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Organizational Variation in Federal Agencies' Gender Pay Gaps

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ORGANIZATIONAL VARIATION IN FEDERAL AGENCIES' GENDER PAY GAPS

A Dissertation Presented

by

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DEDICATION

To women civil servants.

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ABSTRACT

ORGANIZATIONAL VARIATION IN FEDERAL AGENCIES' GENDER PAY GAPS

MAY 2022

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Although previous research has identified differences in the gender pay gap by employment sector, existing research on the causes of employer variation in the gender pay gap, particularly in the U.S. Federal Government, is limited (Smith-Doerr et al. 2019; U.S. Government Accountability Office 2020). This dissertation fills that gap by exploring organizational characteristics contributing to varying inequality regimes (Acker 2006) and subsequent pay equity variation.

Using a linked employer-employee administrative dataset covering over 2 million federal employees, I measured governmentwide and agency-level gender pay gaps and explored organizational characteristics that explain agency-level differences.

I found a governmentwide gross gender pay gap of 7.4%, but gender explained only 0.8% of the variation in logged salary. Workplace (agency) segregation explained 17.8% of the gross pay gap. However, including detailed occupational fixed effects in regression models explained far more of the salary variation than agency. The final governmentwide model, controlling for human capital, geography, agency, occupation,

and occupation within agency, explained 84.9% of variation in logged salary and found a 3.0% within-job pay gap.

Next, I calculated the gender pay gap net of explanatory factors for 371 federal agencies. In the average agency, the gross pay gap was 8.9%. Agencies' gross, human capital/geography-controlled, and within-job pay gaps varied widely (within-job gaps of -12.4% to +12.4%), but 93% of agencies' within-job pay levels favored men. Further, occupational segregation's contribution to the pay gap varied from a 35.0% pay penalty for women to a 13.2% pay bonus.

Finally, I explored whether pay plan segregation, women's participation in management, racial/ethnic minority participation in management, and being part of the Department of Defense (DoD) were associated with between-job and within-job agency-level gender pay gaps. Supporting the concept of inequality regimes, women's participation in management was positively correlated with women's between-job and within-job relative pay, but less so in contexts that may decrease women managers' power. Further, these contexts affect between-job and within-job pay gaps differently.

In sum, the gender pay gap is context dependent. To improve pay equity, organization-specific solutions are needed.

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CHAPTER I

GENDER PAY GAPS BROADLY, DIVERSELY, AND WITHIN THE FEDERAL GOVERNMENT

The gender pay gap is pervasive; however, it is not the same in all organizations. Broad evidence of this exists in the differences in the gender pay gap by industry. For example, the Bureau of Labor Statistics (BLS) reported that in 2019, nationally women earned 81.5% of what men made, but in construction, women earned 94.3%, and in finance and insurance, women had the lowest relative earnings at 62.5%. In public administration, women earned 79.6% of what men earned (U.S. Bureau of Labor Statistics 2021), but within the Federal Government, the gross pay gap was only 7% as of September 2017 (U.S. Government Accountability Office 2020).

The gender pay gap also varies by occupation. In almost all occupations nationwide, women earn less than men. The strongest exception in 2019 was among counselors. However, women counselors earned only 6.2% more than men counselors earned. Note that over 75% of counselors were women (U.S. Bureau of Labor Statistics 2021), and although this occupation usually requires a master's degree, the median annual wage was only $45,670 (U.S. Bureau of Labor Statistics 2022).

In the category of occupations where women earned the least relative to men, legal occupations, women earned 63.3% of what men earned; this is likely due to occupational segregation within legal occupations, where women represented 89% of paralegals and legal assistants, but only 38% of lawyers (U.S. Bureau of Labor Statistics 2021). The gender pay gap varies with individual-level factors as well, such as race and ethnicity, age, marital status, union affiliation, and educational attainment (U.S. Bureau of Labor Statistics 2020).

A. A Recent History of Gender Pay Gap Politics

The Equal Pay Act of 1963 mandates that men and women be paid equal wages for equal work (U.S. Equal Employment Opportunity Commission n.d.a). Title VII of the Civil Rights Act of 1964 prohibits discrimination, including pay inequities based on protected categories, such as gender, as well as employment segregation if it leads to unequal outcomes (U.S. Equal Employment Opportunity Commission n.d.b). Despite almost sixty years of sporadic progress, the pay gap remains, even in the Federal Government.

Prioritizing this issue, President Barack Obama made the Lilly Ledbetter Fair Pay Act the first bill that he signed into law in 2009 (The White House 2016). This bill extended the statute of limitations for filing pay discrimination complaints. Continuing the movement to advance equal pay, President Obama issued the Memorandum on Advancing Pay Equality Through Compensation Data Collection (Obama 2014), mandating that federal contractors report pay data by sex[1] and race to the Department of Labor's Office of Federal Contract Compliance Programs (OFCCP). Under his administration, the Equal Employment Opportunity Commission (EEOC), included "Enforcing Equal Pay Laws" as one of its priorities (U.S. Equal Employment Opportunity Commission 2012) and set up systems requiring private employers to report summary data on their employees' compensation by sex and race (U.S. Equal Employment Opportunity Commission 2016). President Obama also ordered that the

[1] The sociological literature usually uses the term gender. Legislation revolving around equal pay uses the term sex, and legal cases have been fought over discriminating based on violating gender norms in the workplace, not to mention more recent legal cases on gender identity. In the questionnaires that federal employees fill out that provide the data that I use in this paper, the question uses the term sex. While acknowledging the meaningful differences between these words, I use them interchangeably.

Office of Personnel Management (OPM) analyze the gender pay gap in the Federal Government (Obama 2013).

OPM completed its report on the gender pay gap in the Federal Government, resulting in the following recommendations: 1) pay setting flexibility and starting pay setting should be applied in gender-neutral ways; 2) individual agencies, with guidance from OPM, should analyze their own pay gaps; 3) further analyses should be done to cover employees outside the scope of OPM's initial pay gap analysis; 4) best practices for recruitment of women into positions in which they are underrepresented should be shared across agencies; and 5) best practices and guidance for creating part-time work schedules should be disseminated to agencies (U.S. Office of Personnel Management 2014).

However, in 2017, the Trump Administration deprioritized pay data analysis. President Trump's Office of Management and Budget (OMB) ordered the OFCCP and the EEOC to eliminate their pay data collection plans.

Some politicians continued to press the importance of eliminating the gender pay gap in the Federal Government through that time. Senators Patty Murray and Katherine Clark along with representatives Rosa L. DeLauro and Tammy Duckworth asked the U.S. Government Accountability Office (GAO) to identify the status of federal sector pay equity and assess OPM and the EEOC's efforts to address the gender pay gap in the federal workforce. GAO found that the pay gap has continued to decrease, but they also found the EEOC's data on promotions inadequate (U.S. Government Accountability Office 2020).

In the meantime, the EEOC has started to collect better federal sector pay data (U.S. Equal Employment Opportunity Commission n.d.c). In 2019, a U.S. District Court judge ordered the EEOC to resume its private sector pay data collection (Smith 2019), but the same judge deemed the collection "complete" in January of 2020 (Smith 2020). In 2021, a panel put together by the National Academies of Science began evaluating the quality of the EEOC's private sector pay data. The results of that inquiry are pending (National Academies of Science 2022).

Under the Biden Administration, pay equity has reemerged as a priority. President Biden's Executive Order on Diversity, Equity, Inclusion, and Accessibility in the Federal Workforce (2021) required OPM and OMB to create a Government-wide Diversity, Equity, Inclusion, and Accessibility (DEIA) Strategic Plan in part to identify strategies to advance DEIA, and eliminate, where applicable, barriers to equity in Federal workforce functions, including pay and compensation policies. Individual agencies are also required to make DEIA Strategic Plans that include assessments of whether pay and compensation policies are equitable. Further, OPM shall "consider whether to (i) work with agencies to review, and revise if necessary, job classification and compensation practices" (Biden 2021:12(a)). OPM must also consider whether to ban the solicitation of prior salary history in pay setting (Biden 2021:12(a)(ii)).

These are great steps towards finding out what might improve pay equity, including pay equity for women. However, when looking closely at the wording of the Executive Order, OPM, OMB, and individual agencies are mandated to *identify* useful strategies and *consider whether to* revise policies. The second to last subsection reemphasizes the tentative nature of actions, when it states that a general provision of the Executive Order is, "Independent agencies are *strongly encouraged* to comply with the provisions of this order" (Biden 2021:15(c) emphasis added). Without any enforcement mechanisms, we can only hope that this policy and the useful strategies to improve equity are implemented.

B. Research on Organizational Variation in the Gender Pay Gap

Researchers have been studying the gender pay gap for decades, but the gap persists. In this dissertation, I contribute to the literature by expanding knowledge on organizational variation in the pay gap, by identifying methods for observing segregation-related and within-job pay disparities, and by identifying mechanisms that produce or reduce different components of the pay gap. Below, I summarize existing literature related to these topics and how I fill in the gaps in the literature.

Petersen and Morgan (1995) conducted “the first large-scale empirical investigation of within-job wage differences between men and women in the same occupation and establishment” (p. 29). They showed that within-job gender wage differences were small, that occupational segregation and establishment segregation were both widespread, and that occupational segregation contributed more to the gender pay gap than establishment segregation. Like Petersen and Morgan, I examine how occupation, establishment, and within-job segregation contribute to the pay gap. I go beyond this by using a more granular definition of occupation, by identifying pay gaps of individual employers, and by evaluating organizational causes of these pay gaps.

GAO (2009, 2020) measured and decomposed the gender pay gap governmentwide. The also decomposed and reported the gender pay gap for the largest of federal agencies and departments. However, my research goes further again by using more detailed levels of occupation and agency and by testing correlations between organizational characteristics and organizational pay gaps

Smith-Doerr et al. (2019) produced an article that in some ways is quite similar to my research here. Using a similar dataset, they examined organizational variation and gender pay gap mechanisms in seven federal science agencies. They found that pay gap mechanisms vary depending on whether the agency was associated with gender-neutral or traditionally masculine fields. However, their results are generally localized to those seven science agencies.[2] My research covers almost 2 million federal employees at over 500 agencies. I also go further by testing correlations between organizational characteristics and organizational pay gaps.

Other literature has identified some other organizational mechanisms related to pay gaps. For example, Fuller (2018) found that the Canadian motherhood pay gap (among women) was associated with between-establishment segregation. Going further, she found that organizational characteristics that mitigate opportunities for discrimination (unionization and onsite human resources department) reduced the motherhood pay gap. Similarly, Fuller and Cooke (2018) found that collective bargaining and human resources departments reduced the fatherhood pay bonus; however, they found that performance pay systems had mixed effects. Coming back to the gender pay gap, Abendroth et al. (2017), found that the effect of women's representation in management on the gender pay gap in Germany was context dependent: it only reduced the earnings gap in jobs with low qualifications, women with women supervisors did not receive a compensation boost, and human-resources practices moderated the relationship between gendered power and the pay gap.

[2] Smith-Doerr et al. (2019) included the percent of employees at other agencies who were not in science occupations.

However, these studies focused on the effects of organizational context on the within-job component of the gender pay gap; although they control for occupation and its effect on the within-job pay gap, they do not examine segregation's effect on pay as an outcome. One of my major contributions is to not examine the pay gap as a single measure. Pay gaps are results of multiple mechanisms: targeted recruitment, segregated hiring, pay negotiations and setting at hire, promotions, and stratified separations from employment. Although I do not examine these personnel actions directly, I acknowledge that a single measure of inequality can never paint the whole picture.

I examine the between-job and within-job components of the gender pay gap separately and demonstrate that the effects of organizational characteristics on gender pay gaps depend not only on organizational contexts, but also which component of the pay gap is being examined.

C. An Overview of the Dissertation

In this dissertation, I contribute to the literature on pay gaps by identifying organizational variation in pay gaps, by identifying methods for distinguishing segregation-based and within-job pay gaps, and by identifying organizational characteristics associated with different types of gender pay gaps.

In Chapter 2, I focus on the gender pay gap at the governmentwide level. I begin by reviewing government research on the gender pay gap in the Federal Government. This previous research did not seek to compare the effects of occupational segregation and organizational segregation, even though the data used is well-poised to do so. Next, I review the academic literature on explanations for the pay gap including human capital, gendered selection, pay negotiation, and occupational segregation. In this chapter, I go beyond the existing research on the gender pay gap in the Federal Government by comparing the effects of occupational and organizational segregation and by controlling for occupations and organizations at a more granular level than done in previous governmentwide pay gap research.

In Chapter 3, I measure the gender pay gap for 371 separate government agencies and compare these agencies to each other with regard to the within-job pay gap and the segregation component of the pay gap. The chapter begins with a review of the limited research on organizational variation in the federal sector's gender pay gap. Next, I cover federal sector-specific mechanisms that may cause variation in the pay gap, such as agency mission and federal pay systems. After measuring the pay gap for each agency, I describe the distributions of the gross pay gap, the between-job pay gap, and the within-job pay gap. I identify the agencies and departments with the largest and smallest gender pay gaps. Finally, I identify agencies where segregation is most responsible for producing or reducing the gender pay gap.

In Chapter 4, I identify organizational characteristics that are correlated with between-job and within-job pay gaps. I examine gender segregation into pay systems to test whether ununiform application of pay system formalization affects pay gaps. Then I explore the effects of women's managerial participation in varying contexts, stratifying by pay plan segregation, by racial and ethnic minorities' managerial participation, and by whether the agency is part of the traditionally masculine Department of Defense. I find that intersecting organizational contexts correlate with pay gaps and the effects of these contexts are interdependent, but between-job and within-job pay gaps react differently to the various contexts.

In Chapter 5, I conclude by discussing the implications for policy, theory, and future research.

This research is focused on the gender pay gap in the Federal Government. It demonstrates that any effort to improve equality must account for multiple organization-specific contexts. Further, it shows that no single mechanism causes inequality, and no metric of equality is all encompassing.[3] Research using similar data and methodologies in other contexts can show us what solutions for what problems work where.

[3] By demonstrating that workplace bullying is positively associated with programs otherwise thought to improve women's standing in the workplace, Rainey and Melzer (2021) showed that policies that improve one metric of equality might deteriorate other metrics of equality. My work expands this argument to the gender pay gap.

CHAPTER II

GOVERNMENTWIDE GENDER PAY GAPS IN FISCAL YEAR 2014

It has been established that the U.S. Federal Government has a gender pay gap (U.S. Government Accountability Office 2009, 2020; U.S. Office of Personnel Management 2014). However, it is substantially smaller than what is found in the private sector (U.S. Bureau of Labor Statistics 2013, 2015). This chapter addresses the question, to what extent do individual-, organizational-, and occupational-level factors, including employing agency, explain the governmentwide gender pay gap? This is an important predecessor to the rest of my dissertation, setting up Chapters 3 and 4 in which I measure agency-level pay gaps and the effects of organizational characteristics on the gender pay gap.

Scholars have extensively theorized and empirically examined the gender pay gap in general population samples. Common explanations for the gender pay gap include differences in human capital, individual-level selection, segregation, and gender bias or discrimination. These explanations for the gender pay gap, as well as organizational variation, provide the basis for my modeling of the federal sector pay gap.

This chapter is laid out as follows: First, I describe existing research specific to the Federal Government's gender pay gap. Then, I review previous literature that explains the causes of the gender pay gap. Next, I describe my data, the September 2014 FedScope Employment Cube Raw Data, which provides individual-level personnel data for most federal employees. After that, I detail my methodology for calculating the governmentwide pay gap. In the results sections, I will examine individual-level factors that explain the gap, including human capital, occupational segregation, and sorting into different organizations. Finally, I discuss the implications of my findings.

A. Previous Research on the Gender Pay Gap in the Federal Government

Although the gender pay gap within the Federal Government is under-examined, this is not the first study to address the issue. In a 2009 report using Civilian Personnel Data Files (CPDF), The Government Accountability Office (GAO) found that the gap declined from 28 cents on the dollar in 1988 to 11 cents on the dollar in 2007. In both of those years, as well as in 1998, approximately 7 cents of the pay gap could not be explained by the variables that GAO included in its models. In pay gap decompositions, such as the one conducted by GAO, the unexplained part of the pay gap is attributed to omitted variables such as parenthood, marriage, and of course, the difficult to measure variable, discrimination. As is found is many other studies (Blau and Kahn 2017; Goldin 2014; Petersen and Morgan 1995; Tomaskovic-Devey 1993), occupational segregation explained more of the pay gap than other factors. In my work, I control for occupations within agencies to account for occupational sorting's important role in creating the gender pay gap.

In the same report, using annual CPDF data from 1988 through 2007, GAO examined the cohort of federal employees who entered the government in 1988. While it is difficult to infer from this report the full scope of the gender pay gap for this cohort due to attrition and lack of data during breaks in service, the cohort study revealed that for that cohort 1) the gross pay gap was smallest in 1988 at 22 cents on the dollar, and increased to a high of 28 cents in 1993, but decreased back to 25 cents by 2007; 2) the unexplained portion of the pay gap increased from 3 cents in 1988 to 11 cents in 2007; and 3) occupation contributed more to the pay gap than any other factor. Note that GAO did not examine occupation *within agencies*, which I do in my study (U.S. Government

Accountability Office 2009). One contribution of this study is to document the role of workplace segregation in generating gender pay gaps.

GAO also stated that ever having taken leave-without-pay and cumulative duration of breaks in service each explained less than 1 cent of the pay gap; however, they do not provide the coefficients for these variables, and thus, it is difficult to evaluate their impact. While it is difficult to make accurate inferences from the report's sparse explanation, this information implies that maternity leave was a non-significant predictor of the pay gap in the Federal Government (U.S. Government Accountability Office 2009). One weakness of my data is the lack of information on maternity leave and parenthood. This is potentially important, since many academics have concluded that the gender pay gap is associated with motherhood status (Budig, Misra, and Boeckmann 2012; Misra, Budig, and Boeckmann 2011; Misra, Budig, and Moller 2007; Misra and Murray-Close 2014; Petersen, Penner, and Høgsnes 2014; Sigle-Rushton and Waldfogel 2007; Waldfogel 1997). However, if GAO's report was correct in there not being a maternity leave penalty in the Federal Government, the omission of such data should not substantially change the results.

In addition, and relevant to the present study, GAO controlled for agency, but they did not include agency coefficients in their reported results. Furthermore, agencies that made up less than 5% of the government population were all represented in one dummy variable, "other" in the analyses of 1988, 1998, and 2007 data (Bolitzer and Godtland 2012), and all agencies were simply categorized as large agencies or small agencies in the cohort study (U.S. Government Accountability Office 2009).

The U.S. Office of Personnel Management (OPM) also published a report on the federal sector pay gap in 2014. They used the EHRI-SDM/CPDF (Enterprise Human Resources Integration-Statistical Data Mart/Civilian Personnel Data Files)[4] from December of 1992, 2002, and 2012, and they focused on white-collar occupations. In those years respectively, they found the white-collar gender pay gap to be 30.0%, 19.8%, and 12.7%. Also, they conducted some analyses on the General Schedule (GS) Pay Plan population, a subset of federal employees who are mostly white-collar and as of 2014 compose over 70% of the EHRI-SDM dataset.[5] There they found pay gaps of 29.7%, 18.4%, and 10.8% for 1992, 2002, and 2012. Again, occupation explained a large portion of the gap. Their finding of a smaller pay gap in younger age groups echoes general population research (e.g., Goldin 2014). OPM also calculated the gender pay gap separately within 37 occupations. While women's salaries exceeded those of men in 15 of the 37 occupations examined, the gaps in favor of women were much smaller than the gaps in favor of men (U.S. Office of Personnel Management 2014). In my governmentwide analysis, I control for 682 occupations and included interaction effects of those occupations with 517 employing agencies (25,908 fixed effects total), which could potentially lead to different results. OPM found a gender pay gap, typically of 8 to 10%, at all education levels. Within pay grades, gender pay gaps were not significant, but women were overrepresented in lower pay grades (U.S. Office of Personnel Management 2014).[6]

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[4] These are the same data, but EHRI-SDM is the newer name.
[5] The 2014 number comes from my analyses.
[6] In the GS Pay Plan, one's pay grade is the primary determinant of one's pay. There are 15 pay grades in the GS system, each with 10 steps that further determine one's pay. Occupation, experience, and level of responsibility are factored in to determine one's pay grade. Increases in step generally occur at regular

The unexplained portions of the pay gap in OPM's study were gaps of 4.4% for 1992 and 2002, and a gap of 3.8% for 2012. These were substantially smaller than those found in the GAO study. One reason is that OPM used more detailed occupational categories. Another variable that OPM included is a nine-category agency/department factor. While OPM only reported a "snapshot" of the pay gap results by agency/department, there appears to be substantial variation across agencies. In 2012, not controlling for other factors, the Department of Health and Human Services (HHS) had a 15.6 cent pay gap, the largest gap of the agencies. This compares to the Department of Agriculture's 7.3 cent pay gap (U.S. Government Accountability Office 2009; U.S. Office of Personnel Management 2014). In this paper, I go more in depth, controlling for a more detailed version of agency, with 517 categories, and interaction effects of occupation and agency, thus controlling for between agency variation in pay for the same occupation.

In 2020, GAO conducted additional research on the gender pay gap. They examined governmentwide gender pay gaps for every year from 1999 through 2017 using EHRI data. For 2017, their main regression analysis found a gross pay gap of 7.1% disadvantaging women, and their main decomposition analysis found a gross pay gap of 7.2%. When adding controls for 6 occupational groups, work schedule, bargaining unit status, federal work experience, education, age, race and ethnicity, disability status, veteran status, and state where the employee worked, the net pay gap in the regression analysis did not change, and the result from the decomposition analysis only changed by 1.1% to a gap of 6.1%. They ran alternative regression and decomposition models and

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intervals, assuming a satisfactory performance review, but outstanding performance can result in award of an early step increase. Occupation determines the possible range of pay grades available.

included 25 categories to control for the employing agency, but the maximum number of occupational categories included was 38. They improved upon organizational analysis compared to previous reports by calculating pay gaps separately for 24 large agencies, where they found net pay gaps ranging from 2.1% at the U.S. Agency for International Development and the Department of Education to 11.0% at the Department of Transportation (U.S. Government Accountability Office 2020).

In comparison, in this chapter, I include controls for far more occupations and a fixed effect for every federal agency in the dataset. Another difference between my research and this GAO report is that I limit the sample to full-time permanent employees. GAO included temporary employees and those who worked part-time, seasonally, and intermittently. The inclusion of temporary and non-full-time employees is problematic, as men and women may differ in their likelihood to be permanent and full-time employees and as the mechanisms that cause gender pay gaps likely differ based on type of employment and work schedule. The results in my research differ to some extent due to these methodological choices. Relevant to my study, which uses 2014 data, in 2014, GAO found a gross pay gap of 8.1% and a 7.6% pay gap net of the control variables listed above (U.S. Government Accountability Office 2020).

While GAO (2020) found an 8.1% governmentwide gender pay gap in 2014, the Bureau of Labor Statistics (2015) found a 17% gender pay gap among full-time workers in the general population in the same year. This substantial difference suggests that the Federal Government is doing something right, but the persistent gap suggests that improvements are left to be made. Learning more about this gap is critical to the eventual elimination of any discriminatory pay gap.

B. Explanations for the Gender Pay Gap

Scholars have extensively theorized and empirically examined the gender pay gap in general population samples. Here I summarize three explanations for the gender pay gap: differences in human capital, individual-level selection explanations, and segregation. These explanations for the gender pay gap provide the basis for my modeling of the federal pay gap.

1. Differences in Human Capital

Human capital models are commonly used to predict pay and pay gaps. Human capital, commonly measured as the combination of one's education, experience, and tenure with one's employer, is hypothesized to predict one's productive capacity, and thus, should predict one's pay. Quantitative studies of the pay gap almost always *attempt* to incorporate human capital into their models, and the results have robustly shown that education, experience, and tenure are positively associated with pay. I emphasize *attempt* because few datasets contain all three measures of human capital.

If women in the Federal Government or in particular agencies within the Federal Government have less education, less experience, or a shorter tenure than men do, we would expect to see any pay gap lessen after controlling for these factors. On the other hand, if women have more education, more experience, or a longer tenure than men do, we would expect the pay gap to grow after adding these controls. My data allow me to control for these factors, albeit imperfectly. The data include an educational attainment variable measured at time of hire (it is not often routinely updated during one's tenure with the same agency). I also control for age, a commonly used proxy for experience.

While I cannot measure work experience outside of the government, I have a fairly precise measure of length of service which accounts for federal civilian service and military experience; this will be interpreted as a measure of tenure. In the federal government, earnings can be expected to grow with tenure for three reasons – promotions, routine across-the-board pay raises, and merit pay. While experience within the government is important for predicting federal employees' pay, one must keep in mind that experience outside the government may lead to pay inequities within the government. The pay gap is larger in the private sector; if previous pay is considered when setting salaries upon entry to the government, men will retain a cumulative pay advantage. This may magnify government tenure's positive association with pay for women. OPM's finding that overall, white-collar women make about 13% less than white collar men, but female white-collar starting salaries within the government are over 10% less than male starting salaries implies that starting salary setting perpetuates pay inequity (2014).

There is good reason to expect gender variation in human capital across agencies. Agencies vary in their mission critical occupations, and different occupations require different levels and types of education; to the extent agencies have sex segregated occupational structures, they may recruit (and retain) men and women with different average levels and types of human capital. Additionally, agencies' differing gendered cultures may affect workers' willingness to use unpaid leave and worker retention. At family-unfriendly workplaces, using leave for family reasons may be frowned upon, and women may be more likely to turnover, affecting women's tenure (Moen et al. 2017; Stone 2007). Where workplace cultures are hostile to women, women may separate earlier in their careers, also resulting in shorter tenure (Kath et al. 2009). Thus, it would not be surprising to find gender variation in agencies' human capital, which would result in differences in the gross gender pay gap.

2. Gendered Selection Explanations

When choosing a job, women and men might on average select jobs with different amenities. Women, due to their roles as mothers, elder caregivers, and future mothers, are often said to prefer jobs that are family-friendly (Fuller and Hirsh 2019; Kossek, Perrigino, and Rock 2021; Perry-Jenkins and Gerstel 2020). Such jobs are characterized as being part-time, having flexible hours, and/or having telework as an option. Family-friendly jobs often allow people with major family responsibilities to remain in the labor force, allowing them not to lose tenure or experience from their human capital. However, they might be paid less to compensate for this flexibility.

The Federal Government is known for having flexible hours and telework as an option. On-site day care, more common in larger government workplaces, may also improve the family-friendliness of some agencies. Men and women both have access to these amenities, but availability varies by occupation and agency (U.S. Office of Personnel Management 2015). Considering that men and women tend to work in different occupations, any pay penalty for using these amenities may affect one gender more than the other. Therefore, it is important that I control for occupation and account for agency.

In the Federal Government, part-time work is rare, and thus, should explain less of the pay gap within the government than in the private sector. Nonetheless, I included only full-time workers to eliminate pay variation caused by women working part-time more often. In addition, I control for lifetime tenure within the federal service. Thus, time lost from work for family reasons *within one's federal employment* is accounted for; however, my data do not allow me to observe specifically the effect of taking parental leave, and thus, experience lost for that reason may explain part of the observed pay gap.

3. Pay Negotiation

Some writers have claimed that women's unwillingness to negotiate their pay leads to the pay gap. However, managerial practices and organizational culture affect women's willingness to negotiate pay and their success in doing so. Leibbrandt and List (2012) found that women were less likely to negotiate their salaries when policies on negotiation were ambiguous. Furthermore, gender norms can force women to be cautious in their negotiation tactics. Bosses, peers, and subordinates may see women who assertively promote their own interests as aggressive. Such women are violating gender norms that dictate that women should be selfless and communal. Thus, women who use the same forceful negotiation tactics that give men raises may be penalized (Babcock and Laschever 2003).

Evidence from relatively gender egalitarian Sweden showed that women recent college graduates were more likely to negotiate their pay than their men counterparts. At the same time, on average these women requested lower salaries than men, but when requesting the same salaries, women received lower starting pay (Säve-Söderbergh 2019). This relates to, but does not completely support, the relational theory of earnings inequality (Avent-Holt and Tomaskovic-Devey 2014). This theory states that earnings inequality analysts should shift their focus from labor supply and demand to relational claims-making within organizations.

Relational claims-making involves an actor asserting that he or she deserves part of the revenue stream, and an influential alter evaluating the validity of the first actor's claim. Note the power disparity involved in such an interaction. Categorical distinctions, such as status within an organization (e.g., manager-employee), differences in human capital (e.g., degree-no degree) and differences in demographics (e.g., man-woman), influence how often the actor will make a claim, how large of a claim the actor will make, and the degree to which this claim is ratified. Environmental contexts, like the availability of revenue, also influence the ratification of the claim (Avent-Holt and Tomaskovic-Devey 2014). The findings from Sweden show that less powerful actors (women) actually might make claims for revenue through negotiating pay *more* often, yet their claims will be smaller and less accepted by the powerful alters (managers) (Säve-Söderbergh 2016). A more recent paper examined gender differences in negotiation claims, finding for a general German population that women are less likely to be in jobs where negotiation is possible, less likely to negotiate when in such a job, and unlikely to receive positive wage gains from negotiations (Sauer et al. 2021).

As discussed further below, most government agencies use standardized pay systems, like the GS pay plan, that minimize employees' ability to negotiate their pay. There are exceptions. Pay systems can be agency-specific, or specifically targeted toward a small group of employees. If the gender distribution of the various pay plans is unbalanced, it may affect ability to negotiate pay, and thus, affect the pay gap.

4. Occupational Segregation

The literature connects the gender pay gap to segregation through multiple mechanisms. Women-dominated jobs are lower paid, but even holding constant women's lower wages, the female pay penalty remains lower in more integrated labor markets (Cohen and Huffman 2003; Reskin and Roos 1990). The occupational sorting of women into jobs with lower expected earnings contributes as well, regardless of whether this is caused by employers' hiring practices (Fernandez and Mors 2008), women having lower human capital (England, Hermsen, and Cotter 2000), or women's preference for jobs associated with lower pay, perhaps due to an association between lower pay and workplace flexibilities (Cha 2013; England 2005). Finally, devaluation of the labor of women contributes to the pay gap, i.e., as an occupation becomes more predominately female, the wages in that occupation decline (Reskin 1988). Devaluation could be due to male employees having greater social capital to protect their wages or due to managers having greater power to discriminate against female employees (Cohen 2013).

Petersen and Morgan (1995) wrote a pivotal piece on the gender pay gap and workplace segregation. They call the process through which women are sorted into lower paying occupations and establishments allocative discrimination. Other scholars (e.g.,England, Allison, and Wu 2007; Levanon, England, and Allison 2009; Reskin and Roos 1990) have called this the job queueing.

Occupations that are dominated by women often pay less than occupations that are dominated by men despite equal skill requirements and other wage-relevant factors. Petersen and Morgan (1995) call this process valuative discrimination. Others have referred to this as the devaluation view (England et al. 2007; Levanon et al. 2009).

Both allocative and valuative discrimination strongly contribute to the pay gap. When looking at data from mostly blue-collar and clerical workers across 16 manufacturing and service industries from the 1970s and early 1980s, Petersen and

Morgan (1995) found that 89.1% of the gross wage gap could be explained by occupation-establishment segregation. However, segregation was high at the occupation-establishment level, with 82% of workers having to change occupations or establishments to achieve no segregation, and with only 16.7% of occupations within establishments being gender-integrated. While within all industries, the majority of occupation-establishment pairs were segregated, there was substantial variation by industry, with manufacturing industries generally being more segregated than service industries.

When looking at 1981 data on professional and administrative employees at the within occupation-within-establishment (within-job) level, Petersen and Morgan (1995) found an average of a 3.1% gender wage gap disfavoring women, and this gap was larger among higher ranking employees. They saw that 39.2% of occupation-establishments were gender-integrated, but this percentage decreased substantially (to 0.0%) in higher ranking positions.

While that research is dated, there is good reason to believe that segregation still heavily contributes to the gender pay gap. According to Stainback and Tomaskovic-Devey, in private-sector establishments that report their workforce data to the EEOC, establishment-occupation segregation between white women and white men decreased between 1980 and 2005, but in 2005, within-race gender segregation would still have required well over 60% of white men and white women to switch occupations to achieve complete integration (2012:168).

Segregation also plays a role in the gender pay gap in the Federal government. OPM found that differences in occupation explained 76% of the gender pay gap among white-collar federal employees in 2012 (U.S. Office of Personnel Management 2014).

Given the information above on segregation, it is imperative to account for occupation and where possible, establishment, when calculating the gender pay gap. In the present study, I control for occupation to account for allocative and valuative discrimination. In addition, in this chapter's governmentwide analysis, I account for organizational variation by controlling for agency and jobs (detailed occupation within agency). I go further in Chapter 3 by calculating the pay gap separately for each agency. As Smith-Doerr et al. (2019) point out, data available at this detailed of an organizational level are rare, and additional controls for geography make this come close to establishment level data.[7]

C. FedScope Employment Status Raw Data

To broadly explore the gender pay gap in the Federal Government, I use September 2014 FedScope Employment Cube Raw Status Data from OPM (U.S. Office of Personnel Management 2015).[8] OPM designed these data, released quarterly for most recent years, to do statistical analyses of government employees. The dataset contains personnel data on 2,045,707 employees from most Executive Branch agencies, seven

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[7] Depending on the size and structure of a federal agency, it can be analogous to a private sector firm, establishment, or something in between. Smaller federal agencies, where all employees work in the same workplace, operate as an establishment, with the relevant parent firm being the U.S. Government. Larger agencies function more like subsidiary firms of the U.S. Government with their own policies and unmeasured establishment-level variation. For example, the Veterans Health Administration is a single agency that operates like a subsidiary firm of both the Department of Veterans Affairs (VA) and of the Federal Government. Every VA hospital acts as an establishment, but the Department of Veterans Affairs and the Veterans Health Administration create the higher-level policies that affect the employees in those establishments. Thus, my data do not provide information equivalent to the private sector arrangement of firms and establishments. Nonetheless, this dataset provides an abundance of information, including state-level geographic information, to allow inference. Note that standardized pay systems within the Federal Government provide locality adjustments to assist employees in managing different costs of living. These state-level controls also help to control for locality adjustments.

[8] I began downloading FedScope data in 2015. In the meantime, OPM removed the important gender variable from those datasets. Resultantly, I downloaded some of the data through the Wayback Machine Internet Archive (https://archive.org/web/) (2015). Note that as of December 9, 2018, OPM's website included a link to the Wayback Machine.

Legislative Branch agencies, and the U.S. Tax Court from the Judicial Branch, for a total of 528 independent agencies and subcomponents.[9] For each employee, the data reports gender, annual salary, agency, education, length of service, age, geography, occupation, pay plan, and pay grade.

Pay data were only available on an annual, not hourly, basis, and there was no indication of the number of hours worked per week; to ensure that pay differences were not due to women working fewer hours, I limited the dataset to full-time non-seasonal permanent employees (eliminating 219,945 observations).[10] Another 1,916 observations were dropped because they were missing data on salary, education, gender, and/or length of service, leaving 89.2% of the original observations or 1,823,846 employees.[11] Eleven agencies were eliminated from the sample due to missing data.

A full analysis of the gender pay gap-related differences by work schedule is outside the scope of this study, but, considering the large proportion of observations remaining under analysis, studying this group serves well. In contrast, OPM's 2014 report on the gender pay gap in the Federal Government limited the study to full-time non-seasonal employees, but as was necessary to fulfill that report's mission, it only focused on white-collar employees. GAO's 2009 report statistically controlled for an

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[9] As of April 10, 2016, EHRI-SDM did not include data on employees from the following executive agencies: Board of Governors of the Federal Reserve, CIA, Defense Intelligence Agency, Foreign Service personnel at the State Department, National Geospatial Agency, Office of the Director of National Intelligence, Office of the Vice President, Postal Regulatory Commission, Tennessee Valley Authority, U.S. Postal Service, and White House Office. In addition, it excludes Foreign Nationals Overseas, Public Health Service's Commissioned Officer Corps, and non-appropriated fund employees (U.S. Office of Personnel Management n.d.).

[10] Those dropped for scheduling reasons were more often female than in the rest of the federal government population (49.5% of those dropped for this reason were female, as opposed to 43.3% of the entire dataset).

[11] The following describes patterns in missingness of the salary variable among full-time non-seasonal permanent employees. Observations without salary information were disproportionately male (59.1% missing versus 57.4% male overall) and from the Government Publishing Office (7.3% missing) and the General Services Administration's Offices of Regional Administrators (55.1% missing).

employee working full-time non-seasonal, part-time non-seasonal, or another schedule. My approach of dropping part-time and seasonal workers allows for more conservative estimates of the pay gap and eliminates error associated with the potentially wide variation in schedules worked by part-time and seasonal employees.

1. Variables and Measures

The dependent variable is the natural log of annual total pay in 2014 dollars. Total pay includes all pay: base earnings, plus awards (bonuses), differentials, etc.[12] Total pay was annualized so that the pay of workers who had not worked the full year would reflect the amount that they would have been paid had they been working at the same rate of pay over the past 12 months.

The independent variable of interest, gender, was coded as a binary variable with 1 meaning female and 0 meaning male.[13] Human capital was measured with the following variables: educational attainment measured in 22 categories,[14] length of government service in years, and age in years as a proxy for total work experience.[15]

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[12] The dataset does not distinguish between types of pay, e.g., base salary versus awards.

[13] I acknowledge that most sociologists use the terms women and men rather than female and male for gender. Here, I chose to use the terminology in the codebook of the dataset, and throughout the dissertation may use woman interchangeably with female and man interchangeably with male. It is notable that as late as January 2022, OPM's data standards only listed a binary sex variable.

[14] Education attained since last hire is likely not reflected in this dataset. Employees who earn a degree during their federal employment may have a pay boost that is not properly controlled for here. This will introduce error if earning a degree during one's federal tenure is not evenly distributed by gender. The following are the levels of educational attainment: a) Did not complete elementary school, b) Completed elementary school - no high school, c) Some high school - did not complete, d) High school graduate or certificate of equivalency, e) Terminal occupational program – did not complete, f) Completed terminal occupational program, g) Less than one year of college, h) One year of college, i) Two years of college, j) Associate's degree, k) Three years of college, l) Four years of college, m) Bachelor's degree, n) Post-bachelor's degree, o) First professional degree, p) Post-first professional degree, q) Master's degree, r) Post-master's degree, s) Sixth-year degree, t) Post-sixth year, u) Doctorate, and v) Post-doctorate.

[15] I considered adding a variable for potential work experience to the models. Potential work experience is measured as age minus years of education minus five years for the first five years of life when it is assumed that one is not in the labor market. However, age was highly correlated with potential work experience (Pearson's $r = 0.973$), and age was more highly correlated with salary, so I used only age.

Mean-centered age-squared and mean-centered length of service-squared were also included due to the often observed curvilinear nature of their relationships with pay.

To control for locality adjustments in pay, I used fixed effects for the location of the employee's official duty station. Specifically, I included fixed effects for each state, the District of Columbia, other U.S. territories, being in a suppressed location within the United States, being in a foreign country, and being in an unspecified location (one location omitted).

OPM defines agency as, "The employing organization." Some agencies have subcomponents. For example, the Internal Revenue Service is a subcomponent of the parent agency, the Department of Treasury. When an agency had subcomponents, I treated the subcomponents as individual agencies. There are also cases in which a parent agency has subcomponents and as well as employees who are employed directly by the department. In that case, the employees in subcomponents were still treated as employees of the subcomponents, and the employees employed directly by the department were treated as though they were in a separate subcomponent. Except for agencies that were excluded due to missing data, I included employees from all agencies in the governmentwide analysis. This provided fixed effects for each of 517 agencies (one omitted).

To account for occupational segregation, I included fixed-effects for 682 occupations (one occupation omitted); these occupations are 4-digit occupational series as defined in the *Handbook of Occupational Groups and Families* (U.S. Office of Personnel Management 2009a).[16]

To account for agency variation in the treatment of occupations, I also used an interaction term between agency and occupation that led added 25,908 fixed effects (one omitted).[17] Controlling for occupation within agency is important as agencies create their own requirements for different occupations, and these requirements and the related job duties may vary greatly across agencies.[18]

Almost all federal employees are paid according to standardized pay plans, the GS pay plan being the most common. Over 71% of federal employees were on the GS pay plan in September of 2014, but there were 166 other pay plans and some employees not on any pay plan (1,209 employees in the sample). Agencies may, and almost always, have more than one pay plan in effect. The GS pay plan has 15 distinct grades that determine an employee's salary range.[19] Other pay plans have other numbers of grades, between 1 and 70.

D. Methodology

To examine the governmentwide pay gap, I used the individual employee as the unit of analysis. I conducted governmentwide regressions. In these models, the

[16] I explored the effects of controlling for 2-digit occupational group instead of 4-digit detailed occupation. As expected, these models always explained far less variance than controlling for detailed occupation. Even within detailed occupations, skills required, and job duties may vary across and within agencies.
[17] I explored the effects of using a 2-digit occupational group instead of 4-digit detailed occupation to create these interaction fixed effects. As expected, these models always explained far less variance than controlling for detailed occupation. However, further research should examine whether this large number of fixed effects may result in overfitting the model.
[18] The job requirements can also vary within agency.
[19] In the GS system, each grade has 10 steps. Pay is determined by grade, step, and geographic location, and occasionally bonuses that are much smaller than what one would find in the private sector. Advancement to the next step is mostly based on tenure within the grade. Advancement between grades is dependent on performance, and occupations tend to have a limited number of grades. New hires do not necessarily begin in the lowest grade of their occupation.

exponentiated coefficient for female can be interpreted as the proportion of men's pay that women are paid, net of the control variables. I explored how different sets of control variables affected the female coefficient and the explanatory power (R^2) of the model. All models used the natural log of salary, $\ln(\hat{Y}_i)$, as the dependent variable and gender (female=1) as the key independent variable of interest. The models are specified below, where *i* denotes individual:

Model 1: Baseline Gender Inequality

$$\ln(\hat{Y}_i) = \beta_0 + \beta x_{Gender_i} + \varepsilon_i$$

Model 2: Gender Inequality net of Geography and Human Capital

$$\begin{aligned}\ln(\hat{Y}_i) = \beta_0 + \beta x_{Gender_i} + \sum \beta x_{Geogrpahy_i} + \sum \beta x_{Education_i} + \beta x_{(Length\ of\ Service)_i} \\ + \beta x^2_{(Mean-Centered\ Length\ of\ Service)_i} + \beta x_{Age_i} + \beta x^2_{(Mean-Centered\ Age)_i} \\ + \varepsilon_i\end{aligned}$$

Model 3: Gender Inequality net of Geography, Human Capital, and Agency

$$\begin{aligned}\ln(\hat{Y}_i) = \beta_0 + \beta x_{Gender_i} + \sum \beta x_{Geogrpahy_i} + \sum \beta x_{Education_i} + \beta x_{(Length\ of\ Service)_i} \\ + \beta x^2_{(Mean-Centered\ Length\ of\ Service)_i} + \beta x_{Age_i} + \beta x^2_{(Mean-Centered\ Age)_i} \\ + \sum \beta x_{Agency_i} + \varepsilon_i\end{aligned}$$

Model 4: Gender Inequality net of Geography, Human Capital, and Occupation

$$\ln(\hat{Y}_i) = \beta_0 + \beta x_{Gender_i} + \sum \beta x_{Geogrpahy_i} + \sum \beta x_{Education_i} + \beta x_{(Length\ of\ Service)_i} + \beta x^2_{(Mean-Centered\ Length\ of\ Service)_i} + \beta x_{Age_i} + \beta x^2_{(Mean-Centered\ Age)_i} + \sum \beta x_{Occupation_i} + \varepsilon_i$$

Model 5: Gender Inequality net of Geography, Human Capital, Agency, and Occupation

$$\ln(\hat{Y}_i) = \beta_0 + \beta x_{Gender_i} + \sum \beta x_{Geogrpahy_i} + \sum \beta x_{Education_i} + \beta x_{(Length\ of\ Service)_i} + \beta x^2_{(Mean-Centered\ Length\ of\ Service)_i} + \beta x_{Age_i} + \beta x^2_{(Mean-Centered\ Age)_i} + \sum \beta x_{Agency_i} + \sum \beta x_{Occupation_i} + \varepsilon_i$$

Model 6: Gender Inequality net of Geography, Human Capital, and Occupation within Agency

$$\ln(\hat{Y}_i) = \beta_0 + \beta x_{Gender_i} + \sum \beta x_{Geogrpahy_i} + \sum \beta x_{Education_i} + \beta x_{(Length\ of\ Service)_i} + \beta x^2_{(Mean-Centered\ Length\ of\ Service)_i} + \beta x_{Age_i} + \beta x^2_{(Mean-Centered\ Age)_i} + \sum \beta x_{(Agency*Occupation)_i} + \varepsilon_i$$

Model 1, Baseline Gender Inequality, simply provides the mean ratio of women's pay to men's pay. Model 2, Gender Inequality net of Geography and Human Capital, measures the pay gap in a situation where women and men have equal human capital and are in the same geographic area. Model 3, Gender Inequality net of Geography, Human Capital, and Agency, goes further and accounts for what is close to establishment segregation vis-à-vis Petersen and Morgan (1995). Similarly, Model 4, Gender Inequality net of Geography, Human Capital, and Occupation, accounts for occupational segregation. Model 5, Gender Inequality net of Geography, Human Capital, Detailed Occupation, and Agency, accounts for both occupational segregation and establishment segregation. The unrestricted model, Model 6, Gender Inequality net of Geography, Human Capital, and Occupation within Agency, goes a step further to approximate the within-job (same occupation within the same agency) gender pay gap, holding human capital constant. This final model is the closest to meeting the standards of the Equal Pay Act of 1963.

E. Descriptive Statistics

As seen in Table 1 (at the end of this chapter), in the 517 federal agencies and aggregates under analysis, 776,660 of 1,823,846 employees, or 42.6%, were female. Women, on average, worked at agencies that were 48.9% female, and men, on average, worked at agencies that were 37.9% female, but the standard deviation of percent female at the agency was almost the same for men and women. This was heavily influenced by the Veterans' Health Administration, with 61.0% of its 271,814 employees being female.

The mean female salary ($76,993) was 92.5% of the mean male salary ($83,221; $p < 0.001$). Women had a slightly longer length of federal service (14.8 years) than men did (13.2 years; $p < 0.001$). The statistical significance of the very small male-female difference in age ($p < 0.001$) can be explained by the very large sample size; men averaged 46.8 and women averaged 47.0 years of age. On average, women worked in much larger agencies, with an average of 77,155 employees compared to men's agencies having an average of 48,406 employees. Similar to what is seen in the literature (Tomaskovic-Devey 1993), men tend to work with men, and women with women.

As seen in Table 2, for both men and women, the most common level of educational attainment was a bachelor's degree (29.5% for men; 28.4% for women). Very few (0.5%) government employees of either gender did not have a high school diploma or equivalent. Overall, women were more likely to have at least some college (77.3%) when compared to men (71.9%).

This educational distribution as well as gender norms may be related to women's and men's differing participation rates in the PATCOB (Professional, Administrative, Technical, Clerical, Other White Collar, Blue Collar) occupation types. Women were more likely than men to be in professional occupations (27.8% of women and 24.4% of men were professionals) and about equally likely to be in administrative positions. Women were much more likely than men to be in the technical occupations (22.7% vs. 13.1%). OPM's definition of the technical occupation type does not match more common connotations. OPM states, "Technical work is typically associated with and supportive of a professional or administrative field. It involves extensive practical knowledge, gained through experience and/or specific training less than that represented by college graduation" (2009b). As would be more commonly predicted, women were overrepresented in clerical positions (7.0% vs. 2.0%) and underrepresented in blue collar positions (2.1% vs. 14.9%).

Geographically, women were slightly more likely to be in the Washington, D.C. area (D.C., Maryland, and Virginia) and the Midwest. Men were more likely to work in the West, abroad, or in a suppressed location within the United States.

Based on these statistics, on average, women had greater human capital, as seen through their longer length of service and greater educational attainment, and at the broadest level, white collar versus blue collar, they were in higher status occupations. However, they were paid less. Resultantly, one might expect the pay gap to increase after controlling for human capital. Controlling for other factors, like a finer-grained definition of occupation and the agency in which they worked, may reduce the observed pay gap further. That will be explored below.

F. Regression Results

When examining the governmentwide regression results, I focused on the variation in the gender pay gap, based on women's relative pay, calculated from the exponentiated female coefficient and converted to a percentage, and Adjusted R-squared across six models (Figure 1 and Table 3). In all models, the pay gap was statistically significant at the $p < 0.001$ level.

In the base model, in which I predicted logged salary using only gender, women made 7.4% less than men, but the model explained only 0.8% of the variation in logged salary. This means that for every dollar paid to men, women were paid about ninety-three cents. This also means that there was substantial variation in pay not associated with gender. This is much smaller than the 11% gap found by GAO using 2007 data and the 12.2% gap among white collar employees found by OPM using 2012 data (U.S. Government Accountability Office 2009; U.S. Office of Personnel Management 2014). It is only slightly smaller than the 8.1% that GAO (2020) found with their 2014 data. This is likely due to my sample being limited to full-time non-seasonal permanent employees.

In Model 2, adding workplace geography and human capital variables (length of service, length of service-squared, age, age-squared, and education) to the model explained far more of the variation in logged salary (adjusted R-squared = 0.505), and interestingly the pay gap grew to 9.7%. This increase in the pay gap means that women worked in better paying locations, or more likely, had better human capital then men, but were paid less regardless of these factors.

In Model 3, in which I expanded on Model 2 by adding agency, the pay gap decreased to 6.1%; this model explained a little more of the variation in pay (adjusted R-squared = 0.600) than Model 2 did. The segregation of women into lower paying agencies explains part of the pay gap. Compared to Models 1 and 2, workplace (agency) segregation explained 17.8% of the gross pay gap and 37.2% of the human capital/geography adjusted pay gap.

In Model 4, in which I used gender, geographic variables, human capital variables, and detailed occupation (leaving out agency) to predict logged salary, the explained variation in pay increased dramatically to 80.2%. The gap, at 3.6%, was much smaller in this model than in previous models. This means that occupational segregation where women are sorted into lower paying occupations, regardless of whether caused by choice or employer hiring decisions, was a major factor in causing women to be paid less than men. Compared to Models 1 and 2, occupational segregation explained 51.5% of the gross pay gap and 62.9% of the human capital/geography adjusted pay gap.

In additional models (not shown), I explored the effects of controlling for 2-digit occupational group instead of 4-digit detailed occupation. As expected, these models always explained far less variance than controlling for detailed occupation. Interestingly, adding occupational group to the base model (Model 1, controlling only for gender) or to Model 3 (controlling for gender, workplace geography, human capital, and agency) led to an increase in the pay gap. Based on that, it is evident that women were in better paying

2-digit occupational groups, but when looking at a finer grained level, women were sorted into lower paying specific 4-digit occupations.

Model 5 expanded on the previous model to include controls for both occupation and employing agency. The addition of agency barely decreased the pay gap when detailed occupation was controlled for. The gap was 3.5%, and adjusted R-squared was 0.824. As seen from a comparison between Model 2 and Model 3, agency is a meaningful predictor of the pay gap, but this is mostly a function of detailed occupations only existing within certain agencies. This assertion is supported by a comparison between Models 4 and 5.

Finally, I added an interaction term for occupation within agency (Model 6). This slightly increased the adjusted R-squared to 0.849, and the pay gap decreased to 3.0%, implying that the interaction effect between occupational group and agency does not add much to the existing model.

In comparison to previous studies, of OPM’s 13% gross gender pay gap in the 2012 white-collar federal workforce, a gap of 3.8% could not be explained by 8 category agency, age, bargaining unit status, disability status, state, education, GS grade, law enforcement officer status, length of service, 37 category occupation, pay plan, race/ethnicity, supervisory status, and veteran status. Seventy-six percent of the gross gap that was explained in their models was explained by occupation (U.S. Office of Personnel Management 2014). Of GAO’s 8.1% gross gender pay gap in the 2014 federal workforce, a gap of 7.6% could not be explained by age, experience, race/ethnicity, education, occupation, work schedule, disability status, state, larger agencies, bargaining unit, and veteran status (U.S. Government Accountability Office 2020).

In addition, the 3.0% pay gap identified here is far smaller than that found in the general population. This may be related to the extra bureaucratic mechanisms in place to ensure equity and fairness in federal employment. One aspect, pay system standardization, is explored in Chapter 4. Further, federal agencies have EEO responsibilities that go far beyond those required in the private sector. Annually, each agencies is required to write an extensive report, the EEOC MD-715 Report, on the diversity and inclusion of their workforces, which includes identifying the root causes of inequitable workforce distributions on multiple measures such as hires, separations, occupational groups, pay grade levels, and awards (U.S. Equal Employment Opportunity Commission n.d.c). A qualitative analysis of MD-715 Reports may reveal additional reasons why the gender pay gap varies across agencies. In addition, employment discrimination complaint processing, including the processing of pay discrimination complaints, differs between the federal and private sectors. EEOC directly adjudicates private sector charges of discrimination whereas EEOC oversees complaints that are initially filed with the employing agency; with the complainant's permission, the employing agency can decide whether illegal discrimination occurred (29 CFR 1614 n.d.). These factors may all lead to a lower pay gap in the federal sector when compared to the general population.

G. Concluding Thoughts and Policy Recommendations

This chapter has demonstrated that after controlling for a variety of explanatory factors, there remains a statistically significant gender pay gap disfavoring women in the United States' Federal Government. In 2014, when examining a sample of full-time permanent employees, women made 7.4% less than men before controlling for other relevant factors. Previous studies using earlier data by OPM (2014) and GAO (2009) found larger gross pay gaps, but they used earlier data and included part-time workers. Further, GAO's (2020) research using 2014 data that included part-time workers found a marginally larger gross gender pay gap. Thus, my results are potentially conservative, but this inequality is still concerning.

In my research, controlling for human capital and geography increased the pay gap, because on average women employed by the federal government have greater human capital than men do. Adding controls for detailed agency, a major contribution of my study, increased the model fit and decreased the pay gap to 6.1%. Still, controlling for occupation explained much more of the pay gap than agency did. Another major contribution of this chapter was the inclusion of an interaction between agency and occupation; my unrestricted model, which controlled for human capital, geography, and occupation within agency, yielded a 3.0% within-job pay gap. OPM (2014) and GAO (2009, 2020) found larger final pay gaps. That could be due to different years, different populations, or due to my models being more extensive, including detailed agency within detailed occupation fixed effects. The differences demonstrate the strong influence of methodological choices. The differences also demonstrate the importance of accounting for granular occupational and organizational differences when measuring pay gaps.

The next two chapters further decipher the organizational differences in the Federal Government's gender pay gap. This chapter simply measured the governmentwide pay gap. The rest of this dissertation aims to localize the root causes of the pay gap. Calculating the distribution of pay gaps across organizations is the next step which I tackle in Chapter 3.

The within-job pay gap persists, even in the relatively egalitarian federal sector. Considering the relatively condensed pay distribution within the Federal Government, one would expect, and I found a smaller pay gap there than that found in the private sector. Although the pay gap is smaller in the federal sector, the 3.0% pay differential (after controls) between genders must be addressed. For the mean federal sector woman, it penalizes her almost $2,500 annually, and will cumulatively affect her over her lifetime. Across a thirty-year career, that is $75,000 or a full year's lost pay. As we will see next, the Federal Government is not uniform in its pay gap, but rather different pay gaps exist across different agencies. The next chapter will demonstrate and begin to untangle the level and causes of such variation.

Table 1. Governmentwide Means and Standard Deviations (FedScope September 2014)

	Men		Women		All	
	Mean	SD	Mean	SD	Mean	SD
Salary (Annualized)	$83,221	$36,381	$76,993	$33,485	$80,568	$35,311
Logged Salary	11.24	0.42	11.16	0.42	11.21	0.42
Length of Service	13.2	10.1	14.8	10.9	13.9	10.4
Age	46.8	11.1	47.0	10.9	46.9	11.0
Agency Size	48,406	77,433	77,155	103,489	60,648	90,584
Percent of Agency Female	37.9%	15.5%	48.9%	15.4%	42.6%	16.4%
N	1,047,186		776,660		1,823,846	

Note: All t-tests for differences in means by gender were significant at the $p < .001$ level.

Table 2. Governmentwide Descriptive Statistics: Percentages (FedScope September 2014)

	Men	Women	All
Educational Attainment			
No High School Diploma	0.5%	0.6%	0.5%
H.S. Diploma or Equivalent	27.6%	22.1%	25.3%
Some College	21.6%	27.3%	24.0%
Bachelor's Degree	29.5%	28.4%	29.1%
Advanced Degree	20.7%	21.6%	21.1%
Occupation Type			
Professional	24.4%	27.8%	25.8%
Administrative	39.6%	39.4%	39.5%
Technical	13.1%	22.7%	17.2%
Clerical	2.0%	7.0%	4.2%
Other White Collar	6.0%	0.9%	3.8%
Blue Collar	14.9%	2.1%	9.5%
Census Region			
D.C./Maryland/Virginia	20.7%	23.5%	21.9%
Midwest	12.6%	14.4%	13.4%
Northeast	10.8%	10.9%	10.8%
South	28.6%	28.6%	28.6%
West	22.9%	19.5%	21.4%
U.S. Territories	0.7%	0.6%	0.7%
U.S. - Suppressed	2.3%	1.8%	2.1%
Abroad	1.4%	0.7%	1.1%
N	1,047,186	776,660	1,823,846

Note: All Pearson chi-square tests were significant at the $p < .001$ level.

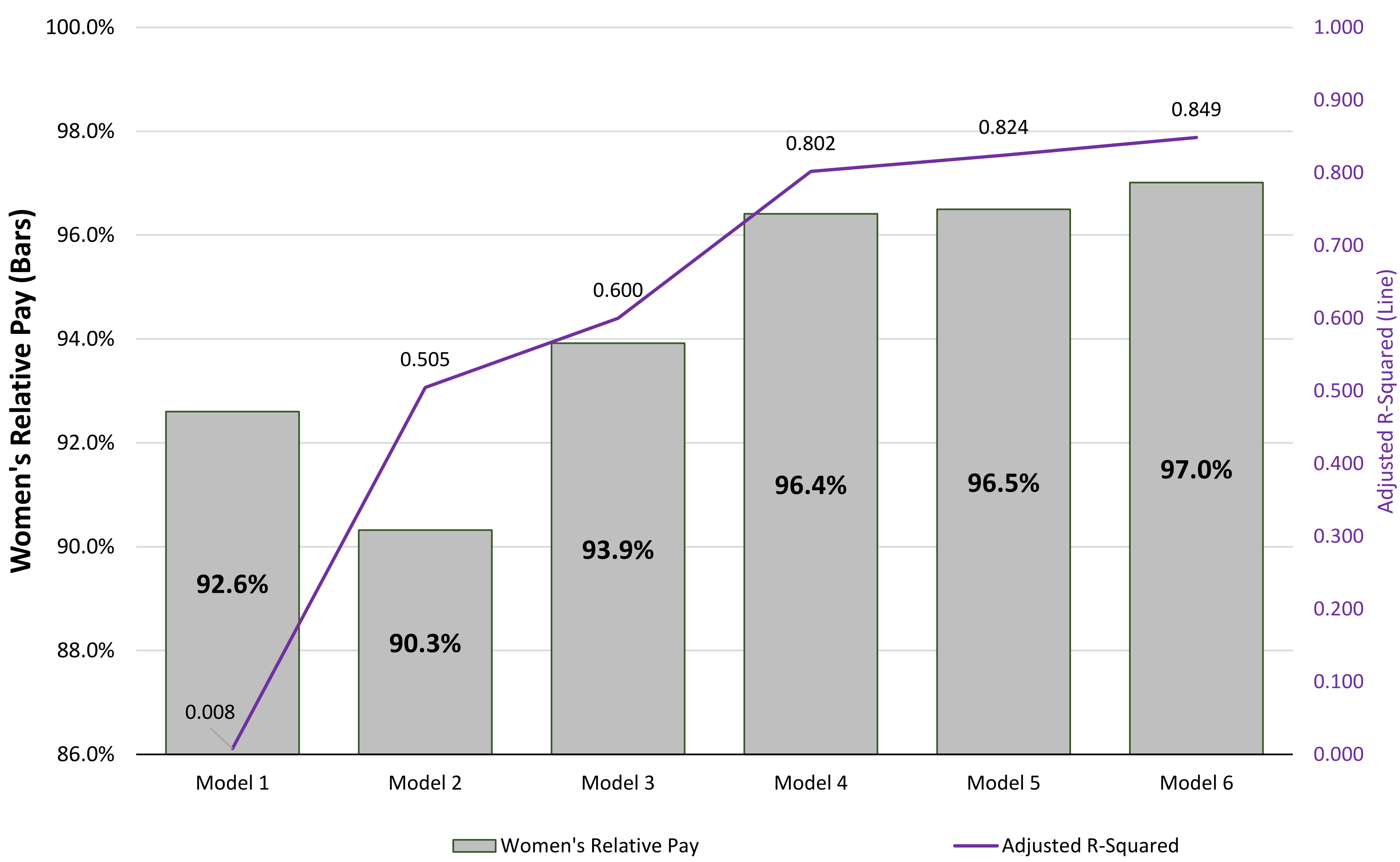

Figure 1. Women's Pay Relative to Men's Pay in the Federal Government (FedScope September 2014)

Table 3. Governmentwide Gender Pay Gap Regression Results (FedScope September 2014)

Model Description	Female Coef.	S.E. of Coef.	Women's Relative Pay	Adjusted R^2
Model 1: Logged Salary=Female	-0.077	0.001	92.6%	0.008
Model 2: Model 1 + Workplace Geography + Human Capital	-0.102	0.001	90.3%	0.505
Model 3: Model 2 + Agency	-0.063	0.000	93.9%	0.600
Model 4: Model 2 + Occupation	-0.037	0.000	96.4%	0.802
Model 5: Model 2 + Agency + Occupation	-0.036	0.000	96.5%	0.824
Model 6: Model 2 + Agency*Occupation	-0.030	0.000	97.0%	0.849
N = 1,823,846				

Note: All Female coefficients significant at the $p < .001$ level. Women's Relative Pay is calculated by exponentiating the Female coefficient and converting to a percentage. Human Capital variables include length of service, mean-centered-length of service-squared, age, mean-centered-age-squared, and education. Additional information is available in Appendix A.

CHAPTER III

AGENCY-LEVEL VARIATION IN FEDERAL SECTOR PAY GAPS

The purpose of this chapter is to examine agency-level variation in the gender pay gap. Due to agencies' varied organizational cultures, missions, occupational compositions, gender distributions, and equal employment opportunity policies and practices, one should expect to see agency-level variation in the gender pay gap, yet it has not yet been explored systematically across all federal agencies, or for that matter in the rest of the economy. While OPM and other agencies, such as the U.S. Government Accountability Office (GAO), have done extensive research on the pay gap and provided initial recommendations, few academics have touched on the pay gap in the federal sector, and to my knowledge, there is no published academic research that compares the pay gap across a wide swathe of U.S. federal agencies.[20]

This chapter addresses the question, how do gender pay gaps vary across federal agencies? It establishes that agency context affects the gender pay gap. This question is important because there is no published research that compares the pay gap by agency across the board. Establishing and examining the agency-level variation as well as identifying agencies with small and large pay gaps can be useful in eliminating the overall pay gap because agencies with small pay gaps can share their successful policies, procedures, and practices.

As mentioned in the previous chapter, common explanations for gender pay gap differences include human capital, individual-level selection explanations, segregation,

[20] Smith-Doerr et al.'s (2019) study focused on organizational gender pay gap variation in large federal science agencies, albeit in only seven agencies. Using data similar to my own, they longitudinally examined these agencies for gender pay gap differences based on being in "gender neutral" or "masculine" science disciplines. See more below.

and gender bias or discrimination. Here I measure organizational differences in the gross pay gap and two components of the pay gap: the between-job pay gap and the within-job pay gap. This sets up Chapter 4, in which I use organizational characteristics to explain agency-level variation in these components of the pay gap.

This chapter is laid out as follows: First, I describe existing research supporting the prediction that there will be organizational variation in the Federal Government's gender pay gap. Next, I describe my methodology for calculating agency-level pay gaps. In the results sections, I will 1) examine the distribution of gross, between-job, and within-job agency-level pay gaps for 371 agencies, 2) identify the agencies with the largest within-job pay gaps favoring men, and 3) explore the role of occupational segregation in producing agency-level pay gaps. Finally, I discuss the policy and sociological implications of my findings.

A. Previous Research on Federal Sector Organizational Pay Gap Variation

Social scientists have barely explored the gender pay gap within the Federal Government; however, scholars in the discipline of public administration have directly approached the topic. Choi (2015) used a Merit Principles Survey from the Merit Systems Protection Board (MSPB) to measure the determinants of the Federal Government's gender pay gap. While methodological flaws in Choi's study abound,[21] she added a focus on salary variation by agency type (regulatory, distributive, redistributive, and constituent). Her main finding is that the women-dominated redistributive agencies pay their employees less than other agencies. One can infer that this agency mission-level

[21] E.g., misinterpretation of coefficients for dummy variables, not logging a skewed salary dependent variable, and misinterpretation of the purpose of survey weights.

segregation will contribute to the gender pay gap. While that tells us little about the gender pay gap within agencies, it shows that there is between agency variation in both the gender distribution and pay; thus, there should be agency variation in the pay gap as well.

Another public administration study by Oh and Kim (2015) examined gender and racial pay disparities among STEM (Science, Technology, Engineering, and Mathematics) majors in the Federal government using 1% samples of the CPDF from 1983, 1996, and 2009. They found that over the study period, women increased their presence among STEM majors working in the Federal Government, and STEM majors in the government have become more racially diverse. There was no significant gender pay gap among STEM majors by 2009, but in all three years of the study, non-STEM majors had a larger and significant gender pay gap, with a 4.3% gap disfavoring women in 2009. Using nested regressions, the authors found that controlling for a five-category occupation barely reduced the gender pay gap; however, controlling for education, Federal Government experience, age, and type of STEM major substantially reduced the gender pay gap. Considering the finding that the gender pay gap differs by college major, one can expect different agencies, with diverse hiring profiles, to have different gender pay gaps.

A 2019 paper by sociologists also addresses the gender pay gap within STEM, but this time compares the gap across federal STEM agencies. Smith-Doerr and colleagues (2019) focused on gendered organizations, specifically hypothesizing that the gender pay gap would be larger in federal science agencies with more masculine cultures. They decomposed the federal pay gap in seven federal agencies into four parts: individual characteristics, occupational segregation, pay grade, and the residual pay gap after controlling for these factors. They found that the pay gap varied widely across agencies, and although the *gross* pay gap did not follow the expected pattern based on the theory of gendered organizations, after implementing their control variables, agencies with masculine cultures had larger residual pay gaps. In addition, the effects of the independent variables on the pay gap varied across agencies. Their study provides further reason to believe that I will find agency variation in the pay gap. Further, my study goes beyond the work of Smith-Doerr and colleagues by examining the variation in the gender pay gap across all federal agencies, not just in science agencies.

Smith-Doerr and colleagues (2019) also found that 74% of federal employees who were paid based on a pay plan other than the common General Schedule (GS) pay plan were men. The General Schedule (GS) pay plan, with 15 grades each having 10 steps, is a standardized system used to determine pay for most federal employees. Similarly, in my full dataset, women were more likely than men to be on the GS Pay Plan (79.4% of women as opposed to 64.9% of men). Smith-Doerr et al. found that the usage of exemptions to the GS system varied by agency as did the effect of being off-grade on the gender pay gap. This reemphasizes the need to measure the gender pay gap separately for separate organizations.

As described below, I chose not to include pay grade as a control variable in this chapter despite Smith-Doerr and colleagues' focus on that element. Pay grades tend to directly determine one's pay within the Federal Government due to standardized pay scales, regardless of whether the agency uses primarily the common General Schedule system or an agency specific system. Most employees who are not on a standardized pay scale are blue collar workers or senior leaders who, based on their occupations, are expected to be on the extremes of the pay distribution. Much of the variation in employees' pay systems should be due to agencies having unique pay systems, and thus, controlling for pay system would diminish agency variation in the pay gap. In addition, OPM (2014) found only small within-pay grade gender pay gaps among General Schedule employees. Many within-grade gaps favored women, but women tended to be in lower grades. In the next chapter, I use agency-level gender pay plan segregation as a potential factor to explain between agency variation in the pay gap.

Learning more about variation in the Federal Government's gender pay gaps, including identifying which agencies should be targeted for such improvement, is critical to the eventual elimination of any discriminatory pay gap. Conversely, identifying low pay gap agencies may produce positive lessons for federal and other public and private employers.

B. Why Might the Gender Pay Gap Vary by Agency?

It is useful to explore why it is reasonable to expect variation. Various organizational mechanisms contribute to the hypothesis that the gender pay gap will differ between Federal Agencies. Some are intrinsic to the variation in agencies' missions. Others are dependent on decision-makers within the agencies.

1. Mission-Related Pay Gap Variation

Due to agencies' distinct missions, they are composed of distinct occupations which require different education levels and degrees, and the pool of available employees may vary by gender as a result. While women currently enroll in college at higher rates than men do, women tend to graduate with majors associated with lower pay, and thus, after controlling for degree level, one still might expect women to earn less than men. Thus, agency variation in the gender pay gap is likely to be associated with gender differences in educational credentials leading to occupational sorting. In turn, occupational segregation will be a central empirical focus of my analyses of the sources of gender pay gap across agencies.

Furthermore, agencies compete with private sector employers in related industries when hiring and retaining employees. This may result in agency differences in policies on pay negotiation, bonuses, and pay plans. For example, when the Consumer Financial Protection Board (CFPB) was established, by law it had to have a pay system different from the General Schedule (GS) system to attract employees from the lucrative finance industry (Roberts 2016). Agencies may have pay gaps similar to those in the industries with which they compete for employees. I do not control for industry variation because here I am focusing on measuring the gaps, not the causes of the gaps, and I consider industry to be an exogenous factor, but I examine the distribution of gender pay gaps by department to see if any industry-related effects are plausible.

Geographic variation in agencies' locations may be related to the agencies' missions. Some agencies are heavily concentrated in the Washington, D.C. area, while others are geographically dispersed nationally or internationally. Functional activities in the agencies may cause geographic variation, but also gender segregation. Since this variation may be linked to gender bias in hiring, I control for the geographic location of the employees' workplaces in two of my models, but do not control for it when calculating the gross pay gap.

2. Pay System Variation

While CFPB's unique pay system is related to its mission, using a non-GS pay system is a common practice and not necessarily linked to agencies' missions. Standardized pay systems, such as the General Schedule (GS) system, within the Federal Government are bureaucratic mechanisms that minimize employees' ability to negotiate pay and regulate manager's promotion decisions. Many have theorized that bureaucratization in organizations levels the playing field for women because rules are in place that stymie biased stereotypes (Bielby 2000; Reskin 2000). Previous research has supported this notion (Baron et al. 2007; Elvira and Graham 2002; Guthrie and Roth 1999; Reskin and McBrier 2000).

As noted above, the GS pay plan is not universal within the federal government. Only 69% of government employees in my dataset are under the GS system. In these data, employees' pay can be based on 170 other pay plans, several of which cover less than 10 employees each. The employees under such small pay plans are likely exempted from the standardized pay setting and promotions systems that apply to employees in the GS system. Research by Smith-Doerr and colleagues (2019) found that 74% of federal employees who were exempted from the grade system were men, but the usage of exemptions varied by agency as did the effect of pay grade on the gender pay gap. In addition, OPM's (2014) research did not find a need to make changes to the GS system to improve gender equality in the federal government; in fact, they found no statistically significant gender pay gap within GS grades, although women were overrepresented in lower grades.

Considering that federal agencies more often use discretional authority to pay higher than the standard starting pay when setting pay for men and when setting pay within man-dominated occupations, there is evidence that the discretional authority that adds flexibility to pay setting contributes to the gender pay gap. Furthermore, there is clear evidence of pay setting disparities when one examines starting salaries within the Federal Government; in 2012, women's gross starting pay was 10% lower than that of men (U.S. Office of Personnel Management 2014).

3. Other Policies Affecting the Pay Gap

Agency variation in family-friendly practices might also result in agency variation in the gender pay gap. If some agencies have policies, procedures, and cultures that allow family caretakers to attend to their outside responsibilities, women may benefit from such policies, procedures, and cultures. This assumes that agencies have a certain amount of autonomy that permits variation in these policies, procedures; however, the cultures of the agencies, which are difficult to quantitatively control for, will vary considering the various individuals that agencies are composed of and controlled by.

Before examining the causes of agency differences in gender pay gaps, it must first be established that these differences exist.

C. Data and Methodology

In this chapter's agency-level analyses, I set the minimum agency size to be 100 employees; this conforms to OPM's definition of a medium size agency. Further, to be included, an agency had to have at least 5 women and 5 men as employees. In the end, I calculated the gender pay gap net of explanatory factors for 371 federal agencies.

Next, I ranked agencies' pay gaps. I ran three regressions separately for each agency: 1) the gross gender pay gap, 2) controlling for geography and human capital – or the between-job pay gap, and 3) controlling for geography, human capital, and detailed occupation – or the within job pay gap. For each individual, i, within an agency, a, they are specified as:

Model 1: The Agency Gross Gender Pay Gap

$$\ln(\hat{Y}_{ia}) = \beta_0 + \beta_a x_{Gender_{ia}} + \varepsilon_{ia}$$

Model 2: The Agency Gender Pay Gap net of Geography and Human Capital

$$\begin{aligned}\ln(\hat{Y}_{ia}) = \ & \beta_{0_a} + \beta_a x_{Gender_{ia}} + \sum \beta_a x_{Geogrpahy_{ia}} + \sum \beta_a x_{Education_{ia}} \\ & + \beta_a x_{(Length\ of\ Service)_{ia}} + \beta_a x^2_{(Mean-Centered\ Length\ of\ Service)_{ia}} \\ & + \beta_a x_{Age_{ia}} + \beta_a x^2_{(Mean-Centered\ Age)_{ia}} + \varepsilon_{ia}\end{aligned}$$

Model 3: The Agency Gender Pay Gap net of Geography, Human Capital, and Occupation

$$\begin{aligned}\ln(\hat{Y}_{ia}) = \ & \beta_{0_a} + \beta_a x_{Gender_{ia}} + \sum \beta_a x_{Geogrpahy_{ia}} + \sum \beta_a x_{Education_{ia}} \\ & + \beta_a x_{(Length\ of\ Service)_{ia}} + \beta_a x^2_{(Mean-Centered\ Length\ of\ Service)_{ia}} \\ & + \beta_a x_{Age_{ia}} + \beta_a x^2_{(Mean-Centered\ Age)_{ia}} + \sum \beta_a x_{Occupation_{ia}} + \varepsilon_{ia}\end{aligned}$$

Note that no agency includes all occupations, and most do not include all geographies or levels of education; in those cases, the coefficients are zero for the missing category.

D. Descriptive Statistics

To show variation across agencies using descriptive statistics, first, I calculated the same means and percentages within the 371 agencies and aggregates that I used in the agency-level regressions. Next, I used the results for the 371 agencies and calculated agency grand means, standard deviations, and medians.

As seen in Table 4 (at the end of this chapter), the mean federal agency had 4,902 employees, 44.2% of them being women. However, the median agency only had 960 employees, 43.4% of them women, indicating that the distribution of agency sizes is right skewed. The standard deviation of agency size, 16,579, was large relative to the means, indicating a great amount of variation in agency size.

The grand mean of females' salaries, $90,085, was 90.8% of the grand mean of males' salaries, $99,169. This was less than the governmentwide mean of 92.5%, and that indicates that many agencies have larger gross pay gaps than the governmentwide average. The standard deviation of mean agency pay for men ($21,918) was larger than that of the mean agency pay for women ($18,095), as one would expect with men having a greater average salary. If one looks at this proportionately, the ratio of the grand mean to the standard deviation of agency means for men was 4.52 (=99,169/21,918) versus 4.98 (=90,085/18,095) for women. From this view, men's salary was more consistent across agencies than women's salary.

The grand mean length of service, 15.0 years, was about a year longer than the governmentwide mean. In the average agency, men on average had worked fewer years than women had (14.0 for men vs. 16.4 for women) but men's average length of service varied more across agencies than women's based on the higher standard deviation.

Although governmentwide, the average woman, at 47.0 years of age, was barely older than the average man (46.8), the grand mean of men's age was 48.4 years, and the grand mean of women's age was only 47.3 years.

Regarding education, in the average agency, men most often had an advanced degree followed by a bachelor's degree, while women most often had a bachelor's degree, followed by an advanced degree. This differed from the governmentwide average, where both men and women were most likely to have bachelor's degrees. Governmentwide, the percentage of women with at least a bachelor's degree was almost the same as the percentage of men with bachelor's degree, but in the average agency women were clearly less likely to have at least a bachelor's degree, indicating that women with higher education are likely clustered in certain large agencies. This substantial variation in human capital will likely explain variation in the pay gap across agencies.

In the median agency, no employees were in blue collar occupations, i.e., most government agencies are exclusively white collar. In the mean agency, a small percentage of employees of both genders (6.0% of men and 1.4% of women) were in blue collar occupations; these percentages were much smaller than the governmentwide means, especially for men. This indicates that blue collar workers are concentrated in a small number of agencies. Although governmentwide women were more likely than men to be in professional occupations, in the average agency, men were more likely to hold professional roles. Both governmentwide and at the average agency, women were more likely to hold technical or clerical positions than men were. However, these are broad occupational types, and the detailed occupational series used in the regressions will tell much more about the effects of occupational segregation on pay.

Finally, the average agency, with about 45% of its employees in Washington, D.C., Maryland, or Virginia, is more concentrated near the nation's capital than the governmentwide concentration in that area. Similarly, most agencies have much smaller concentrations of employees in other regions than the governmentwide average. One exception is having employees abroad: the mean agency representation abroad is 2.9%, and governmentwide, 1.4% of employees work there. This may cause by-agency analyses to differ from governmentwide analyses because of locality adjustments, which are adjustments to pay based on the cost of living in the workplace location.

E. Regression Results

I estimated three regressions separately for each agency: 1) the gross pay gap, 2) controlling for geography and human capital, and 3) controlling for geography, human capital, and occupation. In this section, I first examine the distribution of the pay gaps measured by these models and related descriptive statistics. Next, I focus on agencies with large pay gaps favoring men. After that, I look at the role of occupational segregation in producing the pay gap. Finally, I identify federal departments and agencies that appear to need improvement based on having large pay gaps favoring men and occupational segregation.

1. The Distribution of Gender Pay Gaps in the Federal Government

The gaps calculated separately by agency form distributions of pay gaps in the Federal Government. See Figures 2 and 3. Figure 2 plots the pay gaps calculated by the three regression models across 371 agencies with at least 100 employees. Figure 3 does the same, but only includes statistically significant gaps. When comparing the distribution across the three models, the distribution gets more condensed with each subsequent model. As is to be expected, the outliers are the more extreme in the distribution of the gross pay gap than in the distributions of pay gaps net of other factors. Women's mean relative pay is lowest in the gross pay gap model and greatest in the unrestricted model; this differs from the governmentwide model in the previous chapter, in which the largest gender pay gap was found when controlling for geography and human capital. Most importantly, in the vast majority of agencies, women are disadvantaged regarding pay, even after applying controls; however, there are a few agencies with significant pay gaps favoring females. Using the unrestricted model, only four agencies had significant pay gaps favoring females: The Office of the Chief Financial Officer at the Department of Labor (12.41%), the National Archives and Records Administration (2.22%), the Veterans' Benefits Administration (0.56%) at the Department of Veterans' Affairs (VA), and the Veterans' Health Administration (0.34%) also at the VA.

Table 5 provides a numeric summary of these distributions including the percentage of agencies favoring men and favoring women. Although the mean gap is smaller in the model controlling for human capital and geography (92.21 cents on the dollar) than in the gross pay gap model (91.06 cents on the dollar), the model with the human capital and geographic controls shows the highest percentage of agencies favoring men, significantly favoring men, and extremely favoring men (greater than two standard deviations from pay parity). This pattern is reflective of the governmentwide regression models in which the gross pay gap was smaller than the pay gap controlling for geography and human capital, but models with further controls showed smaller pay gaps.

Attenuation of extreme estimates by applying controls, specifically adding controls for human capital, helps to explain this pattern. In the agencies with the largest gross pay gaps favoring men, it is likely that women have less education, less experience, and/or shorter job tenure (human capital) than men on average, and thus after controlling for human capital, the gap is smaller. Conversely, in agencies where women have the highest relative pay, women have greater human capital, and thus, some agencies that had small gross female pay bonuses have larger gender penalties after applying that control. Overall, this shrinks the standard deviation, increasing the chances of an agency having a pay gap greater than two standard deviations from pay parity.

Compared to human capital inequities, occupational segregation more consistently disfavors women as it sorts women into lower paying occupations. Therefore, when moving to the unrestricted model, which adds controls for occupation, women’s mean relative pay increases to 96.05 cents on the dollar. The fewest agencies have statistically significant pay gaps in either direction in the unrestricted model (66.58% significantly favoring men, 1.08% significantly favoring women). The percentage of agencies favoring men (92.99%) is smaller than in the human capital and geographical controls model (94.61%), but larger than in the gross pay gap model (89.49%). Similarly, despite the standard deviation of the distribution of pay gaps shrinking to 3.09%, fewer agencies are extremely far (more than two standard deviations away) from pay parity in the within-job model than in the human capital and geographical controls model; still, more agencies are extremely far from pay parity in the unrestricted model than in the gross pay gap model. This is likely an artifact of the wide range of pay gaps in the gross gap model and a far more condensed distribution in the unrestricted model. Controlling for occupational segregation decreases the mean pay gap the most because women's position in lower paying occupations is widespread, even after accounting for human capital and geography. However, within-job pay gaps are still very common.

Overall, these models imply that most agencies, but not all, pay women significantly less than men on average, even when accounting for human capital, geography, and occupation. In addition, even at the agency level, controlling for human capital and geography worsen the pay gap because women generally have better human capital and/or are in locations that pay better. Finally, for many agencies, the gender pay gap substantially shrinks, occasionally to non-significance, after controlling for occupation, but in most agencies, there is still a within-job gender pay gap favoring men.

2. Agencies with Large within Job Pay Gaps Favoring Men

Under the Equal Pay Act of 1963, women and men must receive equal pay for equal work within the same workplace; equal work does not necessarily mean identical jobs, but that the work be substantively equal. However, if the work is truly equal, then men and women must receive identical compensation to the cent to be within the law (Paetzold and Willborn 2017; U.S. Equal Employment Opportunity Commission n.d.a).[22]

[22] Paetzold and Willborn write, "In general, if statistical significance is required for a showing of liability, then any significant coefficient, no matter how small, should contribute to an inference of discrimination" (2017, p. 314). Title VII of the Civil Rights Act of 1964 also prohibits pay discrimination and applies to the federal sector, but the standards for liability differ (U.S. Equal Employment Opportunity Commission n.d.a).

By controlling for occupation, geographic location, and human capital, the unrestricted model comes closest to providing a measurement against this standard.

Using this model, over 66% of federal agencies have statistically significant pay gaps. Some of these pay gaps are small but statistically significant in part due to the large size of the agencies. In these cases, small pay gaps may be produced by measurement error or model misspecification, and probably should be treated as rough equality in pay, despite rising above the common legal standard of two standard deviations difference in pay. Other pay gaps, however, are large and deserve extended consideration. Table 6 lists the agencies with significant pay gaps favoring men by more than 10% even after controlling for occupation, geographic location, and human capital. These agencies most urgently should examine their pay practices.

Although there are only 10 agencies in this category, 120 agencies have significant gaps favoring men in pay by at least 5%. To drill down into patterns involved here, I examine agencies by department, including in the analyses the largest of independent agencies (The Social Security Administration [SSA]) and independent agencies with at least 10 subcomponents (The General Services Administration [GSA] and NASA), as well as categories for the remaining large- and medium-sized independent agencies. As one can see in Table 7, the pay gap varies greatly across departments. Based on the mean pay gap (weighted by agency size), the worst offenders are:

- Department of Energy (7.1%)
- Department of the Navy (5.2%)
- Department of the Army (5.0%)

- Department of the Air Force (4.9%)
- Department of State (4.2%)
- Department of Defense (4.1%)
- General Services Administration (4.0%)

The 7.1% pay gap at the Department of Energy, affecting over 14,000 employees, raises concern, but that is primarily driven by the main Department of Energy subcomponent; the Federal Energy Regulatory Commission's gender pay gap is not statistically significant.

Many departments contain primarily subcomponents with significant pay gaps. That is particularly notable in the defense related departments. All of Navy's 20 subcomponents had significant pay gaps favoring men, as did 97.1% of Air Force's subcomponents, 84.0% of Defense's subcomponents, and 81.6% of Army's subcomponents. Note that this dataset covers civilian employees and not active-duty military personnel. At NASA, 90.0% of subcomponents had significant pay gaps. The same figure at Interior was 83.3%. State's gap was 100% significant, but State reported as a single agency with no subcomponents.

When looking at departments with the greatest percentage of subcomponents with large significant pay gaps (greater than 5%) favoring men, five of the departments with the largest mean pay gaps are still the worst offenders:

- Department of the Air Force (65.7%)
- Department of the Army (61.2%)
- Department of the Navy (60.0%)

- Department of Energy (50.0%)
- Department of Defense (44.0%)

In short, the preponderance of unequal pay in the defense-related departments,[23] as well as the Department of Energy, is alarming and requires further investigation.

3. The Role of Segregation in Producing Agency Pay Gaps

Title VII of the Civil Rights Act of 1964 bars not only discrimination, but also segregation in the workplace. It reads,

> It shall be an unlawful employment practice for an employer […] to limit, segregate, or classify his employees or applicants for employment in any way which would deprive or tend to deprive any individual of employment opportunities or otherwise adversely affect his status as an employee, because of such individual's race, color, religion, sex, or national origin.

While discrimination is notoriously difficult to observe, the effect of segregation on the pay gap is relatively straightforward to estimate in these data. The difference in an agency's coefficients between Model 3 and Model 2, exponentiated and subtracted from 1 is the gender pay gap produced by occupational sorting net of human capital and geography. To improve interpretability, I analyze this value with data aggregated to the department level.

As seen in Table 8, the five departments with the largest weighted mean pay gap (favoring men) produced by segregation were

- Department of Transportation (DOT; 13.8%)

[23] I do not explore in this dissertation whether cultural or mission-related reasons cause the poor equal pay conditions in the DoD. The DoD and the Department of Energy have masculine cultures (Herbert 1998; Smith-Doerr et al. 2019). However, it is possible that job requirements, such as working abroad for short tours of duty, may be less appealing to women due to unevenly distributed family-related responsibilities.

- Department of Labor (8.9%)
- Department of the Air Force (7.9%)
- Department of Treasury (6.1%)
- Department of the Army (5.3%)

The departments on this list do not necessarily have large or small pay gaps after controlling for occupation, but rather employ women in lower paying occupations relative to their human capital. As noted in the previous section, Air Force and Army had some of the largest weighted mean within-job pay gaps. DOT was in the middle of the pack with weighted mean gap of 3.6% and Treasury was slightly better at 2.5%. However, Labor (1.8%) had the third smallest weighted mean gap favoring men after controlling for human capital, geography, and occupation. Based on this, Air Force and Army clearly have mechanisms beyond occupational segregation causing their pay gaps and are of great concern. If Labor, Treasury, and especially DOT want to decrease their gross gender pay gaps, their focus should clearly be on segregation, noting that segregation is potentially illegal when it has adverse effects, such as pay inequality.

In all but one department, the Department of Veterans Affairs (VA), the weighted mean pay gap produced by segregation favored men. Occupational segregation favors women's pay by 3.4% in the Veterans Health Administration, by far the largest agency in the government. In addition, the percentage of VA subcomponents with segregation favoring men, 66.7%, was far below the percentage governmentwide, 88.7%. Based on this and its low average pay gap in the unrestricted model, the VA may be a good place to look for best practices regarding both pay and segregation.

As just noted, the vast majority of agencies governmentwide have occupational segregation that produces pay gaps favoring men. In the following departments, all subcomponents have segregation favoring men:

- Department of Commerce
- Department of Energy[24]
- Department of the Interior
- NASA
- Social Security Administration[25]
- Department of State[26]
- Department of Transportation
- Department of the Treasury

These departments may need to look externally to other federal agencies to find solutions to their segregation-related pay gaps.

Other departments may have better opportunities to look internally to decrease the pay gap produced by segregation in certain subcomponents. The following departments have large standard deviations of the gap produced by segregation, and thus, have subcomponents with widely varying amounts of segregation affecting the pay gap:

- Department of Labor (8.7%)

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[24] The Department of Energy has one subcomponent, and in this dataset, the rest of the employees are directly employed by the department.

[25] Note that the Social Security Administration reports as a single agency and its weighted mean pay gap produced by segregation is below the governmentwide average. With its non-significant pay gap after controlling for human capital, geography, and occupation, it may actually be a model for other agencies in more than one respect.

[26] The Department of State also reports as a single department; however, its weighted mean pay gap produced by segregation (5.0%) is above the governmentwide average as is its mean pay gap (4.2%).

- Department of the Air Force (5.7%)
- Department of Transportation (5.0%)[27]

These departments all have at least one subcomponent with over a 10% pay gap favoring men produced by segregation. However, Labor and Air Force have one subcomponent apiece where segregation does not favor men, and DOT has none. Still, it may be easier to modify policies, procedures, and practices that cause segregation and pay inequality when using a managerial practice model from within a subcomponent's larger agency. The underperforming subcomponents of larger agencies should be encouraged to look for agencies that perform better with regard to desegregation and pay equality to find best practices.

F. Concluding Thoughts and Policy Recommendations

Across government agencies, substantial variation in the pay gap exists. A couple of agencies even have pay gaps that significantly favor women. This variation could be useful in eliminating the overall pay gap because agencies with small pay gaps can share their successful policies, procedures, and practices.

My methodological contribution goes beyond the first chapter: I calculated the pay gap separately for 371 agencies. In the average agency, the gross pay gap was 8.9%. After controlling for human capital and geography, it was 7.8%. After adding detailed occupation fixed effects, it was 3.9%. Calculating the pay gap separately for each agency allows for identification of problematic employers and model employers. The departments with the largest pay gaps in September of 2014 were Energy, Navy, Army,

[27] In addition, the medium independent agencies category has a large standard deviation (4.9%).

Air Force, State, Defense, and the General Services Administration. The predominance of the military departments in this list suggests that gendered organizational cultures, like the culture found in the military, may lead to pay inequity. However, further information is needed to confirm the exact causes of this pattern.

In addition, I examined patterns of occupational segregation causing the pay gap. There was substantial variation in the degree to which occupational segregation explained the pay gap. The departments with the largest parts of the pay gap explained by occupational segregation were the Departments of Transportation, Labor, Air Force, Treasury, and Army. One department, the Department of Veteran's Affairs, was segregated in a manner that benefited women's pay, and this may have contributed to its very small pay gap that actually benefitted women. Note that Title VII of the Civil Rights Act prohibits discrimination, including pay inequities based on protected categories, as well as segregation. As previous studies, like that of Petersen and Morgan (1995), have done, my analyses demonstrated that pay inequality is related to segregation. Like them, I found that both establishment level and occupational level segregation generally caused the pay gap. However, going beyond Petersen and Morgan, my study identified organizational variation in both the level of pay inequalities and the effects of segregation.

Federal regulatory authorities and agency equal employment opportunity (EEO) programs can use the results of this chapter to see to what degree gender pay inequality is an organizational problem. The results may help regulatory agencies like the EEOC identify candidate agencies for program evaluations. The results also identify agencies that do not have statistically significant pay gaps. These agencies are candidates for further examination because they may be employing model policies, procedures, and practices that attenuate pay inequality. Furthermore, with the number of pay gaps calculated, agencies with large pay gaps can identify agencies with similar missions, but smaller or non-significant pay gaps; consulting with similar, but more egalitarian organizations may be an effective method for promoting equal employment opportunities.

As demonstrated in this chapter, the gender pay gap varies. Agencies that do not confront their large pay gaps may face the possibility of losing talented women to more egalitarian organizations. It benefits not just women, but their employers as well, to remedy this situation.

In the next chapter, I examine organizational contexts that favor or disfavor women's pay relative to men's pay in federal agencies. Employers who address the contexts disadvantaging women may in the end better retain their talented women employees.

Table 4. Descriptive Statistics of within Agency Means and Compositions (FedScope September 2014)

	Men			Women			All		
	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median
Total Agency Size	4,902	16,579	960	4,902	16,579	960	4,902	16,579	960
Salary (Annualized)	$99,169	$21,918	$100,221	$90,085	$18,095	$91,628	$94,990	$19,814	$96,586
Logged Salary	11.43	0.24	11.47	11.34	0.21	11.37	11.39	0.22	11.43
Length of Service	14.0	3.2	14.2	16.4	2.9	16.6	15.0	3.0	15.3
Age	48.4	3.0	48.8	47.3	2.6	47.6	47.9	2.7	48.3
Percent of Agency Female							44.2%	14.6%	43.4%
Educational Attainment									
No High School Diploma	0.3%	0.6%	0.0%	0.5%	1.0%	0.2%	0.4%	0.8%	0.2%
H.S. Diploma or Equivalent	19.1%	16.3%	14.6%	22.2%	12.5%	20.1%	21.1%	14.5%	18.3%
Some College	14.0%	8.6%	12.8%	20.3%	7.9%	19.2%	17.0%	7.8%	16.1%
Bachelor's Degree	32.6%	14.4%	30.4%	29.5%	10.3%	29.0%	30.8%	12.2%	28.9%
Advanced Degree	34.1%	19.7%	30.5%	27.6%	14.2%	24.8%	30.7%	16.7%	26.9%
Occupation Type									
Professional	28.9%	25.5%	19.6%	24.0%	19.4%	19.6%	26.6%	22.6%	18.9%
Administrative	55.0%	27.6%	55.6%	56.4%	21.9%	57.3%	55.2%	25.0%	56.6%
Technical	6.6%	9.8%	3.1%	12.7%	12.0%	9.0%	9.3%	10.4%	6.2%
Clerical	1.3%	3.2%	0.3%	4.6%	5.7%	2.9%	2.5%	4.0%	1.4%
Other White Collar	2.2%	7.4%	0.1%	0.9%	3.3%	0.1%	1.8%	6.2%	0.2%
Blue Collar	6.0%	13.7%	0.0%	1.4%	5.0%	0.0%	4.5%	11.2%	0.0%
Census Region									
D.C./Maryland/Virginia	43.5%	36.1%	34.0%	47.2%	36.3%	41.1%	44.8%	36.1%	36.0%
Midwest	9.6%	15.5%	4.1%	9.1%	15.5%	3.3%	9.4%	15.3%	4.0%
Northeast	7.6%	14.2%	2.8%	7.0%	13.9%	2.3%	7.4%	14.0%	2.6%
South	20.0%	24.3%	11.5%	19.3%	24.9%	10.9%	19.8%	24.4%	11.7%
West	14.7%	20.5%	8.7%	13.6%	20.4%	7.2%	14.3%	20.4%	7.7%
U.S. Territories	0.3%	0.8%	0.0%	0.2%	0.6%	0.0%	0.3%	0.7%	0.0%
U.S. – Suppressed	1.2%	9.4%	0.0%	1.0%	8.0%	0.0%	1.1%	8.9%	0.0%
Abroad	3.1%	13.6%	0.0%	2.5%	13.1%	0.0%	2.9%	13.4%	0.0%

Note: Among 371 Agencies with 100 employees or more and at least 5 men and 5 women.

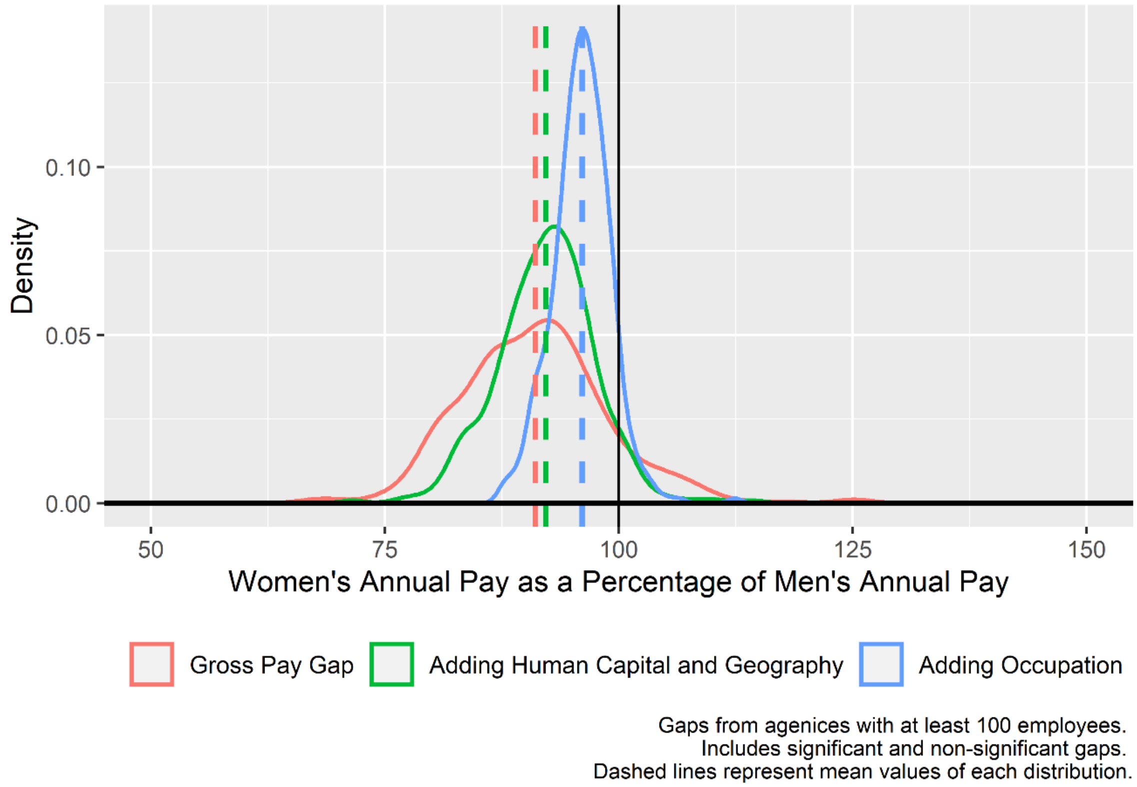

Figure 2. All Gender Pay Gaps in Federal Agencies Across Statistical Models (FedScope September 2014)

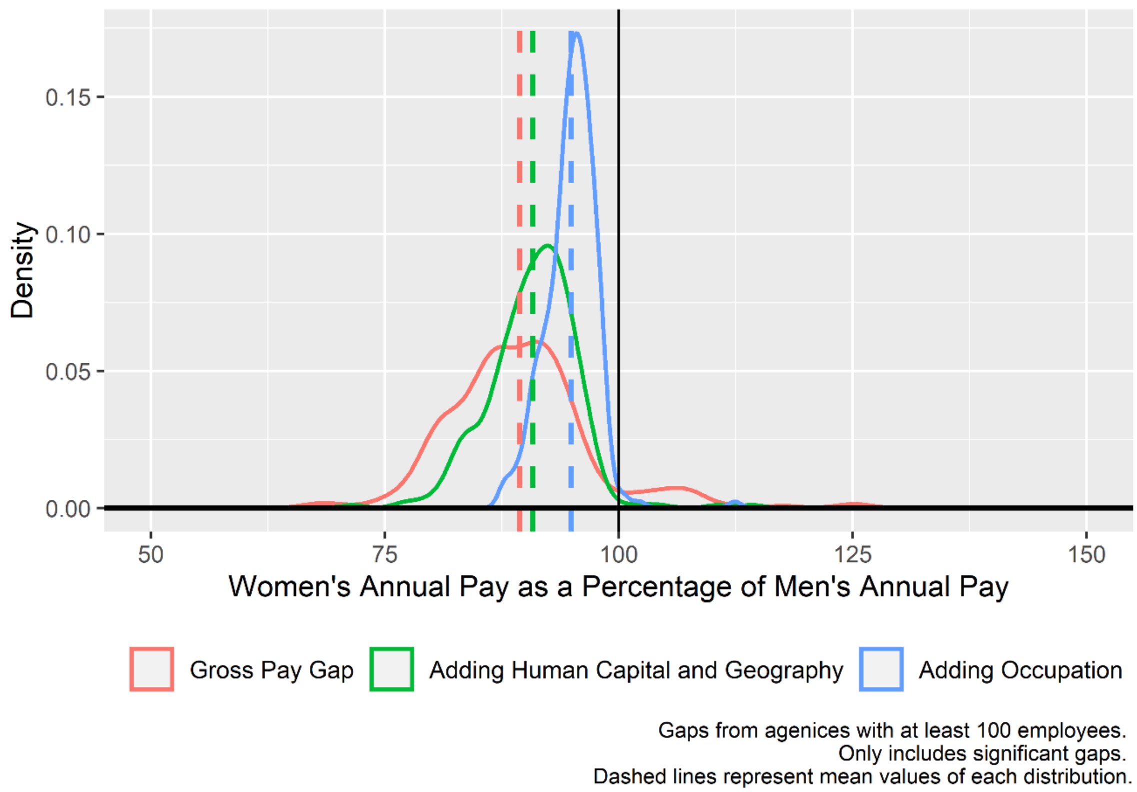

Figure 3. Statistically Significant Gender Pay Gaps in Federal Government Agencies Across Statistical Models (FedScope September 2014)

Table 5. The Distribution of Gender Pay Gaps across Federal Agencies: Descriptive Statistics (FedScope September 2014)

	Gross Pay Gap Model	Human Capital and Geographical Controls Model	Unrestricted Model
Women's Mean Relative Pay	91.06%	92.21%	96.05%
Standard Deviation	7.90%	5.27%	3.09%
Median	90.96%	92.36%	96.19%
Minimum	67.25%	71.53%	87.61%
Maximum	125.66%	114.27%	112.41%
% of Agencies Favoring Men	89.49%	94.61%	92.99%
% of Agencies Favoring Men and			
Less than 0.5 SD from Pay Parity	11.05%	7.82%	12.94%
0.5 to 1 SD from Pay Parity	21.56%	17.52%	18.60%
1 to 2 SD from Pay Parity	38.54%	42.32%	40.70%
2 to 3 SD from Pay Parity	16.44%	19.41%	16.17%
3 or More SD from Pay Parity	1.89%	7.55%	4.58%
Significant	74.39%	78.71%	66.58%
% of Agencies Favoring Women	10.51%	5.39%	7.01%
% of Agencies Favoring Women and			
Less than 0.5 SD from Pay Parity	4.31%	3.50%	3.77%
0.5 to 1 SD from Pay Parity	3.77%	0.81%	1.62%
1 to 2 SD from Pay Parity	1.62%	0.54%	1.08%
2 to 3 SD from Pay Parity	0.27%	0.54%	0.27%
3 or More SD from Pay Parity	0.54%	0.00%	0.27%
Significant	6.20%	1.08%	1.08%

Note: SD in "SD from Pay Parity" refers to the Standard Deviation reported above for the relevant regression model. Significance is based on the t-score of gender variable in the agency-level model. Agency-level results for the female variable are in Appendix B.

Table 6. Federal Agencies with the Largest Pay Gaps Favoring Men (FedScope September 2014)

Rank	Agency	Department	Agency Size	Women's Relative Pay	
1	Economic Development Administration	Department of Commerce	153	87.61%	***
2	Air Force Operational Test and Evaluation Center	Department of the Air Force	225	87.64%	***
3	Office of Mission Assurance	General Services Administration	122	87.82%	**
4	Farm Service Agency	Department of Agriculture	3810	88.25%	***
5	Defense Acquisition University	Department of Defense	177	88.75%	*
6	Office of Inspector General	Federal Housing Finance Agency	142	89.14%	**
7	U.S. Northern Command	Department of the Air Force	668	89.23%	***
8	Defense Technology Security Administration	Department of Defense	123	89.35%	***
9	Office of the Chief Information Officer	Department of Education	127	89.54%	**
10	Federal Railroad Administration	Department of Transportation	825	89.97%	***

Note: Author's calculations after controlling for human capital, geography, and occupation. Among 371 agencies with at least 100 employees.
* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 7. Department-Level Within-Job Gender Pay Gaps (FedScope September 2014)

Parent Agency	Number of Subcomponents	Total Workforce	Weighted Mean Pay Gap	% of Subcomponents with Significant Gaps Favoring Men	% of Subcomponents with Significant Gaps Favoring Men Greater than 5%	Largest Significant Gap Favoring Men (Subcomponent)	Best Subcomponent for Women (Women's Relative Pay)	Mean Pay Gap	S.D.	Median Pay Gap
Government-wide	371	1,818,791	2.9%	66.6%	32.3%	12.4% (Economic Development Administration, Dept. of Commerce)	Office of the Chief Financial Officer (Dept. of Labor; 112.4%)	3.9%	3.1%	3.8%
Agriculture	22	72,312	3.5%	68.2%	31.8%	11.8% (Farm Service Agency)	Economic Research Service (100.9%)	3.8%	2.8%	3.7%
Air Force	35	155,394	4.9%	97.1%	65.7%	12.4% (Air Force Operational Test and Evaluation Center)	U.S. Special Operations Command (Ang, Title 32) (99.8%)	6.0%	2.3%	5.5%
Army	49	235,744	5.0%	81.6%	61.2%	9.8% (Headquarters, AMC)	Seventh Army Training Command (106.4%)	5.6%	2.7%	5.6%
Commerce	11	34,656	2.7%	72.7%	36.4%	12.4% (Economic Development Administration)	Bureau of Economic Analysis (101.8%)	4.5%	4.2%	4.4%
Defense	25	89,287	4.1%	84.0%	44.0%	11.3% (Defense Acquisition University)	Defense Contract Audit Agency (100.3%)	5.6%	3.0%	5.2%
Education	10	3,232	2.2%	20.0%	10.0%	10.5% (Office of the Chief Information Officer)	Office of Postsecondary Education (103.1%)	2.1%	3.9%	2.6%

Parent Agency	Number of Subcomponents	Total Workforce	Weighted Mean Pay Gap	% of Subcomponents with Significant Gaps Favoring Men	% of Subcomponents with Significant Gaps Favoring Men Greater than 5%	Largest Significant Gap Favoring Men (Subcomponent)	Best Subcomponent for Women (Women's Relative Pay)	Mean Pay Gap	S.D.	Median Pay Gap
Energy	2	14,339	7.1%	50.0%	50.0%	7.6% (Department of Energy)	Federal Energy Regulatory Commission (98.3%)	4.7%	4.2%	4.7%
General Services Administration	10	10,933	4.0%	50.0%	20.0%	12.2% (Office of Mission Assurance)	Office of Inspector General (99.8%)	4.4%	4.0%	4.3%
Health and Human Services	14	62,092	2.6%	71.4%	7.1%	6.1% (Agency for Toxic Substances and Disease Registry)	Program Support Center (99.1%)	2.7%	1.4%	2.3%
Homeland Security	13	167,123	1.9%	76.9%	30.8%	7.7% (Federal Emergency Management Agency)	Domestic Nuclear Detection Office (100.6%)	3.3%	2.6%	3.3%
Housing and Urban Development	22	8,040	3.8%	36.4%	13.6%	6.4% (Office of the Senior Coordinator for Midwest)	Office of the Senior Coordinator for Northwest/ Alaska (100.0%)	3.5%	1.8%	4.0%
Interior	12	49,075	3.0%	83.3%	33.3%	7.5% (Office of Surface Mining, Reclamation and Enforcement)	Bureau of Ocean Energy Management (99.5%)	3.4%	2.1%	3.1%
Justice	11	110,092	2.0%	63.6%	0.0%	3.5% (Bureau of Alcohol, Tobacco, Firearms, and Explosives)	Office of the Inspector General (101.8%)	1.8%	1.5%	2.2%

Parent Agency	Number of Subcomponents	Total Workforce	Weighted Mean Pay Gap	% of Subcomponents with Significant Gaps Favoring Men	% of Subcomponents with Significant Gaps Favoring Men Greater than 5%	Largest Significant Gap Favoring Men (Subcomponent)	Best Subcomponent for Women (Women's Relative Pay)	Mean Pay Gap	S.D.	Median Pay Gap
Labor	15	14,807	1.8%	33.3%	13.3%	8.6% (Veterans Employment and Training Services)	Office of the Chief Financial Officer (112.4%)	1.5%	4.6%	1.7%
NASA	10	17,375	3.3%	90.0%	10.0%	6.0% (Dryden Flight Research Center)	Lyndon B. Johnson Space Center (97.5%)	3.6%	1.1%	3.3%
Navy	20	187,589	5.2%	100.0%	60.0%	8.3% (Immediate Office of the Chief of Naval Operations)	Military Sealift Command (98.2%)	5.2%	1.7%	5.2%
Social Security Administration	1	61,944	0.1%	0.0%	0.0%	-	Social Security Administration (99.9%)	0.1%	N/A	0.1%
State	1	10,063	4.2%	100.0%	0.0%	4.2% (Department of State)	-	4.2%	N/A	4.2%
Transportation	12	53,603	3.6%	58.3%	16.7%	10.0% (Federal Railroad Administration)	Federal Transit Administration (99.0%)	3.9%	2.9%	3.5%
Treasury	11	86,015	2.5%	72.7%	27.3%	6.5% (Departmental Offices)	Office of Inspector General (101.3%)	3.7%	2.2%	3.7%
Veterans Affairs	12	306,778	-0.2%	25.0%	0.0%	4.5% (National Cemetery Administration)	Assistant Secretary for Human Resources Management (102.7%)	1.1%	2.3%	0.9%

Parent Agency	Number of Subcomponents	Total Workforce	Weighted Mean Pay Gap	% of Subcomponents with Significant Gaps Favoring Men	% of Subcomponents with Significant Gaps Favoring Men Greater than 5%	Largest Significant Gap Favoring Men (Subcomponent)	Best Subcomponent for Women (Women's Relative Pay)	Mean Pay Gap	S.D.	Median Pay Gap
Large Independent Agencies	21	58,757	2.6%	61.9%	9.5%	5.4% (Government Printing Office)	National Archives and Records Administration (102.2%)	2.5%	1.9%	2.7%
Medium Independent Agencies	32	9,541	3.5%	31.3%	21.9%	10.9% (Federal Housing Finance Agency Office of Inspector General)	Selective Service System (104.9%)	3.2%	4.1%	2.9%

Note: Yellow shading indicates lower numbers and darker green shading indicates higher numbers within columns.

Table 8. Gender Pay Gaps Produced by Occupational Segregation by Department (FedScope September 2014)

Parent Agency	Number of Subcomponents	Total Workforce	Weighted Mean Pay Gap Produced by Segregation	% of Subcomponents with Segregation Favoring Men's Pay	Subcomponent with Largest Pay Gap Produced by Segregation Favoring Men	Subcomponent with Largest Pay Gap Produced by Segregation Favoring Women	Mean Pay Gap Produced by Segregation	SD	Median
Government-wide	371	1,818,791	3.5%	88.7%	Mine Safety and Health Administration (Dept. of Labor) (35.0%)	National Gallery of Art (-15.2%)	4.4%	4.7%	3.9%
Agriculture	22	72,312	2.0%	86.4%	Office of the Chief Financial Officer (11.5%)	Departmental Administration (-10.0%)	3.1%	4.2%	3.4%
Air Force	35	155,394	7.9%	97.1%	Pacific Air Forces (21.2%)	Air Force Personnel Operations Agency (-0.1%)	8.5%	5.7%	6.7%
Army	49	235,744	5.3%	93.9%	U.S. Army Element Shape (16.2%)	Joint Services and Activities Supported by the Office, Secretary of the Army (-4.7%)	6.1%	4.6%	5.5%
Commerce	11	34,656	3.2%	100.0%	Office of the Inspector General (7.3%)	Office of the Secretary (0.3%)	3.9%	2.2%	3.7%
Defense	25	89,287	3.3%	84.0%	Defense Technical Information Center (13.7%)	Washington Headquarters Services (-5.8%)	4.0%	3.8%	4.3%
Education	10	3,232	0.6%	40.0%	Office of the Chief Information Officer (2.8%)	Office of the Chief Financial Officer (-3.2%)	0.1%	1.9%	-0.2%
Energy	2	14,339	3.8%	100.0%	Department of Energy (3.9%)	Federal Energy Regulatory Commission (3.1%)	3.5%	0.5%	3.5%

Parent Agency	Number of Subcomponents	Total Workforce	Weighted Mean Pay Gap Produced by Segregation	% of Subcomponents with Segregation Favoring Men's Pay	Subcomponent with Largest Pay Gap Produced by Segregation Favoring Men	Subcomponent with Largest Pay Gap Produced by Segregation Favoring Women	Mean Pay Gap Produced by Segregation	SD	Median
General Services Administration	10	10,933	0.8%	60.0%	Office of Governmentwide Policy (3.6%)	Office of Administrative Services (-9.4%)	0.3%	4.0%	1.8%
Health and Human Services	14	62,092	2.2%	92.9%	Indian Health Service (5.2%)	Administration for Children and Families (-0.5%)	2.0%	1.6%	2.0%
Homeland Security	13	167,123	4.8%	84.6%	Federal Law Enforcement Training Centers (12.4%)	Science and Technology Directorate (-2.7%)	3.9%	4.0%	4.5%
Housing and Urban Development	22	8,040	2.9%	90.9%	Office of General Counsel (9.2%)	Office of the Chief Human Capital Officer (-0.6%)	3.4%	2.4%	3.2%
Interior	12	49,075	4.1%	100.0%	Bureau of Reclamation (11.5%)	Geological Survey (0.1%)	4.8%	3.3%	4.6%
Justice	11	110,092	5.0%	81.8%	Drug Enforcement Administration (11.0%)	Bureau of Prisons/Federal Prison System (-0.3%)	6.3%	3.9%	7.5%
Labor	15	14,807	8.9%	93.3%	Mine Safety and Health Administration (35.0%)	Office of Workers' Compensation Programs (-1.4%)	6.3%	8.7%	3.9%
NASA	10	17,375	3.9%	100.0%	John C. Stennis Space Center (5.1%)	Lyndon B. Johnson Space Center (2.8%)	4.2%	0.8%	4.3%

Parent Agency	Number of Subcomponents	Total Workforce	Weighted Mean Pay Gap Produced by Segregation	% of Subcomponents with Segregation Favoring Men's Pay	Subcomponent with Largest Pay Gap Produced by Segregation Favoring Men	Subcomponent with Largest Pay Gap Produced by Segregation Favoring Women	Mean Pay Gap Produced by Segregation	SD	Median
Navy	20	187,589	3.5%	95.0%	Naval Education and Training Command (10.8%)	Naval Facilities Engineering Command (-0.4%)	4.9%	3.5%	4.6%
Social Security Administration	1	61,944	3.0%	100.0%	Social Security Administration (3.0%)	Social Security Administration (3.0%)	3.0%	NA	3.0%
State	1	10,063	5.0%	100.0%	Department of State (5.0%)	Department of State (5.0%)	5.0%	NA	5.0%
Transportation	12	53,603	13.8%	100.0%	Federal Aviation Administration (15.3%)	Maritime Administration (1.1%)	6.0%	5.0%	4.5%
Treasury	11	86,015	6.1%	100.0%	Office of the Comptroller of the Currency (6.5%)	Special Inspector General for the Troubled Assets Relief Program (0.1%)	3.4%	2.6%	3.9%
Veterans Affairs	12	306,778	-3.4%	66.7%	Assistant Secretary for Human Resources Management (7.7%)	Veterans Health Administration (-3.8%)	1.5%	3.7%	0.4%
Large Independent Agencies	21	58,757	3.0%	85.7%	Nuclear Regulatory Commission (8.6%)	National Gallery of Art (-15.2%)	2.3%	4.7%	2.7%
Medium Independent Agencies	32	9,541	3.9%	84.4%	Federal Mediation and Conciliation Service (14.0%)	Office of Special Counsel (-8.7%)	3.5%	4.9%	3.6%

Note: Yellow shading indicates lower numbers and darker green shading indicates higher numbers within columns.

CHAPTER IV

ORGANIZATIONAL CONTEXTS AND GENDER PAY GAPS

The previous chapter established that as of September 2014, in the average federal agency, women made 3.9 cents less on the dollar than men after controlling for human capital, geography, and occupation; however, that pay gap varied from 12.4 cents on the dollar at the Department of Commerce's Economic Development Administration to women making 12.4 cents on the dollar more than men on average at the Department of Labor's Office of the Chief Financial Officer. Although these agency-level gaps are similar in magnitude, it is important to note that the Department of Labor's Office of the Chief Financial Officer was an extreme outlier. Only 1.1% of agencies had gross pay gaps that significantly favored women, whereas the pay gap at over 66% of agencies favored men.

Why do some agencies have larger gender pay gaps than others? I provide some explanations below by analyzing the between-job and within-job components of the agency-level gender pay gaps in the context of other agency-level characteristics, such as pay plan gender segregation, women's representation in management, racial and ethnic minority representation in management, and whether the agency is part of the traditionally masculine Department of Defense (DoD). These are not an exhaustive list of plausible correlates of organizational variation but serve to demonstrate that such analyses are possible and useful.

The between-job gender pay gap is calculated with controls for education, age (experience), federal employment tenure, and geography. Most of the between-job pay gap is caused by occupational segregation that results from the gendered differences in job preferences, occupation-related gender biases in hiring processes, and gender differences in job retention by occupation.

After controlling for human capital, geography, and occupational segregation, the unexplained within-job pay gap remains. Quite often, this is the pay gap that draws the most focus (U.S. Government Accountability Office 2009; U.S. Office of Personnel Management 2014). This unexplained part includes all unmeasured factors such as continuity and relevancy of work experience, work effort,[28] and discrimination. It is important, however, to remember that discrimination potentially contributes to both components of the pay gap being considered here. When the pay gap is larger, net of gender differences in human capital, it is likely that discrimination in job sorting and within-job pay is larger as well.

It is important to note that the two dependent variables here, components of the pay gap, have not commonly been used as dependent variables in other studies. This study's separate examination of these components of the gender pay gap is a novel contribution to the literature.

This chapter begins by examining previous studies that connected employer characteristics to disparities among employees. Next, I describe the variables used, which come from the agency-level pay gap results from the previous chapter as well as other agency characteristics calculated from the same dataset. Then, I describe the methodology and present the results. Overall, the findings suggest that certain organizational characteristics intersect to contribute to the pay gap and that organizational

[28] Note that traditional assumptions about the distribution of labor market effort by gender (e.g., Becker 1985) do not necessarily hold up empirically (e.g., Bielby and Bielby 1988).

characteristics related to the between-job pay gap may differ from those related to the within-job pay gap.

A. Literature Review and Hypotheses

The existing literature highlights contexts where employment inequalities are stronger and weaker. This includes literature on categorical distinctions in explicit pay determinants, the participation of traditionally disadvantaged groups in management, and the theory of gendered organizations. With the exception of one article (Smith-Doerr et al. 2019), I am not aware of literature that examines the relationship between any of these and the gender pay gap in the U.S. Federal Government.

1. Federal Pay Plans as a Determinant of Pay Inequality

Standardized pay plans, such as the General Schedule (GS) pay plan, within the Federal Government are bureaucratic mechanisms that minimize employees' ability to negotiate pay and regulate manager's pay at hire and promotion decisions. As stated in Chapter 3, many have theorized that bureaucratization in organizations levels the playing field for women because rules are in place that stymie biased stereotypes (Bielby 2000; Reskin 2000), and research supports this notion (Baron et al. 2007; Elvira and Graham 2002; Guthrie and Roth 1999; Reskin and McBrier 2000). If standardized pay plans reduce discrimination at the hiring phase, then where they are used consistently for men and women, occupational segregation should be lower and women's between-job relative pay (women's pay relative to men's pay) should be higher. If standardized pay plans reduce discrimination in evaluation and promotion decisions, then where they are used consistently for men and women, women's within-job relative pay (women's pay relative to men's pay) should be higher.

However, the GS pay plan is not universal within the federal government. Almost 30% of the employees in my 2014 sample did not work under the GS system. In the data used in this chapter, employees' pay can be based on 153 other pay plans, several of which cover less than 10 employees each. The employees under such small pay plans were likely exempted from the standardized pay setting and promotions systems that apply to employees in the GS system.

Having more than one pay plan opens a new categorical distinction. If bureaucratization makes it difficult to discriminate against women within a pay plan, federal employers can segregate men and women into different pay plans and propagate the pay gap.

Smith-Doerr and colleagues (2019) included a variable for being off of the GS pay plan in the only published paper to my knowledge that used an organizational perspective to examine the gender pay gap in the Federal Government, albeit only within select science agencies. They, using data similar to my own, found that 74% of the federal employees who were paid "off-grade" (referring to pay plans outside the GS pay plan)[29] were men, but the usage of exemptions to the GS system varied by agency as did the effect of being off-grade on the gender pay gap.

These important findings imply that part of the gender pay gap may be due to pay plan sorting by gender. However, these findings do not distinguish between the multitude of other pay plans in the Federal Government. More research is needed to understand whether gender segregation into different pay systems more broadly affects the gender

[29] The paper was not clear on what "off-grade" meant, but I confirmed this with one of the authors, Sharla Alegria, via email.

pay gap. Thus, I calculated the index of dissimilarity (segregation) of men and women into different pay systems within agencies. Based on Smith-Doerr et al.'s findings, I hypothesize that

> *H1: Gender pay plan segregation is negatively associated with women's between-job relative pay and women's within-job relative pay.*

If the results support this hypothesis, federal agencies should consider greater standardization of their pay plans and eliminating pay plans that are disproportionately one gender. Considering that pay plans are more directly tied to pay than to job sorting, it would not be surprising for Hypothesis 1 to be more strongly tied to within-job pay gaps. At the same time, if pay plan segregation maps onto distinct job titles with similar skill requirements within an agency, it could very well predict the between-job component of the pay gap as well.

2. Managerial Participation of Women

Previous research has found that having more women in management improves women's employment opportunities overall. This has been shown to occur through various mechanisms such as hiring, mentoring, and promotions.

Research that has assessed the effect of women decision-makers in the hiring process on gendered hiring has primarily done so by using recruiters' assessments of resumes. For example, Carlsson and Eriksson (2019) submitted fictitious resumes for low- and medium-skilled jobs in Sweden. Using an administrative database, they were able to identify the gender of the job advertisement's point of contact and women's overall representation at the companies. They found that women recruiters and companies with more women favored women applicants, but they did not find that men who were recruiters favored men. However, earlier work by Cole, Feild, and Giles (2004) found that female recruiters, when reviewing real resumes, perceived that men applicants had more experience than women applicants; evaluations on experience from male recruiters in the same study did not differ by applicant gender. Male recruiters perceived women applicants to have more extracurricular activities than men applicants. The results of another paper that focused on the gendered effects of having a high GPA on one's chances of receiving a callback showed that women decision makers favored recommending women applicants for interviews (Quadlin 2018). Further, Gorman (2005) found that law firms with female decision-makers were more likely to hire more women, and Cohen, Broschak, and Haveman (1998) found that women were more likely to be hired into particular job levels when women were already present in those job levels. Based on the literature related to hiring, I expect that agencies with a greater proportion of women managers would have lower pay gaps produced by occupational segregation.

In addition, literature specific to segregation demonstrates that having women in management can also improve the types of jobs that women have. Using private sector data from EEOC and the Securities and Exchange Commission, Stainback et al. (2016) found that having women on corporate boards, in executive positions, and in managerial positions was associated with lower gender segregation. Based on this, I expect that agencies with a greater proportion of women managers would have lower pay gaps produced by occupational segregation.

Once hired, through mentoring, women managers may provide women employees better opportunities for advancement. For example, using American private sector establishment-level data, Kalev, Kelly, and Dobbin (2006), found that the implementation of mentoring programs was associated with modest improvements in managerial diversity, particularly for black women. In a German employer-employee linked dataset, Huffman et al. (2017) found that diversity policies, including mentoring programs for women, were associated with lower gender wage gaps for the lower two-thirds of the wage distribution. In addition, woman-to-woman mentoring was found more often in law firms with more women in the higher echelons (Ely 1994). Although my study does not specifically measure whether women employees are mentored by women managers, at a minimum, the presence of women managers allows women employees to see that attaining managerial positions is possible and may help them strive for those positions.

In addition, longitudinal studies using EEO-1 private sector workplace-level demographic and occupation data have found that where more women are in higher managerial levels, other women move into middle management positions. For example, Kalev et al. (2006) combined 1971-2002 EEO-1 data with survey data on HR practices for 708 establishments and found that both white women and black women's odds of being in management increased in establishments with more women in top management the prior year. Similarly, using EEO-1 data for over 20,000 firms from 1990 through 2003, Kurtulus and Tomaskovic-Devey (2012) found that women being in top management has a clear positive effect on women's representation in middle management, particularly where women's overall presence at the firm was larger; however, those effects declined over time.

Overall, the evidence points towards women in management being beneficial for women's employment opportunities. Based on the literature described above, I hypothesize that

H2: The proportion of managers who are women is negatively associated with women's between-job relative pay and women's within-job relative pay.

The literature has clearly established that women managers are associated with better EEO; however, the mechanisms that they most effect have not been discerned. My study will work towards that goal.

3. Organizational Characteristics Mitigating the Effect of Women's Managerial Participation

We know that having women in management improves women's opportunities, but in what contexts? Acker (2006) defines inequality regimes "as loosely interrelated practices, processes, actions, and meanings that result in and maintain class, gender, and racial inequalities within particular organizations" (p.443). Based on Acker's concepts of inequality regimes and gendered organizations, I hypothesize that women's participation in management will be associated with a lower gender pay gaps, but more so or less so in different organizational contexts. Previous research using a German sample found that the relationship between women's participation in management and gender earnings inequality depends on organizational contexts (Abendroth et al. 2017). My research expands on this by identifying inequality regimes specific to the U.S. Federal Government.

For example, seemingly gender-neutral bureaucratic control systems may actually reinforce gender inequalities if they are built on the gendered principle that the ideal worker is male (Acker 1990). This may be the case for the Federal Government having standardized pay systems if not every employee is employed in the same pay system; even if women are in management, gender pay plan segregation may outweigh women managers' ability to improve EEO.

Acker (1990) also asks, "Are racial differences produced by organizational practice as gender differences are?" (p.154). The Federal Government is known not only as a relatively good employer for women, but also for racial minorities. My question here is, do minority managers boost women managers' positive impact on women employees? If the answer is yes, this would be evidence that, indeed, racial differences are produced by similar organizational practices as gender differences. However, it is possible that when competing claims are made based separately on race or gender, the power of (mostly male) minority managers may outweigh the power of (mostly white) female managers. I test that below.

Further, women at the masculine Department of Defense (DoD) agencies may not have the same power to improve women's opportunities as they would in less gendered organizations. Women may face a backlash from men, who represent most managers and who may feel threatened by women occupying historically male positions. In addition, non-manager women in DoD agencies with relatively high participation of women in management might experience the "Marie Curie Effect" and not be rewarded because they are held up to unreasonable standards established by the extraordinarily successful women who managed to achieve managerial status in such a masculine institution (Huber

2015; Smith-Doerr, Alegria, and Husbands Fealing 2016). Smith-Doerr et al.'s research (2019) supports the claim that masculine-typed organizations disadvantage women as they found that within-job pay gaps were more common at male-typed federal science agencies than at gender-neural science agencies.

The contexts in which women's participation in management might have the greatest impact might vary when looking at different dependent variables as well. Being in an agency with pay plan segregation, racial diversity in management, or a DoD masculine culture may affect women managers' ability to reduce occupational segregation (as measured by between-job pay gaps) differently than the contexts affect women managers' ability to reduce direct discrimination (as measured by within-job pay gaps). I hypothesize the following:

H3: Where gender pay plan segregation is higher, the positive effect of women's participation in management on women's between-job and within-job relative pay will be weaker.

H4: In DoD agencies, the positive effect of women's participation in management on women's between-job and within-job relative pay will be weaker.

As alluded to above, racial minority participation in management may be indicative of a better EEO climate overall, but it may also create competing claims based on race and gender. Therefore, I examine two competing hypotheses.

H5a: Where racial minority managerial participation is higher, the positive effect of women's participation in management on women's between-job and within-job relative pay will be stronger.

H5b: Where racial minority managerial participation is higher, the positive effect of women's participation in management on women's between-job and within-job relative pay will be weaker.

B. Data and Measures

The agency-level data calculated in Chapter 3 from September 2014 FedScope Employment Status Raw Data were used to calculate the dependent variables in this chapter. For each agency, women's between-job relative pay (how much less women make than men because of occupational segregation) was calculated by subtracting the within-job pay gap from the pay gap net of human capital and geography. The other dependent variable here is women's within-job relative pay as calculated in the previous chapter. As different organizational characteristics may have different relationships with these components of the gap, I used each as separate dependent variables, and the results will show us how the hypothesized mechanisms differ in their association with segregation and within job disparities.

To measure how unequal gender distributions across pay plans were associated with women's relative pay, I calculated gender pay plan segregation using the index of dissimilarity, *D*:

$$D = \frac{1}{2}\sum_{i=1}^{n}\left|\frac{P_{wi}}{P_w} - \frac{P_{mi}}{P_m}\right|$$

where P_w is the number of women agency-wide, P_m is the number of men agency-wide, P_{wi} is the number of women in pay plan i, and P_{mi} is the number of men in pay plan i. The resulting value can be interpreted as the proportion of employees who would have to switch pay plans to achieve gender parity.

To measure how having women in management was associated with the pay gap, I calculated the percentage of managers[30] who were women in each agency from the same dataset. This is women's managerial participation rate.

As race and ethnicity data is not available in the FedScope Employment Status Raw Data, September 2014 FedScope Diversity Cubes (U.S. Office of Personnel Management 2019) provided agency-level data on racial and ethnic minority managerial representation, that is, the percentage of managers at the agency who were racial minorities (non-white and/or Hispanic/Latino).[31]

To see if masculine military culture changes the effect of women in management on the gender pay gap, a dummy variable was assigned to agencies from the Department of Defense (DoD), including the Department of the Air Force, the Department of the Army, the Department of the Navy, and all their subcomponents.

In addition to pay plan segregation, women in management, minorities in management, and DoD agencies, I controlled for the effects of agency size, agency-level pay dispersion (the standard deviation [SD] of pay), and average (median) agency-wide pay, all in hundreds of thousands, with information from the same dataset.

C. <u>Methodology</u>

To find out what organizational characteristics were associated with the two types of women's relative pay in the Federal Government, I ran eight OLS regressions on each dependent variable (the between-job component [$\hat{Y}_{Sa}$] and the within-job component of

[30] In FedScope data, supervisors and managers, including high-level executives, are all classified in one category.
[31] One agency was dropped because it did not have Diversity Cubes Data.

the gender pay gap [$\hat{Y}_{Wa}$]) for a total of 16 regressions. In the equations below, the agency-level components of the pay gap are generically referred to as ($\hat{Y}_{Za}$).

Model 1 examines the effect of pay plan segregation, net of other agency characteristics.

Model 1: Gender Pay Plan Segregation Model

$$\hat{Y}_{Za} = \beta_0 + \beta x_{Agency\ Size_a} + \beta x_{Pay\ Dispersion_a} + \beta x_{Median\ Pay_a} + \beta x_{Pay\ Plan\ Segregation_a} + \varepsilon_a$$

Model 2 adds women's managerial participation rate to Model 1.

Model 2: Pay Plan Segregation and Women's Managerial Participation Rate Model

$$\hat{Y}_{Za} = \beta_0 + \beta x_{Agency\ Size_a} + \beta x_{Pay\ Dispersion_a} + \beta x_{Median\ Pay_a} + \beta x_{Pay\ Plan\ Segregation_a} + \beta x_{Women's\ Managerial\ Participation\ Rate_a} + \varepsilon_a$$

Models 3, 5 and 7 examine the addition of (a) pay plan segregation, (b) racial minority managerial participation, or (c) a fixed effect for being a DoD agency to the model. Models 4, 6, and 8 each separately add an interaction effect to women's managerial participation rate to see how women in management have different effects in different contexts.

Model 3 adds an interaction effect between women's managerial participation rate and gender pay plan segregation to see how women in management have different effects in contexts of varying levels of pay plan segregation.

Model 3: Pay Plan Segregation Interacting with the Effect of Women's Managerial Participation Rate Model

$$\hat{Y}_{Za} = \beta_0 + \beta x_{Agency\ Size_a} + \beta x_{Pay\ Dispersion_a} + \beta x_{Median\ Pay_a} \\ + \beta x_{Pay\ Plan\ Segregation_a} + \beta x_{Women's\ Managerial\ Participation\ Rate_a} \\ + \beta x_{Women's\ Managerial\ Participation\ Rate_a} x_{Pay\ Plan\ Segregation_a} + \varepsilon_a$$

Model 4 examines the addition of racial minority managerial participation to Model 2.

Model 4: Racial Minorities' Managerial Participation Rate Base Model

$$\hat{Y}_{Za} = \beta_0 + \beta x_{Agency\ Size_a} + \beta x_{Pay\ Dispersion_a} + \beta x_{Median\ Pay_a} \\ + \beta x_{Pay\ Plan\ Segregation_a} + \beta x_{Women's\ Managerial\ Participation\ Rate_a} \\ + \beta x_{Racial\ Minority\ Managerial\ Participation\ Rate_a} + \varepsilon_a$$

Model 5 adds an interaction effect between women's managerial participation rate and racial minorities' managerial participation rate to see how women in management have different effects in contexts of varying levels of minority managerial participation.

Model 5: Racial Minorities' Managerial Participation Rate Interacting with the Effect of Women's Managerial Participation Rate Model

$$\hat{Y}_{Za} = \beta_0 + \beta x_{Agency\ Size_a} + \beta x_{Pay\ Dispersion_a} + \beta x_{Median\ Pay_a} + \beta x_{Pay\ Plan\ Segregation_a} + \beta x_{Women's\ Managerial\ Participation\ Rate_a} + \beta x_{Racial\ Minority\ Managerial\ Participation\ Rate_a} + \beta x_{Women's\ Managerial\ Participation\ Rate_a} x_{Racial\ Minority\ Managerial\ Participation\ Rate_a} + \varepsilon_a$$

Model 6 adds a fixed effect to Model 2 for whether the agency is part of the DoD.

Model 6: DoD Agency Fixed Effect Model

$$\hat{Y}_{Za} = \beta_0 + \beta x_{Agency\ Size_a} + \beta x_{Pay\ Dispersion_a} + \beta x_{Median\ Pay_a} + \beta x_{Pay\ Plan\ Segregation_a} + \beta x_{Women's\ Managerial\ Participation\ Rate_a} + \beta x_{DOD\ Agency_a} + \varepsilon_a$$

Model 7 adds an interaction effect between women's managerial participation rate and the DoD fixed effect to see how women in management have different effects in the traditionally masculine DoD contexts.

Model 7: DoD Agencies Interacting with the Effect of Women's Managerial Participation Rate Model

$$\hat{Y}_{Za} = \beta_0 + \beta x_{Agency\ Size_a} + \beta x_{Pay\ Dispersion_a} + \beta x_{Median\ Pay_a} + \beta x_{Pay\ Plan\ Segregation_a} + \beta x_{Women's\ Managerial\ Participation\ Rate_a} + \beta x_{DOD\ Agency_a} + \beta x_{Women's\ Managerial\ Participation\ Rate_a} x_{DOD\ Agency_a} + \varepsilon_a$$

When doing exploratory analysis for Model 7, a curvilinear relationship was noted as a possibility when the DoD interaction effect was added. Therefore, an additional model, Model 8, was included.

Model 8: DoD Agencies Interacting with the Effect of Women's Managerial Participation Rate and Women's Managerial Participation Rate-Squared Model

$$\hat{Y}_{Za} = \beta_0 + \beta x_{Agency\ Size_a} + \beta x_{Pay\ Dispersion_a} + \beta x_{Median\ Pay_a} + \beta x_{Pay\ Plan\ Segregation_a} + \beta x_{Women's\ Managerial\ Participation\ Rate_a} + \beta x_{Women's\ Managerial\ Participation\ Rate\ Squared_a} + \beta x_{DOD\ Agency_a} + \beta x_{Women's\ Managerial\ Participation\ Rate_a} x_{DOD\ Agency_a} + \beta x_{Women's\ Managerial\ Participation\ Rate\ Squared_a} x_{DOD\ Agency_a} + \varepsilon_a$$

In addition, for the interaction models, I calculated, plotted, and tested the differences in simple slopes. (For more information on simple slopes see Newsom 2021). When both interaction variables were continuous, I split the moderating variable (pay plan gender segregation or minority managerial participation) into terciles and probed the effects of women's participation in management on women's relative pay at the median values of the terciles of the moderating variable. When the moderator was dichotomous, as with DoD agency, I probed the effects of women's participation in management on women's relative pay separately for the two groups, DoD agencies and non-DoD agencies.

D. Descriptive Statistics

Descriptive statistics of organizational contexts and women's between-job and within-job relative pay are seen in Table 9. At the mean agency, women's between-job relative pay was -0.038, meaning that segregation explained 3.8 cents on the dollar of the pay gap. This varied greatly with segregation explaining over 25 cents of women's pay disadvantage at the worst agency for women and the largest positive women's between-job relative pay being associated with women making over 17 cents more than men on the dollar. The within-job component had a similar mean (-0.039) but did not vary as much, with a minimum of -0.124 and a maximum of 0.124.

The mean agency had 4,915 employees, but this varied greatly, with the median agency having 970 employees and the largest agency having over 270,000 employees. For salary dispersion, the mean of the standard deviation of agency salaries was $28,286, and the mean of median agency salaries was $93,718. The mean of pay plan gender segregation was 0.083, meaning at the average agency, 8.3% of employees would have to switch pay plans for representation to be equal across pay plans; however, the standard deviation of pay plan gender segregation was 0.113 and the maximum level of gender pay plan segregation was 0.648.

At the mean agency, 36.1% of managers were women, but this ranged widely from 3.8% to 73.9%. At the mean agency 28.2% of managers were Hispanic and/or non-White, but the range was even greater, from 2.0% to 89.6%.

As for military agencies, 34.9% of agencies were part of the Department of Defense, including the Departments of the Air Force, Army and Navy, and other DoD agencies.

Pearson correlations of the organizational context and pay gap component variables are seen in Table 10. Between-job relative pay and within-job relative pay were not significantly correlated with each other, which may indicate that they are determined by different factors. They were also not significantly correlated with agency size.

Between-job relative pay (r = 0.221) and within-job relative pay (r = 0.160) were significantly higher in agencies with higher salary dispersion as measured by the standard deviation of salary. Median salary was marginally and positively correlated with the segregation component (r = 0.116), but it was not significantly correlated with the within-job component (r = 0.029). This means that between-job allocative discrimination and within-job direct discrimination are less detrimental to women's pay in agencies with high median salaries and high salary dispersion. In addition, agencies with high salary dispersion tended to have a higher median salary (r = 0.484), have more women in management (r = 0.392), and were less likely to be military departments (r = -0.402). Smaller agencies tended to have higher median salaries (r = -0.233). Agencies with higher median salaries were less likely to be military departments (r = -0.401).

Contrary to Hypothesis 1, pay plan gender segregation was not significantly correlated with between-job relative pay. However, it was very weakly and negatively correlated with women's within-job relative pay (r = -0.109), which provides support for Hypothesis 1 and continues to provide evidence that between-job and within-job relative pay are determined by different mechanisms. As anticipated above, these correlations indicate that pay plans are more directly tied to within-job pay differences than with job sorting. Pay plan gender segregation was higher in larger agencies (r = 0.175), and lower in agencies with a higher median salary (r = -0.279).

Women's participation in management was positively correlated with women's between-job relative pay (r = 0.284) and with women's within-job relative pay (r = 0.417) meaning that relative to men, women's wages rise under female management. This supports Hypothesis 2. Women were less likely to be in management in agencies with higher pay plan gender segregation (r = -0.283).

Where there were more racial and ethnic minorities in management, women's between-job (r = 0.171) and within-job (r = 0.220) relative pay were more positive, meaning they benefited women. Women also had greater representation in management where minorities were also in management (r = 0.466). These patterns should be kept in mind when examining Hypotheses 5a and 5b, which involve the interaction effect of racial and ethnic minority representation in management and women's participation in management. Generally, these zero order correlations suggest that agencies that do a better job incorporating women are also better at incorporating non-whites, suggesting a more general equal opportunity inequality regime.

Being a DoD agency was associated with lower women's between-job relative pay (r = -0.259) and lower women's within-job relative pay (-0.394), providing support for Hypothesis 4. DoD agencies also had lower salary dispersion (r = -0.402), lower median salary (r = -0.401), and lower managerial participation for women (r = -0.485) and racial and ethnic minorities (r = -0.266). DoD agencies had greater pay plan gender segregation (r = 0.218) than other agencies. Being a DoD agency was not significantly correlated to agency size. At the zero-order level, there is a good deal of evidence in favor of the notion that the DoD has a masculine culture, as suggested by previous research (e.g., Herbert 1998).

E. Regression Results

1. Pay Plan Gender Segregation's Effect on Women's Relative Pay

As mentioned above, standardized pay plans are thought to reduce managerial discretion in pay-setting and other employment decisions (Bielby 2000; Reskin 2000). Previous research has found that men are more likely to be on a pay plan other than the widespread General Schedule pay plan, and depending on the context, this could exacerbate the pay gap (Smith-Doerr et al. 2019). I hypothesized that where men and women are segregated into different pay plans, occupational segregation (measured by between-job relative pay) and direct discrimination (measured by within-job relative pay) will more negatively affect women's pay relative to men's pay.

Table 11 displays regression results from models in which pay plan gender segregation and control variables predict women's between-job relative pay and women's within-job relative pay. Pay plan gender segregation was not significantly associated with women's between-job relative pay (b = 0.005; n.s.), and thus, these results do not support

Hypothesis 1 for between-job relative pay. One explanation for this finding is that men managers might have the opportunity to use either occupational segregation or pay plan segregation, but not both, to put men employees in better-paying positions. As seen further below, this finding depends on the organizational context, particularly whether women are in management.

Pay plan gender segregation was, however, significantly associated with women receiving lower within-job relative pay (b = -0.041; $p < 0.01$). This means that at agencies where the within-job pay gap is large, management should examine improving pay plan standardization to reduce the effects of implicit or explicit bias on pay inequality.

2. Women in Management Affecting Women's Between-Job and Within-Job Relative Pay

As seen in Table 12, when women make decisions, they reduce organizational inequality, including in the Federal Government. Women's participation in management is associated with better women's between-job relative pay (b = 0.074; $p < 0.001$) and with better within-job relative pay (b = 0.091; $p < 0.001$). This supports Hypothesis 2. The between-job finding may be explained by women managers hiring women into occupations in a more equitable manner than men managers do. The within-job finding supports the claim that women managers evaluate women and men more equitably than men managers do when making pay and within-job promotion decisions.

Adding women's participation in management to the equation improved the explanatory power of the model for both dependent variables, but much more so for within-job relative pay (R^2 = 0.186) than for between job-relative pay (R^2 = 0.102).

Notably, once controlling for women's participation in management, pay plan segregation no longer significantly affected between-job nor within-job relative pay. Bivariate correlations showed that where women are in management there is less pay plan segregation. It is likely that women managers hire men and women into various pay plans more equitably where women are in management. It is also possible that organizational cultures that lead to hiring women managers also prioritize pay equity.

In the next section, I examine the varying effects of women's participation in management in different organizational contexts.

3. The Effects of Women in Management in Varying Contexts

In different organizational contexts, women managers have greater or lesser influence on between-job and within-job gender-based pay differences. The interactions between women's participation in management and three context-related variables are explored below. These variables are 1) pay plan gender segregation, 2) racial/ethnic minority participation in management, and 3) being a Department of Defense agency.

a. Women in Management and Pay Plan Gender Segregation

Table 13 displays the results of regression models that add an interaction effect between women's participation in management and pay plan segregation. For between-job relative pay, the interaction effect is negative and significant (b = -0.308; $p < 0.05$), but the pay plan segregation coefficient is now statistically significant and positive (b = 0.110; $p < 0.05$), and the women's participation in management coefficient remains highly significant (b = 0.093; $p < 0.001$).

To better interpret these results, see Figure 4 and Table 14 for the simple slope effects of women's participation in management on women's between-job relative pay by three levels of gender pay plan segregation. Where pay plan segregation is high (as measured by the median of the third tercile of pay plan segregation), the effect of women's participation in management on women's relative pay is relatively weak. In those agencies, women being in management still improves women's between-job relative pay, but less so than it does at agencies where pay plans are not segregated by gender. There is little difference in the effect of women's participation in management on women's between-job relative pay when comparing agencies with low and medium pay plan gender segregation. In Figure 4, the ranges for high, medium, and low levels of pay plan gender segregation are truncated to existing values of women's participation in management in each of those groups. Notably, the best high segregation agency for women in management has a lower women in management participation rate than the medium and low segregation agencies. Also, the lowest women's participation in management rate is higher in low pay plan segregation agencies.

In Table 15, the contrasts of the three levels of simple slopes confirm that the differences in slopes are statistically significant. Table 16 shows that the predicted values of women's between-job relative pay are only significantly different between low and high pay plan segregation workplaces when women's participation in management is minimal, and then, workplaces have higher predicted relative pay for woman in high pay plan segregation workplaces than in low pay plan segregation workplaces. I verified whether this counterintuitive finding was a function of an outlier, The Department of Labor's Mine Safety and Health Administration, where women's between job relative pay is over 20% less than what men make but pay plan segregation (0.006) and women's participation in management (16.6%) are both very low. In fact, when that outlier agency is removed from the model, the interaction effect (b = -0.275; t = -1.92; $p < 0.1$) and the simple slope contrasts are only marginally significant. However, without the outlier, contrasts of predicted values still showed that only in workplaces where women's participation in management is minimal do between-job gender pay gaps significantly differ between low and high pay plan segregation workplaces, and again, in that situation, workplaces have higher predicted relative pay for woman in high pay plan segregation workplaces than in low pay plan segregation workplaces.

Due to this dependence on the outlier, for between-job pay inequities, the results do not provide enough evidence to support Hypothesis 3. Based on the evidence in this research, pay plan gender segregation is not significantly associated with between-job gender pay inequality in the Federal Government.

However, the pattern for within-job relative pay differs. The interaction effect is negative and significant (b = -0.212; $p < 0.05$), and the women's participation in management coefficient remains highly significant (b = 0.104; $p < 0.001$). Although pay plan segregation's coefficient is not statistically significant, it is important to interpret this in the context of the interaction effect, as illustrated in Figure 5 and Table 17.

Like what was seen for between-job relative pay, when gender pay plan segregation is high, woman's participation in management has a weaker effect in improving women's within-job relative pay, supporting Hypothesis 3. Women's participation in management most improves women's relative pay in workplaces with low or medium pay plan segregation. The contrasts of the three levels of simple slopes in

Table 18 confirms that the differences in slopes are statistically significant. As with between-job relative pay, Table 19 shows that the predicted values of women's within-job relative pay are not significantly different between low and high pay plan segregation workplaces unless women's participation in management is unusually high, in which case it is predicted that women and men make the same amount in low pay plan segregation workplaces, but women make less in high pay plan segregation workplaces.

Overall, the data support Hypothesis 3.[32] The positive effect of women's participation in management on women's within-job relative pay is weaker where gender pay plan segregation is higher. It is quite possible that the direct discrimination that causes within-job pay disparities also causes gender pay plan segregation and low numbers of women in management. Agencies with high pay plan segregation may have to address that issue to reap more pay equity benefits from increasing the number of women in their management cadre. Predicted values of the within-job pay gap generally did not differ by the level of pay plan segregation, but increasing women's participation in management still is more effective in reducing pay inequity where pay plan segregation is not high.

These findings, like those of Smith-Doerr et al. (2019), support the claim that bureaucratic standardization of pay setting improves within-job pay equality, at least when equality, as measured by women's representation in management, has reached a reasonable threshold.

[32] The results here for within-job gender pay gaps are robust to removing outliers.

b. Women in Management and Racial/Ethnic Minorities in Management

Another organizational context examined here is how women in management may be more or less able to help women's relative pay in agencies with higher managerial participation of racial and ethnic minorities. Racial minority managers may be indicative of a better EEO climate overall and promote EEO for all. However, when two underserved groups attain power, it may create competing claims, which would be demonstrated if agencies with higher rates of both women and minority managers have larger gender pay gaps than agencies with just high rates of women managers.

The first two columns in Table 20 display results of regressions on the between-job relative pay. When looking at the base model, the coefficient for racial/ethnic minority participation in management is not statistically significant (b = 0.023). The coefficient for women's participation in management (b = 0.062) is attenuated from the model that did not include minority participation in management (seen in Table 12, b = 0.074) and is significant at only the $p < 0.01$ level.

The interaction model is more telling. When there are more women in management, but few minorities in management, women's relative pay increases as indicated by the positive coefficient of women's participation in management (b = 0.144; $p < 0.001$). When there are more minorities in management, but few women in management, women's relative pay still increases, as indicated by the positive and significant coefficient of minority participation in management (b = 0.133; $p < 0.01$). However, in agencies where women's participation in management and minorities' participation in management are both higher, the positive effects of having only one of these groups in management decreases as indicated by the negative and significant interaction effect (b = -0.268; $p < 0.01$).

Figure 6 and Tables 21, 22, and 23 further illustrate the interaction effect. In Figure 6, as racial minority participation in management increases, the positive effect of women's participation in management on women's relative pay weakens as shown by the decreasing slope of the lines. The decreasing effect of women's participation in management is statistically significant between tercile medians of racial minorities' participation in management (Table 22). Despite the weakening effect of women's participation in management as racial minority managerial participation increases, the effect is positive at the three levels of minority managerial participation examined, and predicted values (Table 23) show that at low levels of women's participation in management, women's relative pay is predicted to be higher where minorities' managerial participation is higher. Minority participation in management is also positively associated with higher women's participation in management.

For women's between-job relative pay, these data support Hypothesis 5b, which claims that the positive effect of women's participation in management on women's between-job relative pay weakens as racial minority managerial participation increases. This implies that women and minority managers balance competing claims when assigning women and men to higher or lower paying occupations. In particular, women managers might use some of their designated power to help other women, but the influence of (mostly male) minority managers and their sympathy for another disadvantaged group might cause the women managers to split the equalizing influence they have between women and minorities.

Next, I explore how women's participation in management and minorities' participation in management combine to affect women's within-job relative pay. As anticipated, the pattern differs from that found for women's between-job relative pay.

As seen in the regression results, Figure 7, and Table 24, 25, and 26, the effect of women's participation in management on women's within-job relative pay does not change as minorities' managerial participation increases. In the regression results, neither the effect of racial minority participation in management nor the interaction effect were statistically significant in either the base model or interaction model. In Figure 7, the lines for the effects of women's participation in management on women's within-job relative pay differentiated by level of racial/ethnic minority managerial participation almost completely overlap. The simple slopes reported in Table 24 and their contrasts in Table 25 show that the effects do not significant differ by level of racial minority managerial participation, and in Table 26, the predicted values of women's within-job relative pay do not significantly differ between levels of minority managerial participation regardless of the level of women's participation in management.

This is notable, demonstrating that different components of the pay gap are influenced by different factors. For between-job pay differences, which are caused by job segregation, racial minority managerial participation independently improves women's opportunities, but when combined with women's managerial participation, the positive effect of each underserved community's managerial participation wanes. However, for the within-job gap, much of which is attributed to direct discrimination, particularly in evaluation, minorities being in positions of power does not affect women manager's effect on the gender pay gap. The within-job relative pay finding does not provide evidence to support Hypothesis 5a nor Hypothesis 5b. That one component of the gender pay gap is influenced by racial minority participation in management and the other is not tells us that researchers should look at the pay gap in more nuanced manners, and not just examine the gross pay gap or the within-job pay gap when aiming to remedy the issue.

Note that the data used here does not permit me to cross race/ethnicity by gender. Ideally, I would like to know how race and gender combined affect women's pay and how the gender ***and*** race of individual managers affect the relative pay of women of different races. In addition, the binary race/ethnicity variable may disguise additional patterns of interest. Future research should attempt to address this intersectionality issue.

c. Women in Management and DoD Agencies

I hypothesized that the gendered culture found in DoD agencies would be associated with weaker effects of women's managerial participation on women's relative pay. This would be indicated by a negative statistically significant coefficient for the interaction of women's participation in management and being a DoD agency.

As shown in the base models in Table 27, in the DoD, women's between-job (b = -0.012; p <0.05) and within-job (b = -0.020; p <0.001) relative pay was less than that found in other agencies. This confirms that, as found in Chapter 3, something about DoD agencies disadvantages women regarding pay more so than in other federal agencies. The interaction models below examine whether that is women manager's ability to influence women's pay overall.

However, contrary to Hypothesis 4, the interaction effect between being a DoD agency and women's participation in management was not statistically significant for either between-job relative pay (*b* = -0.054; n.s.) or within-job relative pay (*b* = -0.037; n.s.).

For the between-job relative pay model, after adding the interaction effect, women's participation in management was still statistically significant and positive (*b* = 0.074; $p < 0.001$), but being a DoD agency was not (*b* = 0.005; n.s.). Figure 8 plots the effect of women's participation in management separately for DoD and non-DoD agencies. The slopes appear to differ for DoD and non-DoD agencies, with non-DoD agencies allowing women's participation in management to improve women's relative pay; however, the standard errors are large, particularly for DoD agencies, and the 95% confidence intervals, represented by the shaded areas, substantially overlap. This is confirmed in Tables 28 and 29 which display the simple slope effects of women's participation in management and the contrast by agency type. However, the predicted values of women's between-job relative pay differ by agency type when women's participation in management is moderate to high, with non-DoD agencies providing women greater between-job relative pay (See Table 30).

This difference at high levels of women's participation in management prompted further analyses. Further exploratory analyses revealed that when split into DoD and Non-DoD agencies, the effect of women's participation in management on women's between job relative pay may be non-linear. However, an F-test comparing the fit of a model with the linear effect and the fit of a model with a second-degree polynomial effect supported the use of the linear model when examining between-job relative pay.

For the within-job relative pay model, after adding the interaction effect, women's participation in management was still statistically significant and positive (*b* = 0.076; *p* <

0.001), but the being a DoD agency was not (*b* = -0.008; n.s.). Figure 9 plots the effect of women's participation in management on within-job relative pay separately for DoD and non-DoD agencies. Although they have different y-intercepts, the slopes barely appear to differ for DoD and non-DoD agencies; a contrast of the simple slopes (Table 32) showed that they were not significantly different. However, the standard errors are smaller for within-job pay as opposed to between-job pay, and the 95% confidence intervals, represented by the shaded areas, only overlap at the lowest levels of women's participation in management. This indicates that DoD agencies are worse for equal pay by gender, but it does not provide clear support for Hypothesis 4, that women managers' ability to improve gender pay equality differs in DoD agencies. Still, when looking at predicted values of women's within-job relative pay at various levels of women's participation in management and comparing the predicted values of DoD and non-DoD agencies (Table 33), there are clearly DoD vs. non-DoD differences in the effect of women's participation in management after meeting a minimal threshold of women's participation in management.

Finding that the effect of women's participation in management was significantly different for the DoD and Non-DoD agencies at most levels of women's participation in management again led to additional analyses to see if adding a quadratic term on women's participation in management to the interaction effect would improve the explanatory power of the model. For women's within-job relative pay, adding a quadratic term did improve the model fit (F = 10.491; df = 2; $p < 0.000$). The results of the regression with the quadratic term are in Table 34. All five independent variables that involve women’s relative pay or whether the agency is part of the DoD are statistically significant.

As with the previous models, the interpretation of the model above must be done accounting for all the interaction terms and the quadratic terms at once. Figure 10 displays predicted values and standard errors of women's within-job relative pay based on women's participation in management by agency type when including quadratic terms for women’s participation in management (based on the data in Table 34).

First, Figure 10 clearly shows that the DoD contains the agencies with the lowest levels of women’s participation in management and the DoD agency with the highest level of women’s participation in management is far behind the best non-DoD agency for women’s participation in management.

Second, for most levels of women’s participation in management that exist in both DoD agencies and non-DoD agencies, non-DoD agencies are doing better for women’s within-job relative pay. At women in management levels below 22%, within the range for which we have women’s participation in management data for both agency types, women’s predicted within-job relative pay does not significantly differ by agency type. DoD agencies, however, made up over 70% (44 out of 61) of agencies with less than 22% of managers being women.

Women’s predicted within-job relative pay does not significantly differ by agency type at women manager levels above about 50%. The DoD represents only 7 of the 67 agencies that have women being more than 50% of managers. At the 65% of agencies

(239 agencies) where women's participation in management levels are between 22% and 50%, it is predicted that agency type, DoD or non-DoD, factors into the gender pay gap.

More importantly, notice that for the DoD, when looking at women's participation in management levels below 25%, as women's participation in management increases, women's relative pay *decreases*. This may mean that in these agencies where women have little power, men managers backlash against women broadly when they see women in management. Another possible explanation is that "token" women managers at the DoD agencies with the very lowest levels of women managers are given leeway: As there aren't many women managers that they can't make "threatening" systemic change as solo actors. Once women manager levels at masculine DoD agencies are above tokenism, but still relatively low, the backlash occurs. However, this occurs up until the 25% turning point, after which women in management have more agency to improve women's pay as the percentage of women in management increases.

For non-DoD agencies, the effect of women's participation in management on women's predicted within-job relative pay increases as there are more women in management until women make up more than 55% of managers. At that point, women are predicted to make 98.2 cents for a similarly situated man's dollar. Beyond the 55% threshold, there appears to be a backlash in non-DoD agencies that have high levels of women in management. This could be direct discrimination from men managers who feel threatened by women's dominance in management, or it could be a broader devaluation of women's labor. Additional analyses would be required to see if omitted variables may explain this apparent backlash; however, very few agencies (23) agencies have women making up more than 60% of managers, contributing to the wide confidence intervals at high levels of women in management.[33]

In sum, the results related to women's within-job relative pay support Hypothesis 4, that in DoD agencies, the positive effect of women's participation in management on women's within-job relative pay will be weaker. However, the between-job relative pay results suggest but do not sufficiently support that claim. This implies that DoD and non-DoD agencies do not substantially differ in women managers' abilities to improve pay for women through the mechanism of reducing occupational segregation. But, for within-job pay inequities, likely caused by evaluation bias and direct discrimination, DoD women managers typically have less power than non-DoD women managers to improve women's pay.

F. Concluding Thoughts

Researchers rarely have the appropriate data to identify organizational characteristics associated with pay gaps. Further, when they do have the right data, they often interpret the pay gap as a single unit; they do not acknowledge that different inequity producing interactional mechanisms, such as segregation, promotions, and direct discrimination, might be associated with different organizational characteristics. Here, I examined two separate components of the pay gap, the between-job pay gap and the within-job pay gap. This chapter demonstrated that for federal agencies, organizational characteristics associated with the between-job gender pay gap differ from the organizational characteristics associated with the within-job pay gap. Future researchers

[33] The quadratic interaction model was still supported when examining a model removing outliers with extremely high within-job relative pay or with the very highest women's participation in management.

seeking to find causes of inequality should remember to be nuanced in the definition of their dependent variables.

Pay plan gender segregation, or the sorting of men and women into different pay systems, generally does not significantly correlate with the between-job gender pay gap. However, pay plan gender segregation is associated with lower within-job pay for women relative to men. When examined in the context of women's participation in management, in agencies with high pay plan gender segregation, increasing women's participation in management has a weaker effect on improving women's within-job relative pay. There was only weak evidence that women's participation in management might be less effective in improving between-job pay equity in the context of high pay plan segregation. This finding supports the research of Smith-Doerr et al. (2019) and previous research that has asserted that standardization and bureaucratization of pay determinants improves pay equity.

The results in this chapter support the plethora of previous research showing that more women in management is associated with greater pay equity. However, it goes further to decipher the contexts in which women's participation in management most improves pay equity. For example, this research provides evidence that having more minorities in management improves women's between-job relative pay when not accounting for women's participation in management. However, competing gender-based and race-based claims may reduce the positive effects on between-job relative pay when there are high levels of both racial minorities and women in management. Despite the reduction of the positive effect on women's between-job relative pay, the combined effect of having persons from these underserved communities reduces between-job gender pay inequity. One possible explanation is that racial minority managers may be sympathetic with women at the time of hire, ensuring that women get into good positions, but the combined power of women and minority managers can only go so far.

Conversely, racial minority participation in management does not significantly affect women's within-job relative pay, and it does not significantly reduce the positive effect of women's participation in management on women's within-job relative pay.

In most federal sector organizational contexts, women's participation in management improves women's relative pay, but in the extremely gendered context of the DoD, the pattern differs – at least for within-job relative pay. In non-DoD agencies, which could be considered more gender-neutral organizations, as women's participation in management rises to 55% of managers, women's relative pay improves. That accounts for most non-DoD agencies. Beyond 55% there appears to be a backlash, and additional women managers are related to decreasing women's relative pay, but that applies to very few agencies. The DoD, which was established as having very problematic gender pay gaps in Chapter 3, showed decreasing women's within-job relative pay with increases in women managers until women's participation in management reached a 25% threshold. Beyond that threshold, women's participation in management started to be associated with better within-job relative pay for women. This provides cause to argue that DoD agencies must aim to get past that threshold in their employment of women in management to have a chance to improve women's pay equity more broadly. When agencies set goals for improving their participation of women in management, they should keep this in mind.

These different patterns between DoD and non-DoD agencies demonstrate that there is more than one inequality regime, even within the limited context of the U.S. Federal Government. However, the DoD and non-DoD inequality regimes identified in this chapter are only a starting point. Organizations with subordinate establishments or multiple divisions within an establishment have multiple inequality regimes, each with their own explanations for inequality. Tracks for future research, particularly in the policy realm, should include expanding on my DoD analysis by teasing out inequality regimes in other organizations, and within the DoD, drilling down to more granular agency types. In preliminary research, I found that the different branches of the DoD display different patterns regarding the effect of women's participation in management on women's within-job predicted relative pay. See Figure 12. While the Air Force, Army, and Other DoD civilian branches show approximately the same U-shaped pattern seen earlier, the Navy looks much more like non-DoD agencies. This is evidence that organizational variation is more nuanced than described earlier in this chapter.

In sum, as seen previous literature, women's participation in management is positively correlated with women's between-job and within-job relative pay. In addition, the following findings apply to between-job relative pay:

- Racial/ethnic minority participation in management was positively correlated with women's between-job relative pay.
- Racial/ethnic minority participation in management was associated with a weakened positive effect of women's participation in management on women's between-job relative pay.

The following findings apply to within-job relative pay:

- Pay plan gender segregation was negatively correlated with women's within-job relative pay.
- Being part of the DoD was negatively correlated with women's within-job relative pay.
- High pay plan gender segregation was associated with a weakened positive effect of women's participation in management on women's within-job relative pay.
- Being part of the DoD ***and*** having very low women's participation in management was associated with a negative effect of women's participation in management on women's within-job relative pay.
- Being a non-DoD agency ***and*** having very high women's participation in management was associated with a negative effect of women's participation in management on women's within-job relative pay.

This chapter has demonstrated that the gender pay gap in federal agencies depends on multiple intersecting organizational characteristics. Further, it demonstrated that explanatory factors for the between-job and within-job pay gap components differ. Each organization has its own pay gaps, with different components and potentially different explanatory factors. From a policy point of view, this reestablishes the assertion that unique institutions require unique solutions to achieve equity. From a sociological perspective, this chapter supports the conceptualization of inequality regimes as "different practices, processes, actions and meanings" (Acker 2006:443) and that unique actors with different levels of agency related to their demographic characteristics generate different in levels of inequality (Tomaskovic-Devey and Avent-Holt 2019).

Table 9. Descriptive Statistics of Organizational Contexts and Components of the Pay Gap (FedScope September 2014)

Variable	Mean	S.D.	Min.	Median	Max.
Between-Job Women's Relative Pay	-0.038	0.041	-0.251	-0.035	0.174
Within-Job Women's Relative Pay	-0.039	0.031	-0.124	-0.039	0.124
Agency Size	4,915	16,599	100	970	271,814
SD of Agency-Wide Salary	$28,286	5,922	14,817	27,690	52,773

Median Agency-Wide Salary	$93,718	22,852	37,938	95,785	169,546
Pay Plan Gender Segregation	0.083	0.113	0.000	0.034	0.648
Women's Participation in Management	0.361	0.141	0.038	0.348	0.739
Minority Participation in Management	0.282	0.135	0.020	0.257	0.896
DoD Agency	0.349	0.477	0	0	1

Table 10. Pearson Correlations of Organizational Context and Pay Gap Component Variables (FedScope September 2014)

	1	2	3	4	5	6	7	8
1) Women's Between-Job Relative Pay	1.000							
2) Women's Within-Job Relative Pay	0.068	1.000						
3) Agency Size	0.060	0.099	1.000					
4) SD of Agency-Wide Salary	0.221 ***	0.160 **	0.062	1.000				
5) Median Agency-Wide Salary	0.116 *	0.029	-0.233 ***	0.484 ***	1.000			
6) Pay Plan Gender Segregation	-0.009	-0.109 *	0.175 ***	0.007	-0.279 ***	1.000		
7) Women's Participation in Management	0.284 ***	0.417 ***	-0.001	0.392 ***	0.210 ***	-0.283 ***	1.000	
8) Minority Participation in Management	0.171 **	0.220 ***	0.017	0.043	-0.116 ***	-0.011	0.446 ***	1.000
9) DoD Agency	-0.259 ***	-0.394 ***	0.012	-0.402 ***	-0.401 ***	0.218 ***	-0.485 ***	-0.266 ***

* *p* < .05; ** *p* < .01; *** *p* < .001.

Table 11. Pay Plan Segregation Regression Results (FedScope September 2014)

	Between-Job Relative Pay		Within-Job Relative Pay	
Agency Size (100,000s)	0.014		0.017	
	(0.013)		(0.010)	
SD of Agency-Wide Salary (100,000s)	0.141	***	0.103	**
	(0.041)		(0.031)	
Median Agency-Wide Salary (100,000s)	0.005		-0.012	
	(0.011)		(0.009)	
Pay Plan Gender Segregation	-0.005		-0.041	**
	(0.019)		(0.015)	
Constant	-0.083	***	-0.055	***
	(0.011)		(0.009)	
N	370		370	
R^2	0.052		0.055	

Note: Standard errors are in parentheses.
* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 12. Women's Participation in Management Regression Results (FedScope September 2014)

	Between-Job Relative Pay		Within-Job Relative Pay	
Agency Size (100,000s)	0.013		0.017	
	(0.013)		(0.009)	
SD of Agency-Wide Salary (100,000s)	0.064		0.009	
	(0.044)		(0.032)	
Median Agency-Wide Salary (100,000s)	0.009		-0.007	
	(0.011)		(0.008)	
Pay Plan Segregation	0.024		-0.006	
	(0.020)		(0.014)	
Women's Participation in Management	0.074	***	0.091	***
	(0.016)		(0.012)	
Constant	-0.094	***	-0.069	***
	(0.011)		(0.008)	
N	370		370	
R^2	0.102		0.186	

Note: Standard errors are in parentheses.
* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 13. Women in Management and Pay Plan Segregation Interaction Effect Regression Results (FedScope September 2014)

	Between-Job Relative Pay		Within-Job Relative Pay	
Agency Size (100,000s)	0.015		0.018	
	(0.013)		(0.009)	
SD of Agency-Wide Salary (100,000s)	0.091	*	0.028	
	(0.045)		(0.033)	
Median Agency-Wide Salary (100,000s)	0.007		-0.008	
	(0.011)		(0.008)	
Pay Plan Segregation	0.110	*	0.053	
	(0.046)		(0.033)	
Women's Participation in Management	0.093	***	0.104	***
	(0.019)		(0.014)	
Women's Participation in Management ×	-0.308	*	-0.212	*
Pay Plan Segregation	(0.148)		(0.107)	
Constant	-0.107	***	-0.077	***
	(0.013)		(0.009)	
N	370		370	
R^2	0.112		0.194	

Note: Standard errors are in parentheses.
* *p* < .05; ** *p* < .01; *** *p* < .001.

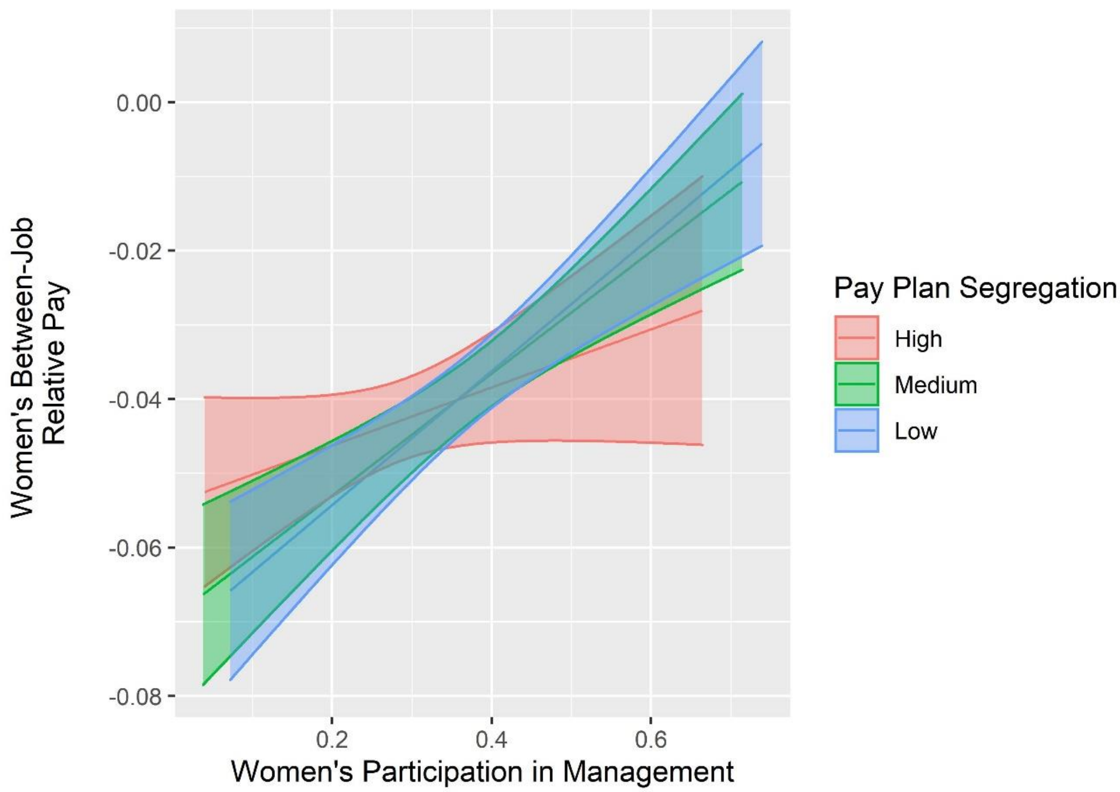

Figure 4. Effect of Women's Participation in Management on Women's Between-Job Relative Pay by Levels of Gender Pay Plan Segregation (FedScope September 2014)

Table 14. Simple Slope Effects of Women's Participation in Management on Women's Between-Job Relative Pay by Levels of Gender Pay Plan Segregation (FedScope September 2014)

Pay Plan Gender Segregation				95% Confidence Interval	
Level	Index of Dissimilarity	Effect of Women's Participation in Management	S.E.	Lower Limit	Upper Limit
Low	0.008	0.090	0.018	0.055	0.126
Medium	0.034	0.082	0.017	0.049	0.115
High	0.174	0.039	0.023	-0.007	0.085

Table 15. Contrasts of Simple Slope Effects of Women's Participation in Management on Women's Between-Job Relative Pay by Levels of Gender Pay Plan Segregation (FedScope September 2014)

Level of Pay Plan Segregation	Contrast	S.E.	t	*p*-value
Low vs. Medium	0.008	0.004	2.077	0.039
Low vs. High	0.051	0.025	2.077	0.039
Medium vs. High	0.043	0.021	2.077	0.039

Table 16. Predicted Values of Women's Between-Job Relative Pay by Women's Participation in Management and Gender Pay Plan Segregation (FedScope September 2014)

Percentile of Women's Participation in Management	Percent of Managers Who are Women	Level of Pay Plan Segregation	Predicted Women's Between-Job Relative Pay	S.E.	Contrast	Contrast S.E.	t	*p*-value
0th	3.8%	Low	-0.069	0.007	-0.016	0.007	-2.405	0.017
	3.8%	High	-0.053	0.007				
25th	25.6%	Low	-0.049	0.003	-0.005	0.003	-1.538	0.125
	25.6%	High	-0.044	0.003				
50th	34.8%	Low	-0.041	0.003	0.000	0.004	-0.123	0.902
	34.8%	High	-0.040	0.003				
75th	46.5%	Low	-0.030	0.003	0.006	0.006	0.976	0.330
	46.5%	High	-0.036	0.005				
100th	73.9%	Low	-0.006	0.007	0.020	0.012	1.655	0.099
	73.9%	High	-0.025	0.011				

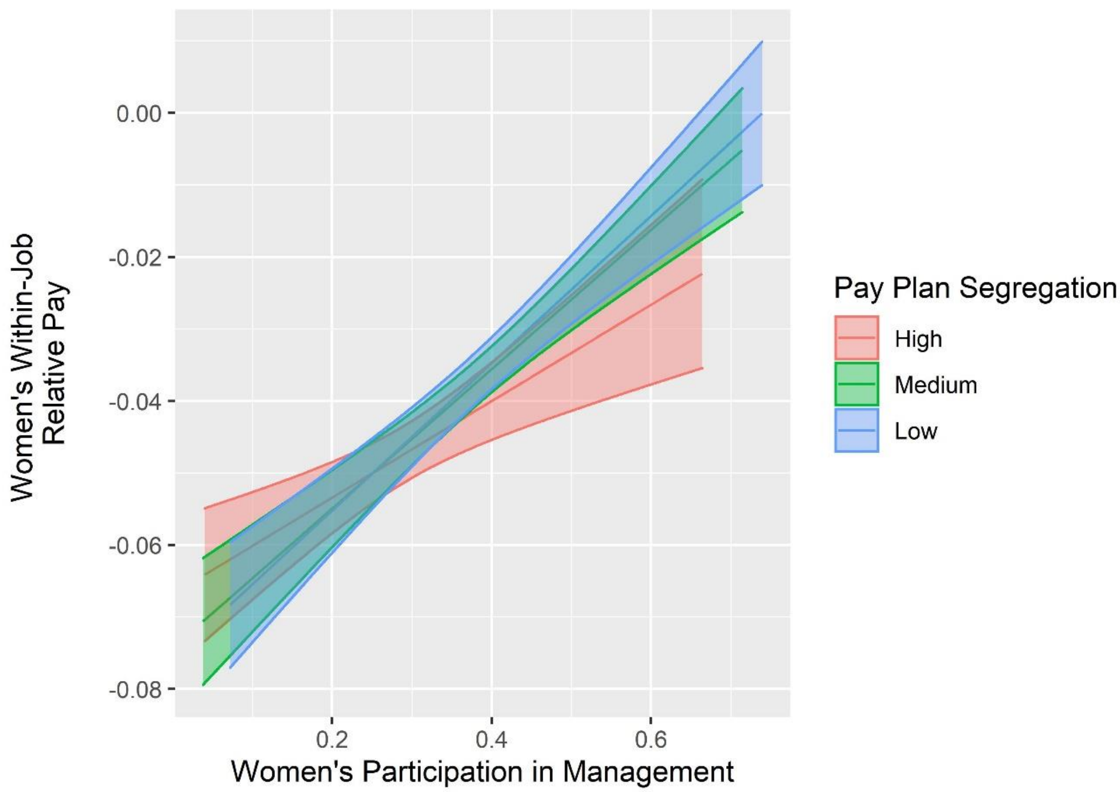

Figure 5. Effect of Women's Participation in Management on Women's Within-Job Relative Pay by Levels of Gender Pay Plan Segregation (FedScope September 2014)

Table 17. Simple Slope Effects of Women's Participation in Management on Women's Within-Job Relative Pay by Levels of Gender Pay Plan Segregation (FedScope September 2014)

Pay Plan Gender Segregation				95% Confidence Interval	
Level	Index of Dissimilarity	Effect of Women's Participation in Management	S.E.	Lower Limit	Upper Limit
Low	0.008	0.102	0.013	0.077	0.128
Medium	0.034	0.097	0.012	0.073	0.121
High	0.174	0.067	0.017	0.034	0.100

Table 18. Contrasts of Simple Slope Effects of Women's Participation in Management on Women's Within-Job Relative Pay by Levels of Gender Pay Plan Segregation (FedScope September 2014)

Level of Pay Plan Segregation	Contrast	S.E.	t	*p*-value
Low vs. Medium	0.006	0.003	1.979	0.049
Low vs. High	0.035	0.018	1.979	0.049
Medium vs. High	0.030	0.015	1.979	0.049

Table 19. Predicted Values of Women's Within-Job Relative Pay by Women's Participation in Management and Gender Pay Plan Segregation (FedScope September 2014)

Percentile of Women's Participation in Management	Percent of Managers Who are Women	Level of Pay Plan Segregation	Predicted Women's Within-Job Relative Pay	S.E.	Contrast	Contrast S.E.	t	*p*-value
0th	3.8%	Low	-0.072	0.005	-0.008	0.005	-1.532	0.126
	3.8%	High	-0.064	0.005				
25th	25.6%	Low	-0.049	0.002	0.000	0.002	0.075	0.940
	25.6%	High	-0.050	0.002				
50th	34.8%	Low	-0.040	0.002	0.003	0.003	1.269	0.205
	34.8%	High	-0.043	0.002				
75th	46.5%	Low	-0.028	0.002	0.008	0.004	1.842	0.066
	46.5%	High	-0.036	0.004				
100th	73.9%	Low	0.000	0.005	0.017	0.009	2.013	0.045
	73.9%	High	-0.017	0.008				

Table 20. Women in Management and Minorities in Management Regression Results (FedScope September 2014)

	Between-Job Relative Pay				Within-Job Relative Pay			
	Base Model		Interaction Model		Base Model		Interaction Model	
Agency Size (100,000s)	0.014		0.013		0.017		0.017	
	(0.013)		(0.013)		(0.009)		(0.009)	
SD of Agency-Wide Salary (100,000s)	0.069		0.063		0.010		0.010	
	(0.044)		(0.044)		(0.032)		(0.032)	
Median Agency-Wide Salary (100,000s)	0.011		0.010		-0.006		-0.006	
	(0.011)		(0.011)		(0.008)		(0.008)	
Pay Plan Segregation	0.021		0.022		-0.007		-0.007	
	(0.020)		(0.020)		(0.015)		(0.015)	
Women's Participation in Management	0.062	**	0.144	***	0.087	***	0.091	***
	(0.019)		(0.035)		(0.014)		(0.026)	
Racial/Ethnic Minority Participation in Management	0.023		0.133	**	0.008		0.014	
	(0.017)		(0.044)		(0.013)		(0.032)	
Women's Participation in Management × Minority Participation in Management			-0.268	**			-0.014	
			(0.099)				(0.072)	
Constant	-0.099	***	-0.128	***	-0.071	***	-0.072	***
	(0.012)		(0.016)		(0.009)		(0.012)	
N	370		370		370		370	
R^2	0.106		0.124		0.187		0.187	

Note: Standard errors are in parentheses.
*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

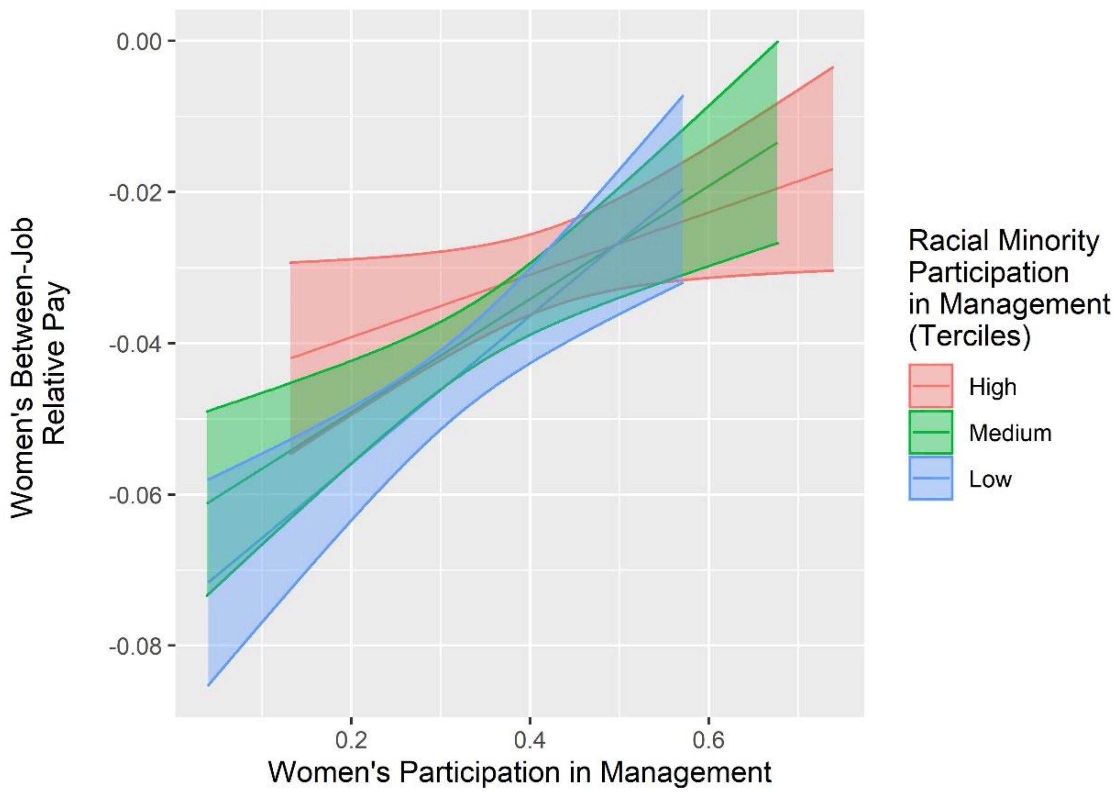

Figure 6. Effect of Women's Participation in Management on Women's Between-Job Relative Pay by Levels of Racial Minorities' Participation in Management (FedScope September 2014)

Table 21. Simple Slope Effects of Women's Participation in Management on Women's Between-Job Relative Pay by Levels of Racial/Ethnic Minority Managerial Participation (FedScope September 2014)

Minority Participation in Management				95% Confidence Interval	
Level	Minority Managerial Participation Rate	Effect of Women's Participation in Management	S.E.	Lower Limit	Upper Limit
Low	17.1%	0.098	0.023	0.053	0.143
Medium	25.7%	0.075	0.019	0.037	0.113
High	38.2%	0.041	0.020	0.002	0.081

Table 22. Contrasts of Simple Slope Effects of Women's Participation in Management on Women's Between-Job Relative Pay by Levels of Racial/Ethnic Minority Managerial Participation (FedScope September 2014)

Level of Minority Managerial Participation	Contrasts	S.E.	t	*p*-value
Low vs. Medium	0.023	0.009	2.720	0.007
Low vs. High	0.057	0.021	2.720	0.007
Medium vs. High	0.034	0.012	2.720	0.007

Table 23. Predicted Values of Women's Between-Job Relative Pay by Women's Participation in Management and Racial/Ethnic Minority Participation in Management (FedScope September 2014)

Percentile of Women's Participation in Management	Percent of Managers Who are Women	Level of Minority Managerial Participation	Predicted Women's Between-Job Relative Pay	S.E.	Contrast	Contrast S.E.	t	*p*-value
0th	3.8%	Low	-0.072	0.007	-0.026	0.009	-3.042	0.003
	3.8%	High	-0.046	0.008				
25th	25.6%	Low	-0.050	0.003	-0.014	0.005	-2.818	0.005
	25.6%	High	-0.037	0.004				
50th	34.8%	Low	-0.041	0.003	-0.008	0.004	-2.184	0.030
	34.8%	High	-0.033	0.003				
75th	46.5%	Low	-0.030	0.004	-0.002	0.004	-0.467	0.640
	46.5%	High	-0.028	0.003				
100th	73.9%	Low	-0.003	0.010	0.014	0.008	1.770	0.078
	73.9%	High	-0.017	0.007				

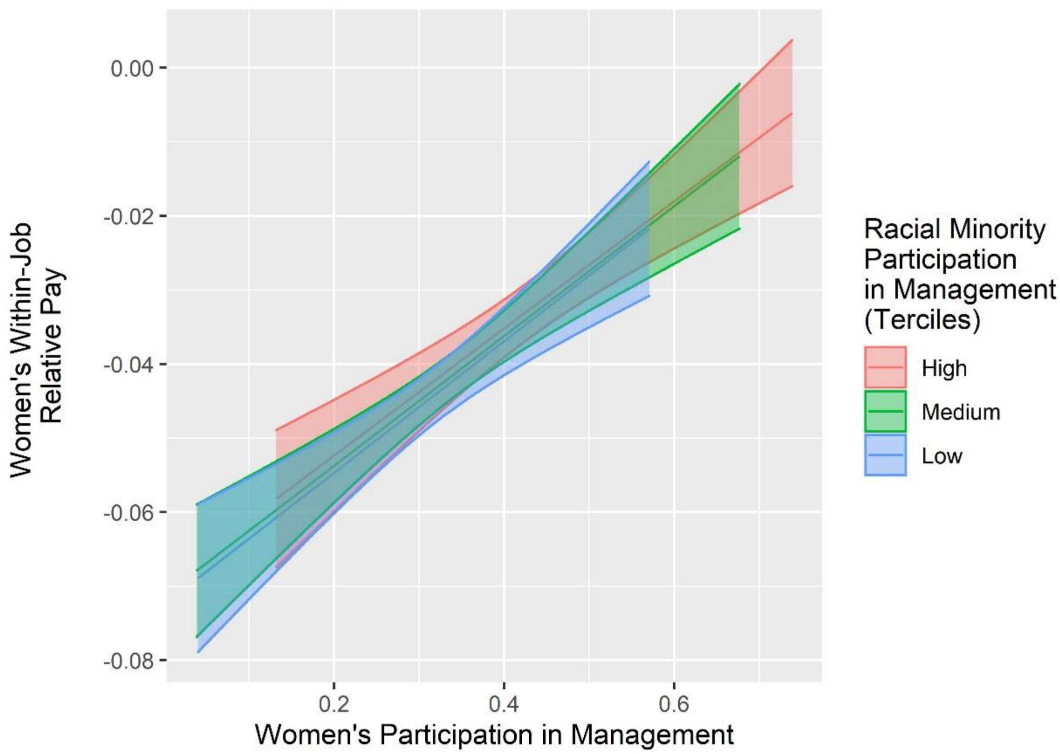

Figure 7. Effect of Women's Participation in Management on Women's Within-Job Relative Pay by Levels of Racial Minorities' Participation in Management (FedScope September 2014)

Table 24. Simple Slope Effects of Women's Participation in Management on Women's Within-Job Relative Pay by Levels of Racial/Ethnic Minority Managerial Participation (FedScope September 2014)

Minority Participation in Management				95% Confidence Interval	
Level	Minority Managerial Participation Rate	Effect of Women's Participation in Management	S.E.	Lower Limit	Upper Limit
Low	17.1%	0.089	0.017	0.056	0.122
Medium	25.7%	0.089	0.014	0.060	0.115
High	38.2%	0.086	0.015	0.057	0.115

Table 25. Contrasts of Simple Slope Effects of Women's Participation in Management on Women's Within-Job Relative Pay by Levels of Racial/Ethnic Minority Managerial Participation (FedScope September 2014)

Level of Minority Managerial Participation	Contrast	S.E.	t	*p*-value
Low vs. Medium	0.001	0.006	0.199	0.842
Low vs. High	0.003	0.015	0.199	0.842
Medium vs. High	0.002	0.009	0.199	0.842

Table 26. Predicted Values of Women's Within-Job Relative Pay by Women's Participation in Management and Racial/Ethnic Minority Participation in Management (FedScope September 2014)

Percentile of Women's Participation in Management	Percent of Managers Who are Women	Level of Minority Managerial Participation	Predicted Women's Within-Job Relative Pay	S.E.	Contrast	Contrast S.E.	t ratio	*p*-value
0th	3.8%	Low	-0.069	0.005	-0.003	0.006	-0.451	0.652
	3.8%	High	-0.066	0.006				
25th	25.6%	Low	-0.050	0.002	-0.002	0.004	-0.610	0.542
	25.6%	High	-0.048	0.003				
50th	34.8%	Low	-0.042	0.002	-0.002	0.003	-0.667	0.505
	34.8%	High	-0.040	0.002				
75th	46.5%	Low	-0.031	0.003	-0.002	0.003	-0.545	0.586
	46.5%	High	-0.030	0.002				
100th	73.9%	Low	-0.007	0.007	-0.001	0.006	-0.121	0.904
	73.9%	High	-0.006	0.005				

Table 27. Women in Management and DoD Agency Regression Results (FedScope September 2014)

	Between-Job Relative Pay		Within-Job Relative Pay	
	Base Model	Interaction Model	Base Model	Interaction Model
Agency Size (100,000s)	0.012	0.011	0.014	0.014
	(0.013)	(0.013)	(0.009)	(0.009)
SD of Agency-Wide Salary (100,000s)	0.051	0.057	-0.013	-0.008
	(0.044)	(0.044)	(0.031)	(0.031)
Median Agency-Wide Salary (100,000s)	0.002	0.001	-0.018 *	-0.018 *
	(0.011)	(0.011)	(0.008)	(0.008)
Pay Plan Segregation	0.027	0.025	-0.001	-0.003
	(0.020)	(0.020)	(0.014)	(0.014)
Women's Participation in Management	0.059 ***	0.074 ***	0.068 ***	0.076 ***
	(0.018)	(0.020)	(0.014)	(0.014)
DoD Agency	-0.012 *	0.005	-0.020 ***	-0.008
	(0.005)	(0.012)	(0.004)	(0.009)
Women's Participation in Management × DoD Agency		-0.054		-0.037
		(0.036)		(0.025)
Constant	-0.075 ***	-0.082 ***	-0.037 ***	-0.042 ***
	(0.014)	(0.015)	(0.010)	(0.010)
N	370	370	370	370
R^2	0.115	0.120	0.238	0.253

Note: Standard errors are in parentheses.
*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

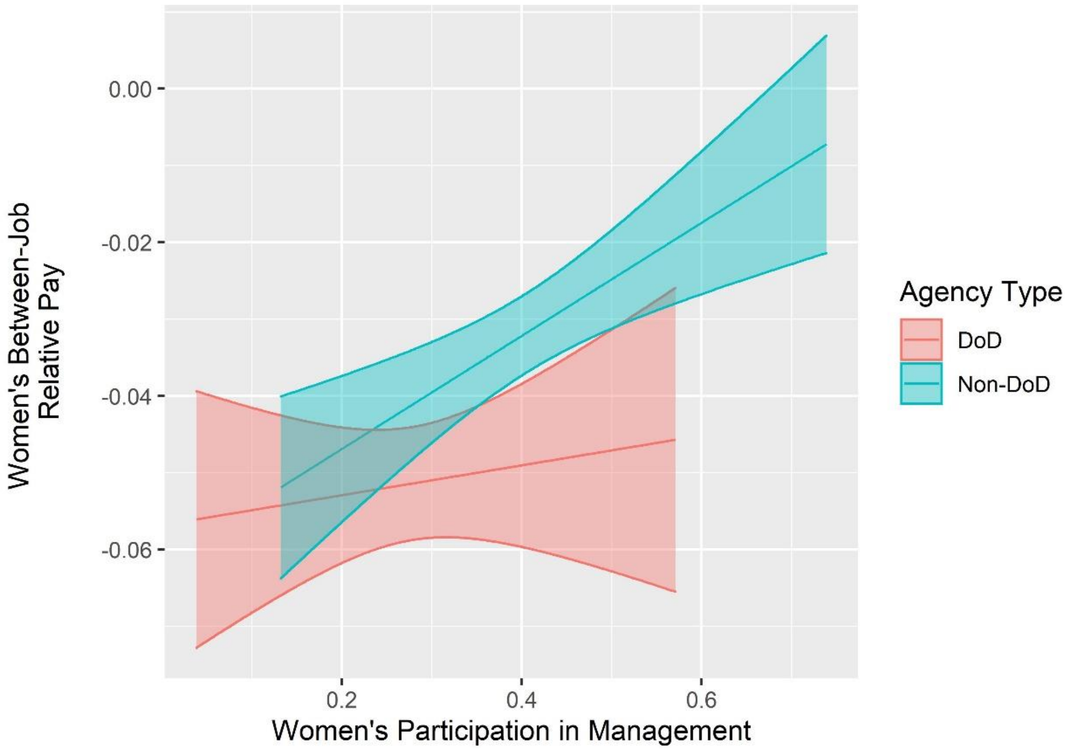

Figure 8. Effect of Women's Participation in Management on Women's Between-Job Relative Pay: DoD and Non-DoD Agencies (FedScope September 2014)

Table 28. Simple Slope Effects of Women's Participation in Management on Women's Between-Job Relative Pay by Agency Type - DoD or Non-DoD (FedScope September 2014)

			95% Confidence Interval	
Agency Type	Effect of Women's Participation in Management	S.E.	Lower Limit	Upper Limit
DoD	0.020	0.032	-0.043	0.082
Non-DoD	0.074	0.020	0.034	0.113

Table 29. Contrasts of Simple Slope Effects of Women's Participation in Management on Women's Between-Job Relative Pay by Agency Type - DoD or Non-DoD (FedScope September 2014)

Comparison	Contrast	S.E.	t	p-value
DoD - (Non-DoD)	-0.054	0.036	-1.496	0.136

Table 30. Predicted Values of Women's Between-Job Relative Pay by Women's Participation in Management and Agency Type - DoD or Non-DoD (FedScope September 2014)

Percentile of Women's Participation in Management	Agency Type	Predicted Women's Between-Job Relative Pay	S.E.	Contrast	Contrast S.E.	t	*p*-value
0^{th}	DoD	-0.056	0.009	0.003	0.011	0.247	0.805
	Non-DoD	-0.059	0.008				
25^{th}	DoD	-0.052	0.004	-0.009	0.006	-1.632	0.104
	Non-DoD	-0.043	0.004				
50^{th}	DoD	-0.050	0.004	-0.014	0.005	-2.617	0.009
	Non-DoD	-0.036	0.003				
75th	DoD	-0.048	0.007	-0.020	0.008	-2.674	0.008
	Non-DoD	-0.027	0.003				
100th	DoD	-0.042	0.015	-0.035	0.016	-2.153	0.032
	Non-DoD	-0.007	0.007				

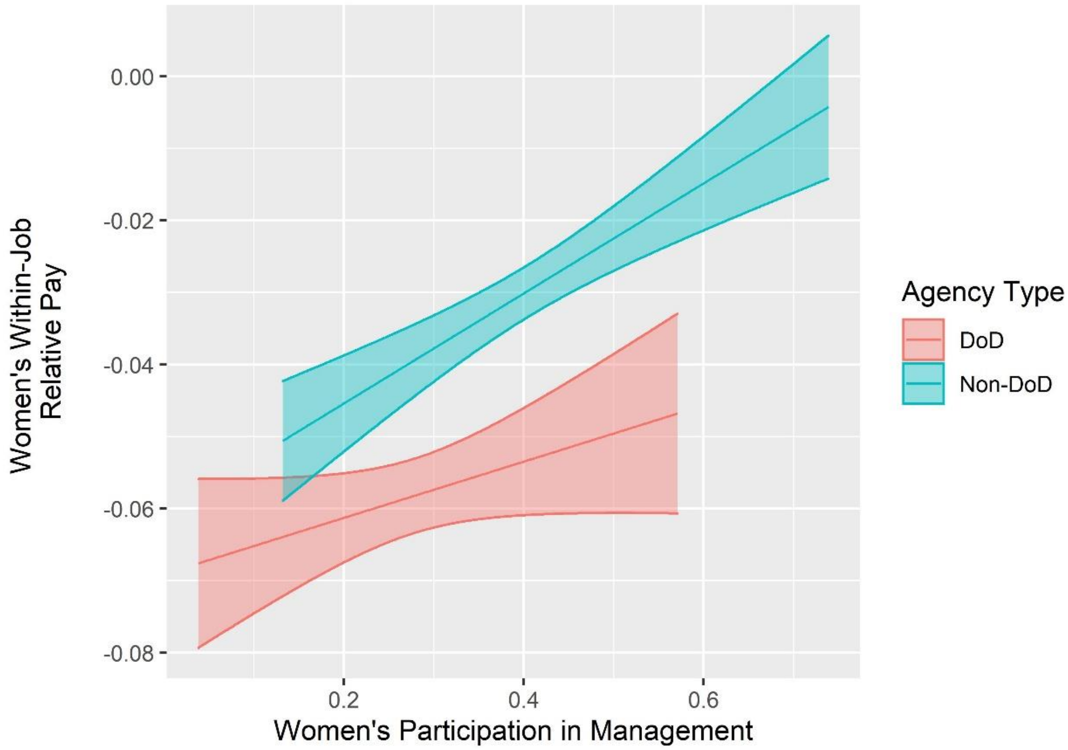

Figure 9. Effect of Women's Participation in Management on Women's Within-Job Relative Pay: DoD and Non-DoD Agencies (FedScope September 2014)

Table 31. Simple Slope Effects of Women's Participation in Management on Women's Within-Job Relative Pay by Agency Type - DoD or Non-DoD (FedScope September 2014)

			95% Confidence Interval	
Agency Type	Effect of Women's Participation in Management	S.E.	Lower Limit	Upper Limit
DoD	0.0390	0.0223	-0.0049	0.0829
Non-DoD	0.0763	0.0140	0.0488	0.1039

Table 32. Contrasts of Simple Slope Effects of Women's Participation in Management on Women's Within-Job Relative Pay by Agency Type - DoD or Non-DoD (FedScope September 2014)

Comparison	Contrast	S.E.	t	*p*-value
DoD - (Non-DoD)	-0.0373	0.0254	-1.4699	0.1425

Table 33. Predicted Values of Women's Within-Job Relative Pay by Women's Participation in Management and Agency Type - DoD or Non-DoD (FedScope September 2014)

Percentile of Women's Participation in Management	Agency Type	Predicted Women's Within-Job Relative Pay	S.E.	Contrast	Contrast S.E.	t	*p*-value
0th	DoD	-0.068	0.006	-0.010	0.008	-1.254	0.211
	Non-DoD	-0.058	0.005				
25th	DoD	-0.059	0.003	-0.018	0.004	-4.614	0.000
	Non-DoD	-0.041	0.003				
50th	DoD	-0.056	0.003	-0.021	0.004	-5.691	0.000
	Non-DoD	-0.034	0.002				
75th	DoD	-0.051	0.005	-0.026	0.005	-4.823	0.000
	Non-DoD	-0.025	0.002				
100th	DoD	-0.040	0.011	-0.036	0.011	-3.138	0.000
	Non-DoD	-0.004	0.005				

Table 34. Women's Within-Job Relative Pay Regression Results Including on Women's Participation in Management-Squared and a DoD Agency Interaction Term (FedScope September 2014)

	Coef. (S.E.)	
Agency Size (100,000s)	0.014	
	(0.009)	
SD of Agency-Wide Salary (100,000s)	-0.008	
	(0.030)	
Median Agency-Wide Salary (100,000s)	-0.020	*
	(0.008)	
Pay Plan Segregation	0.002	
	(0.014)	
Women's Participation in Management	0.326	***
	(0.077)	
Women's Participation in Management Squared	-0.294	***
	(0.089)	
DoD Agency	0.072	***
	(0.020)	
Women's Participation in Management x DoD Agency	-0.550	***
	(0.115)	
Women's Participation in Management Squared x DoD Agency	0.738	***
	(0.167)	
Constant	-0.088	***
	(0.017)	
N	370	
R^2	0.294	

Note: Standard errors are in parentheses.
*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

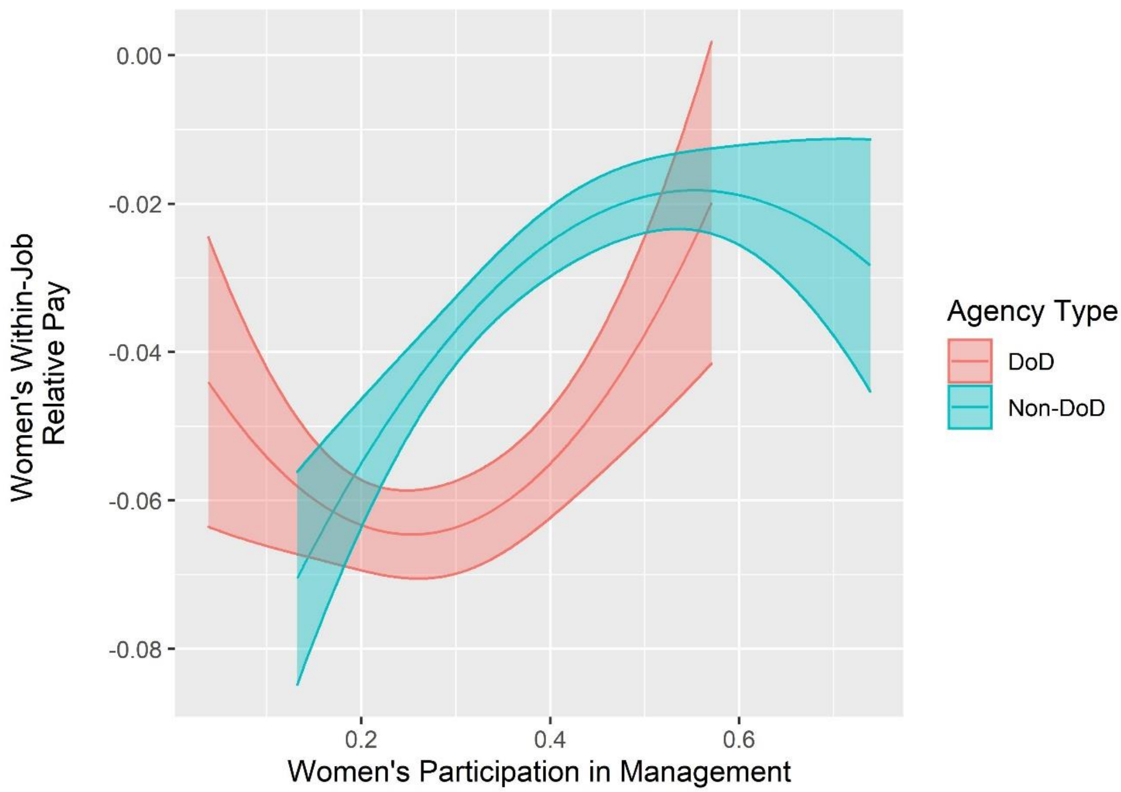

Figure 10. Predicted Values of Women's Within-Job Relative Pay Based on Women's Participation in Management by Agency Type - Quadratic Model – Truncated to Existing Values of Women’s Participation in Management for the Agency Type (FedScope September 2014)

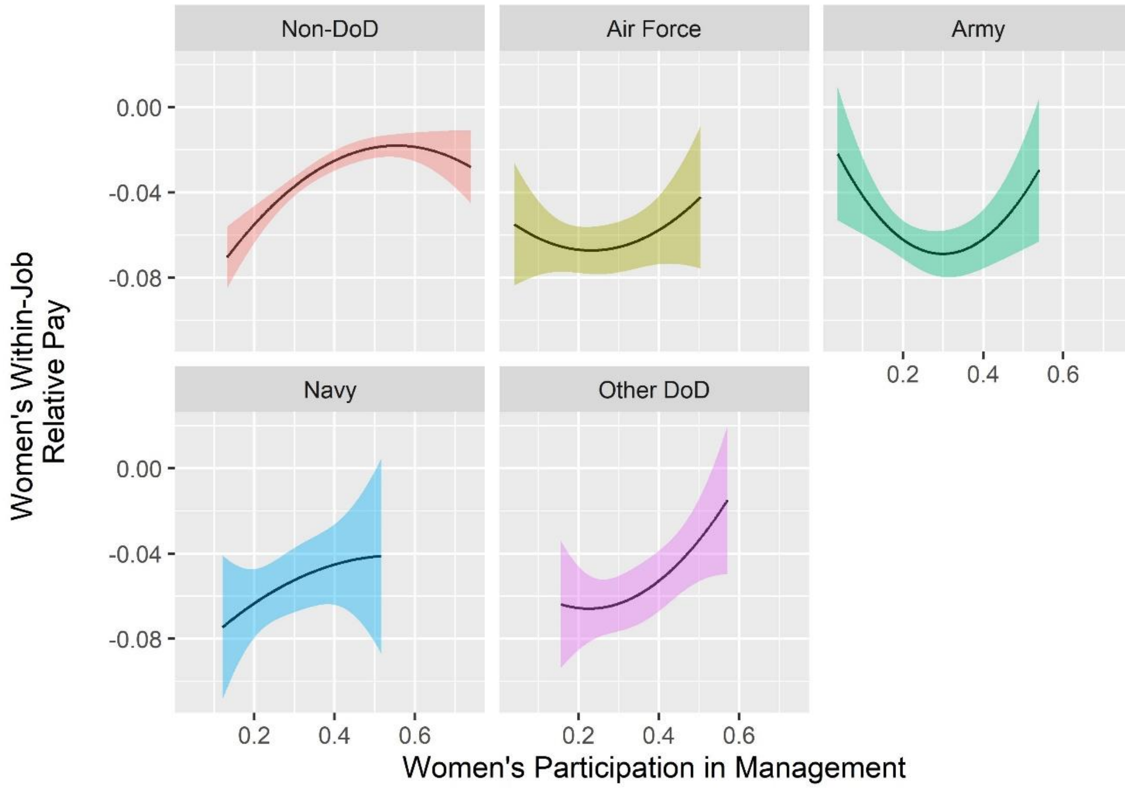

Figure 11. Predicted Values of Women's Within-Job Relative Pay Based on Women's Participation in Management by DoD Branch - Quadratic Model – Truncated to Existing Values of Women's Participation in Management for the Agency Type (FedScope September 2014)

CHAPTER V

CONCLUSION

This dissertation aimed to (1) measure governmentwide gender pay gaps, accounting for organizational variation and other explanatory factors, (2) demonstrate the types of variation in federal agencies' gender pay gaps, and (3) identify organizational contexts associated with larger and smaller gender pay gaps. In this chapter, I present the key findings of this research, the theoretical and practical contributions, limitations, and paths for future research.

A. Key Findings

In my governmentwide analysis, I examined individual-level factors that explain the gender pay gap, including human capital, occupational segregation, and sorting into different organizations. I found a 7.4% gross gender pay gap in the Federal Government in 2014, but gender alone explained little of the variation in pay (Adjusted R^2 = 0.008). Human capital and geography explained far more pay variation (Adjusted R^2 = 0.505). Controlling for human capital and geography, however, increased the pay gap to 9.7%, indicating that women in government have better human capital, work in higher-paying localities, or both.

A major goal of the governmentwide analysis was to compare the gender pay gap contributions of organizational segregation and occupational segregation. When controlling for human capital, geography, and agency, the gender pay gap was 6.1% and the adjusted R^2 was 0.600. With an adjusted R^2 of 0.802 and a 3.6% gender pay gap, controlling for human capital, geography, and occupation explained more of the gap than the previously described model. A model accounting for both agency and occupation and a model accounting for occupation within agency slightly improved the explanatory power of the model (Adjusted R^2 = 0.824 and 0.849, respectively), and showed slightly smaller gender pay gaps. In the end, after controlling for geography, human capital, agency, occupation, and occupation within agency, the gender pay gap was 3.0%.

After Chapter 2 demonstrated that there is organizational variation in the government's gender pay gap, in Chapter 3, I wanted to learn more about how agencies' pay gaps varied. I calculated three pay gaps (the gross pay gap, the between-job gap [controlling for human capital and geography], and the within-job gap [controlling for occupation, human capital, and geography]) separately for 371 government agencies. The gross gender pay gap ranged from women making 67.25% of what men make to women making 25.66% more than men. With the additional control variables, the range of the gender pay gap shank. The within-job pay gap ranged from women making 87.61% of what men make to women making 12.41% more than men. However, the distribution was skewed toward favoring men. In the within-job pay gap model, over two-thirds of agencies had pay gaps significantly favoring men, whereas barely over 1% of agencies significantly favored women.

Next, I examined department-level within-job pay gaps to see which departments had the largest gender pay gaps and whether there was variation within departments. Notably, the four Department of Defense (DoD) sub-departments (Department of the Air Force, Department of the Army, Department of the Navy, and other DoD) and the Department of Energy were among the departments with the largest overall within-job gender pay gaps, and they had the highest percentage of subcomponents with large significant pay gaps.

After that, I examined the role of segregation in producing agency pay gaps. I found that the agencies with the largest gender pay gaps favoring men produced by segregation to some degree differed from the agencies with the largest within-job pay gaps. Although the Department of the Air Force and the Department of the Army were offenders here as well, the Department of Transportation, Department of Labor, and the Department of Treasury had large portions of their gender pay gaps explained by occupational segregation. These agencies should examine the circumstances in which men and women are being placed into different occupations despite having similar human capital.

In Chapter 4, I built off Chapter 3's findings to identify organizational contexts that are correlated with between-job and within-job gender pay gaps. I separately examined the within-job pay gap and the between-job pay gap because the worst agencies identified in Chapter 3 differed when examining the within-job gap and the pay gap caused by segregation. Because previous research has identified federal government pay plans (Smith-Doerr et al. 2019) and women's participation in management (e.g., Carlsson and Eriksson 2019; Kalev et al. 2006; Kurtulus and Tomaskovic-Devey 2012) as factors that influence gender employment inequality, I examined pay plan gender segregation and women's participation in management as factors that might affect the pay gap. I also examined contexts where women's participation in management might be more or less beneficial to women's pay based on the level of pay plan gender segregation, the level of racial/ethnic minorities' participation in management, and DoD agencies.

An important finding based on first-order correlations was that the between-job gender pay gap was not significantly correlated to the within-job gender pay gap. This sets up the rest of the chapter in which I examine these pay gaps as separate dependent variables. It also suggests that future research should consider these measures of inequality separately.

In the regression analyses, pay plan gender segregation was significantly associated with larger within-job gender pay gaps, but it was not significantly associated with the between-job gender pay gap. This demonstrates the importance of examining the pay gap, like other measures of inequality, not as a single construct. This evidence suggests pay plan standardization improves (within-job) pay equality, but in organizations with high occupational segregation, occupational segregation might need to be addressed first.

In agencies with higher women's participation in management, women's relative pay was higher when examining both between-job relative pay ($b = 0.074$; $p < 0.001$) and within-job relative pay ($b = 0.091$; $p < 0.001$). These findings concur with previous research that shows that when more women are in management, other women broadly benefit (Abendroth et al. 2017; Kalev et al. 2006; Kurtulus and Tomaskovic-Devey 2012). This sets up the rest of the chapter that examines the contexts in which women's participation in management is or is not so much positively associated with women's pay. However, it also shows that, at least for the Federal Government, pay inequities result through both wage setting and job placement mechanisms.

I also examined minority participation in management as an indicator of an organization's commitment to further equal opportunity. For women's between-job relative pay, racial/ethnic minority participation in management was positively correlated with women's between-job relative pay. However, it was a factor that made women's participation in management's effect context dependent. Racial/ethnic minority participation in management was associated with a weakened positive effect of women's participation in management on women's between-job relative pay.

For women's within-job relative pay, pay plan gender segregation and being part of the DoD were each negatively correlated with women's within-job relative pay. High pay plan gender segregation was associated with a weakened positive effect of women's participation in management on women's within-job relative pay.

There was a quadratic effect of being part of the DoD on the effect of women's participation on management on women's relative pay. For DoD agencies this implies that there was an initial backlash negatively affecting women's pay as women's managerial participation grew. Being part of the DoD and having very low women's participation in management was associated with a negative effect of women's participation in management on women's within-job relative pay. However, DoD agencies with at least 25% of their managers being women saw a positive effect of women's participation in management on women's relative pay.

This quadratic effect was inverted for non-DoD agencies. Being a non-DoD agency and having very high women's participation in management (greater than 55%) was associated with a negative effect of women's participation in management on women's within-job relative pay. However, very few agencies are in that category.

B. Sociological and Practical Contributions

While previous studies have measured the governmentwide pay gap (U.S. Government Accountability Office 2009, 2020; U.S. Office of Personnel Management

2014), little attention has been paid to organizational differences in gender pay gaps, both in the Federal Government and the general population. My research fills this gap by establishing the breadth of gender pay gaps in subcomponents of the U.S.'s largest employer, and further, by identifying organizational characteristics that may cause this variation.

The findings in Chapter 4 support Acker's (2006) assertion that inequality regimes constructed of "loosely interrelated practices, processes, actions, and meanings [...] result in and maintain class, gender, and racial inequalities within particular organizations" (p.443). Organizational practices, processes, actions, and meanings all influence how men and women are hired into different pay plans, whether women get to be managers, and whether racial and ethnic minorities get to be managers. Further, DoD civilian employers act as inequality regimes that differ from other government employers.

In addition, my research supports Tomaskovic-Devey and Avent-Holt's (2019) theory of relational inequalities that asserts that unique actors with different levels of agency related to their demographic characteristics generate different levels of inequality. Where women are in management, women generally are better off. This also applies to organizations where racial and ethnic minorities are in management. However, even when these traditionally disadvantaged groups are placed in authority positions, in certain inequality regimes their agency may diminish, perhaps due to backlash from more powerful authority figures. Overall, if women in management are agentic, they still might not be able to do as much in segregated environments (a structural factor), when competing with other EEO goals (racial minority participation in management, a more individualistic factor), and different cultural settings (e.g., the DoD).

What might be my most important finding is that between- and within-job gender pay gaps are not associated with the same organizational characteristics. This implies that the pay gap is not a single unit. When looking for the causes of pay gaps and other measures of inequality, researchers should seek multiple components of the outcome of interest to use as dependent variables. Different interactional mechanisms, such as segregation, promotions, and direct discrimination, cause pay gaps. These mechanisms might be associated with different organizational characteristics. When employers seek to improve equality, if they identify the most pressing aspects of inequality, then they will be better equipped to identify the most important interactional mechanisms to work on.

C. Limitations

Despite these contributions, there are limitations to this study. The U.S. Federal Government is a unique employer. The Federal Sector starts with a smaller pay gap than what is seen in the general population, and federal agencies are obligated to work towards improving equity in their workforces. Therefore, these findings might not be generalizable to the other organizations.

The sample was limited to full-time non-seasonal permanent employees. In this Federal Government dataset, that removed about 10% of the observations, and the removed observations were slightly disproportionately women. Including part-time, seasonal, or temporary employees may change the results using this dataset. In a private sector sample, it would skew the results more as women are much more disproportionately part-time workers in the private sector. Exploring different methods of accounting for work schedule and permanent status variation may elicit different results.

In addition, this cross-sectional study cannot infer causality. OPM and other federal agencies have access to the full EHRI dataset which can be examined using longitudinal analyses back to 1979. That dataset has additional variables as well, such as more detailed workplace, race, ethnicity, disability status, bargaining unit status, and other variables that I had to omit from my analyses due to lack of availability. With such a large dataset, there should be enough power to substantially reduce omitted variable bias present in my study.

As just mentioned, the dataset for this project did not include a race variable for individual employees. Gender pay gaps in the general population differ by race and ethnicity (U.S. Bureau of Labor Statistics 2020), as might the organizational causes. Although including the racial minorities in management variable made some attempt to address race in this paper, it does not account for the race of the unequally paid employees nor the dyadic relationship between workers and managers of different races and sexes.

D. Recommendations for Future Research

What I've done here is just the beginning. Future research should consider examining employment inequalities using different scopes, data sources, dependent variables, independent variables, and methodologies.

The scope of my research was limited to full-time non-seasonal permanent employees of the U.S. Federal Government as of September 2014. Examining pay inequity in different situations is possible. EEOC's pay data collected from all medium and large private sector employers in the U.S. provides a data source for this. In addition, individual employers can do similar analyses comparing the segregation component of the pay gap to the within-job component; that will help them identify the types of personnel actions and policies that may be causing pay inequalities. Other large employers can also use similar methodologies to identify pay gaps in their subordinate establishments.

As noted above, a major contribution of this study is that it demonstrates that the pay gap is not a single dependent variable. Rather it contains different components (e.g., between-job and within-job) that can be separately examined as dependent variables yielding different results. Future research should see if other components of the pay gap and other measures of employment inequality are associated with different organizational characteristics and contexts. For example, one might examine gender differences in separations broadly, but then break separations into resignations, retirements, lay-offs, and disciplinary terminations to better understand what personnel actions are creating participation and other workplace inequities.

Researchers should also examine different independent variables that measure different organizational practices, characteristics, and contexts. Inequities in personnel actions could be used as independent variables that predict outcomes like gender pay gaps. Results from such research would help employers identify the types of human interactions that should be changed to improve equality.

Measures of formalization beyond pay plan segregation should be examined as causes of gender pay gaps. On EEOC MD-715 Reports, federal agencies already annually report whether they are compliant on over one hundred EEO policies, procedures, and practices. Examples include whether the agency’s EEO Director reports directly to the agency head, whether they have an in-house anti-harassment program, and whether they process EEO complaints in a timely manner. The reports also include qualitative data and could be used for historical analyses (U.S. Equal Employment Opportunity Commission n.d.c). This data source, which has scarcely been used by academics, should be further explored.

Different contexts of organizational variation should be examined. The DoD's hierarchical, masculine culture is one example of organizational variation. We might find different results in different sectors, such as finance, law enforcement, and STEM. Other ways to measure organizational cultures include climate surveys (such as the government's Federal Employee Viewpoint Survey) and qualitative research, which may also help us understand the causes of the pay gap.

Additional methodologies should be explored as well. Longitudinal analysis may yield different results and may allow for causal arguments. In addition, although the data could permit it, I did not choose to use multi-level modeling. I wanted to compare the organizations and go beyond stating how much variation in salary is due to between-organization variation or due to within-organization variation. The results from a multi-level model may overemphasize the effects of the largest organizations. However, a deeper analysis of whether multi-level modeling would be a better methodology would be beneficial. Finally, historical and qualitative analyses may better identify the cultural aspects associated with the gender pay gap.

E. Final Thoughts

As of 2014, the within-job gender pay gap penalized the mean federal sector woman by almost $2,500 annually; that penalty will cumulatively affect her over her lifetime. However, this penalty is not uniform across all employers, both within and outside of the Federal Government. There are a few federal agencies where, on average, women make more than men. In this dissertation, I identified some of the organizational characteristics associated with gender pay gaps and found that the gender pay gap is made of more than one component, with different components being associated with different organizational characteristics. In sum, the gender pay gap is context dependent. To improve pay equity, organization-specific solutions are needed.

APPENDIX A

GOVERNMENTWIDE REGRESSION RESULTS

Table 35. Chapter 2 Governmentwide Regression Results for Selected Independent Variables (FedScope September 2014)

	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6		
	Coef.	S.E.		Coef.	S.E.		Coef.	S.E.		Coef.	S.E.		Coef.	S.E.		Coef.	S.E.	
Intercept	11.240	0.000	***	-	-		-	-		-	-		-	-		-	-	
Female	-0.077	0.001	***	-0.102	0.000	***	-0.063	0.000	***	-0.037	0.000	***	-0.036	0.000	***	-0.030	0.000	***
Tenure				0.016	0.000	***	0.014	0.000	***	0.012	0.000	***	0.012	0.000	***	0.012	0.000	***
Tenure-Squared				0.000	0.000	***	0.000	0.000	***	0.000	0.000	***	0.000	0.000	***	0.000	0.000	***
Age				0.001	0.000	***	0.002	0.000	***	0.003	0.000	***	0.003	0.000	***	0.003	0.000	***
Age-Squared				0.000	0.000	***	0.000	0.000	***	0.000	0.000	***	0.000	0.000	***	0.000	0.000	***
Elementary School Completed - No High School				-0.354	0.020	***	-0.299	0.018	***	-0.088	0.013	***	-0.089	0.012	***	-0.057	0.011	***
Some High School - Did Not Complete				-0.255	0.012	***	-0.203	0.011	***	-0.061	0.007	***	-0.056	0.007	***	-0.035	0.007	***
High School Graduate or Certificate of Equivalency				-0.010	0.011		-0.004	0.010		-0.004	0.007		-0.001	0.007		0.004	0.006	
Terminal Occupational Program - Did Not Complete				-0.150	0.012	***	-0.106	0.011	***	-0.021	0.007	**	-0.014	0.007	*	-0.006	0.007	
Terminal Occupational Program - Certificate of Completion, Diploma or Equivalent				-0.095	0.011	***	-0.053	0.010	***	-0.005	0.007		0.003	0.007		0.005	0.006	
Some College - Less Than One Year				0.006	0.011		0.007	0.010		0.000	0.007		0.003	0.007		0.008	0.006	
One Year College				0.012	0.011		0.015	0.010		0.000	0.007		0.006	0.007		0.010	0.006	
Two Years College				0.029	0.011	*	0.035	0.010	***	0.008	0.007		0.012	0.007		0.015	0.006	*
Associate Degree				0.078	0.011	***	0.081	0.010	***	0.000	0.007		0.004	0.007		0.007	0.006	
Three Years College				0.096	0.012	***	0.095	0.010	***	0.021	0.007	**	0.023	0.007	**	0.024	0.006	***
Four Years College				0.132	0.012	***	0.125	0.010	***	0.034	0.007	***	0.034	0.007	***	0.034	0.006	***
Bachelor's Degree				0.288	0.011	***	0.265	0.010	***	0.079	0.007	***	0.077	0.007	***	0.070	0.006	***
Post-Bachelor's				0.309	0.011	***	0.292	0.010	***	0.106	0.007	***	0.101	0.007	***	0.091	0.006	***
First Professional				0.838	0.011	***	0.859	0.010	***	0.216	0.007	***	0.201	0.007	***	0.161	0.007	***
Post-First Professional				0.501	0.013	***	0.467	0.012	***	0.147	0.008	***	0.126	0.008	***	0.131	0.007	***
Master's Degree				0.421	0.011	***	0.394	0.010	***	0.163	0.007	***	0.156	0.007	***	0.139	0.006	***
Post-Master's				0.454	0.012	***	0.423	0.011	***	0.192	0.007	***	0.181	0.007	***	0.161	0.007	***
Sixth-Year Degree				0.477	0.015	***	0.438	0.013	***	0.191	0.009	***	0.177	0.009	***	0.160	0.008	***
Post-Sixth Year				0.480	0.016	***	0.439	0.014	***	0.185	0.010	***	0.167	0.010	***	0.148	0.009	***
Doctorate Degree				0.620	0.011	***	0.609	0.010	***	0.265	0.007	***	0.247	0.007	***	0.214	0.006	***
Post-Doctorate				0.704	0.012	***	0.681	0.011	***	0.294	0.008	***	0.264	0.007	***	0.225	0.007	***

Notes: Author’s calculations. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. Coef.: Coefficient. S.E.: Standard Error.
Models 2 through 6 include fixed effects for geography.

Model 3 also includes fixed effects for Agency.
Model 4 also includes fixed effects for Occupation.
Model 5 also includes fixed effects for Agency and Occupation.
Model 6 also includes fixed effects for Agency, Occupation, and the Interaction of Agency and Occupation.
See Figure 1 and Table 1 for additional statistics.

APPENDIX B:

FEMALE COEFFICIENTS AND STANDARD ERRORS FOR EACH AGENCY BASED ON CHAPTER 3 MODELS

Table 36. Female Coefficients and Standard Errors for Each Agency Based on Chapter 3 Models (FedScope September 2014)

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
ARMED FORCES RETIREMENT HOME	ARMED FORCES RETIREMENT HOME	262	-0.060	0.049		-0.047	0.040		-0.002	0.026	
BROADCASTING BOARD OF GOVERNORS	BROADCASTING BOARD OF GOVERNORS	1,497	-0.060	0.011	***	-0.064	0.011	***	-0.037	0.010	***
COMMODITY FUTURES TRADING COMMISSION	COMMODITY FUTURES TRADING COMMISSION	616	-0.108	0.020	***	-0.063	0.016	***	-0.040	0.013	**
CONSUMER PRODUCT SAFETY COMMISSION	CONSUMER PRODUCT SAFETY COMMISSION	488	-0.042	0.024		-0.076	0.020	***	-0.004	0.016	
CORPORATION FOR NATIONAL AND COMMUNITY SERVICE	CORPORATION FOR NATIONAL AND COMMUNITY SERVICE	597	-0.132	0.031	***	-0.110	0.022	***	-0.072	0.020	***
COURT SERVICES AND OFFENDER SUPERVISION AGENCY FOR THE DISTRICT OF COLUMBIA	OFFICE OF THE DIRECTOR	824	-0.071	0.022	**	-0.070	0.016	***	-0.028	0.011	*
COURT SERVICES AND OFFENDER SUPERVISION AGENCY FOR THE DISTRICT OF COLUMBIA	PRETRIAL SERVICES AGENCY	341	-0.089	0.030	**	-0.070	0.024	**	-0.028	0.016	
DEFENSE NUCLEAR FACILITIES SAFETY BOARD	DEFENSE NUCLEAR FACILITIES SAFETY BOARD	101	-0.381	0.065	***	-0.184	0.042	***	-0.102	0.047	*
DEPARTMENT OF AGRICULTURE	AGRICULTURAL MARKETING SERVICE	1,775	-0.065	0.016	***	-0.092	0.011	***	-0.058	0.009	***
DEPARTMENT OF AGRICULTURE	AGRICULTURAL RESEARCH SERVICE	5,615	-0.188	0.011	***	-0.042	0.006	***	-0.037	0.005	***
DEPARTMENT OF AGRICULTURE	ANIMAL AND PLANT HEALTH INSPECTION SERVICE	5,385	-0.064	0.010	***	-0.066	0.007	***	-0.018	0.005	***
DEPARTMENT OF AGRICULTURE	CIVIL RIGHTS	125	-0.029	0.070		-0.075	0.052		-0.039	0.037	

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
DEPARTMENT OF AGRICULTURE	DEPARTMENTAL ADMINISTRATION	392	0.118	0.042	**	0.101	0.035	**	-0.005	0.025	
DEPARTMENT OF AGRICULTURE	ECONOMIC RESEARCH SERVICE	303	-0.236	0.031	***	-0.021	0.024		0.009	0.023	
DEPARTMENT OF AGRICULTURE	FARM SERVICE AGENCY	3,810	-0.226	0.010	***	-0.140	0.008	***	-0.125	0.007	***
DEPARTMENT OF AGRICULTURE	FOOD AND NUTRITION SERVICE	1,358	-0.041	0.015	**	-0.026	0.013	*	-0.011	0.010	
DEPARTMENT OF AGRICULTURE	FOOD SAFETY AND INSPECTION SERVICE	8,675	-0.057	0.007	***	-0.003	0.004		-0.011	0.002	***
DEPARTMENT OF AGRICULTURE	FOREIGN AGRICULTURAL SERVICE	528	-0.215	0.025	***	-0.074	0.019	***	-0.040	0.015	**
DEPARTMENT OF AGRICULTURE	FOREST SERVICE	24,480	0.010	0.004	*	-0.044	0.003	***	-0.028	0.002	***
DEPARTMENT OF AGRICULTURE	GRAIN INSPECTION, PACKERS AND STOCKYARDS ADMINISTRATION	597	-0.057	0.033		-0.122	0.020	***	-0.060	0.017	***
DEPARTMENT OF AGRICULTURE	NATIONAL AGRICULTURAL STATISTICS SERVICE	920	-0.206	0.025	***	-0.105	0.015	***	-0.067	0.011	***
DEPARTMENT OF AGRICULTURE	NATIONAL INSTITUTE OF FOOD AND AGRICULTURE	319	-0.226	0.047	***	-0.025	0.030		-0.037	0.024	
DEPARTMENT OF AGRICULTURE	NATURAL RESOURCES CONSERVATION SERVICE	10,076	-0.055	0.006	***	-0.035	0.004	***	-0.026	0.003	***
DEPARTMENT OF AGRICULTURE	OFFICE OF THE CHIEF FINANCIAL OFFICER	1,323	-0.161	0.021	***	-0.171	0.017	***	-0.061	0.012	***
DEPARTMENT OF AGRICULTURE	OFFICE OF THE CHIEF INFORMATION OFFICER	1,008	-0.019	0.015		-0.074	0.013	***	-0.049	0.013	***
DEPARTMENT OF AGRICULTURE	OFFICE OF THE GENERAL COUNSEL	261	-0.262	0.040	***	-0.066	0.022	**	-0.018	0.017	

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
DEPARTMENT OF AGRICULTURE	OFFICE OF THE INSPECTOR GENERAL	480	-0.097	0.023	***	-0.107	0.020	***	-0.036	0.015	*
DEPARTMENT OF AGRICULTURE	RISK MANAGEMENT AGENCY	426	-0.137	0.028	***	-0.115	0.024	***	-0.058	0.020	**
DEPARTMENT OF AGRICULTURE	RURAL HOUSING SERVICE	4,206	-0.210	0.010	***	-0.136	0.008	***	-0.075	0.006	***
DEPARTMENT OF AGRICULTURE	RURAL UTILITIES SERVICE	250	-0.220	0.036	***	-0.081	0.040	*	-0.005	0.033	
DEPARTMENT OF COMMERCE	BUREAU OF ECONOMIC ANALYSIS	443	-0.021	0.030		-0.021	0.024		0.018	0.021	
DEPARTMENT OF COMMERCE	BUREAU OF INDUSTRY AND SECURITY	345	-0.172	0.029	***	-0.123	0.026	***	-0.088	0.028	**
DEPARTMENT OF COMMERCE	BUREAU OF THE CENSUS	5,107	-0.183	0.011	***	-0.076	0.008	***	-0.024	0.005	***
DEPARTMENT OF COMMERCE	ECONOMIC DEVELOPMENT ADMINISTRATION	153	-0.158	0.042	***	-0.183	0.040	***	-0.132	0.038	***
DEPARTMENT OF COMMERCE	INTERNATIONAL TRADE ADMINISTRATION	1,258	-0.103	0.015	***	-0.048	0.012	***	-0.033	0.011	**
DEPARTMENT OF COMMERCE	NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY	2,738	-0.216	0.016	***	-0.081	0.011	***	-0.045	0.009	***
DEPARTMENT OF COMMERCE	NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	11,317	-0.088	0.007	***	-0.079	0.005	***	-0.045	0.004	***
DEPARTMENT OF COMMERCE	NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION	306	-0.197	0.036	***	-0.160	0.032	***	-0.093	0.030	**
DEPARTMENT OF COMMERCE	OFFICE OF THE INSPECTOR GENERAL	149	-0.143	0.045	**	-0.076	0.038	*	-0.006	0.035	

Parent Agency/Department	Agency Name	Agency Size	Model 1 Female Coef.	Model 1 S.E.		Model 2 Female Coef.	Model 2 S.E.		Model 3 Female Coef.	Model 3 S.E.	
DEPARTMENT OF COMMERCE	OFFICE OF THE SECRETARY	710	-0.097	0.025	***	-0.063	0.021	**	-0.059	0.019	**
DEPARTMENT OF COMMERCE	PATENT AND TRADEMARK OFFICE	12,130	-0.070	0.006	***	-0.025	0.004	***	-0.006	0.003	
DEPARTMENT OF DEFENSE	DEFENSE ACQUISITION UNIVERSITY	177	-0.246	0.052	***	-0.179	0.046	***	-0.119	0.047	*
DEPARTMENT OF DEFENSE	DEFENSE COMMISSARY AGENCY	10,710	-0.096	0.007	***	-0.142	0.005	***	-0.053	0.004	***
DEPARTMENT OF DEFENSE	DEFENSE CONTRACT AUDIT AGENCY	4,979	-0.046	0.009	***	-0.013	0.006	*	0.003	0.005	
DEPARTMENT OF DEFENSE	DEFENSE CONTRACT MANAGEMENT AGENCY	11,403	-0.060	0.005	***	-0.113	0.004	***	-0.051	0.004	***
DEPARTMENT OF DEFENSE	DEFENSE FINANCE AND ACCOUNTING SERVICE	10,801	-0.112	0.007	***	-0.082	0.005	***	-0.023	0.003	***
DEPARTMENT OF DEFENSE	DEFENSE HEALTH AGENCY	5,620	-0.073	0.011	***	-0.037	0.009	***	-0.037	0.005	***
DEPARTMENT OF DEFENSE	DEFENSE HUMAN RESOURCES ACTIVITY	1,041	-0.075	0.017	***	-0.085	0.015	***	-0.048	0.012	***
DEPARTMENT OF DEFENSE	DEFENSE INFORMATION SYSTEMS AGENCY	5,883	-0.075	0.007	***	-0.110	0.006	***	-0.061	0.005	***
DEPARTMENT OF DEFENSE	DEFENSE LEGAL SERVICES AGENCY	139	-0.206	0.042	***	-0.122	0.041	**	-0.041	0.019	*
DEPARTMENT OF DEFENSE	DEFENSE LOGISTICS AGENCY	23,299	0.071	0.005	***	-0.027	0.004	***	-0.038	0.003	***
DEPARTMENT OF DEFENSE	DEFENSE MEDIA ACTIVITY	575	-0.102	0.024	***	-0.131	0.022	***	-0.081	0.020	***
DEPARTMENT OF DEFENSE	DEFENSE MICROELECTRONICS ACTIVITY	185	-0.053	0.056		-0.070	0.037		-0.073	0.042	
DEPARTMENT OF DEFENSE	DEFENSE SECURITY COOPERATION AGENCY	529	-0.118	0.032	***	-0.147	0.023	***	-0.090	0.020	***
DEPARTMENT OF DEFENSE	DEFENSE SECURITY SERVICE	864	-0.058	0.016	***	-0.067	0.013	***	-0.025	0.012	*

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
DEPARTMENT OF DEFENSE	DEFENSE TECHNICAL INFORMATION CENTER	202	-0.221	0.042	***	-0.195	0.041	***	-0.066	0.035	
DEPARTMENT OF DEFENSE	DEFENSE TECHNOLOGY SECURITY ADMINISTRATION	123	-0.232	0.036	***	-0.144	0.029	***	-0.113	0.030	***
DEPARTMENT OF DEFENSE	DEFENSE THREAT REDUCTION AGENCY	1,196	-0.132	0.017	***	-0.129	0.015	***	-0.099	0.014	***
DEPARTMENT OF DEFENSE	DEPARTMENT OF DEFENSE EDUCATION ACTIVITY	1,726	0.077	0.024	**	-0.073	0.017	***	-0.045	0.010	***
DEPARTMENT OF DEFENSE	MISSILE DEFENSE AGENCY	2,362	-0.124	0.014	***	-0.086	0.010	***	-0.051	0.010	***
DEPARTMENT OF DEFENSE	NATIONAL DEFENSE UNIVERSITY	229	-0.079	0.043		-0.118	0.034	***	-0.064	0.031	*
DEPARTMENT OF DEFENSE	OFFICE OF THE INSPECTOR GENERAL	1,508	-0.106	0.014	***	-0.081	0.011	***	-0.027	0.009	**
DEPARTMENT OF DEFENSE	OFFICE OF THE SECRETARY OF DEFENSE	1,672	-0.150	0.011	***	-0.100	0.009	***	-0.073	0.008	***
DEPARTMENT OF DEFENSE	ORGANIZATION OF THE JOINT CHIEFS OF STAFF	942	-0.185	0.019	***	-0.144	0.019	***	-0.099	0.017	***
DEPARTMENT OF DEFENSE	PENTAGON FORCE PROTECTION AGENCY	1,173	0.024	0.019		0.000	0.017		-0.002	0.015	
DEPARTMENT OF DEFENSE	WASHINGTON HEADQUARTERS SERVICES	1,949	0.008	0.016		-0.003	0.014		-0.063	0.011	***
DEPARTMENT OF EDUCATION	FEDERAL STUDENT AID	1,239	-0.090	0.017	***	-0.053	0.014	***	-0.033	0.012	**
DEPARTMENT OF EDUCATION	INSTITUTE OF EDUCATION SCIENCES	139	-0.114	0.046	*	-0.043	0.034		-0.035	0.031	
DEPARTMENT OF EDUCATION	OFFICE FOR CIVIL RIGHTS	532	-0.042	0.025		-0.003	0.018		-0.005	0.012	
DEPARTMENT OF EDUCATION	OFFICE OF ELEMENTARY AND SECONDARY EDUCATION	197	-0.021	0.053		0.009	0.039		-0.007	0.035	

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
DEPARTMENT OF EDUCATION	OFFICE OF INSPECTOR GENERAL	242	-0.072	0.032	*	-0.031	0.022		-0.034	0.020	
DEPARTMENT OF EDUCATION	OFFICE OF MANAGEMENT	174	-0.008	0.057		0.043	0.040		0.031	0.039	
DEPARTMENT OF EDUCATION	OFFICE OF POSTSECONDARY EDUCATION	173	-0.043	0.050		0.008	0.038		0.031	0.036	
DEPARTMENT OF EDUCATION	OFFICE OF SPECIAL EDUCATION AND REHABILITATIVE SERVICES	236	-0.052	0.042		-0.018	0.030		-0.019	0.024	
DEPARTMENT OF EDUCATION	OFFICE OF THE CHIEF FINANCIAL OFFICER	173	-0.039	0.053		-0.001	0.032		-0.034	0.030	
DEPARTMENT OF EDUCATION	OFFICE OF THE CHIEF INFORMATION OFFICER	127	-0.189	0.048	***	-0.138	0.039	***	-0.110	0.039	**
DEPARTMENT OF ENERGY	DEPARTMENT OF ENERGY	12,942	-0.105	0.006	***	-0.118	0.004	***	-0.080	0.004	***
DEPARTMENT OF ENERGY	FEDERAL ENERGY REGULATORY COMMISSION	1,397	-0.112	0.017	***	-0.048	0.012	***	-0.017	0.010	
DEPARTMENT OF HEALTH AND HUMAN SERVICES	ADMINISTRATION FOR CHILDREN AND FAMILIES	1,146	-0.086	0.017	***	-0.033	0.014	*	-0.038	0.012	**
DEPARTMENT OF HEALTH AND HUMAN SERVICES	ADMINISTRATION FOR COMMUNITY LIVING	150	-0.124	0.050	*	-0.044	0.042		-0.022	0.041	
DEPARTMENT OF HEALTH AND HUMAN SERVICES	AGENCY FOR HEALTHCARE RESEARCH AND QUALITY	271	-0.184	0.041	***	-0.050	0.030		-0.024	0.028	
DEPARTMENT OF HEALTH AND HUMAN SERVICES	AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY	225	-0.220	0.041	***	-0.065	0.030	*	-0.063	0.024	**
DEPARTMENT OF HEALTH AND HUMAN SERVICES	CENTERS FOR DISEASE CONTROL AND PREVENTION	8,510	-0.102	0.007	***	-0.068	0.005	***	-0.045	0.005	***
DEPARTMENT OF HEALTH AND HUMAN SERVICES	CENTERS FOR MEDICARE & MEDICAID SERVICES	5,578	-0.041	0.007	***	-0.031	0.006	***	-0.018	0.005	***
DEPARTMENT OF HEALTH AND HUMAN SERVICES	FOOD AND DRUG ADMINISTRATION	12,783	-0.055	0.006	***	-0.031	0.004	***	-0.017	0.003	***

Parent Agency/Department	Agency Name	Agency Size	Model 1 Female Coef.	Model 1 S.E.		Model 2 Female Coef.	Model 2 S.E.		Model 3 Female Coef.	Model 3 S.E.	
DEPARTMENT OF HEALTH AND HUMAN SERVICES	HEALTH RESOURCES AND SERVICES ADMINISTRATION	1,610	-0.052	0.017	**	-0.044	0.013	***	-0.031	0.011	**
DEPARTMENT OF HEALTH AND HUMAN SERVICES	INDIAN HEALTH SERVICE	12,868	-0.195	0.009	***	-0.078	0.005	***	-0.028	0.003	***
DEPARTMENT OF HEALTH AND HUMAN SERVICES	NATIONAL INSTITUTES OF HEALTH	13,271	-0.045	0.007	***	-0.023	0.005	***	-0.023	0.004	***
DEPARTMENT OF HEALTH AND HUMAN SERVICES	OFFICE OF INSPECTOR GENERAL	1,533	-0.050	0.011	***	-0.046	0.009	***	-0.016	0.008	*
DEPARTMENT OF HEALTH AND HUMAN SERVICES	OFFICE OF THE SECRETARY OF HEALTH AND HUMAN SERVICES	3,079	-0.123	0.013	***	-0.079	0.010	***	-0.036	0.008	***
DEPARTMENT OF HEALTH AND HUMAN SERVICES	PROGRAM SUPPORT CENTER	515	-0.077	0.033	*	-0.027	0.026		-0.010	0.021	
DEPARTMENT OF HEALTH AND HUMAN SERVICES	SUBSTANCE ABUSE AND MENTAL HEALTH SERVICES ADMINISTRATION	553	-0.076	0.030	*	-0.037	0.023		-0.011	0.016	
DEPARTMENT OF HOMELAND SECURITY	CITIZENSHIP AND IMMIGRATION SERVICES	12,873	-0.020	0.007	**	-0.043	0.005	***	-0.015	0.004	***
DEPARTMENT OF HOMELAND SECURITY	CUSTOMS AND BORDER PROTECTION	58,821	0.014	0.002	***	-0.058	0.002	***	-0.012	0.002	***
DEPARTMENT OF HOMELAND SECURITY	DHS HEADQUARTERS	2,910	-0.070	0.011	***	-0.061	0.008	***	-0.046	0.008	***
DEPARTMENT OF HOMELAND SECURITY	DOMESTIC NUCLEAR DETECTION OFFICE	121	-0.177	0.047	***	-0.002	0.032		0.006	0.036	
DEPARTMENT OF HOMELAND SECURITY	FEDERAL EMERGENCY MANAGEMENT AGENCY	4,814	-0.066	0.009	***	-0.091	0.007	***	-0.080	0.006	***
DEPARTMENT OF HOMELAND SECURITY	FEDERAL LAW ENFORCEMENT TRAINING CENTERS	1,037	-0.139	0.020	***	-0.172	0.016	***	-0.055	0.014	***
DEPARTMENT OF HOMELAND SECURITY	IMMIGRATION AND CUSTOMS ENFORCEMENT	18,683	-0.031	0.005	***	-0.073	0.004	***	-0.004	0.003	

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
DEPARTMENT OF HOMELAND SECURITY	NATIONAL PROTECTION AND PROGRAMS DIRECTORATE	2,862	-0.008	0.011		-0.060	0.010	***	-0.066	0.009	***
DEPARTMENT OF HOMELAND SECURITY	OFFICE OF THE INSPECTOR GENERAL	630	-0.060	0.019	**	-0.056	0.014	***	-0.012	0.014	
DEPARTMENT OF HOMELAND SECURITY	SCIENCE AND TECHNOLOGY DIRECTORATE	432	-0.106	0.035	**	-0.018	0.023		-0.045	0.021	*
DEPARTMENT OF HOMELAND SECURITY	TRANSPORTATION SECURITY ADMINISTRATION	49,897	-0.098	0.003	***	-0.062	0.002	***	-0.015	0.001	***
DEPARTMENT OF HOMELAND SECURITY	U.S. COAST GUARD	8,093	-0.065	0.008	***	-0.138	0.007	***	-0.064	0.005	***
DEPARTMENT OF HOMELAND SECURITY	U.S. SECRET SERVICE	5,950	-0.137	0.007	***	-0.095	0.005	***	-0.033	0.004	***
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	ASSISTANT SECRETARY FOR COMMUNITY PLANNING AND DEVELOPMENT	233	-0.062	0.038		-0.053	0.033		-0.039	0.031	
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	ASSISTANT SECRETARY FOR FAIR HOUSING AND EQUAL OPPORTUNITY	111	-0.202	0.061	**	-0.111	0.059		-0.048	0.047	
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	ASSISTANT SECRETARY FOR HOUSING--FEDERAL HOUSING COMMISSIONER	995	-0.094	0.020	***	-0.061	0.017	***	-0.045	0.014	**
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	ASSISTANT SECRETARY FOR POLICY DEVELOPMENT AND RESEARCH	110	-0.140	0.056	*	-0.075	0.049		-0.044	0.051	
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	ASSISTANT SECRETARY FOR PUBLIC AND INDIAN HOUSING	617	-0.090	0.022	***	-0.065	0.019	***	-0.053	0.017	**
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	GOVERNMENT NATIONAL MORTGAGE ASSOCIATION (GINNIE MAE)	114	-0.096	0.052		-0.046	0.054		-0.014	0.056	

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	OFFICE OF GENERAL COUNSEL	299	-0.180	0.035	***	-0.101	0.032	**	-0.014	0.018	
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	OFFICE OF INSPECTOR GENERAL	589	-0.029	0.018		-0.035	0.014	*	-0.013	0.013	
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	OFFICE OF THE CHIEF FINANCIAL OFFICER	153	-0.055	0.067		-0.046	0.038		-0.024	0.030	
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	OFFICE OF THE CHIEF HUMAN CAPITAL OFFICER	401	-0.038	0.034		-0.020	0.032		-0.026	0.027	
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	OFFICE OF THE CHIEF INFORMATION OFFICER	240	-0.051	0.035		-0.087	0.032	**	-0.027	0.029	
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	OFFICE OF THE CHIEF PROCUREMENT OFFICER	119	-0.062	0.045		-0.110	0.043	*	-0.068	0.039	
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	OFFICE OF THE SENIOR COORDINATOR FOR GREAT PLAINS	173	-0.046	0.045		-0.074	0.035	*	-0.025	0.027	
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	OFFICE OF THE SENIOR COORDINATOR FOR MID-ATLANTIC	523	-0.154	0.024	***	-0.094	0.023	***	-0.042	0.015	**
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	OFFICE OF THE SENIOR COORDINATOR FOR MIDWEST	535	-0.121	0.024	***	-0.090	0.022	***	-0.067	0.014	***
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	OFFICE OF THE SENIOR COORDINATOR FOR NEW ENGLAND	196	-0.137	0.036	***	-0.075	0.036	*	-0.042	0.027	

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	OFFICE OF THE SENIOR COORDINATOR FOR NEW YORK/NEW JERSEY	341	-0.138	0.031	***	-0.110	0.029	***	-0.045	0.021	*
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	OFFICE OF THE SENIOR COORDINATOR FOR NORTHWEST/ALASKA	177	-0.051	0.045		-0.033	0.041		0.000	0.026	
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	OFFICE OF THE SENIOR COORDINATOR FOR PACIFIC/HAWAII	498	-0.083	0.025	***	-0.044	0.023		-0.044	0.017	**
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	OFFICE OF THE SENIOR COORDINATOR FOR ROCKY MOUNTAINS	301	-0.050	0.031		-0.038	0.031		-0.007	0.020	
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	OFFICE OF THE SENIOR COORDINATOR FOR SOUTHEAST/CARIBBEAN	819	-0.085	0.020	***	-0.083	0.018	***	-0.040	0.012	***
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	OFFICE OF THE SENIOR COORDINATOR FOR SOUTHWEST	496	-0.083	0.026	**	-0.058	0.023	*	-0.059	0.016	***
DEPARTMENT OF JUSTICE	BUREAU OF ALCOHOL, TOBACCO, FIREARMS, AND EXPLOSIVES	4,562	-0.127	0.008	***	-0.109	0.006	***	-0.035	0.005	***
DEPARTMENT OF JUSTICE	BUREAU OF PRISONS/FEDERAL PRISON SYSTEM	38,529	0.041	0.003	***	-0.006	0.002	**	-0.009	0.001	***
DEPARTMENT OF JUSTICE	DRUG ENFORCEMENT ADMINISTRATION	9,118	-0.208	0.006	***	-0.135	0.005	***	-0.030	0.004	***
DEPARTMENT OF JUSTICE	EXECUTIVE OFFICE FOR IMMIGRATION REVIEW	1,173	-0.271	0.029	***	-0.062	0.017	***	-0.010	0.008	
DEPARTMENT OF JUSTICE	EXECUTIVE OFFICE FOR U.S. ATTORNEYS AND THE OFFICES OF THE U.S. ATTORNEYS	10,064	-0.397	0.008	***	-0.098	0.005	***	-0.022	0.003	***

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
DEPARTMENT OF JUSTICE	FEDERAL BUREAU OF INVESTIGATION	33,631	-0.147	0.003	***	-0.100	0.002	***	-0.028	0.002	***
DEPARTMENT OF JUSTICE	OFFICE OF JUSTICE PROGRAMS	605	-0.058	0.021	**	-0.026	0.017		-0.026	0.015	
DEPARTMENT OF JUSTICE	OFFICE OF THE INSPECTOR GENERAL	402	-0.081	0.030	**	-0.029	0.020		0.017	0.016	
DEPARTMENT OF JUSTICE	OFFICES, BOARDS AND DIVISIONS	5,611	-0.184	0.009	***	-0.060	0.006	***	-0.015	0.004	***
DEPARTMENT OF JUSTICE	U.S. MARSHALS SERVICE	5,306	-0.067	0.008	***	-0.128	0.006	***	-0.027	0.005	***
DEPARTMENT OF JUSTICE	U.S. TRUSTEE PROGRAM	1,091	-0.352	0.024	***	-0.108	0.016	***	-0.011	0.007	
DEPARTMENT OF LABOR	BUREAU OF LABOR STATISTICS	1,968	-0.066	0.013	***	-0.035	0.010	***	-0.012	0.008	
DEPARTMENT OF LABOR	EMPLOYEE BENEFITS SECURITY ADMINISTRATION	949	-0.062	0.021	**	-0.026	0.015		-0.003	0.012	
DEPARTMENT OF LABOR	EMPLOYMENT AND TRAINING ADMINISTRATION	1,059	-0.058	0.017	***	-0.060	0.015	***	-0.017	0.012	
DEPARTMENT OF LABOR	MINE SAFETY AND HEALTH ADMINISTRATION	2,285	-0.244	0.015	***	-0.335	0.012	***	-0.035	0.010	***
DEPARTMENT OF LABOR	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION	2,138	-0.091	0.014	***	-0.127	0.011	***	-0.021	0.008	*
DEPARTMENT OF LABOR	OFFICE OF FEDERAL CONTRACT COMPLIANCE PROGRAMS	644	-0.006	0.025		-0.033	0.020		0.002	0.013	
DEPARTMENT OF LABOR	OFFICE OF LABOR-MANAGEMENT STANDARDS	203	-0.153	0.044	***	-0.114	0.039	**	-0.024	0.035	
DEPARTMENT OF LABOR	OFFICE OF THE ASSISTANT SECRETARY FOR ADMINISTRATION AND MANAGEMENT	717	-0.021	0.029		-0.046	0.023	*	-0.028	0.018	
DEPARTMENT OF LABOR	OFFICE OF THE CHIEF FINANCIAL OFFICER	100	-0.018	0.088		0.011	0.068		0.117	0.054	*

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
DEPARTMENT OF LABOR	OFFICE OF THE INSPECTOR GENERAL	374	-0.091	0.024	***	-0.066	0.019	***	-0.047	0.020	*
DEPARTMENT OF LABOR	OFFICE OF THE SECRETARY OF LABOR	227	-0.208	0.062	***	-0.070	0.039		-0.063	0.029	*
DEPARTMENT OF LABOR	OFFICE OF THE SOLICITOR	663	-0.183	0.026	***	-0.025	0.016		0.013	0.009	
DEPARTMENT OF LABOR	OFFICE OF WORKERS' COMPENSATION PROGRAMS	1,539	-0.027	0.015		0.000	0.013		-0.014	0.008	
DEPARTMENT OF LABOR	VETERANS EMPLOYMENT AND TRAINING SERVICES	221	-0.123	0.041	**	-0.133	0.045	**	-0.090	0.037	*
DEPARTMENT OF LABOR	WAGE AND HOUR DIVISION	1,720	-0.037	0.015	*	-0.056	0.011	***	-0.015	0.009	
DEPARTMENT OF STATE	DEPARTMENT OF STATE	10,063	-0.109	0.007	***	-0.091	0.005	***	-0.042	0.004	***
DEPARTMENT OF THE AIR FORCE	AF INSTALLATION AND MISSION SUPPORT	1,742	-0.088	0.014	***	-0.097	0.010	***	-0.052	0.008	***
DEPARTMENT OF THE AIR FORCE	AIR COMBAT COMMAND	9,658	-0.203	0.007	***	-0.211	0.006	***	-0.050	0.004	***
DEPARTMENT OF THE AIR FORCE	AIR EDUCATION AND TRAINING COMMAND	13,516	-0.100	0.006	***	-0.130	0.005	***	-0.048	0.003	***
DEPARTMENT OF THE AIR FORCE	AIR FORCE AUDIT AGENCY	573	-0.086	0.020	***	-0.064	0.012	***	-0.041	0.010	***
DEPARTMENT OF THE AIR FORCE	AIR FORCE CIVILIAN CAREER TRAINING	1,693	-0.010	0.016		-0.069	0.009	***	-0.043	0.009	***
DEPARTMENT OF THE AIR FORCE	AIR FORCE DISTRICT OF WASHINGTON	922	-0.128	0.024	***	-0.149	0.020	***	-0.035	0.016	*
DEPARTMENT OF THE AIR FORCE	AIR FORCE ELEMENTS	720	-0.261	0.035	***	-0.117	0.022	***	-0.056	0.016	***
DEPARTMENT OF THE AIR FORCE	AIR FORCE ELEMENTS, U.S. CENTRAL COMMAND	404	-0.097	0.031	**	-0.105	0.029	***	-0.078	0.025	**

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
DEPARTMENT OF THE AIR FORCE	AIR FORCE ELEMENTS, U.S. SPECIAL OPERATIONS COMMAND	933	-0.140	0.018	***	-0.141	0.017	***	-0.093	0.014	***
DEPARTMENT OF THE AIR FORCE	AIR FORCE ELEMENTS, U.S. STRATEGIC COMMAND	1,906	-0.120	0.014	***	-0.148	0.011	***	-0.086	0.010	***
DEPARTMENT OF THE AIR FORCE	AIR FORCE ELEMENTS, U.S. TRANSPORTATION COMMAND	603	-0.174	0.024	***	-0.179	0.022	***	-0.099	0.019	***
DEPARTMENT OF THE AIR FORCE	AIR FORCE GLOBAL STRIKE COMMAND	2,294	-0.190	0.013	***	-0.225	0.011	***	-0.055	0.010	***
DEPARTMENT OF THE AIR FORCE	AIR FORCE INTELLIGENCE, SURVEILLANCE, & RECONNAISSANCE AGENCY	2,324	-0.142	0.012	***	-0.144	0.010	***	-0.079	0.008	***
DEPARTMENT OF THE AIR FORCE	AIR FORCE LEGAL OPERATIONS AGENCY	237	-0.224	0.049	***	-0.161	0.039	***	-0.054	0.025	*
DEPARTMENT OF THE AIR FORCE	AIR FORCE MATERIEL COMMAND	58,136	-0.010	0.003	***	-0.086	0.002	***	-0.048	0.002	***
DEPARTMENT OF THE AIR FORCE	AIR FORCE MEDICAL OPERATIONS AGENCY	155	-0.244	0.061	***	-0.083	0.048		-0.070	0.034	*
DEPARTMENT OF THE AIR FORCE	AIR FORCE OFFICE OF SPECIAL INVESTIGATIONS	783	-0.153	0.020	***	-0.153	0.017	***	-0.052	0.013	***
DEPARTMENT OF THE AIR FORCE	AIR FORCE OPERATIONAL TEST AND EVALUATION CENTER	225	-0.278	0.041	***	-0.202	0.039	***	-0.132	0.035	***
DEPARTMENT OF THE AIR FORCE	AIR FORCE PERSONNEL CENTER	1,447	-0.078	0.015	***	-0.125	0.015	***	-0.061	0.011	***
DEPARTMENT OF THE AIR FORCE	AIR FORCE PERSONNEL OPERATIONS AGENCY	238	-0.019	0.025		-0.060	0.024	*	-0.062	0.021	**
DEPARTMENT OF THE AIR FORCE	AIR FORCE SPECIAL OPERATIONS COMMAND	1,542	-0.245	0.016	***	-0.233	0.014	***	-0.066	0.012	***
DEPARTMENT OF THE AIR FORCE	AIR FORCE TECHNICAL APPLICATIONS CENTER	404	-0.301	0.031	***	-0.265	0.027	***	-0.079	0.020	***

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
DEPARTMENT OF THE AIR FORCE	AIR MOBILITY COMMAND	7,845	-0.149	0.007	***	-0.187	0.006	***	-0.052	0.005	***
DEPARTMENT OF THE AIR FORCE	AIR NATIONAL GUARD	612	-0.112	0.025	***	-0.092	0.023	***	-0.046	0.017	**
DEPARTMENT OF THE AIR FORCE	AIR NATIONAL GUARD SUPPORT CENTER	673	-0.035	0.022		-0.092	0.020	***	-0.040	0.016	*
DEPARTMENT OF THE AIR FORCE	AIR NATIONAL GUARD UNITS (TITLE 32)	18,549	-0.102	0.005	***	-0.081	0.004	***	-0.032	0.003	***
DEPARTMENT OF THE AIR FORCE	HEADQUARTERS, AIR FORCE RESERVE COMMAND	12,239	-0.152	0.006	***	-0.177	0.005		-0.050	0.003	***
DEPARTMENT OF THE AIR FORCE	HEADQUARTERS, AIR FORCE SPACE COMMAND	7,225	-0.105	0.009	***	-0.155	0.007	***	-0.060	0.005	***
DEPARTMENT OF THE AIR FORCE	HEADQUARTERS, AIR FORCE WEATHER AGENCY	311	-0.118	0.037	**	-0.129	0.034	***	-0.063	0.025	*
DEPARTMENT OF THE AIR FORCE	HQ USAF AND SUPPORT ELEMENTS	1,786	-0.160	0.012	***	-0.117	0.011	***	-0.083	0.010	***
DEPARTMENT OF THE AIR FORCE	PACIFIC AIR FORCES	2,766	-0.225	0.013	***	-0.251	0.010	***	-0.059	0.008	***
DEPARTMENT OF THE AIR FORCE	U.S. AIR FORCE ACADEMY	960	-0.126	0.026	***	-0.124	0.019	***	-0.050	0.012	***
DEPARTMENT OF THE AIR FORCE	U.S. AIR FORCES, EUROPE	1,127	-0.216	0.018	***	-0.206	0.017	***	-0.068	0.013	***
DEPARTMENT OF THE AIR FORCE	U.S. NORTHERN COMMAND	668	-0.148	0.027	***	-0.152	0.025	***	-0.114	0.020	***
DEPARTMENT OF THE AIR FORCE	U.S. SPECIAL OPERATIONS COMMAND (ANG, TITLE 32)	178	-0.073	0.051		-0.052	0.038		-0.002	0.033	
DEPARTMENT OF THE ARMY	21ST THEATER SUSTAINMENT COMMAND (TSC)	279	-0.142	0.035	***	-0.145	0.032	***	-0.031	0.023	
DEPARTMENT OF THE ARMY	ARMY NATIONAL GUARD UNITS (TITLE 32)	25,460	-0.076	0.004	***	-0.083	0.003	***	-0.027	0.002	***

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
DEPARTMENT OF THE ARMY	FIELD OPERATING OFFICES OF THE OFFICE OF THE SECRETARY OF THE ARMY	1,793	0.049	0.019	*	-0.066	0.012	***	-0.056	0.010	***
DEPARTMENT OF THE ARMY	HEADQUARTERS, AMC	734	-0.125	0.019	***	-0.127	0.019	***	-0.103	0.017	***
DEPARTMENT OF THE ARMY	HQDA FIELD OPERATING AGENCIES AND STAFF SUPPORT AGENCIES AND STAFF SUPPORT AGENCIES	5,941	-0.126	0.010	***	-0.132	0.008	***	-0.072	0.006	***
DEPARTMENT OF THE ARMY	IMMEDIATE OFFICE OF THE CHIEF OF STAFF OF THE ARMY	1,379	-0.146	0.013	***	-0.102	0.013	***	-0.069	0.012	***
DEPARTMENT OF THE ARMY	IMMEDIATE OFFICE OF THE COMMANDER-IN-CHIEF OF THE U.S. ARMY EUROPE AND SEVENTH ARMY	890	-0.044	0.023		-0.084	0.020	***	-0.035	0.015	*
DEPARTMENT OF THE ARMY	JOINT ACTIVITIES	2,116	-0.081	0.014	***	-0.112	0.011	***	-0.078	0.010	***
DEPARTMENT OF THE ARMY	JOINT SERVICES AND ACTIVITIES SUPPORTED BY THE OFFICE, SECRETARY OF THE ARMY	1,003	0.034	0.023		-0.004	0.020		-0.053	0.015	***
DEPARTMENT OF THE ARMY	MATERIEL ACQUISITION ACTIVITIES	376	-0.156	0.033	***	-0.088	0.020	***	-0.064	0.019	***
DEPARTMENT OF THE ARMY	MATERIEL READINESS ACTIVITIES	299	-0.124	0.028	***	-0.176	0.026	***	-0.101	0.023	***
DEPARTMENT OF THE ARMY	OFFICE OF THE CHIEF OF THE NATIONAL GUARD BUREAU	879	-0.024	0.023		-0.105	0.019	***	-0.079	0.016	***
DEPARTMENT OF THE ARMY	OFFICE OF THE SECRETARY OF THE ARMY	980	-0.142	0.017	***	-0.102	0.015	***	-0.087	0.014	***

Parent Agency/Department	Agency Name	Agency Size	Model 1 Female Coef.	Model 1 S.E.	Model 1	Model 2 Female Coef.	Model 2 S.E.	Model 2	Model 3 Female Coef.	Model 3 S.E.	Model 3
DEPARTMENT OF THE ARMY	SEVENTH ARMY TRAINING COMMAND	284	-0.001	0.055		-0.012	0.048		0.062	0.046	
DEPARTMENT OF THE ARMY	U. S. ARMY ACCESSION COMMAND	2,701	-0.033	0.010	***	-0.115	0.009	***	-0.040	0.006	***
DEPARTMENT OF THE ARMY	U. S. ARMY CONTRACTING COMMAND	4,735	-0.032	0.008	***	-0.072	0.006	***	-0.051	0.006	***
DEPARTMENT OF THE ARMY	U. S. ARMY SPACE AND MISSILE DEFENSE COMMAND/U. S. ARMY FORCES STRATEGIC COMMAND	844	-0.143	0.022	***	-0.174	0.017	***	-0.072	0.014	***
DEPARTMENT OF THE ARMY	U. S. MILITARY ENTRANCE PROCESSING COMMAND	1,978	-0.064	0.016	***	-0.065	0.010	***	-0.019	0.006	**
DEPARTMENT OF THE ARMY	U.S. ARMY ACQUISITION SUPPORT CENTER	4,638	-0.212	0.009	***	-0.162	0.007	***	-0.083	0.006	***
DEPARTMENT OF THE ARMY	U.S. ARMY AVIATION AND MISSILE COMMAND	8,413	0.051	0.007	***	-0.096	0.005	***	-0.070	0.004	***
DEPARTMENT OF THE ARMY	U.S. ARMY CENTRAL	167	-0.072	0.046		-0.118	0.039	**	-0.014	0.040	
DEPARTMENT OF THE ARMY	U.S. ARMY CHEMICAL MATERIALS ACTIVITY	552	0.228	0.046	***	-0.012	0.025		-0.037	0.019	
DEPARTMENT OF THE ARMY	U.S. ARMY COMMUNICATIONS ELECTRONICS COMMAND	6,094	0.024	0.010	*	-0.106	0.006	***	-0.053	0.005	***
DEPARTMENT OF THE ARMY	U.S. ARMY CORPS OF ENGINEERS	29,840	-0.099	0.004	***	-0.123	0.003	***	-0.045	0.002	***
DEPARTMENT OF THE ARMY	U.S. ARMY CRIMINAL INVESTIGATION COMMAND	681	-0.166	0.026	***	-0.189	0.024	***	-0.046	0.015	**
DEPARTMENT OF THE ARMY	U.S. ARMY ELEMENT SHAPE	146	-0.229	0.073	**	-0.186	0.067	**	-0.036	0.057	
DEPARTMENT OF THE ARMY	U.S. ARMY FORCES COMMAND	2,411	-0.215	0.012	***	-0.204	0.011	***	-0.089	0.009	***

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
DEPARTMENT OF THE ARMY	U.S. ARMY INSTALLATION MANAGEMENT COMMAND	25,095	0.020	0.005	***	-0.084	0.004	***	-0.064	0.003	***
DEPARTMENT OF THE ARMY	U.S. ARMY INTELLIGENCE AND SECURITY COMMAND	3,171	-0.118	0.009	***	-0.121	0.009	***	-0.051	0.007	***
DEPARTMENT OF THE ARMY	U.S. ARMY JOINT MUNITIONS COMMAND	4,285	0.059	0.011	***	-0.070	0.007	***	-0.065	0.006	***
DEPARTMENT OF THE ARMY	U.S. ARMY MEDICAL COMMAND	36,941	-0.185	0.005		-0.086	0.003	***	-0.037	0.002	***
DEPARTMENT OF THE ARMY	U.S. ARMY MILITARY DISTRICT OF WASHINGTON	378	0.045	0.038		-0.055	0.032		-0.095	0.029	**
DEPARTMENT OF THE ARMY	U.S. ARMY MILITARY SURFACE DEPLOYMENT AND DISTRIBUTION COMMAND	1,182	0.017	0.021		-0.138	0.016	***	-0.090	0.013	***
DEPARTMENT OF THE ARMY	U.S. ARMY NETWORK ENTERPRISE TECHNOLOGY COMMAND/9TH ARMY SIGNAL COMMAND	4,482	-0.050	0.008	***	-0.112	0.008	***	-0.059	0.006	***
DEPARTMENT OF THE ARMY	U.S. ARMY NORTH	315	-0.171	0.033	***	-0.086	0.035	*	-0.048	0.033	
DEPARTMENT OF THE ARMY	U.S. ARMY RESEARCH, DEVELOPMENT AND ENGINEERING COMMAND	13,148	-0.162	0.005	***	-0.103	0.004	***	-0.050	0.004	***
DEPARTMENT OF THE ARMY	U.S. ARMY RESERVE COMMAND	8,965	-0.042	0.006	***	-0.072	0.004	***	-0.023	0.003	***
DEPARTMENT OF THE ARMY	U.S. ARMY SECURITY ASSISTANCE COMMAND	492	-0.094	0.028	***	-0.168	0.024	***	-0.096	0.022	***
DEPARTMENT OF THE ARMY	U.S. ARMY SOUTH	265	-0.149	0.034	***	-0.180	0.033	***	-0.079	0.036	*
DEPARTMENT OF THE ARMY	U.S. ARMY SUSTAINMENT COMMAND	3,938	-0.066	0.012	***	-0.117	0.010	***	-0.058	0.007	***

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
DEPARTMENT OF THE ARMY	U.S. ARMY TANK-AUTOMOTIVE AND ARMAMENT COMMAND (TACOM)	10,594	0.085	0.007	***	-0.078	0.004	***	-0.060	0.004	***
DEPARTMENT OF THE ARMY	U.S. ARMY TEST AND EVALUATION COMMAND	3,733	-0.115	0.012	***	-0.109	0.008	***	-0.057	0.007	***
DEPARTMENT OF THE ARMY	U.S. ARMY TRAINING AND DOCTRINE COMMAND	9,219	-0.153	0.007	***	-0.178	0.007	***	-0.079	0.005	***
DEPARTMENT OF THE ARMY	U.S. ARMY WAR COLLEGE	217	-0.196	0.044	***	-0.173	0.044	***	-0.068	0.038	
DEPARTMENT OF THE ARMY	U.S. ARMY, PACIFIC	1,288	-0.090	0.019	***	-0.146	0.016	***	-0.069	0.013	***
DEPARTMENT OF THE ARMY	U.S. MILITARY ACADEMY	477	-0.144	0.027	***	-0.138	0.026	***	-0.036	0.018	*
DEPARTMENT OF THE ARMY	U.S. SPECIAL OPERATIONS COMMAND (ARMY)	1,591	-0.161	0.015	***	-0.189	0.015	***	-0.091	0.012	***
DEPARTMENT OF THE ARMY	UNITED STATES ARMY CYBER COMMAND	176	-0.157	0.036	***	-0.195	0.039	***	-0.053	0.042	
DEPARTMENT OF THE ARMY	US ARMY AFRICA/SOUTHERN EUROPEAN TASK FORCE (USAFRAF/SETAF)	179	-0.077	0.041		-0.113	0.041	**	-0.055	0.037	
DEPARTMENT OF THE INTERIOR	BUREAU OF LAND MANAGEMENT	7,698	-0.064	0.007	***	-0.057	0.005	***	-0.017	0.004	***
DEPARTMENT OF THE INTERIOR	BUREAU OF OCEAN ENERGY MANAGEMENT	551	-0.154	0.028	***	-0.037	0.020		-0.005	0.018	
DEPARTMENT OF THE INTERIOR	BUREAU OF RECLAMATION	4,923	-0.127	0.010	***	-0.142	0.008	***	-0.033	0.006	***
DEPARTMENT OF THE INTERIOR	BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT	778	-0.071	0.028	*	-0.154	0.021	***	-0.056	0.020	**

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
DEPARTMENT OF THE INTERIOR	GEOLOGICAL SURVEY	6,559	-0.098	0.010	***	-0.055	0.006	***	-0.053	0.005	***
DEPARTMENT OF THE INTERIOR	INDIAN AFFAIRS	3,863	-0.114	0.012	***	-0.107	0.009	***	-0.053	0.008	***
DEPARTMENT OF THE INTERIOR	NATIONAL PARK SERVICE	12,813	-0.016	0.006	*	-0.053	0.005	***	-0.024	0.004	***
DEPARTMENT OF THE INTERIOR	OFFICE OF SURFACE MINING, RECLAMATION AND ENFORCEMENT	421	-0.130	0.033	***	-0.092	0.024	***	-0.078	0.021	***
DEPARTMENT OF THE INTERIOR	OFFICE OF THE INSPECTOR GENERAL	263	-0.072	0.033	*	-0.055	0.026	*	-0.006	0.027	
DEPARTMENT OF THE INTERIOR	OFFICE OF THE SECRETARY OF THE INTERIOR	3,397	-0.163	0.014	***	-0.084	0.010	***	-0.030	0.008	***
DEPARTMENT OF THE INTERIOR	OFFICE OF THE SOLICITOR	310	-0.221	0.037	***	-0.096	0.023	***	-0.046	0.015	**
DEPARTMENT OF THE INTERIOR	U.S. FISH AND WILDLIFE SERVICE	7,499	-0.039	0.008	***	-0.046	0.005	***	-0.022	0.005	***
DEPARTMENT OF THE NAVY	BUREAU OF NAVAL PERSONNEL	4,218	-0.163	0.014	***	-0.135	0.010	***	-0.046	0.006	***
DEPARTMENT OF THE NAVY	COMMANDER, NAVY INSTALLATIONS	10,567	0.072	0.007	***	-0.066	0.006	***	-0.041	0.005	***
DEPARTMENT OF THE NAVY	DEPARTMENT OF THE NAVY/ASSISTANT FOR ADMINISTRATION (DON/AA)	4,446	-0.216	0.012	***	-0.162	0.009	***	-0.063	0.007	***
DEPARTMENT OF THE NAVY	IMMEDIATE OFFICE OF THE CHIEF OF NAVAL OPERATIONS	1,655	-0.217	0.018	***	-0.186	0.015	***	-0.087	0.012	***
DEPARTMENT OF THE NAVY	MILITARY SEALIFT COMMAND	6,621	0.072	0.016	***	-0.072	0.012	***	-0.018	0.005	***
DEPARTMENT OF THE NAVY	NAVAL AIR SYSTEMS COMMAND	24,236	-0.002	0.005		-0.064	0.003	***	-0.053	0.003	***
DEPARTMENT OF THE NAVY	NAVAL EDUCATION AND TRAINING COMMAND	3,952	-0.059	0.011	***	-0.136	0.010	***	-0.034	0.007	***

Parent Agency/Department	Agency Name	Agency Size	Model 1 Female Coef.	Model 1 S.E.		Model 2 Female Coef.	Model 2 S.E.		Model 3 Female Coef.	Model 3 S.E.	
DEPARTMENT OF THE NAVY	NAVAL FACILITIES ENGINEERING COMMAND	14,297	0.088	0.006	***	-0.027	0.004	***	-0.031	0.004	***
DEPARTMENT OF THE NAVY	NAVAL INTELLIGENCE COMMAND	1,537	-0.111	0.013	***	-0.096	0.011	***	-0.060	0.009	***
DEPARTMENT OF THE NAVY	NAVAL MEDICAL COMMAND	10,628	-0.060	0.008	***	-0.043	0.006	***	-0.025	0.004	***
DEPARTMENT OF THE NAVY	NAVAL RESERVE FORCE	427	-0.054	0.034		-0.106	0.031	***	-0.049	0.019	*
DEPARTMENT OF THE NAVY	NAVAL SEA SYSTEMS COMMAND	25,804	-0.104	0.004	***	-0.097	0.003	***	-0.053	0.003	***
DEPARTMENT OF THE NAVY	NAVAL SPECIAL WARFARE COMMAND	1,151	-0.028	0.021		-0.091	0.021	***	-0.056	0.016	***
DEPARTMENT OF THE NAVY	NAVAL SUPPLY SYSTEMS COMMAND	6,157	0.035	0.009	***	-0.047	0.007	***	-0.043	0.005	***
DEPARTMENT OF THE NAVY	OFFICE OF NAVAL RESEARCH	2,775	-0.290	0.015	***	-0.120	0.010	***	-0.059	0.009	***
DEPARTMENT OF THE NAVY	SPACE AND NAVAL WARFARE SYSTEMS COMMAND	9,044	-0.141	0.006	***	-0.133	0.005	***	-0.054	0.005	***
DEPARTMENT OF THE NAVY	STRATEGIC SYSTEMS PROGRAMS OFFICE	1,040	-0.097	0.022	***	-0.128	0.015	***	-0.078	0.013	***
DEPARTMENT OF THE NAVY	U.S. ATLANTIC FLEET, COMMANDER IN CHIEF	22,275	-0.016	0.006	**	-0.084	0.004	***	-0.075	0.003	***
DEPARTMENT OF THE NAVY	U.S. MARINE CORPS	18,313	-0.020	0.006	***	-0.117	0.005	***	-0.077	0.004	***
DEPARTMENT OF THE NAVY	U.S. PACIFIC FLEET, COMMANDER IN CHIEF	18,446	-0.106	0.005	***	-0.109	0.004	***	-0.064	0.003	***
DEPARTMENT OF THE TREASURY	ALCOHOL AND TOBACCO TAX AND TRADE BUREAU	468	-0.145	0.029	***	-0.105	0.025	***	-0.067	0.020	**
DEPARTMENT OF THE TREASURY	BUREAU OF ENGRAVING AND PRINTING	1,748	-0.087	0.017	***	-0.091	0.016	***	-0.038	0.010	***
DEPARTMENT OF THE TREASURY	BUREAU OF THE FISCAL SERVICE	3,230	-0.079	0.014	***	-0.095	0.010	***	-0.033	0.007	***

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
DEPARTMENT OF THE TREASURY	DEPARTMENTAL OFFICES	1,660	-0.099	0.015	***	-0.073	0.013	***	-0.068	0.012	***
DEPARTMENT OF THE TREASURY	FINANCIAL CRIMES ENFORCEMENT NETWORK	255	-0.076	0.032	*	-0.062	0.027	*	-0.038	0.025	
DEPARTMENT OF THE TREASURY	INTERNAL REVENUE SERVICE	72,251	-0.181	0.003	***	-0.086	0.002	***	-0.023	0.001	***
DEPARTMENT OF THE TREASURY	OFFICE OF INSPECTOR GENERAL	153	-0.006	0.047		0.009	0.036		0.013	0.038	
DEPARTMENT OF THE TREASURY	OFFICE OF THE COMPTROLLER OF THE CURRENCY	3,748	-0.095	0.014	***	-0.087	0.009	***	-0.024	0.007	**
DEPARTMENT OF THE TREASURY	OFFICE OF THE INSPECTOR GENERAL FOR TAX ADMINISTRATION	739	-0.085	0.017	***	-0.096	0.014	***	-0.053	0.012	***
DEPARTMENT OF THE TREASURY	SPECIAL INSPECTOR GENERAL FOR THE TROUBLED ASSETS RELIEF PROGRAM (TARP)	132	-0.011	0.041		-0.047	0.038		-0.046	0.039	
DEPARTMENT OF THE TREASURY	U.S. MINT	1,631	0.059	0.018	**	-0.048	0.013	***	-0.037	0.010	***
DEPARTMENT OF TRANSPORTATION	FEDERAL AVIATION ADMINISTRATION	44,818	-0.160	0.004	***	-0.177	0.003	***	-0.035	0.003	***
DEPARTMENT OF TRANSPORTATION	FEDERAL HIGHWAY ADMINISTRATION	2,845	-0.132	0.012	***	-0.091	0.009	***	-0.037	0.007	***
DEPARTMENT OF TRANSPORTATION	FEDERAL MOTOR CARRIER SAFETY ADMINISTRATION	1,104	-0.071	0.022	**	-0.163	0.016	***	-0.023	0.012	
DEPARTMENT OF TRANSPORTATION	FEDERAL RAILROAD ADMINISTRATION	825	-0.058	0.021	**	-0.198	0.017	***	-0.106	0.015	***
DEPARTMENT OF TRANSPORTATION	FEDERAL TRANSIT ADMINISTRATION	509	-0.108	0.026	***	-0.040	0.021		-0.010	0.017	
DEPARTMENT OF TRANSPORTATION	MARITIME ADMINISTRATION	717	-0.029	0.035		-0.106	0.026	***	-0.096	0.019	***

Parent Agency/Department	Agency Name	Agency Size	Model 1 Female Coef.	Model 1 S.E.		Model 2 Female Coef.	Model 2 S.E.		Model 3 Female Coef.	Model 3 S.E.	
DEPARTMENT OF TRANSPORTATION	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	567	-0.149	0.024	***	-0.103	0.019	***	-0.037	0.015	*
DEPARTMENT OF TRANSPORTATION	OFFICE OF INSPECTOR GENERAL	404	-0.081	0.026	**	-0.040	0.019	*	-0.018	0.020	
DEPARTMENT OF TRANSPORTATION	OFFICE OF THE SECRETARY OF TRANSPORTATION	670	-0.069	0.028	*	-0.051	0.022	*	-0.037	0.018	*
DEPARTMENT OF TRANSPORTATION	OFFICE OF THE SECRETARY, RESEARCH AND TECHNOLOGY	602	-0.159	0.027	***	-0.054	0.017	**	-0.019	0.016	
DEPARTMENT OF TRANSPORTATION	PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION	413	-0.093	0.028	**	-0.107	0.026	***	-0.048	0.022	*
DEPARTMENT OF TRANSPORTATION	SURFACE TRANSPORTATION BOARD	129	-0.149	0.054	**	-0.034	0.044		-0.012	0.034	
DEPARTMENT OF VETERANS AFFAIRS	ASSISTANT SECRETARY FOR HUMAN RESOURCES MANAGEMENT	231	0.017	0.046		-0.047	0.042		0.027	0.034	
DEPARTMENT OF VETERANS AFFAIRS	BOARD OF VETERANS APPEALS	638	-0.040	0.031		-0.003	0.017		-0.011	0.015	
DEPARTMENT OF VETERANS AFFAIRS	DEPUTY ASSISTANT SECRETARY FOR ACQUISTION AND LOGISTICS	1,059	0.006	0.022		-0.047	0.016	**	-0.042	0.014	**
DEPARTMENT OF VETERANS AFFAIRS	DEPUTY ASSISTANT SECRETARY FOR FINANCE	690	-0.008	0.031		0.008	0.021		0.011	0.016	
DEPARTMENT OF VETERANS AFFAIRS	DEPUTY ASSISTANT SECRETARY FOR INFORMATION AND TECHNOLOGY	7,662	0.013	0.007		-0.056	0.006	***	-0.034	0.005	***
DEPARTMENT OF VETERANS AFFAIRS	DEPUTY ASSISTANT SECRETARY FOR OFFICE OF RESOLUTION MANAGEMENT	232	-0.017	0.042		-0.082	0.038	*	-0.024	0.027	

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
DEPARTMENT OF VETERANS AFFAIRS	GENERAL COUNSEL	656	-0.110	0.030	***	0.028	0.018		0.003	0.010	
DEPARTMENT OF VETERANS AFFAIRS	INSPECTOR GENERAL	648	-0.043	0.021	*	-0.052	0.016	**	-0.007	0.014	
DEPARTMENT OF VETERANS AFFAIRS	NATIONAL CEMETERY ADMINISTRATION	1,625	0.221	0.021	***	-0.047	0.016	**	-0.046	0.013	***
DEPARTMENT OF VETERANS AFFAIRS	OFFICE OF THE SECRETARY	457	-0.103	0.029	***	-0.081	0.025	**	-0.026	0.024	
DEPARTMENT OF VETERANS AFFAIRS	VETERANS BENEFITS ADMINISTRATION	21,066	0.062	0.004	***	0.020	0.003	***	0.006	0.002	*
DEPARTMENT OF VETERANS AFFAIRS	VETERANS HEALTH ADMINISTRATION	271,814	0.016	0.002	***	0.042	0.001	***	0.003	0.001	***
ENVIRONMENTAL PROTECTION AGENCY	ENVIRONMENTAL PROTECTION AGENCY	14,533	-0.087	0.004	***	-0.039	0.003	***	-0.023	0.002	***
EQUAL EMPLOYMENT OPPORTUNITY COMMISSION	EQUAL EMPLOYMENT OPPORTUNITY COMMISSION	2,167	-0.045	0.019	*	-0.041	0.012	***	0.012	0.008	
EXPORT-IMPORT BANK OF THE UNITED STATES	EXPORT-IMPORT BANK OF THE UNITED STATES	396	-0.138	0.031	***	-0.085	0.024	***	-0.030	0.021	
FARM CREDIT ADMINISTRATION	FARM CREDIT ADMINISTRATION	263	-0.011	0.050		-0.010	0.033		0.011	0.030	
FEDERAL COMMUNICATIONS COMMISSION	FEDERAL COMMUNICATIONS COMMISSION	1,644	-0.137	0.016	***	-0.061	0.011	***	-0.035	0.009	***
FEDERAL DEPOSIT INSURANCE CORPORATION	FEDERAL DEPOSIT INSURANCE CORPORATION	5,484	-0.134	0.011	***	-0.111	0.008	***	-0.050	0.006	***
FEDERAL ELECTION COMMISSION	FEDERAL ELECTION COMMISSION	310	-0.090	0.042	*	0.011	0.031		0.016	0.025	
FEDERAL HOUSING FINANCE AGENCY	FEDERAL HOUSING FINANCE AGENCY	561	-0.126	0.027	***	-0.101	0.021	***	-0.094	0.019	***

Parent Agency/Department	Agency Name	Agency Size	Model 1 Female Coef.	Model 1 S.E.		Model 2 Female Coef.	Model 2 S.E.		Model 3 Female Coef.	Model 3 S.E.	
FEDERAL HOUSING FINANCE AGENCY	OFFICE OF INSPECTOR GENERAL	142	-0.198	0.051	***	-0.128	0.042	**	-0.115	0.043	**
FEDERAL LABOR RELATIONS AUTHORITY	FEDERAL LABOR RELATIONS AUTHORITY	125	-0.201	0.059	***	-0.015	0.041		0.038	0.037	
FEDERAL MARITIME COMMISSION	FEDERAL MARITIME COMMISSION	104	-0.145	0.061	*	-0.046	0.060		-0.013	0.047	
FEDERAL MEDIATION AND CONCILIATION SERVICE	FEDERAL MEDIATION AND CONCILIATION SERVICE	224	-0.194	0.041	***	-0.102	0.044	*	0.029	0.022	
FEDERAL RESERVE SYSTEM	BUREAU OF CONSUMER FINANCIAL PROTECTION	1,169	-0.012	0.022		-0.048	0.017	**	-0.027	0.015	
FEDERAL RETIREMENT THRIFT INVESTMENT BOARD	FEDERAL RETIREMENT THRIFT INVESTMENT BOARD	185	-0.164	0.048	***	-0.089	0.039	*	-0.041	0.041	
FEDERAL TRADE COMMISSION	FEDERAL TRADE COMMISSION	1,050	-0.084	0.020	***	-0.019	0.012		0.000	0.010	
GENERAL SERVICES ADMINISTRATION	FEDERAL ACQUISITION SERVICE	3,056	0.012	0.010		-0.031	0.008	***	-0.042	0.007	***
GENERAL SERVICES ADMINISTRATION	OFFICE OF ADMINISTRATIVE SERVICES	105	-0.056	0.061		0.001	0.057		-0.098	0.039	*
GENERAL SERVICES ADMINISTRATION	OFFICE OF GENERAL COUNSEL	146	-0.091	0.057		-0.044	0.038		-0.012	0.027	
GENERAL SERVICES ADMINISTRATION	OFFICE OF GOVERNMENTWIDE POLICY	157	-0.090	0.038	*	-0.102	0.041	*	-0.067	0.037	
GENERAL SERVICES ADMINISTRATION	OFFICE OF GSA IT	521	-0.064	0.020	**	-0.080	0.018	***	-0.046	0.017	**
GENERAL SERVICES ADMINISTRATION	OFFICE OF INSPECTOR GENERAL	282	-0.101	0.031	**	-0.029	0.024		-0.002	0.021	
GENERAL SERVICES ADMINISTRATION	OFFICE OF MISSION ASSURANCE	122	-0.167	0.046	***	-0.147	0.046	**	-0.130	0.044	**

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
GENERAL SERVICES ADMINISTRATION	OFFICE OF THE CHIEF FINANCIAL OFFICER	858	-0.025	0.022		-0.005	0.017		-0.008	0.014	
GENERAL SERVICES ADMINISTRATION	OFFICE OF THE HUMAN RESOURCES MANAGEMENT	328	0.050	0.046		0.018	0.032		-0.011	0.025	
GENERAL SERVICES ADMINISTRATION	PUBLIC BUILDINGS SERVICE	5,358	-0.055	0.008	***	-0.065	0.006	***	-0.046	0.005	***
GOVERNMENT PRINTING OFFICE	GOVERNMENT PRINTING OFFICE	1,684	-0.039	0.016	*	-0.052	0.014	***	-0.055	0.010	***
INTERNATIONAL BOUNDARY AND WATER COMMISSION: UNITED STATES AND MEXICO	INTERNATIONAL BOUNDARY AND WATER COMMISSION: UNITED STATES AND MEXICO	228	0.017	0.054		-0.126	0.041	**	-0.095	0.041	*
JUDICIAL BRANCH	U.S. TAX COURT	120	0.046	0.078		0.082	0.061		-0.004	0.046	
MERIT SYSTEMS PROTECTION BOARD	MERIT SYSTEMS PROTECTION BOARD	198	-0.163	0.048	***	-0.083	0.031	**	-0.010	0.025	
MILLENNIUM CHALLENGE CORPORATION	MILLENNIUM CHALLENGE CORPORATION	195	-0.190	0.040	***	-0.076	0.034	*	-0.052	0.035	
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	AMES RESEARCH CENTER	1,186	-0.158	0.015	***	-0.070	0.011	***	-0.029	0.010	**
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	DRYDEN FLIGHT RESEARCH CENTER	545	-0.156	0.033	***	-0.104	0.020	***	-0.062	0.018	***
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	GEORGE C. MARSHALL SPACE FLIGHT CENTER	2,401	-0.146	0.011	***	-0.083	0.008	***	-0.039	0.007	***
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	GODDARD SPACE FLIGHT CENTER	3,193	-0.153	0.010	***	-0.061	0.007	***	-0.031	0.006	***

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	HEADQUARTERS, NASA	1,406	-0.183	0.015	***	-0.099	0.011	***	-0.050	0.010	***
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	JOHN C. STENNIS SPACE CENTER	292	-0.172	0.033	***	-0.086	0.022	***	-0.037	0.020	
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	JOHN F. KENNEDY SPACE CENTER	1,973	-0.119	0.013	***	-0.064	0.008	***	-0.027	0.008	***
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	JOHN GLENN RESEARCH CENTER AT LEWIS FIELD	1,562	-0.168	0.016	***	-0.079	0.010	***	-0.038	0.009	***
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	LANGLEY RESEARCH CENTER	1,784	-0.139	0.016	***	-0.075	0.010	***	-0.028	0.009	**
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	LYNDON B. JOHNSON SPACE CENTER	3,033	-0.130	0.011	***	-0.052	0.006	***	-0.025	0.005	***
NATIONAL ARCHIVES AND RECORDS ADMINISTRATION	NATIONAL ARCHIVES AND RECORDS ADMINISTRATION	2,479	-0.016	0.019		0.021	0.013		0.022	0.010	*
NATIONAL CREDIT UNION ADMINISTRATION	NATIONAL CREDIT UNION ADMINISTRATION	1,188	-0.029	0.022		-0.047	0.015	**	-0.020	0.013	
NATIONAL FOUNDATION ON THE ARTS AND THE HUMANITIES	NATIONAL ENDOWMENT FOR THE ARTS	119	-0.147	0.068	*	-0.169	0.058	**	-0.096	0.066	
NATIONAL FOUNDATION ON THE ARTS AND THE HUMANITIES	NATIONAL ENDOWMENT FOR THE HUMANITIES	128	-0.212	0.063	**	-0.111	0.048	*	-0.041	0.037	
NATIONAL LABOR RELATIONS BOARD	NATIONAL LABOR RELATIONS BOARD	1,486	-0.230	0.023	***	-0.068	0.014	***	-0.035	0.008	***

Parent Agency/Department	Agency Name	Agency Size	Model 1 Female Coef.	Model 1 S.E.		Model 2 Female Coef.	Model 2 S.E.		Model 3 Female Coef.	Model 3 S.E.	
NATIONAL SCIENCE FOUNDATION	NATIONAL SCIENCE FOUNDATION	1,202	-0.197	0.024	***	-0.035	0.015	*	-0.010	0.013	
NATIONAL TRANSPORTATION SAFETY BOARD	NATIONAL TRANSPORTATION SAFETY BOARD	390	-0.176	0.026	***	-0.123	0.023	***	-0.036	0.023	
NUCLEAR REGULATORY COMMISSION	NUCLEAR REGULATORY COMMISSION	3,614	-0.216	0.009	***	-0.127	0.007	***	-0.044	0.006	***
OFFICE OF ADMINISTRATION	OFFICE OF ADMINISTRATION	220	0.078	0.051		0.010	0.044		-0.020	0.037	
OFFICE OF MANAGEMENT AND BUDGET	OFFICE OF MANAGEMENT AND BUDGET	407	-0.078	0.030	**	-0.036	0.019		-0.022	0.018	
OFFICE OF PERSONNEL MANAGEMENT	OFFICE OF PERSONNEL MANAGEMENT	4,865	-0.095	0.011	***	-0.099	0.008	***	-0.029	0.005	***
OFFICE OF SPECIAL COUNSEL	OFFICE OF SPECIAL COUNSEL	105	0.100	0.071		0.060	0.050		-0.030	0.047	
OFFICE OF THE U.S. TRADE REPRESENTATIVE	OFFICE OF THE U.S. TRADE REPRESENTATIVE	166	-0.206	0.046	***	-0.063	0.024	*	-0.045	0.020	*
OVERSEAS PRIVATE INVESTMENT CORPORATION	OVERSEAS PRIVATE INVESTMENT CORPORATION	202	-0.089	0.049		-0.058	0.032		-0.021	0.030	
PENSION BENEFIT GUARANTY CORPORATION	PENSION BENEFIT GUARANTY CORPORATION	909	-0.143	0.020	***	-0.076	0.016	***	-0.043	0.014	**
PRESIDIO TRUST	PRESIDIO TRUST	278	0.046	0.045		-0.062	0.038		-0.089	0.042	*
RAILROAD RETIREMENT BOARD	RAILROAD RETIREMENT BOARD	893	-0.087	0.025	***	-0.098	0.020	***	-0.020	0.015	
SECURITIES AND EXCHANGE COMMISSION	SECURITIES AND EXCHANGE COMMISSION	3,962	-0.135	0.010	***	-0.064	0.007	***	-0.020	0.006	***
SELECTIVE SERVICE SYSTEM	SELECTIVE SERVICE SYSTEM	111	-0.048	0.082		-0.045	0.060		0.047	0.038	
SMALL BUSINESS ADMINISTRATION	SMALL BUSINESS ADMINISTRATION	2,266	-0.125	0.015	***	-0.084	0.011	***	-0.053	0.009	***

			Model 1			Model 2			Model 3		
Parent Agency/Department	Agency Name	Agency Size	Female Coef.	S.E.		Female Coef.	S.E.		Female Coef.	S.E.	
SMITHSONIAN INSTITUTION	NATIONAL GALLERY OF ART	755	0.162	0.034	***	0.133	0.031	***	-0.032	0.020	
SMITHSONIAN INSTITUTION	SMITHSONIAN INSTITUTION (EXCEPT UNITS ADMINISTERED UNDER SEPARATE BOARDS OF TRUSTEES)	3,621	0.040	0.015	**	-0.011	0.010		-0.021	0.007	**
SOCIAL SECURITY ADMINISTRATION	SOCIAL SECURITY ADMINISTRATION	61,944	-0.053	0.003	***	-0.031	0.002	***	-0.001	0.001	
U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT	U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT	2,926	-0.072	0.011	***	-0.035	0.008	***	-0.023	0.007	**
U.S. HOLOCAUST MEMORIAL MUSEUM	U.S. HOLOCAUST MEMORIAL MUSEUM	169	0.030	0.057		0.019	0.051		0.002	0.047	
U.S. INTERNATIONAL TRADE COMMISSION	U.S. INTERNATIONAL TRADE COMMISSION	329	-0.224	0.036	***	-0.123	0.027	***	-0.075	0.022	***

Notes: Author's calculations. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. Coef.: Coefficient. S.E.: Standard Error.
The dependent variable for all models is the natural log of salary.
Model 1 only includes female as an independent variable.
Model 2 includes female, tenure, tenure-squared, age, age-squared, and fixed effects for geography as independent variables.
Model 3 includes female, tenure, tenure-squared, age, age-squared, and fixed effects for geography and occupation as independent variables.

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