the residual log pay after controlling for locations, five-year birth cohorts, education, tenure, and occupation dummies, and part-time status in yearly regressions. See footnote 28 and equation 1 for details. Standard errors clustered at the office are in parentheses.
* p<0.10 ** p<0.05 *** p<0.01.