# Gender Equity in the US Civil Service: Evidence from the Classification Act of 1923

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**Abstract**

Pay standardization schemes are commonly implemented in organizations to address pay gaps based on gender, race, or ethnicity. These schemes limit managerial discretion to determine wages, thereby limiting opportunities for pay discrimination against women within job titles. However, this may shift gender discrimination to other margins such as position types or promotions. This study examines the effects of the Classification Act of 1923, which standardized pay grades and position categories and required "equal pay for equal work" in the US Civil Service, on the gender pay gap. Overall, we find that the law widened the unconditional pay gender gap but had no effect on the pay gap within job titles. However, we see large differences between incumbent civil servants and new hires. We find that the law improved the gender gap for incumbent women while newly hired women were placed in lower-paid positions with slower compensation growth.

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# 1 Introduction

Pay standardization, which ties positions to set salary ranges, is commonly practiced in organizations to promote transparency and fairness. In the labor market, pay dispersion is substantial even within the same firm and position, and pay standardization seeks to narrow these disparities (Cullen 2024). Standardization is particularly prevalent in the public sector, where profit motives do not drive personnel policies, work involves multi-tasking and hard-to-measure output, and there is often a desire to shield employees from political influence (Finan, Olken, and Pande 2017). Even in the private sector, firms use market benchmarks to set salaries, which has been shown to reduce pay dispersion within positions (Cullen, Li, and Perez-Truglia 2022). While pay dispersion may reflect true differences in marginal products, it can also result from "unjustified" differences such as discrimination based on gender, race, or ethnicity. Consequently, pay transparency regulations in many countries aim to narrow the gender pay gap (Cullen 2024).[1] By limiting pay differences within positions, pay standardization can reduce opportunities for discrimination against women. However, it may also shift gender discrimination to other areas, such as employment, promotions, or position types.

In this paper, we study the consequences of pay standardization for gender equity in the context of the Classification Act of 1923, a law that created standardized position categories and pay grades in the US Civil Service. The law created five services, or high-level position groups, and pay grades within each service. It required that federal departments place employees in services and grades based on the qualifications and responsibilities of their positions. Importantly, the law stated, "In determining the rate of compensation which an employee shall receive, the principle of equal pay for equal work irrespective of sex shall be followed" (Congress 1923). Prior to the law, department heads and bureau chiefs had a large amount of discretion to set compensation for civil servants. Leading up to the Classification Act, there were increasing complaints about pay inequities among similarly qualified individuals performing the same job. These disparities were exacerbated during World War I, as new government agencies offering higher salaries were established (Betters 1931). The Classification Act aimed to correct these inequities and create a more uniform and scientific process for determining compensation.

The law coincided with a period of rising female representation in the civil service. Aneja, Farina, and Xu (2024) document a large increase in female employment in the civil service

[1] These regulations make information on pay public but do not necessarily enforce standardization.

during World War I (WWI), especially in clerical positions. The share of women employed remained high even after the war, but women were generally paid less than men and faced many barriers to equal treatment. Until 1919, departments could bar women from taking a position's civil service exam. An 1870 law permitted women to hold the same positions as men at the same pay, but the exact terms of employment were at the discretion of departments and there was no requirement of equal pay for equal work (Nienburg 1920). Female civil servants had advocated for equal pay since the 1860s, when the government began hiring large numbers of women (Ziparo 2017). World War I increased interest in women's working conditions, and women's groups saw position classification as an opportunity to achieve equal pay (National Women's Trade Union League of America 1924). Although the Classification Act had multiple motivations, our analysis focuses on the gender pay gap due to it being an important period for women in the federal workforce, the explicit equal pay language in the law, and features of our data that allow us to track the careers of both men and women in the federal government.

Our setting has two key empirical advantages for studying the consequences of pay standardization and equal pay requirements within an organization. First, our analysis uses rich personnel data that allows us to track the wage gap over time and study potential margins of adjustment such as employment, position types, and wage growth. Our data consists of newly digitized US federal government personnel records for 1917-1929 from *The Official Register of the United States* (referred to as the Register). These records include information on civil servants' names, place of employment, job title, and annual compensation. We focus our analysis on employees at an administrative or supervisory level as these employees are consistently included in the Registers throughout this period.

Second, the Classification Act applied to civil servants working in the departmental service in Washington, D.C., but not to civil servants working in field offices of the federal government outside of Washington. This provides us with spatial variation in the application of the law. We estimate the effects of the Classification Act on the gender pay gap using a difference-in-differences (DD) strategy. We compare annual compensation between DC and the field service pre- and post-Classification Act. We allow for differential compensation effects by gender. For the law to improve the gender pay gap, compensation for women should grow faster in DC relative to the field service than for men. We additionally estimate a difference-in-differences model within DC, comparing compensation between men and women in the departmental

service pre- and post-Classification Act. We explore effects on other potential margins of discrimination including employment, starting salaries, wage growth, and position types. As the law only addressed pay discrimination, these are areas where departments could discriminate against women without violating the law.

Overall, we see that the law generally raised salaries in DC compared to the field. Differentiating effects by gender, we find that the law widened the unconditional gender gap. Compensation for women in DC relative to the field did not rise as fast as it did for men, not controlling for position. However, we do not find a difference in the compensation effects between women and men within job titles, suggesting that the law did not affect the conditional gender gap. We find substantial heterogeneity between incumbent and newly hired workers. The law actually improved the gender gap for incumbent civil servants but not for civil servants hired after the Classification Act. We see that newly hired women were placed in worse positions with lower starting salaries and slower compensation growth. We do not find effects on overall female employment. Taken together, these results reflect a downgrading of positions for new hires rather than an expanded opportunity for women at the extensive margin in lower-level positions. Lastly, we see that gender segregation of positions in DC increased slightly in 1926 and 1927 but returned to pre-reform levels by 1929.

Our results provide a cautionary tale about how a law designed to promote wage fairness can shift discrimination to other areas, benefiting some individuals within the marginalized group while harming others. Underscoring our findings, a report on civil servant salaries conducted by the Women's Bureau in 1925 found that although women received modest gains from the Classification Act, they were more likely to be placed in the minimum salary of a pay grade. Additionally, for individuals performing similar jobs, men were more likely to be placed in the "Professional and Scientific Service" and women in the "Clerical, Fiscal, and Administrative Service," which had a lower salary floor (Nienburg 1926).

We first contribute to the literature on anti-discrimination regulations and pay transparency policies by showing that equal pay requirements without additional discrimination protections can improve relative pay for some women but may also lead to downgrading positions. Equal pay regulations, such as the Equal Pay Acts of 1963 in the US and 1970 in the UK require equal pay for equal work and allow legal recourse for violations. Bailey, Helgerman, and Stuart

(2024) find that the Equal Pay Act of 1963 and Title VII of the Civil Rights Act of 1964 increased women's wages, particularly in industries with larger preexisting gaps, consistent with narrowing the gender pay gap. Nevertheless, the authors present evidence that female employment grew more slowly in jobs more affected by the law, suggesting employer adjustment on the employment margin. Neumark and Stock (2006) study equal pay laws in US states and find that they negatively affect female employment. Additionally, they find an initial drop in female-to-male relative wages which recover over time. These studies use repeated cross-sectional data, providing nationally representative estimates of the effects of equal pay regulations. Our data complement the existing body of evidence by allowing us to focus on the decisions made within an employer, the US government, in response to the law.

Similar to anti-discrimination regulations, pay transparency policies intend to close the gender pay gap. Cullen (2024) summarizes the literature on pay transparency policies such as making salaries public or publishing information on relative earnings by gender. The majority of studies found that transparency lowered the gender pay gap but also lowered overall wages (Cullen 2024). Cullen, Li, and Perez-Truglia (2022) show that providing information to firms on the aggregate distribution of pay for a position, a practice called "benchmarking," leads to decreased pay dispersion but the authors do not find heterogeneous effects by gender. Although benchmarking provides salary information that can be used in wage-setting, it does not go as far as standardization which places rigid bounds on salaries for a given position. We add to these studies by highlighting the unintended consequences of a policy that aimed to make wage-setting more transparent.

Second, we contribute to the literature on the personnel economics of the state. The state's ability to provide public services is an important driver in the development process (Besley and Persson 2010). There is a large literature on how personnel practices such as pay increases and merit-based selection affect the qualifications of civil servants and the efficiency of public service delivery (Ferraz and Finan 2011; Dal Bó, Finan, and Rossi 2013; De Ree et al. 2018; Aneja and Xu 2023; Moreira and Pérez 2024). Additionally, there is a growing literature on diversity in the public sector (Dal Bó et al. 2017; Aneja and Xu 2022; Moreira and Pérez 2022; Li 2023; Aneja, Farina, and Xu 2024). This reform came just after the Woodrow Wilson administration, which implemented racial segregation in the civil service. Aneja and Xu (2022) show that Wilson's segregation policy had far-reaching negative consequences for the

careers of black civil servants and their children. Aneja, Farina, and Xu (2024) document the large increase in representation of women in the US civil service during WWI. They show that men working in offices with a larger increase in the share of women from 1915 to 1919 were not only more likely to have daughters who participated in the labor force but also that the gender pay gap was smaller for the children of civil servants who worked in these more exposed offices, likely due to changing gender norms around working women (Aneja, Farina, and Xu 2024). Our paper builds on this work by showing that even though women were increasingly represented in the civil service during and after WWI, they continued to be paid less than men. We also show that a policy designed to address this pay inequality produced mixed results.

Third, we shed further light on the experience of working women at an important time in the evolution of women in the workforce and in the development of the US economy. The early twentieth century was a period of considerable political, economic, and social change for American women with the suffrage and labor movements. Women's suffrage groups such as the National American Woman Suffrage Association also advocated for improvements in female working conditions, including equal pay (Dumenil 2017). Goldin (1990) shows that the female-to-male earnings ratio increased from 1890-1930 but slowed from 1930-1970. In particular, the earnings ratio in clerical and professional jobs, which make up most positions in our data, rose from 0.487 to 0.706 and from 0.263 to 0.385, respectively, between 1890 and 1930 (Goldin 1990). We further add to our understanding of the dynamics of female earnings within a large employer at a time when there is little data. The US Census did not collect earnings information until 1940 and most studies of this period use occupational earning scores which do not differentiate between men and women.

We proceed first by providing historical background on women in the civil service and the Classification Act of 1923 in Section 2. We then describe the data used in our analysis and descriptive statistics about the gender pay gap in Section 3. We lay out our empirical strategy in Section 4 and present our main results on the gender pay gap in Section 5. We provide evidence on mechanisms for our main results in Section 6 and robustness checks in Section 7. Finally, we conclude in Section 8.

# 2 Historical Background

## 2.1 Early Classification Efforts

Calls for pay standardization in the civil service go back to the 1830s with concerns that pay for clerks should keep up with the cost of living, reflect the nature of duties, and be competitive with similar positions in the private sector. In 1853, Congress passed a law designating four pay grades for federal government clerks (Betters 1931). A major shortcoming of the law was that it did not require that pay be tied to job responsibilities or performance. Therefore, clerks performing the same duties could be paid different salaries. Although changes to these pay grades were made in subsequent years, there were no additional job classifications made until the Classification Act of 1923.[2] Position classification came to the forefront again with the Pendleton Act of 1883, which changed selection for many federal positions from a patronage system, where civil servants were selected by the president's political party, to a merit-based system, where civil servants were selected via competitive examinations. However, the Pendelton Act only addressed the hiring stage, and grouping positions based on duties performed was seen as necessary for implementing a functioning merit system past employee selection (Betters 1931).

Prior to the Classification Act, individual compensation was determined in one of two ways. Wages were set directly by Congress for some positions through a process called "statutory roll." For other positions, Congress appropriated lump sums of money for departments. Bureau Chiefs, in charge of units of employees within departments, could determine how many people to hire at what pay, based on the lump sum amount. According to the 1920 Congressional Joint Commission on the Reclassification of Salaries, there were 2,066 job titles submitted for the 1920-1921 budget, 583 appropriated through statutory roll and 1,483 through lump sums (Jones et al. 1920).

In the years following the Pendleton Act, the president and Congress organized several committees and investigations on classification of federal positions. Central findings of these investigations included low pay for highly skilled positions and pay disparities for individuals

[2] A 1921 executive order by President Harding tasked the Bureau of Efficiency with classifying civil servants to implement an efficiency rating system, although the reach of this policy was limited. According to Betters (1931), "It was not possible to use the classification generally because of statutory limitations upon salary rates in particular offices. It was obvious that legislation was necessary for a proper classification and adjustment of compensation in the federal service." Additionally, the classifications were done after our 1921 data was collected, so the policy should not bias our treatment effects.

doing the same job. The Joint Commission on Reclassification of Salaries found that, "Salary and wage rates involving like duties and responsibilities and calling for the same qualifications (that is, for positions of the same class) show wide variations and marked inequalities" (Jones et al. 1920). Civil servant salaries also did not grow as fast as those in the private sector and did not keep up with inflation in the period following the Pendleton Act (Johnson and Libecap 2007). Johnson and Libecap (2007) hypothesize that the Pendleton Act took away the incentive for Congress to increase appropriations for civil servant pay because civil servants were no longer politically connected and could not be required to make campaign contributions.

The expansion of the federal government with World War I helped provide the final push for the Classification Act. Several new federal agencies which paid higher salaries were established during the war. Many civil servants working in older offices wanted to transfer to the new ones and Congress had to pass regulations limiting transfers between departments (Betters 1931). The Classification Act aimed to correct this by creating a uniform process for assigning compensation throughout the departmental service in DC.

## 2.2 Classification and Women in the Civil Service

With a few exceptions, the US federal government did not hire women until the 1860s. Men and women were integrated in many positions, however, women were paid lower salaries than men for the same work (Ziparo 2017). Female civil servants advocated for equal pay and Congress even debated the issue in the late nineteenth century (Ziparo 2017). An 1870 law allowed women to be appointed at the same salaries as men but did not go as far as requiring equal pay. Calls for position classification spurred by World War I came at the same time as a drastic increase in the number of women working in the federal government. The share of women in the federal government more than doubled between 1917 and 1919 and remained high even after the war (Aneja, Farina, and Xu 2024). Although women joined the civil service in increasing numbers at this time, they faced discrimination on many margins. Before November 1919, women could be barred from taking position examinations at the discretion of departments (Nienburg 1920). A 1919 report by the Women's Bureau shows that the majority of men were appointed at higher salaries than women for a number of positions such as clerk, expert clerk, typist, and bookkeeper (Nienburg 1920).

Although the main motivation for the Classification Act was to address general pay inequality, gender played a large role as well. This is likely due in part to the efforts of the Women's Bureau and female labor organizations. World War I accelerated efforts by the suffrage and labor movements that were already well underway at the beginning of the twentieth century to improve the status of women in society (Dumenil 2017). An important step toward representing the interests of women in the federal government was the creation of the Women's Bureau.[3] It was created as part of the Department of Labor to improve conditions for working women and advance employment opportunities for women (Women's Bureau 2021). The first heads of the Women's Bureau, Mary van Kleeck and Mary Anderson, were active in the labor movement and advocated for equal pay (Dumenil 2017). The Women's Joint Congressional Committee, a legislative advocacy group made up of women's organizations such as the National Women's Trade Union League (WTUL), actively campaigned for the Classification Act. Upon passage of the law, a 1924 report from the WTUL states, "In some instances new and better standards are to be hoped for because of the opportunity for an actual scientific appraisement of the skill required for much of the work done by women which has thus far been undervalued. In other instances the Classification law will afford opportunity for correction of inequalities in the civil service between the ratings of similar jobs when done by women and men" (National Women's Trade Union League of America 1924). These groups supported the Classification Act, hoping it would close the gender pay gap and create better job opportunities for women.

## 2.3 Classification Act of 1923

The Classification Act of 1923 had the goals of aligning pay with responsibilities, implementing equal pay for equal work both within and across federal departments, and basing changes in pay on merit. The law established five services within the departmental service in DC: professional and scientific; subprofessional; clerical, administrative, and fiscal; custodial; and clerical-mechanical. The law included a description of the work and qualifications of employees in each service. Each service included grades with a description of duties and qualifications, as well as annual salaries that could be paid in each grade. The law also established the Personnel Classification Board to oversee the implementation of the law. Department heads were required to classify all positions into services, grades, and salaries. However, classifications were

[3]It was originally founded as the Women in Industry Service in 1918 and became the Women's Bureau in 1920.

reviewed and could be revised by the Classification Board, which had final approval (Congress 1923). Additionally, employees who were unhappy with their classification could appeal to the Classification Board.

The Classification Act prescribed a process for making salary adjustments. If an employee's pay was currently below her grade then it would be increased. If pay was above her grade, then it would be decreased unless the employee was a Civil War veteran. If pay was within range of the grade but not at one of the fixed steps then it would be upgraded to the next step. New appointments would be made at the minimum rate. Additionally, the law required that decisions about pay raises and dismissals be made on the basis of efficiency ratings. Lastly, the law applied to civil servants working in the departmental services in Washington, D.C. but not to civil servants based in the field services outside of Washington. The Personnel Classification Board was charged with submitting a study and classification recommendations for the field service during the next congress (Congress 1923).

The law required the classifications to be completed by the time Congress passed the budget for 1925. The Classification Board published class specifications in 1924 which included more detailed descriptions of job titles, duties, and qualifications for each pay grade (Personnel Classification Board 1924). Departmental service classifications were completed in July 1924. From then onward, the Board was responsible for hearing appeals of classifications and performing audits. Additionally, the board submitted a report on the classification of the field service to Congress in 1924, however, Congress was not satisfied with the Classification Board's report. Congress commissioned another study of classification in the field service as part of the Welch Act of 1928. The Welch Act also updated the pay grades, giving general pay raises to civil servants in DC (Betters 1931). In addition, the Welch Act granted department heads the ability to adjust the compensation of positions in the field service to correspond to rates in the departmental service, but left it at their discretion. The classification of field service positions was not required until the Mead-Ramspeck Act of 1941 (Schinagl 1966). The Classification Act of 1923 was later repealed by the Classification Act of 1949, which established the "General Schedule" classification system that is still used in the federal government today (Congress 1949).

Although the Classification Act was the first step toward fixing position classification problems

in the federal government, there were issues with its implementation. Members of the Personnel Classification Board often disagreed on the right approach to implementing the law, especially regarding how detailed class specifications should be (Van Riper 1976). Additionally, there was limited review of departments' position allocations, although the Personnel Classification Board had the authority to do so. Lastly, employees did not get as broad of salary increases as expected. However, this was partially remedied with the Welch Act of 1928 which gave general pay raises and created new grades (Van Riper 1976).

# 3 Data

## 3.1 Personnel Records

Our personnel data for the federal government come from the *Official Register of the United States* (referred to as the Register). This publication was issued from 1816 to 1959 and contains detailed information about the federal workforce (Deeben 2004). We digitized information from 8 registers: 1917, 1919, 1921, 1925, 1926, 1927, 1928, and 1929. Our pre-period consists of data from 1917 to 1921 and post consists of 1925 to 1929. The Register was published biennially through 1921 and annually from 1925 onward. There was no register printed in 1923. Additionally, the Register only included employees with administrative or supervisory roles from 1925 onward. However, registers in the pre-period have tables of employees at an administrative or supervisory level at the beginning and a directory of all employees in a list format at the back. We only digitize the beginning tables and not the full directory in the pre-period. The format of these tables stays consistent throughout the study years. Therefore, our estimates are representative of upper-level positions, but not necessarily of the entire federal government. To alleviate concerns about changes in the Register format, we restrict our sample to a panel of units that appear in both the pre- and post-period. Units and sub-units are teams of employees within government departments. Our analysis includes the main government departments: Agriculture, Commerce, Interior, Justice, Labor, Navy, Post Office (non-Postal Service), State (non-diplomatic), Treasury, and War. We also include independent government establishments subject to the Classification Act as per Nienburg (1926): the Bureau of Efficiency, Civil Service Commission, Employee's Compensation Commission, Federal Board for Vocational Education, Federal Trade Commission, Tariff Commission, and Veterans' Bureau.[4]

[4]The Classification Act applied to all government establishments except for the Postal Service, certain units with the DC Municipal government, the US Park Police, the Public Health Service, Coast Guard, and the Coast and Geodetic Survey according to the text of the law (Congress 1923). However, Betters (1931) points out

The registers include the name, job title, annual compensation, department, unit, sub-unit (when applicable), and place of employment for employees in the executive branch of the US government. The 1925-1929 registers additionally include employees' legal residence which corresponds to the state and district from which the employee was appointed to the civil service. We infer gender based on first names using the method of Abramitzky, Boustan, and Eriksson (2020). We take the one percent US Census samples from IPUMS for 1900, 1910, and 1920 and restrict the sample to individuals born between 1855 and 1900, who would be of working age during our study period (Ruggles et al. 2024). We then calculate an index given by Equation (1) below for each first name in the sample. The female index is equal to the proportion of the female population with a given name divided by the proportion of the male population with that name plus the proportion of women with that name. We classify all names with an index of 0.8 or higher as female, all names with an index less than 0.5 as male, and do not classify the gender of names with an index between 0.5 and 0.8 as many of these are ambiguous such as "Marion" or "Leslie." We are able to classify the gender for 84.5% of individuals in our data.

$$FemaleIndex_{name} = \frac{\frac{\#female_{name}}{total\#female}}{\frac{\#female_{name}}{total\#female} + \frac{\#male_{name}}{total\#male}} \tag{1}$$

We construct a panel data set by matching civil servant names across registers using the method of Abramitzky et al. (2021). We match on first and last name (and middle initial when available) using a Jaro-Winkler distance threshold of 0.1. For example, we see "Karl F. Kellerman" in both 1917 and 1919 and assume he is the same person. We drop all non-unique names for each pair of years and do not match on department or unit as civil servants may move within the government. Additionally, some observations only report the first initial of the first name. For example, we observe "E. P. Costigan" in 1919 and we observe "Edward P. Costigan" in 1921. We match on first initial and last name when the last name is within the distance threshold and there is no closer first name match. We also infer gender based on the observations within an individual that include a full first name. For "E. P. Costigan" and "Edward P. Costigan," we infer this individual is male based on "Edward."

additional independent government establishments that were not subject to the law. We therefore only include independent government establishments for which we are confident whether or not the law applied.

### 3.2 Grouping Job Titles by K-Means Clustering

Many of the same positions have slight variations in the job titles included in the Register. For example, two of the titles for chemists in the Department of Agriculture's Bureau of Chemistry are "Chemist in Charge of Concentrated Fertilizer Investigations" and "Chemist in Charge of Potash Investigations." We want to group both titles together since they both describe chemists overseeing lab work. To do this, we make three groupings of job titles. For the first, we group together all job titles within a Levenshtein distance of 0.1. We do this to group together the exact same job titles accounting for typos. This is the finest level of position that we use in our analysis. For the next groupings, we perform k-means clustering on the job titles. We do this twice, once with 50 clusters and once with 100 clusters, to group together similar titles.

The k-means algorithm randomly generates centroids for the specified number of clusters and groups the titles into clusters to minimize distance from the centroids. We also incorporate a large language model into the k-means algorithm to infer similarities in word meaning. For instance, the words "Physician" and "Doctor" do not look similar in terms of string distance but they have the same meaning, so we want to group them together. K-means clustering requires specifying the number of clusters. We chose 50 and 100 clusters to ensure that position groups were larger enough while also capturing meaningful differences in the types of work done under the different titles. We use both 50 and 100 cluster groupings in our analysis to test if our results are robust to how fine we make the groups. We present histograms of the cluster sizes across years in Figure A1 for clusters with less than 400 observations per year. Our data contain many distinct job titles and the clustering algorithm loads sparse job titles into a single cluster even if they are not closely related. We therefore have a few clusters with a large number of observations. In the robustness section, we estimate effects, dropping clusters with more than 400 observations and limiting the sample to a balanced panel of clusters.

### 3.3 Pre-Period Descriptive Statistics

We document a large gender pay gap in our pre-period. In Table 1, we regress log annual compensation on an indicator for being female, an indicator for being based in DC, and year fixed effects using the data from 1917-1921. We include fixed effects for the 50 position clusters in column (2), 100 position clusters in column (3), and job titles in column (4). On average,

women make 0.28 log points (24 percent) less than men in the pre-period and we see that although the gap decreases when adding fixed effects, it remains even within job titles.

For our main analysis, we compare differential changes in compensation by gender between DC and the field offices. Figure 1 plots the average log compensation for men and women in DC and the field service over time. The lines look fairly parallel in the pre-period, although the average compensation of women grows faster from 1917-1919 in the field than in DC, but grows at about the same rate from 1919-1921. It is important to note that in the post-period, women's average compensation appears to catch up to men's in the field service but not in DC. However, the figure displays averages, and masks changes within occupations.

Table 2 reports descriptive statistics for 1917-1921 by gender and location. We see that men in DC tend to have higher retention, higher earnings, and are employed in higher-paid positions compared to the field. Although we see significant differences in levels, our identification relies on the assumption that outcomes would have changed at the same rate between DC and the field in the absence of treatment. We will test for differences in pre-period trends in our event study analyses. The female sample looks fairly balanced, but it is important to note that there are very few women in the field service. To account for this, we estimate a difference-in-differences (DD) model comparing women and men within DC in addition to differential difference-in-differences between DC and the field services.

# 4 Empirical Strategy

## 4.1 Differential Difference-in-Differences

Our main analysis focuses on the law's effect on the gender wage gap. However, we first estimate the first-stage effects of the law on overall employee compensation and the two-year retention rate, not differentiated by gender. We do this to verify that the law was binding and led to overall changes in salaries. We also estimate the law's effect on the overall share of women. Since departments could no longer pay women less than men in the same position, the law may have led to overall lower female employment. We estimate the following difference-in-differences model, comparing outcomes between the departmental service in DC and the field offices pre- and post-Classification Act.

$$y_{ijt} = \beta_0 + \beta_1 DC_j \times POST_t + \beta_2 DC_j + \delta_t + \varepsilon_{ijt} \tag{2}$$

where $y_{ijt}$ is outcome $y$ for civil servant $i$ in location $j$ and year $t$. $DC_j$ is an indicator for whether the civil servant is employed in DC, and $POST_t$ is an indicator for being after the Classification Act. $\delta_t$ are year fixed effects. We include the indicator, $DC_j$, rather than state fixed effects to keep the DD and differential DD specifications consistent as the sample size of women outside of DC is small and there are some states with only one woman. Standard errors are clustered at the unit level. We cluster at this level as unit heads had some discretion in determining wages and compensation is likely to be correlated within a unit. We also estimate an event study specification given below, where we sum over the interaction of $DC_j$ with event time, fixing 1921 as the reference year (the last year that we have data before the policy).

$$y_{ijt} = \beta_0 + \sum_{t=1917, t\neq 1921}^{1929} \beta_t DC_j \times \delta_t + \alpha DC_j + \delta_t + \varepsilon_{ijt} \tag{3}$$

As shown in the previous section, women were underpaid before the law, even within job title. If the law closes the gender gap, we expect compensation for women in DC to grow faster compared to women in the field service than it does for men. To test this, we allow for heterogeneity by gender in equation (4) below, estimating the difference-in-differences model with differential effects.

$$\begin{aligned} y_{ijt} = \beta_0 + \beta_1 DC_j \times POST_t \times FEMALE_{it} + \beta_2 DC_j \times POST_t + \\ \beta_3 DC_j \times FEMALE_i + \beta_4 POST_t \times FEMALE_i + \beta_5 FEMALE_i + \beta_6 DC_j + \delta_t + \varepsilon_{ijt} \end{aligned} \tag{4}$$

where all variables and subscripts are the same as above and $FEMALE_i$ is an indicator for being female. As stated above, we include an indicator for being employed in DC, $DC_j$, rather than state fixed effects as there are some states with very few women. The coefficient $\beta_1$ gives the additional effect of the law for women, relative to men. If the law closes the gender gap, then $\beta_1$ should be positive. We additionally estimate an event study model given below, analogous to equation (4), where we interact $FEMALE_i$, $DC_j$, and indicators for event time. Lastly, we estimate Equation (2) separately for men and women which shows the total effect of the law for men and women, respectively.

$$y_{ijt} = \beta_0 + \sum_{t=1917, t\neq 1921}^{1929} \beta_t Female_i \times DC_j \times \delta_t + \alpha_1 DC_j \times POST_t + \alpha_2 DC_j \times FEMALE_i + \alpha_3 POST_t \times FEMALE_i + \alpha_4 FEMALE_i + \alpha_5 DC_j + \delta_t + \varepsilon_{ijt} \quad (5)$$

### 4.2 Difference-in-Differences within DC

There are very few women in the field service per year in our data. Therefore, we also estimate a difference-in-differences model within DC to strengthen our differential treatment effect results. We compare outcomes between men and women pre- and post-Classification Act just within DC, leaving out the field service. The DD model is given by equation (6) and the event study by equation (7).

$$y_{it} = \beta_0 + \beta_1 FEMALE_i \times POST_t + \beta_2 Female_i + \delta_t + \varepsilon_{it} \quad (6)$$

$$y_{ijt} = \beta_0 + \sum_{t=1917, t\neq 1921}^{1929} \beta_t Female_i \times \delta_t + \alpha Female_i + \delta_t + \varepsilon_{ijt} \quad (7)$$

where all variables and subscripts are the same as above. Our coefficient of interest is $\beta_1$ in equation (6). As both men and women in DC are treated, we test for a differential effect by gender and assume that compensation for men and women would have evolved at the same rate in the absence of the law. In other words, the gender gap would remain constant without the law. This is true if there are no additional shocks occurring around the same time as the Classification Act that affect the compensation of men and women differently. Based on Figure 2, this assumption seems reasonable as men's and women's compensation in DC moves together and the gap stays fairly constant over the pre-period.

## 5 Results

### 5.1 Overall Effects

We first present results for overall compensation and retention, not differentiated by gender. Table 3 presents results from our difference-in-differences estimation for the outcomes of em-

ployee compensation, the two-year retention rate, and the four-year retention rate. We find that the law increased employee compensation by $823 or 0.17 log points (18.5%) in DC relative to the field service. Columns (3) and (4) present results for two- and four-year retention. We define retention as an indicator equal to 1 if a civil servant is listed in the register at year $t$ and appears again in year $t+2$, for 2-year retention, and $t+4$ for four-year retention. Although not significant, point estimates for both 2- and 4-year retention are negative. There may have been turnover resulting from displeasure with the law's implementation if one was placed in a lower pay grade than expected. Figure 2 and Figure 3 plot the event study coefficients for the overall effects on log compensation and two-year retention. For log compensation, the pre-period coefficients are small and statistically indistinguishable from zero although the direction of the estimates suggests a slight pre-trend. If the trend were to continue, we would expect compensation to decrease in DC in the post-period. We find the opposite effect in our results, effects on log compensation are positive and large.

We also estimate the effects of the law on the share of women. If the law makes hiring women in DC more expensive, this could lead to decreased employment of women. We display event study coefficients for the share of women in Figure 4. There is a significant pre-trend with the share of women rising faster in the pre-period in DC relative to the field, although we see a break in trend with small and null coefficients in the post-period. We additionally plot the share of women in DC and the field over time in Figure 5. We see that the share of women in DC rises rapidly from 1917-1921, decreases between 1921 and 1925, and then starts to recover. The share of women in the field service remains fairly constant over our study period. We present regression results for effects on the share of women in Table 4. We do not include any position fixed effects in column (1). We add fixed effects for the 50 position clusters in column (2), 100 position clusters in column (3), and job titles in column (4). All coefficients are indistinguishable from zero. We cannot fully identify effects on the share of women given the pre-trends, but these results suggest that the law did not increase the share of women in DC.

## 5.2 Differential Gender Effects

Our main analysis estimates the differential effect of the law on men's and women's compensation in DC relative to the field service. If the law improves the gender gap, then we expect there to be an additional positive effect on compensation for women relative to men. We present

the differential DD results in Table 5. We do not include any position fixed effects in column (1). We add fixed effects for the 50 position clusters in column (2), 100 position clusters in column (3), and job titles in column (4). Without conditioning on position, we find a negative and significant differential effect for women in DC relative to men in column (1). Adding the coefficients on $DCXPOSTXFEMALE$ and $DCXPOST$ implies an overall negative effect for women of -0.111 log points (10.5%).

As we look within finer groupings of positions, the differential effect becomes smaller. The differential effect with job title fixed effects, column (4), is positive but small and close to zero. Overall, we see that the unconditional gender gap is widening and the gender gap remains unchanged by the law within job title. We also plot the event study coefficients for the three-way interaction of the female indicator, DC indicator, and event time in Figure 6. Additionally, we estimate event study effects separately by gender in Figure 7, comparing the difference in compensation pre- and post-Classification Act between DC and the field. We see positive and significant compensation effects for men. We find negative but not statistically significant effects for women. Although the pre-period coefficients move around a bit, they are indistinguishable from zero, suggesting that the parallel trends assumption holds.

### 5.3 Gender Effects Within DC

As our differential gender results are based on a small sample of women in the field service, we also estimate DD effects on women's compensation within DC. We compare the change in compensation pre- and post-Classification Act between men and women, limiting our sample to employees based in DC. DD estimates are reported in Table 6, again including 50 position cluster fixed effects in column (2), 100 position cluster fixed effects in column (3), and job title fixed effects in Column (4). Event study coefficients are displayed in Figure 8. If the law narrowed the gender pay gap, then we expect the coefficient on $FEMALEXPOST$ to be positive. Estimates are small and indistinguishable from zero in all columns, suggesting that the law did not improve the gender pay gap. Again, the pre-period coefficients are small and statistically indistinguishable from zero, consistent with parallel trends.

# 6 Mechanisms

## 6.1 Incumbents Versus New Hires

In our differential DD results, we find that the law widened the unconditional gender gap and did not affect the gender gap within job title. However, these results mask differences in the experiences of incumbents and new hires. To explore this, we restrict our sample to civil servants who appear in our data before the Classification Act, which we refer to as the "incumbent sample," and estimate effects on log compensation. We refer to civil servants who first appear in the registers in 1925 or later as "new hires." The new hire sample consists of civil servants who are new to the federal government as well as civil servants promoted from lower levels positions that do not appear in the Registers. We present our estimates for the incumbent sample using the differential DD specification and the within DC specification in Table 7 and Table 8, respectively. For the differential DD, both the conditional and unconditional differential effects are positive although indistinguishable from zero. For the within DC specification, we find a positive and significant effect on women's compensation in all columns except column (4) with job title fixed effects. We plot event study coefficients for incumbent compensation effects in Figure 9 and Figure 10. These results suggest that the law actually improved the gender gap for incumbent women.

We next investigate what is driving the differences between incumbents and new hires. We estimate the effects of the law on starting salaries and two-year compensation growth. Table 9 presents estimates of the effects on starting salaries for the differential DD specification and Table 10 for the within DC specification. All columns except for column (4) with job title fixed effects have a negative point estimate. Only the specification with 100 position cluster fixed effects in the differential DD is statistically significant. Additionally, the magnitudes of the effect sizes on starting compensation are similar to the overall compensation effects found in Table 5 and Table 6. We plot event study coefficients for the effect on starting salaries in Figure 11 and Figure 12.

We also estimate the effect of the Classification Act on compensation growth. We define compensation growth as the log of the two-year change in compensation for an individual. Table 11 and Table 12 present point estimates from the differential DD and within DC specifications. In both tables, column (1) includes the full sample, and column (2) only includes the incumbent

sample. We do not condition on position in either specification as changes in compensation may reflect promotions to higher job titles. For the full sample, we estimate negative effects on compensation growth for women relative to men. Point estimates are considerably smaller when restricted to the incumbent sample and even become positive in the within DC specification, however, neither estimate in the within DC specification is distinguishable from zero. Event study graphs for compensation growth are presented in Figure 13 and Figure 14. Taken together, these results suggest that the law improved the gender gap for incumbent women but not for new hires, through lower starting salaries and slower compensation growth.

## 6.2 Job Quality

Additionally, we consider whether our overall results on compensation could be driven by women being downgraded to lower-level positions. This could explain why we see negative unconditional effects and no effect within job title. To explore this, we calculate the pre-law average compensation for each position cluster and job title and assign every observation the average pre-compensation of the corresponding cluster and job title. This allows us to see whether women in the post-period were assigned to jobs that were lower-paid before the reform. Table 13 and Table 14 present results from the differential DD and within DC DD, respectively. The dependent variable is the average pre-reform log compensation of the 50 cluster position groups in column (1), the average of the 100 cluster position group in column (2), the average pre-reform job title log compensation in column (3), and an indicator for whether an individual's compensation is in the top 25% of the compensation distribution for each year in column (4).[5] Although not all estimates are significant, the direction of the results suggests that women in DC were employed in lower-paying positions as a result of the law and were less likely to be in the top 25% of the compensation distribution.

We also estimate the same effects on job quality, restricting to the incumbent sample in Table 15 and Table 16. The negative effects are far more muted in the incumbent sample and we estimate positive effects on the pre-wage of job titles that incumbent women hold as a result of the law. Additionally, we estimate the effects of the law on starting job quality in Table 17 and Table 18 for the differential DD and within DC DD, respectively. The job quality outcomes are

[5]The mean for column (4) is taken over all years but the indicator is defined within a year, resulting in the mean being larger than 25%

defined the same as above, but we only include individuals when they first appear in the data in these specifications. For instance, if an individual first appears in our data in 1926, we only look at the job quality of their position in 1926. Although not all estimates are significant, we again see that women start in worse positions and at a lower part of the earnings distribution as a result of the law. This is consistent with the starting compensation and wage growth evidence, that new hires drive the negative effects we see for job quality. Given that we do not find effects of the law on female employment, the starting compensation, wage growth, and job quality results suggest a downgrading of positions for newly hired women rather than expansion of employment for women in lower-level positions.

Lastly, we check for changes in occupation segregation over our study period. We calculate the dissimilarity index for gender in each year across the 50 cluster groups, 100 clutser groups, and job titles, respectively. The dissimilarity index is given by equation (8) below, where $g$ is the number of groups (e.g. 50 for the 50 cluster grouping and 100 for the 100 cluster grouping), $\#male_{gt}$ and $\#female_{gt}$ are the number of men and women in group $g$ and year $t$, and $total\#male_t$ and $total\#female_t$ are the total number of men and women in year t. The index measures how evenly distributed women are across groups compared to their proportion in the overall sample where 0 is full integration and 1 is full segregation.

$$D_t = 0.5 \times \sum_{g=1}^{N} \left| \frac{\#male_{gt}}{total\#male_t} - \frac{\#female_{gt}}{total\#female_t} \right| \tag{8}$$

We plot the dissimilarity index over time for DC across the 50 clusters, 100 clusters, and job title groupings in Figure 15. As the index is defined at the year level, we present descriptive evidence on occupation segregation. The index is considerably higher for job titles as it is a finer grouping. Positions became more integrated from 1917-1921. We see a spike in the index (increased segregation) for 1925 and 1926, however, the increase is small and the index recovers to the 1925 level by 1929. In general, we do not see a large increase in occupation segregation following the Classification Act, suggesting that it was not a major margin of adjustment in response to the Classification Act.

# 7 Robustness

As a robustness check, we additionally estimate our differential DD and within DD specifications with a sample of men and women matched on observable characteristics. We create two matched samples of men and women. We first take the sample of women hired before the Classification Act and match them to men in our data based on their 100 cluster position category, rank of job title, last name foreignness index, and department using nearest neighbor propensity score matching. We do not match on salary as our data show that women were underpaid within positions. This is analogous to the "incumbent sample" in our main results. Table A1 presents means for observable characteristics in the matched sample. Characteristics are largely balanced between men and women except for annual compensation. We present evidence on log compensation and compensation growth in Table A2 and Table A3 and job quality in Table A4 and Table A5. The matching results are largely consistent with those for the non-matched sample. We see that the Classification Act increased the relative compensation of incumbent women and although not significant, the direction of the results indicates improved job quality.

We additionally match men and women separately pre- and post-Classification Act to test the robustness of results for new hires. We take the sample of women who first appear in our data between 1917 and 1921 and match them to comparable men, again using nearest-neighbor propensity score matching. We keep all of the matched individuals' pre-Classification Act observations. We then do the same for women who first appear in our data between 1925 and 1929 and keep all of the matched post-Classification Act observations. We track civil servants who start before the Act through 1921 and those who start after through 1929, but we do not follow incumbents pre and post. Means for observable characteristics are presented in Table A6, again characteristics are balanced except for compensation. We estimate the effects on compensation, starting compensation, and compensation growth in Table A7 and Table A8 and job quality in Table A9 and Table A10. Again, we see negative results for new hires. Relative compensation decreases for newly hired women and they have worse job quality outcomes.

Finally, we check that our compensation results are robust to the cluster groupings. We estimate the effects on compensation and starting compensation, restricting our sample to a balanced panel of clusters and dropping clusters with 400 or more observations, which is likely

due to the k-means clustering algorithm loading all distinct job titles into a single cluster. Table A11 and Table A13 present results for the 50 cluster grouping overall and within DC, respectively. Table A12 and Table A14 present results for the 100 cluster grouping. Columns (1) and (3) restrict the sample to a balanced panel of clusters and columns (2) and (4) drop clusters with more than 400 observations. Point estimates are very similar to those found with 50 cluster and 100 cluster fixed effects in our main analysis.

# 8 Conclusion

In this paper, we study how the Classification Act of 1923, which standardized pay and required "equal pay for equal work" in the US Civil Service, affected women's relative pay. The law fundamentally changed the way pay was determined in the US government and was the basis for the General Schedule system currently used by the US federal government. It also came at an important period for women in the federal government. There was a large increase in the representation of women in the civil service with WWI and increased attention to the conditions of women in the workforce. The Classification Act was widely supported by women's organizations with the hope that it would lead to equal pay.

We find that the reform raised overall compensation, but widened the unconditional gender gap and did not affect the gender gap within job titles. However, we see large differences between incumbent and newly hired civil servants. The gender gap improved for employees working in the federal government before the Classification Act, but newly hired women worked in lower-paid jobs with slower compensation growth. These results suggest that departments adjusted to the equal pay regulation by downgrading positions, at least for new hires. Our analysis adds to the literatures on anti-discrimination and pay transparency policies. We capture responses to an equal pay policy within an employer and our results are in line with Bailey, Helgerman, and Stuart (2024), which finds slower employment growth in positions more exposed to the Equal Pay Act of 1963. We also contribute to a growing literature on diversity in the public sector and see that gender discrimination in the civil service persists despite the growing representation of women and efforts to make wage setting more objective. Pay standardization does little to improve gender equity without sufficient protection from other forms of discrimination.

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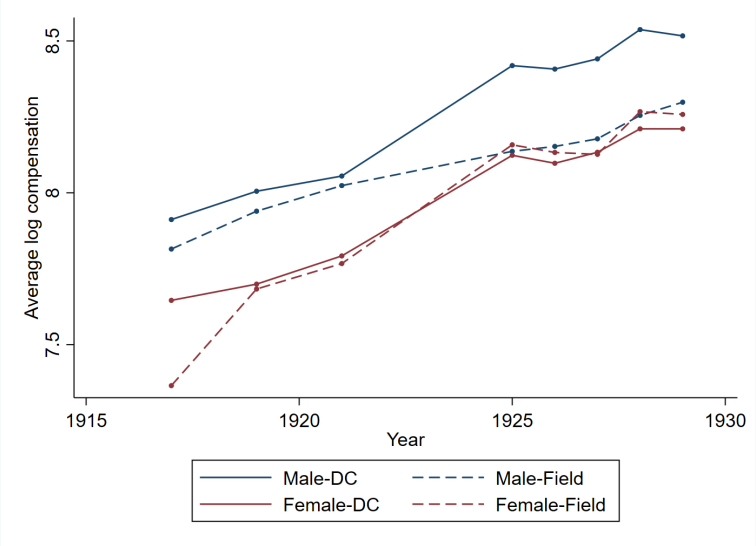
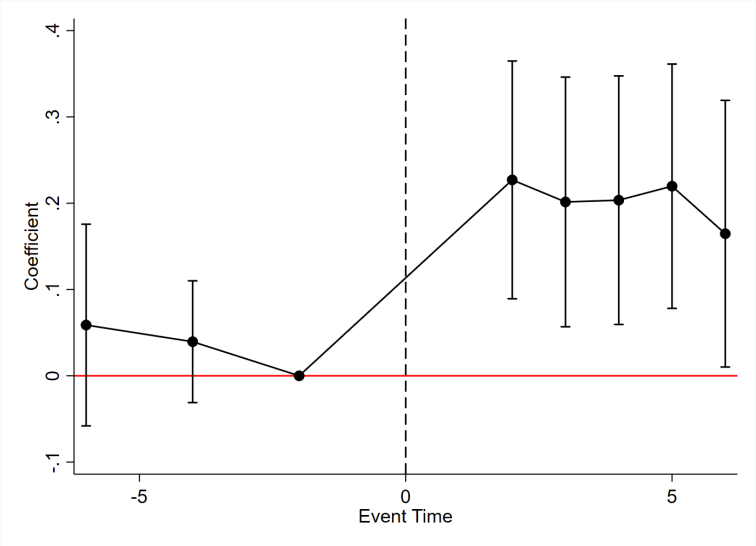
# 9 Figures and Tables

Figure 1: Average Annual Log Compensation by Gender and Location



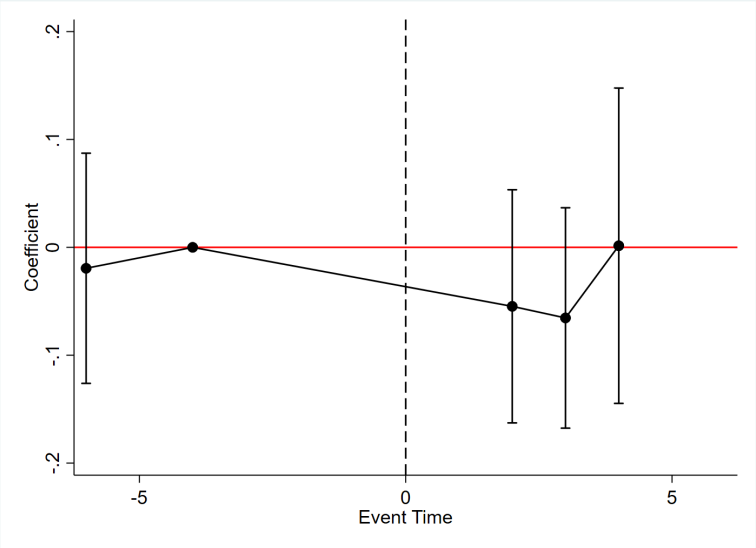

Notes: This figure displays the average log compensation for men in DC, men in the field service, women in DC, and women in the field service from 1917-1929.

Figure 2: Event Study Overall Log Compensation



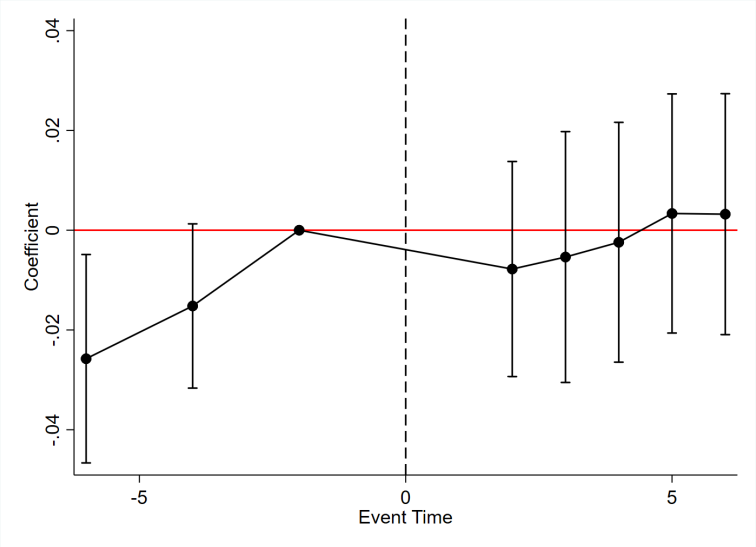

Notes: This figure displays event study coefficients and 95 percent confidence intervals for the effect of the Classification Act on log compensation. The plotted coefficients are on the interaction of an indicator for DC with the event year. The reference year is 1921 and 1923 is represented by year 0.

Figure 3: Event Study Overall 2-Year Retention



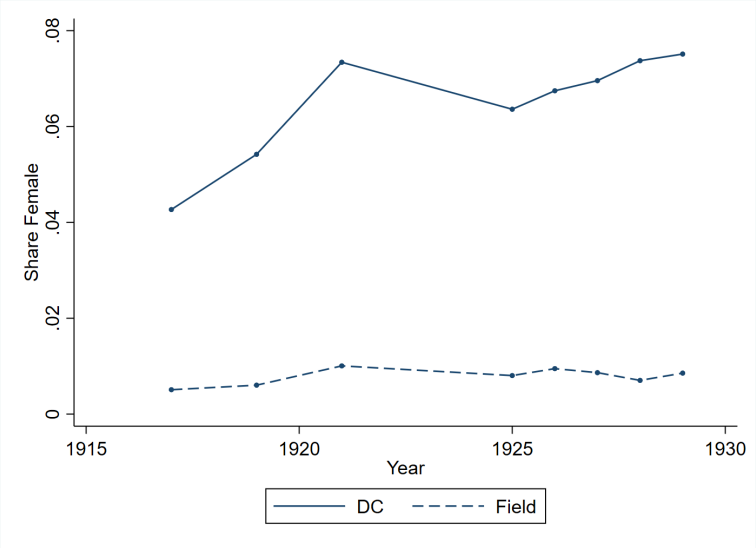

Notes: This figure displays event study coefficients and 95 percent confidence intervals for the effect of the Classification Act on the 2-year retention rate. The 2-year retention rate is an indicator equal to 1 if a civil servant is reported in the Register for year t and then again in year t+2. The retention variable is defined in year t. The plotted coefficients are on the interaction of an indicator for DC with the event year. The reference year is for retention from 1919 to 1921.

Figure 4: Event Study Overall Share Female



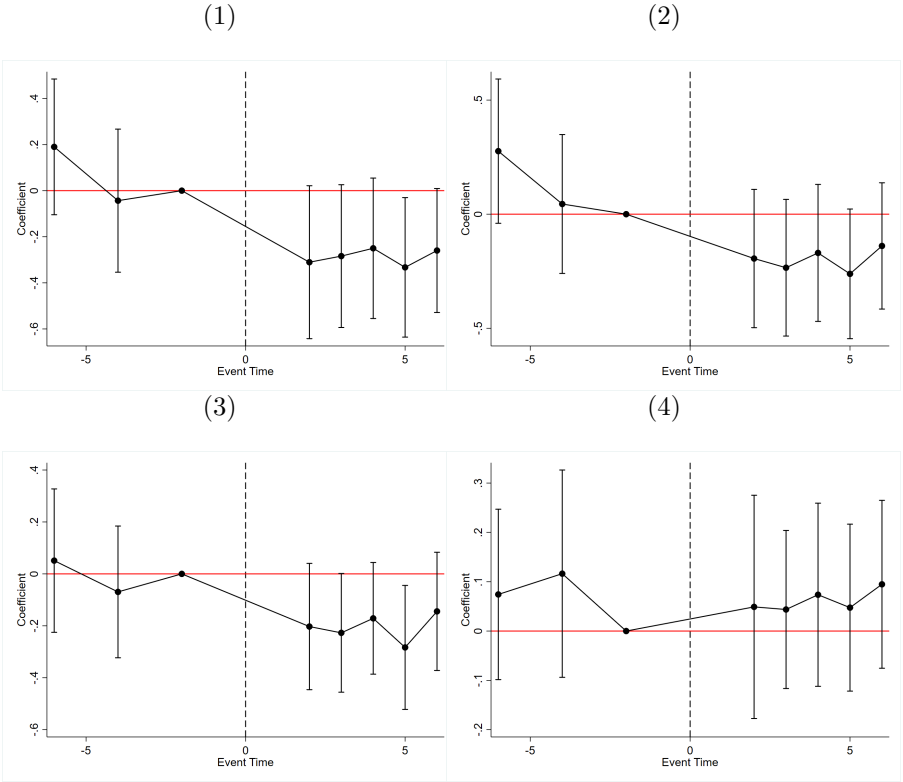

Notes: This figure displays event study coefficients and 95 percent confidence intervals for the effect of the Classification Act on the share of women. The plotted coefficients are on the interaction of an indicator for DC with the event year. The reference year is for retention from 1919 to 1921.

Figure 5: Share of Women by Location



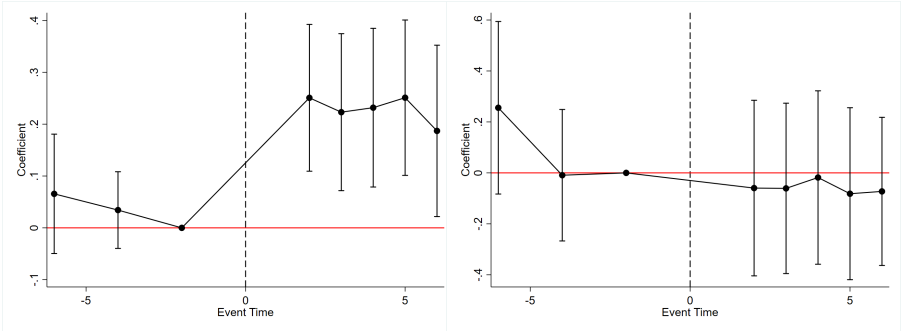

Notes: This figure displays the share of women in DC on the solid line and the share of women in the field service on the dotted line from 1917-1929.

Figure 6: Event Study Differential Gender Effects Log Compensation



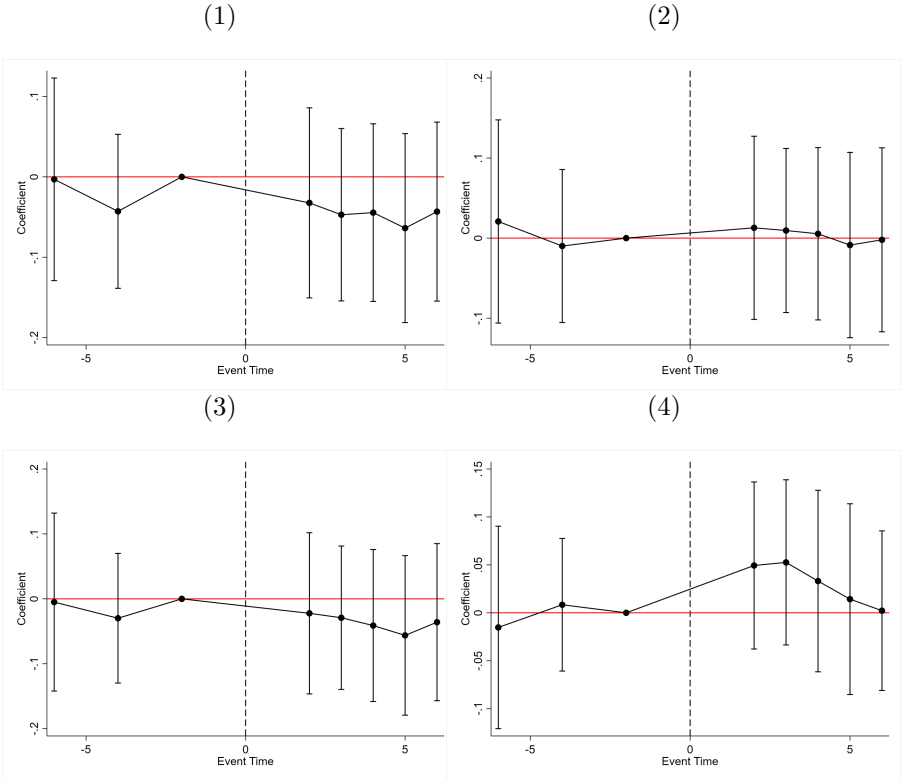

Notes: This figure displays event study coefficients and 95 percent confidence intervals for the differential log compensation effect by gender of the Classification Act. The plotted coefficients are on the interaction of an indicator for DC, an indicator for female, and the event year. The specification for Graph (1) does not include position fixed effects, Graph (2) includes 50 position cluster fixed effects, Graph (3) 100 position cluster fixed effects, and Graph (4) title fixed effects. The reference year is 1921 and 1923 is represented by year 0.

Figure 7: Event Study Log Compensation by Gender



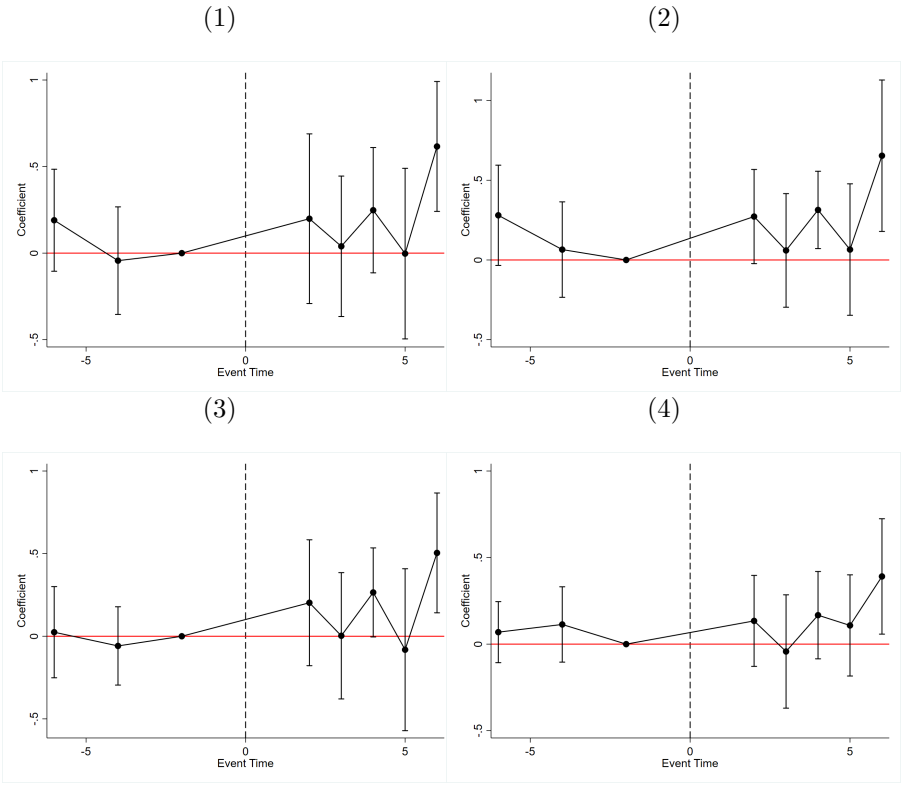

Notes: This figure displays event study coefficients and 95 percent confidence intervals for the effect of the Classification Act on log compensation split by gender. The plotted coefficients are on the interaction of an indicator for DC with the event year. The left graph only includes observations for males and the right graph only includes observations for females. The reference year is 1921 and 1923 is represented by year 0.

Figure 8: Event Study Log Compensation Within DC



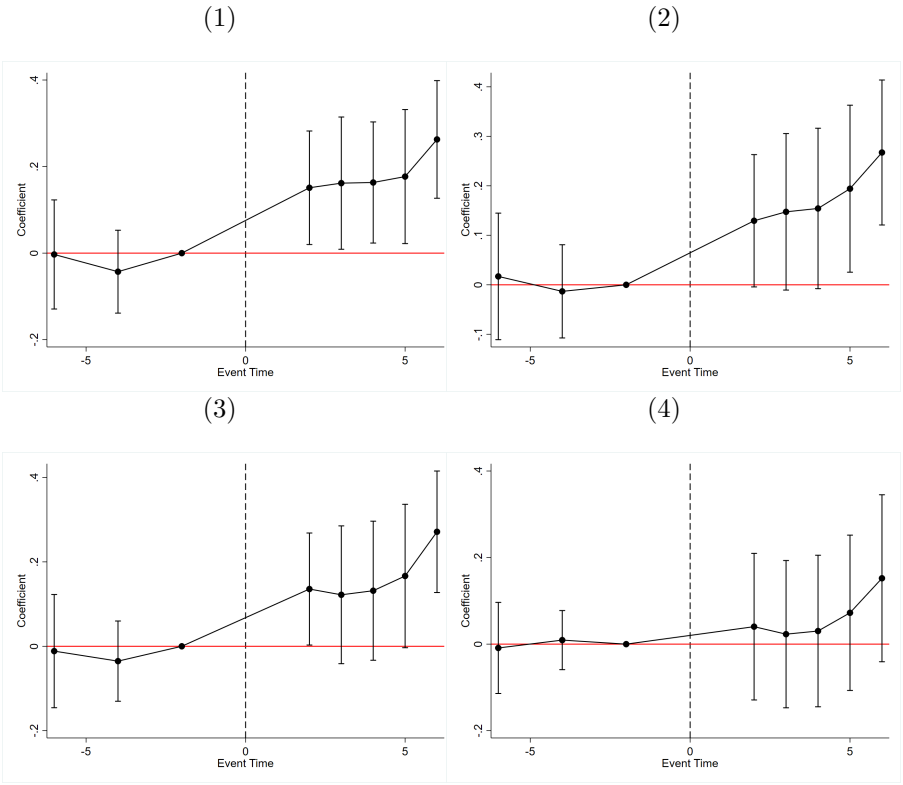

Notes: This figure displays event study coefficients and 95 percent confidence intervals for the differential log compensation effect by gender using the within DC specification. The plotted coefficients are on the interaction of an indicator for female and the event year. We include only observations in Washington, DC. The specification for Graph (1) does not include position fixed effects, Graph (2) includes 50 position cluster fixed effects, Graph (3) 100 position cluster fixed effects, and Graph (4) title fixed effects. The reference year is 1921 and 1923 is represented by year 0.

Figure 9: Event Study Incumbent Compensation



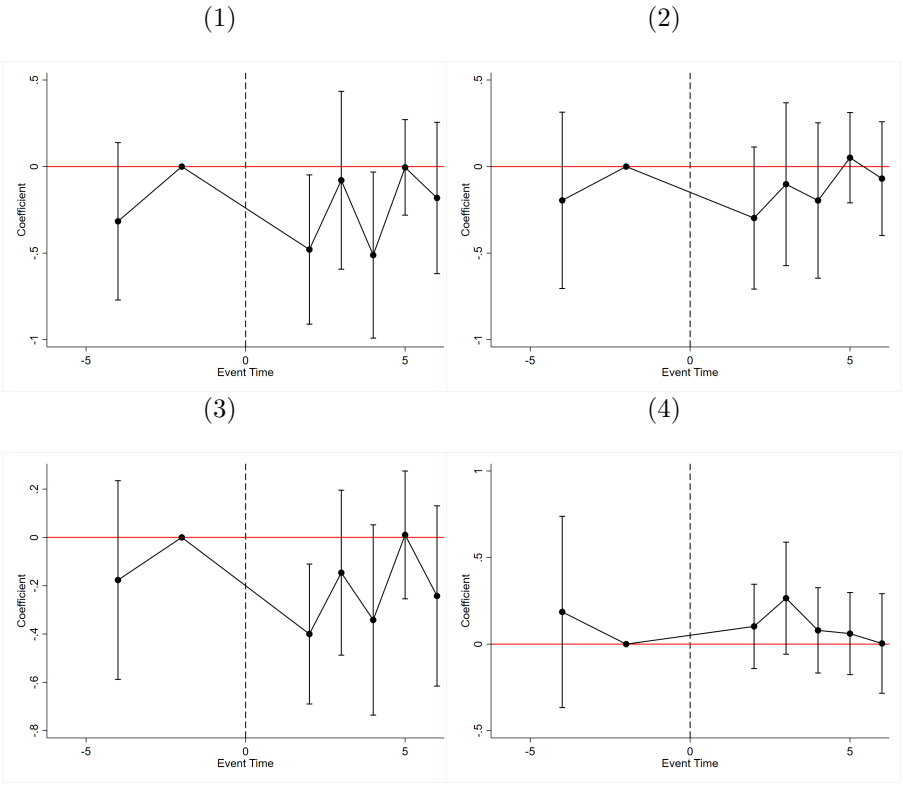

Notes: This figure displays event study coefficients and 95 percent confidence intervals for the differential log compensation effect by gender of the Classification Act for the incumbent sample. The plotted coefficients are on the interaction of an indicator for DC, an indicator for female, and the event year. We only include civil servants working in the federal government before the Classification Act. The specification for Graph (1) does not include position fixed effects, Graph (2) includes 50 position cluster fixed effects, Graph (3) 100 position cluster fixed effects, and Graph (4) title fixed effects. The reference year is 1921 and 1923 is represented by year 0.

Figure 10: Event Study Incumbent Compensation Within DC



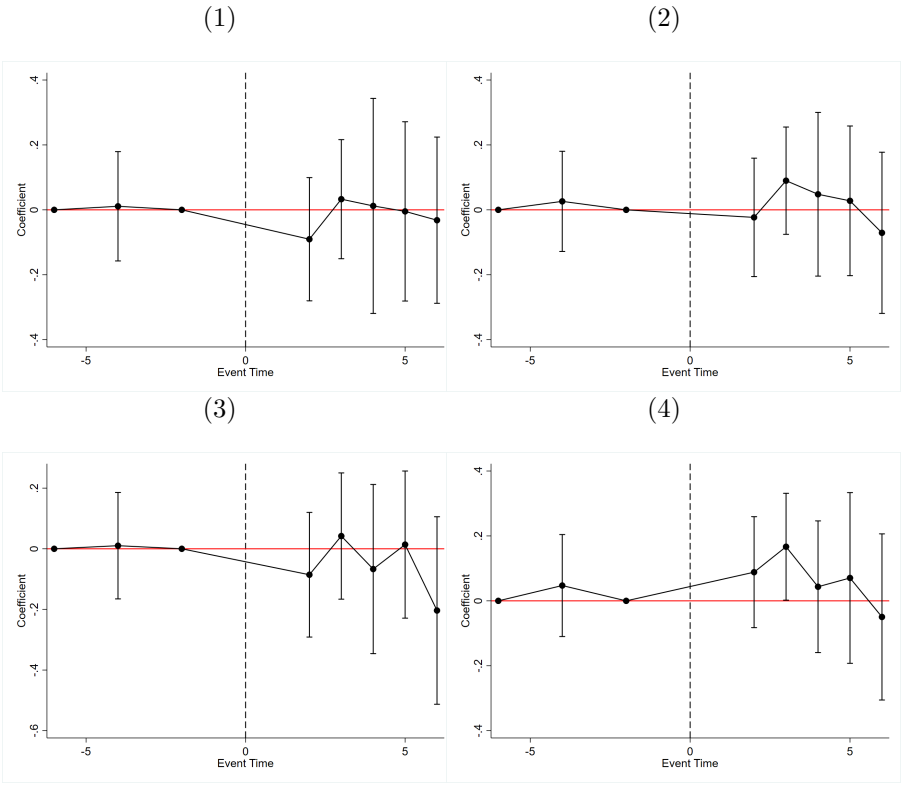

Notes: This figure displays event study coefficients and 95 percent confidence intervals for the differential log compensation effect by gender using the within DC specification and for the incumbent sample. The plotted coefficients are on the interaction of an indicator for female and the event year. We include only individuals in Washington, DC who worked in the federal government before the Classification Act. The specification for Graph (1) does not include position fixed effects, Graph (2) includes 50 position cluster fixed effects, Graph (3) 100 position cluster fixed effects, and Graph (4) title fixed effects. The reference year is 1921 and 1923 is represented by year 0.

Figure 11: Event Study Starting Compensation




Notes: This figure displays event study coefficients and 95 percent confidence intervals for the differential starting log compensation effect by gender of the Classification Act. The plotted coefficients are on the interaction of an indicator for DC, an indicator for female, and the event year. We define starting compensation as the compensation received by an individual the first year they appear in the data. The specification for Graph (1) does not include position fixed effects, Graph (2) includes 50 position cluster fixed effects, Graph (3) 100 position cluster fixed effects, and Graph (4) title fixed effects. The reference year is 1921 and 1923 is represented by year 0.

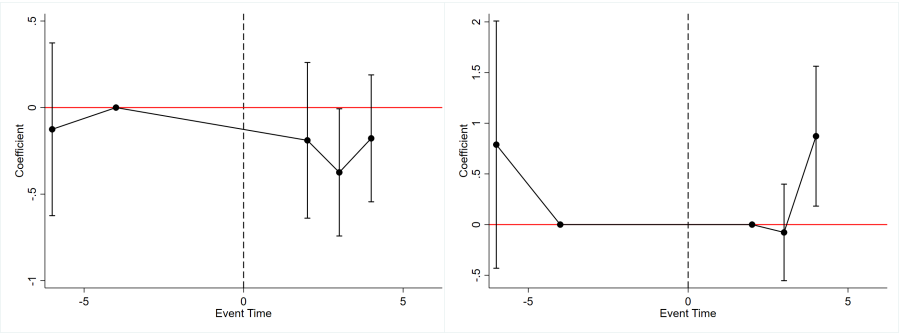
Figure 12: Event Study Starting Compensation Within DC




Notes: This figure displays event study coefficients and 95 percent confidence intervals for the differential log compensation effect by gender using the within DC specification. The plotted coefficients are on the interaction of an indicator for female and the event year. We define starting compensation as the compensation received by an individual the first year they appear in the data. We include only individuals in Washington, DC. The specification for Graph (1) does not include position fixed effects, Graph (2) includes 50 position cluster fixed effects, Graph (3) 100 position cluster fixed effects, and Graph (4) title fixed effects. The reference year is 1921 and 1923 is represented by year 0

Figure 13: Event Study Compensation Growth

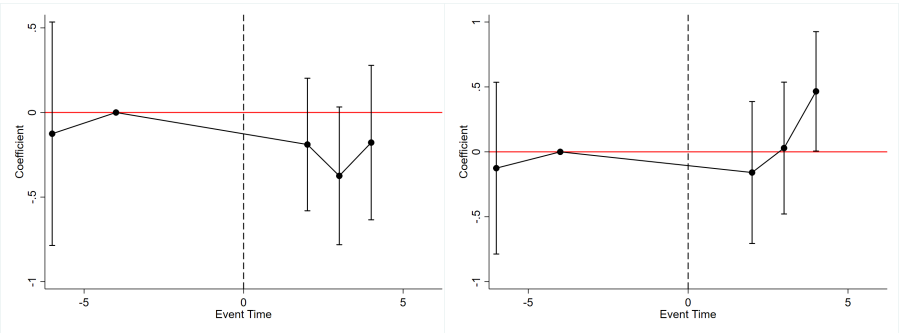
All Incumbents




Notes: This figure displays event study coefficients and 95 percent confidence intervals for the differential gender effect on log compensation growth. The plotted coefficients are on the interaction of an indicator for DC, an indicator for female, and the event year. We define compensation growth as the log of the change in compensation from year t to year t+2. Compensation growth is defined at year t. The left panel includes the full sample and the right panel only includes incumbents. The reference year is compensation growth from 1919 to 1921 and 1923 is represented by year 0.

Figure 14: Event Study Compensation Growth Within DC

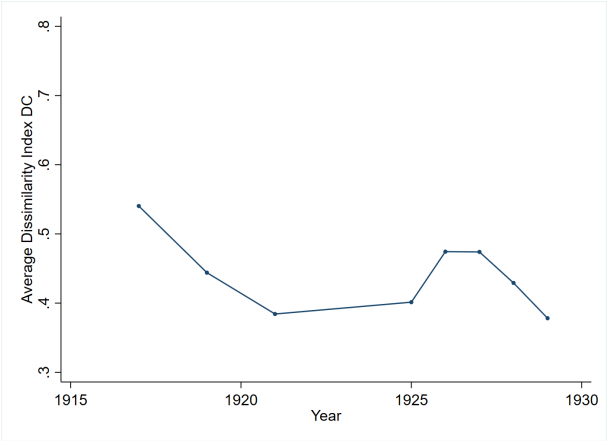
All Incumbents



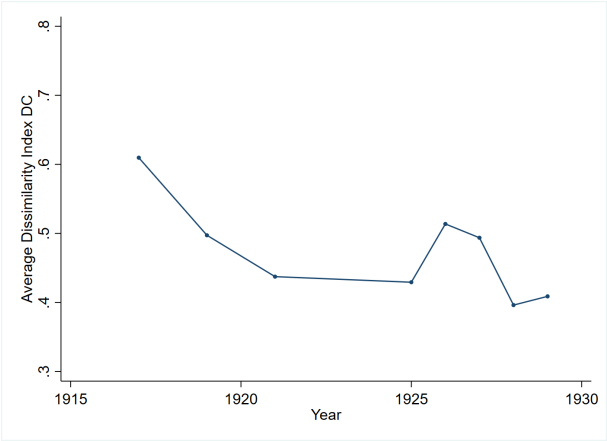

Notes: This figure displays event study coefficients and 95 percent confidence intervals for the differential gender effect on log compensation growth using the within DC specification. The plotted coefficients are on the interaction of an indicator for female and the event year. We define compensation growth as the log of the change in compensation from year t to year t+2. Compensation growth is defined at year t. We only include observations in Washington, DC. The left panel includes the full sample and the right panel only includes incumbents. The reference year is compensation growth from 1919 to 1921 and 1923 is represented by year 0.

Figure 15: Gender Dissimilarity Index of Occupation in DC

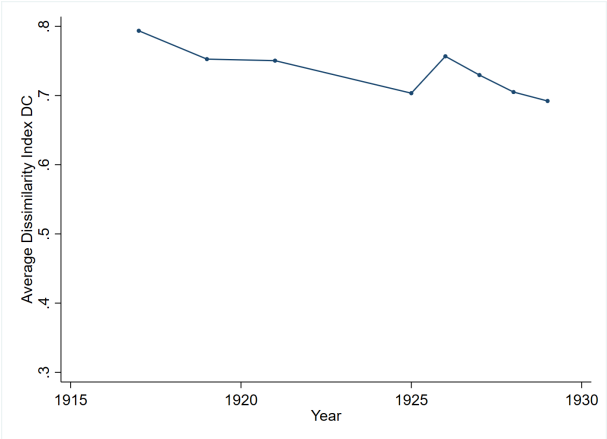
50 Clusters




100 Clusters




Job Titles




Notes: This figure graphs the gender dissimilarity index for different groupings of positions in DC for 1917-1929. The top panel defines the dissimilarity index across the 50 position cluster, the middle panel across the 100 position clusters, and the bottom panel across job titles.

Table 1: Pre-Period Gender Gap

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_compensation | log_compensation | log_compensation | log_compensation |
| female | -0.282*** | -0.275*** | -0.260*** | -0.129*** |
| | (0.0241) | (0.0233) | (0.0221) | (0.0187) |
| DC | 0.0632*** | 0.123*** | 0.159*** | 0.0868*** |
| | (0.00864) | (0.00988) | (0.00970) | (0.0110) |
| $N$ | 7717 | 7717 | 7717 | 7717 |
| R-squared | 0.0500 | 0.156 | 0.278 | 0.691 |
| Mean Log Compensation | 7.960 | 7.960 | 7.960 | 7.960 |
| Cluster50 FE | | X | | |
| Cluster100 FE | | | X | |
| Title FE | | | | X |

Notes: This table presents point estimates from regressions of log compensation on an indicator for being female and an indicator for being employed in DC for 1917-1922. All specifications include year fixed effects. Column (2) also includes fixed effects for the 50 position clusters, (3) includes fixed effects for the 100 position clusters, and (4) for job titles. Standard errors are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$

Table 2: Descriptive Statistics 1917-1921 by Location and Gender

| | (1) | (2) | (3) |
|---|---|---|---|
| Variable | Field | DC | Diff |
| 2-year retnetion | 0.602 | 0.658 | 0.056*** |
| | (0.490) | (0.474) | (0.014) |
| Log compensation | 7.931 | 7.995 | 0.063*** |
| | (0.393) | (0.373) | (0.009) |
| Rank job title | 1,540.255 | 1,454.073 | -86.182*** |
| | (610.065) | (689.348) | (15.079) |
| FB Index | 0.262 | 0.259 | -0.002 |
| | (0.217) | (0.217) | (0.005) |
| Observations | 3,704 | 3,756 | 7,460 |

| | (1) | (2) | (3) |
|---|---|---|---|
| Variable | Field | DC | Diff |
| 2-year retnetion | 0.615 | 0.637 | 0.022 |
| | (0.506) | (0.483) | (0.141) |
| Log compensation | 7.656 | 7.730 | 0.074 |
| | (0.440) | (0.360) | (0.075) |
| Rank job title | 1,702.926 | 1,819.557 | 116.631 |
| | (734.335) | (619.443) | (128.593) |
| FB Index | 0.207 | 0.268 | 0.060 |
| | (0.225) | (0.242) | (0.050) |
| Observations | 27 | 230 | 257 |

Notes: This table displays mean characteristics for employees in the field in column (1) and in DC in column (2) for 1917-1921. The difference in means is presented in column (3). Panel A presents means for men and Panel B for women. Observations are at the person-year level. Standard deviations are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$

Table 3: Overall Compensation and Retention Effects

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | compensation | log_compensation | retention | retention_4 |
| DC X POST | 823.0*** | 0.172*** | -0.0295 | -0.0638 |
| | (213.0) | (0.0599) | (0.0388) | (0.0489) |
| DC | 203.3 | 0.0642 | 0.0535* | 0.0802* |
| | (179.0) | (0.0574) | (0.0310) | (0.0421) |
| *N* | 24849 | 24849 | 15058 | 9017 |
| Mean Compensation | 3845.8 | | | |
| Mean Log Compensation | | 8.170 | | |
| Mean 2-Year Retention | | | 0.730 | |
| Mean 4_Year Retention | | | | 0.490 |
| R-squared | 0.220 | 0.250 | 0.0500 | 0.0700 |
| Year FE | X | X | X | X |

Notes: This table presents difference-in-difference estimates for the effect of the Classification Act on overall compensation in column (1), log compensation in column (2), 2-year retention in column (3), and 4-year retention in column (4). All specifications include year fixed effects. Standard errors are clustered at the unit level and reported in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$.

Table 4: Overall Effects Share of Women

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | female_census_mode | female_census_mode | female_census_mode | female_census_mode |
| DC X POST | 0.0112 | 0.0149 | 0.0137 | 0.00475 |
| | (0.0105) | (0.0114) | (0.0110) | (0.0124) |
| DC | 0.0505*** | 0.0536*** | 0.0504*** | 0.0263** |
| | (0.00984) | (0.0128) | (0.00992) | (0.0112) |
| *N* | 21862 | 21862 | 21862 | 21862 |
| Share Female | 0.0300 | 0.0300 | 0.0300 | 0.0300 |
| R-squared | 0.0300 | 0.0567 | 0.0883 | 0.395 |
| Year FE | X | X | X | X |
| Cluster 50 FE | | X | | |
| Cluster 100 FE | | | X | |
| Title FE | | | | X |

Notes: This table presents difference-in-difference estimates for the effect of the Classification Act on the share of women in the civil service. The dependent variable is an indicator for being female. Column (1) does not include position fixed effects, column (2) includes fixed effects for the 50 position clusters, (3) includes fixed effects for the 100 position clusters, and (4) for job titles. All specifications include year fixed effects. Standard errors are clustered at the unit level and reported in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$

Table 5: Differential Log Compensation Effects by Gender

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_compensation | log_compensation | log_compensation | log_compensation |
| DC X POST X FEMALE | -0.308** | -0.268* | -0.189* | 0.0195 |
| | (0.149) | (0.137) | (0.110) | (0.0833) |
| DC X POST | 0.197*** | 0.180*** | 0.159*** | 0.0746* |
| | (0.0639) | (0.0541) | (0.0413) | (0.0431) |
| DC X FEMALE | 0.0152 | 0.0142 | -0.00713 | 0.0365 |
| | (0.142) | (0.132) | (0.112) | (0.0896) |
| POST X FEMALE | 0.278* | 0.265** | 0.167* | 0.0147 |
| | (0.143) | (0.128) | (0.0994) | (0.0735) |
| DC | 0.0630 | 0.0994* | 0.125*** | 0.0943*** |
| | (0.0624) | (0.0539) | (0.0429) | (0.0328) |
| FEMALE | -0.296** | -0.310*** | -0.282*** | -0.173** |
| | (0.135) | (0.116) | (0.0990) | (0.0845) |
| *N* | 21862 | 21862 | 21862 | 21862 |
| R-squared | 0.250 | 0.364 | 0.410 | 0.748 |
| Mean Log Compensation | 8.180 | 8.180 | 8.180 | 8.180 |
| Year FE | X | X | X | X |
| Cluster 50 FE | | X | | |
| Cluster 100 FE | | | X | |
| Title FE | | | | X |

Notes: This table presents difference-in-difference estimates for the effect of the Classification Act on log compensation, allowing for differential effects by gender. Column (1) does not include position fixed effects, column (2) includes fixed effects for the 50 position clusters, (3) includes fixed effects for the 100 position clusters, and (4) for job titles. All specifications include year fixed effects. Standard errors are clustered at the unit level and reported in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$

Table 6: Gender Log Compensation Effects Within DC

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_compensation | log_compensation | log_compensation | log_compensation |
| FEMALE X POST | -0.0323 | 0.00135 | -0.0269 | 0.0286 |
| | (0.0421) | (0.0438) | (0.0440) | (0.0370) |
| FEMALE | -0.277*** | -0.264*** | -0.255*** | -0.145*** |
| | (0.0463) | (0.0446) | (0.0494) | (0.0291) |
| *N* | 9373 | 9373 | 9373 | 9373 |
| R-squared | 0.340 | 0.450 | 0.466 | 0.756 |
| Mean Log Compensation | 8.250 | 8.250 | 8.250 | 8.250 |
| Year FE | X | X | X | X |
| Cluster 50 FE | | X | | |
| Cluster 100 FE | | | X | |
| Title FE | | | | X |

Notes: This table presents estimates of the effect of the Classification Act on log compensation for women relative to men using the within DC difference-in-differences specification. All columns only include observations in Washington, DC. Column (1) does not include position fixed effects, column (2) includes fixed effects for the 50 position clusters, (3) includes fixed effects for the 100 position clusters, and (4) for job titles. All specifications include year fixed effects. Standard errors are clustered at the unit level and reported in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$

Table 7: Differential Log Compensation Effects by Gender for Incumbent Sample

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_compensation | log_compensation | log_compensation | log_compensation |
| DC X POST X FEMALE | 0.150 | 0.149 | 0.166 | 0.0770 |
| | (0.217) | (0.154) | (0.167) | (0.142) |
| DC X POST | 0.115** | 0.127*** | 0.121*** | 0.0834 |
| | (0.0506) | (0.0441) | (0.0380) | (0.0524) |
| DC X FEMALE | 0.0152 | 0.0228 | -0.0103 | 0.0454 |
| | (0.142) | (0.133) | (0.108) | (0.0950) |
| POST X FEMALE | 0.0463 | 0.0497 | 0.0244 | 0.00348 |
| | (0.212) | (0.153) | (0.165) | (0.125) |
| DC | 0.0630 | 0.106* | 0.149*** | 0.105*** |
| | (0.0624) | (0.0545) | (0.0428) | (0.0327) |
| FEMALE | -0.296** | -0.292** | -0.250** | -0.174* |
| | (0.135) | (0.116) | (0.0963) | (0.0900) |
| *N* | 12608 | 12608 | 12608 | 12608 |
| R-squared | 0.300 | 0.371 | 0.441 | 0.742 |
| Mean Log Compensation | 8.120 | 8.120 | 8.120 | 8.120 |
| Year FE | X | X | X | X |
| Cluster 50 FE | | X | | |
| Cluster 100 FE | | | X | |
| Title FE | | | | X |

Notes: This table presents difference-in-difference estimates for the effect of the Classification Act on log compensation, allowing for differential effects by gender. Only individuals appearing in the register before the Classification Act are included in all regressions. Column (1) does not include position fixed effects, column (2) includes fixed effects for the 50 position clusters, (3) includes fixed effects for the 100 position clusters, and (4) for job titles. All specifications include year fixed effects. Standard errors are clustered at the unit level and reported in parentheses. $*_*p < 0.10, * * p < 0.05, * * *p < 0.01$

Table 8: Gender Log Compensation Effects Within DC for Incumbent Sample

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_compensation | log_compensation | log_compensation | log_compensation |
| FEMALE X POST | 0.193*** | 0.173** | 0.174** | 0.0587 |
| | (0.0624) | (0.0679) | (0.0695) | (0.0782) |
| FEMALE | -0.277*** | -0.264*** | -0.263*** | -0.137*** |
| | (0.0463) | (0.0426) | (0.0472) | (0.0269) |
| *N* | 6650 | 6650 | 6650 | 6650 |
| R-squared | 0.360 | 0.468 | 0.491 | 0.775 |
| Mean Log Compensation | 8.250 | 8.250 | 8.250 | 8.250 |
| Year FE | X | X | X | X |
| Cluster 50 FE | | X | | |
| Cluster 100 FE | | | X | |
| Title FE | | | | X |

Notes: This table presents estimates of the effect of the Classification Act on log compensation for women relative to men using the within DC difference-in-differences specification and for the incumbent sample. All columns only include observations in Washington, DC, and only individuals appearing in the registers before the Classification Act. Column (1) does not include position fixed effects, column (2) includes fixed effects for the 50 position clusters, (3) includes fixed effects for the 100 position clusters, and (4) for job titles. All specifications include year fixed effects. Standard errors are clustered at the unit level and reported in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$

Table 9: Differential Log Starting Compensation Effects by Gender

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_start_compensation | log_start_compensation | log_start_compensation | log_start_compensation |
| DC X POST X FEMALE | -0.260 | -0.144 | -0.241* | 0.0954 |
| | (0.177) | (0.162) | (0.124) | (0.127) |
| DC X POST | 0.266*** | 0.239*** | 0.231*** | 0.0536 |
| | (0.0762) | (0.0650) | (0.0583) | (0.0584) |
| DC X FEMALE | -0.134 | -0.160 | -0.0558 | -0.0654 |
| | (0.160) | (0.161) | (0.136) | (0.114) |
| POST X FEMALE | 0.218 | 0.132 | 0.167* | -0.0410 |
| | (0.161) | (0.141) | (0.1000) | (0.103) |
| DC | 0.0160 | 0.0455 | 0.0630 | 0.0797* |
| | (0.0652) | (0.0590) | (0.0577) | (0.0427) |
| FEMALE | -0.192 | -0.190 | -0.254** | -0.0883 |
| | (0.146) | (0.139) | (0.116) | (0.106) |
| *N* | 5045 | 5045 | 5045 | 5045 |
| R-squared | 0.150 | 0.277 | 0.317 | 0.743 |
| Mean Log Compensation | 8.120 | 8.120 | 8.120 | 8.120 |
| Year FE | X | X | X | X |
| Cluster 50 FE | | X | | |
| Cluster 100 FE | | | X | |
| Title FE | | | | X |

Notes: This table presents difference-in-difference estimates for the effect of the Classification Act on the log of starting compensation, allowing for differential effects by gender. We define starting compensation as the compensation received by an individual the first year they appear in the data. Column (1) does not include position fixed effects, column (2) includes fixed effects for the 50 position clusters, (3) includes fixed effects for the 100 position clusters, and (4) for job titles. All specifications include year fixed effects. Standard errors are clustered at the unit level and reported in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$

Table 10: Gender Log Starting Compensation Effects Within DC

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_start_compensation | log_start_compensation | log_start_compensation | log_start_compensation |
| FEMALE X POST | -0.0443 | -0.00521 | -0.0646 | 0.0574 |
| | (0.0661) | (0.0588) | (0.0689) | (0.0773) |
| FEMALE | -0.324*** | -0.294*** | -0.275*** | -0.144*** |
| | (0.0567) | (0.0507) | (0.0534) | (0.0403) |
| *N* | 1991 | 1991 | 1991 | 1991 |
| R-squared | 0.260 | 0.386 | 0.414 | 0.740 |
| Mean Start Log Compensation | 8.170 | 8.170 | 8.170 | 8.170 |
| Year FE | X | X | X | X |
| Cluster 50 FE | | X | | |
| Cluster 100 FE | | | X | |
| Title FE | | | | X |

Notes: This table presents estimates of the effect of the Classification Act on log starting compensation for women relative to men using the within DC difference-in-differences specification. All columns only include observations in Washington, DC. We define starting compensation as the compensation received by an individual the first year they appear in the data. Column (1) does not include position fixed effects, column (2) includes fixed effects for the 50 position clusters, (3) includes fixed effects for the 100 position clusters, and (4) for job titles. All specifications include year fixed effects. Standard errors are clustered at the unit level and reported in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$

Table 11: Differential Compensation Growth Effects by Gender

| | (1) | (2) |
|---|---|---|
| | log_compensation_delta | log_compensation_delta |
| DC X POST X FEMALE | -0.897* | -0.625 |
| | (0.520) | (0.530) |
| DC X POST | 0.307** | 0.158 |
| | (0.137) | (0.133) |
| DC X FEMALE | 0.640 | 0.640 |
| | (0.466) | (0.466) |
| POST X FEMALE | 0.677 | 0.826* |
| | (0.447) | (0.467) |
| DC | 0.000338 | 0.000338 |
| | (0.128) | (0.128) |
| FEMALE | -0.845** | -0.845** |
| | (0.408) | (0.408) |
| *N* | 7241 | 3790 |
| R-squared | 0.0900 | 0.0500 |
| Mean Log Compensation Growth | 6.010 | 6.120 |
| Year FE | X | X |

Notes: This table presents difference-in-difference estimates for the effect of the Classification Act on the 2-year log compensation growth, allowing for differential effects by gender. We define compensation growth as the log of the change in compensation from year t to year t+2. Compensation growth is defined at year t. Column (1) includes all observations and column (2) only includes observations for individuals who appear in the registers before the Classification Act. All specifications include year fixed effects. Standard errors are clustered at the unit level and reported in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$

Table 12: Gender Compensation Growth Effects Within DC

| | (1) | (2) |
|---|---|---|
| | log_compensation_delta | log_compensation_delta |
| FEMALE X POST | -0.216 | 0.204 |
| | (0.161) | (0.195) |
| FEMALE | -0.210 | -0.210 |
| | (0.166) | (0.166) |
| *N* | 3033 | 2068 |
| R-squared | 0.0600 | 0.0600 |
| mean_log_compensation_delta | 6.150 | 6.150 |
| Year FE | X | X |

Notes: This table presents estimates of the effect of the Classification Act on 2-year log compensation growth for women relative to men using the within DC difference-in-differences specification. We define compensation growth as the log of the change in compensation from year t to year t+2. Compensation growth is defined at year t. Column (1) includes all observations in DC and column (2) only includes observations for individuals in DC who appear in the registers before the Classification Act. All specifications include year fixed effects. Standard errors are clustered at the unit level and reported in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$

Table 13: Differential Job Quality Effects by Gender

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_pre_cluster50 | log_pre_cluster100 | log_pre_title | compensation_top |
| DC X POST X FEMALE | -0.0566 | -0.0715 | -0.290* | -0.196 |
| | (0.0426) | (0.0647) | (0.168) | (0.128) |
| DC X POST | 0.0310 | 0.0686* | 0.170*** | 0.257*** |
| | (0.0357) | (0.0387) | (0.0623) | (0.0648) |
| DC X FEMALE | -0.0105 | -0.0124 | -0.0449 | -0.128 |
| | (0.0293) | (0.0351) | (0.162) | (0.127) |
| POST X FEMALE | 0.0173 | 0.0560 | 0.252 | 0.0932 |
| | (0.0309) | (0.0513) | (0.155) | (0.126) |
| DC | 0.00427 | -0.0172 | 0.0320 | 0.0495 |
| | (0.0220) | (0.0293) | (0.0525) | (0.0620) |
| FEMALE | 0.0167 | 0.0195 | -0.164 | -0.102 |
| | (0.0206) | (0.0281) | (0.150) | (0.117) |
| *N* | 21862 | 21862 | 21862 | 21862 |
| R-squared | 0.0100 | 0.0200 | 0.130 | 0.0700 |
| Mean Log Pre Comp Cluster50 | 8.240 | | | |
| Mean Log Pre Comp Cluster100 | | 8.240 | | |
| Mean Log Pre Comp Title | | | 8.200 | |
| Mean Top Compensation Quartile | | | | 0.290 |
| Year FE | X | X | X | X |

Notes: This table presents difference-in-difference estimates for the effect of the Classification Act on job quality, allowing for differential effects by gender. The dependent variable in column (1) is the average pre-period log compensation for the individual's cluster in the 50 position groups, column (2) the average pre-period log compensation for the individual's cluster in the 100 position groups, column (3) is the average pre-period log compensation for the individual's job title, and column (4) is an indicator for being in the top 25% of a given year's compensation distribution. All specifications include year fixed effects. Standard errors are clustered at the unit level and reported in parentheses. $^{*}*p < 0.10, **p < 0.05, ***p < 0.01$

Table 14: Gender Job Quality Effects Within DC

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_pre_cluster50 | log_pre_cluster100 | log_pre_title | compensation_top |
| FEMALE X POST | -0.0390 | -0.0152 | -0.0380 | -0.106** |
| | (0.0270) | (0.0304) | (0.0417) | (0.0414) |
| FEMALE | 0.00638 | 0.00694 | -0.208*** | -0.226*** |
| | (0.0228) | (0.0193) | (0.0396) | (0.0391) |
| *N* | 9373 | 9373 | 9373 | 9373 |
| R-squared | 0.0100 | 0.0200 | 0.180 | 0.0400 |
| Mean Log Pre Comp Cluster50 | 8.260 | | | |
| Mean Log Pre Comp Cluster100 | | 8.260 | | |
| Mean Log Pre Comp Title | | | 8.260 | |
| Mean Top Compensation Quartile | | | | 0.400 |
| Year FE | X | X | X | X |

Notes: This table presents estimates of the effect of the Classification Act on job quality for women relative to men using the within DC difference-in-differences specification. All specifications only include individuals in DC. The dependent variable in column (1) is the average pre-period log compensation for the individual's cluster in the 50 position groups, column (2) the average pre-period log compensation for the individual's cluster in the 100 position groups, column (3) is the average pre-period log compensation for the individual's job titles, and column (4) is an indicator for being in the top 25% of a given year's compensation distribution. All specifications include year fixed effects. Standard errors are clustered at the unit level and reported in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$

Table 15: Differential Job Quality Effects by Gender for Incumbent Sample

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_pre_cluster50 | log_pre_cluster100 | log_pre_title | compensation_top |
| DC X POST X FEMALE | -0.0212 | -0.0175 | 0.0443 | -0.0168 |
| | (0.0586) | (0.0503) | (0.217) | (0.178) |
| DC X POST | -0.0230 | 0.0254 | 0.105* | 0.145* |
| | (0.0332) | (0.0324) | (0.0608) | (0.0757) |
| DC X FEMALE | -0.0105 | -0.0124 | -0.0449 | -0.128 |
| | (0.0293) | (0.0351) | (0.162) | (0.127) |
| POST X FEMALE | 0.0185 | -0.00265 | 0.103 | 0.142 |
| | (0.0496) | (0.0352) | (0.192) | (0.174) |
| DC | 0.00427 | -0.0172 | 0.0320 | 0.0495 |
| | (0.0220) | (0.0293) | (0.0525) | (0.0620) |
| FEMALE | 0.0167 | 0.0195 | -0.164 | -0.102 |
| | (0.0206) | (0.0281) | (0.150) | (0.118) |
| *N* | 12608 | 12608 | 12608 | 12608 |
| R-squared | 0.0100 | 0.0100 | 0.140 | 0.0300 |
| Mean Log Pre Comp Cluster50 | 8.250 | | | |
| Mean Log Pre Comp Cluster100 | | 8.250 | | |
| Mean Log Pre Comp Title | | | 8.170 | |
| Mean Top Compensation Quartile | | | | 0.330 |
| Year FE | X | X | X | X |

Notes: This table presents difference-in-difference estimates for the effect of the Classification Act on job quality, allowing for differential effects by gender. All specifications only include individuals who appear in the registers before the Classification Act. The dependent variable in column (1) is the average pre-period log compensation for the individual's cluster in the 50 position groups, column (2) the average pre-period log compensation for the individual's cluster in the 100 position groups, column (3) is the average pre-period log compensation for the individual's job titles, and column (4) is an indicator for being in the top 25% of a given year's compensation distribution. All specifications include year fixed effects. Standard errors are clustered at the unit level and reported in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$

Table 16: Gender Job Quality Effects Within DC for Incumbent Sample

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_pre_cluster50 | log_pre_cluster100 | log_pre_title | compensation_top |
| FEMALE X POST | -0.00307 | -0.0198 | 0.147** | 0.121 |
| | (0.0295) | (0.0326) | (0.0722) | (0.0963) |
| FEMALE | 0.00638 | 0.00694 | -0.208*** | -0.226*** |
| | (0.0228) | (0.0193) | (0.0396) | (0.0391) |
| *N* | 6650 | 6650 | 6650 | 6650 |
| R-squared | 0 | 0.0200 | 0.170 | 0.0300 |
| Mean Log Pre Comp Cluster50 | 8.250 | | | |
| Mean Log Pre Comp Cluster100 | | 8.250 | | |
| Mean Log Pre Comp Title | | | 8.210 | |
| Mean Top Compensation Quartile | | | | 0.380 |
| Year FE | X | X | X | X |

Notes: This table presents estimates of the effect of the Classification Act on job quality for women relative to men using the within DC difference-in-differences specification. All specifications only include individuals in DC who appear in the registers before the Classification Act. The dependent variable in column (1) is the average pre-period log compensation for the individual's cluster in the 50 position groups, column (2) the average pre-period log compensation for the individual's cluster in the 100 position groups, column (3) is the average pre-period log compensation for the individual's job titles, and column (4) is an indicator for being in the top 25% of a given year's compensation distribution. All specifications include year fixed effects. Standard errors are clustered at the unit level and reported in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$

Table 17: Differential Starting Job Quality Effects by Gender

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_pre_start_cluster50 | log_pre_start_cluster100 | log_pre_start_title | start_compensation_top |
| DC X POST X FEMALE | -0.115* | -0.0291 | -0.258 | -0.133 |
| | (0.0657) | (0.0708) | (0.173) | (0.163) |
| DC X POST | 0.0260 | 0.0627 | 0.236*** | 0.360*** |
| | (0.0354) | (0.0414) | (0.0735) | (0.0768) |
| DC X FEMALE | 0.00941 | -0.0793** | -0.152 | -0.217 |
| | (0.0483) | (0.0398) | (0.167) | (0.157) |
| POST X FEMALE | 0.0518 | 0.0303 | 0.220 | 0.0123 |
| | (0.0463) | (0.0516) | (0.154) | (0.153) |
| DC | 0.0169 | -0.0108 | 0.00325 | -0.0313 |
| | (0.0260) | (0.0314) | (0.0582) | (0.0720) |
| FEMALE | 0.00639 | 0.0742*** | -0.114 | -0.0382 |
| | (0.0391) | (0.0280) | (0.147) | (0.148) |
| *N* | 5045 | 5045 | 5045 | 5045 |
| R-squared | 0.0300 | 0.0200 | 0.110 | 0.0900 |
| Mean Log Pre Start Comp Cluster50 | 8.240 | | | |
| Mean Log Pre Start Comp Cluster100 | | 8.240 | | |
| Mean Log Pre Start Comp Title | | | 8.180 | |
| Mean Top Compensation Start | | | | 0.260 |
| Year FE | X | X | X | X |

Notes: This table presents difference-in-difference estimates for the effect of the Classification Act on starting job quality, allowing for differential effects by gender. The dependent variable in column (1) is the average pre-period log compensation for the individual's cluster in the 50 position groups, column (2) the average pre-period log compensation for the individual's cluster in the 100 position groups, column (3) is the average pre-period log compensation for the individual's job titles, and column (4) is an indicator for being in the top 25% of a given year's compensation distribution. Each dependent variable is only defined for the year an individual first shows up in our data. All specifications include year fixed effects. Standard errors are clustered at the unit level and reported in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$

Table 18: Starting Job Quality Effects Within DC

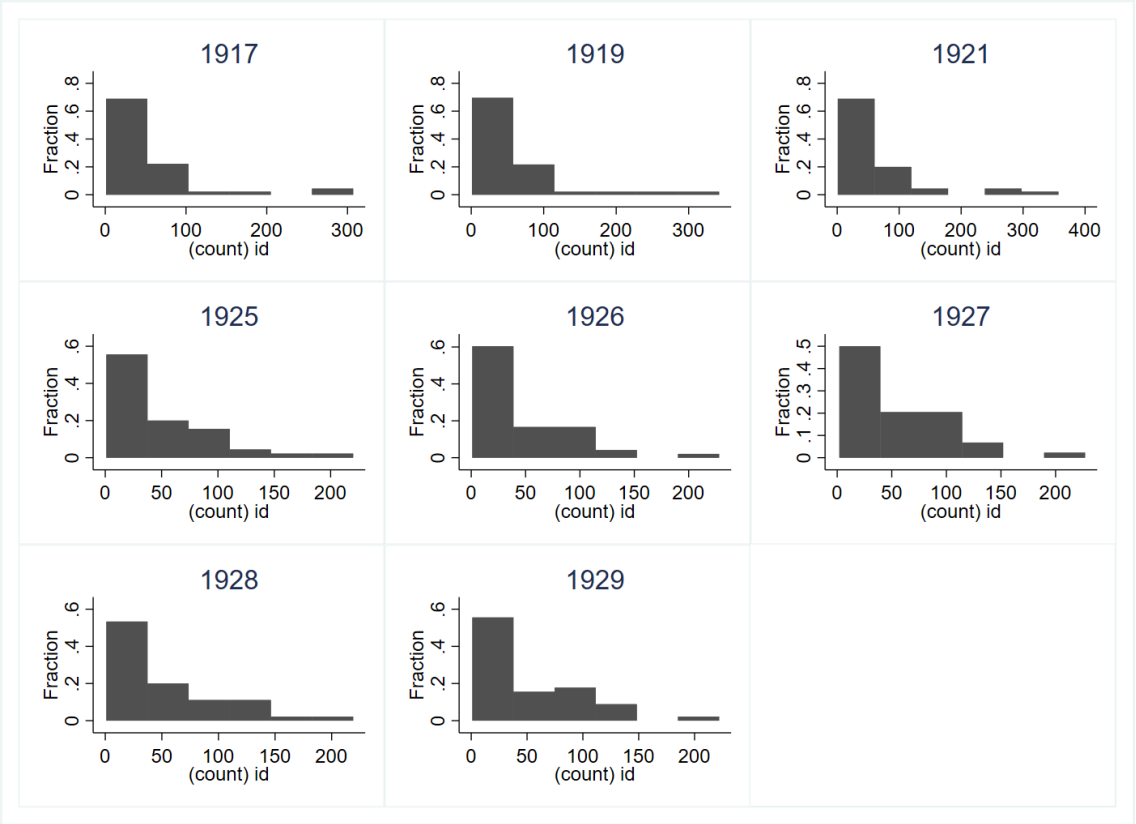
| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_pre_start_cluster50 | log_pre_start_cluster100 | log_pre_start_title | start_compensation_top |
| FEMALE X POST | -0.0658* | -0.000435 | -0.0376 | -0.122** |
| | (0.0344) | (0.0420) | (0.0635) | (0.0604) |
| FEMALE | 0.0156 | -0.00543 | -0.267*** | -0.254*** |
| | (0.0250) | (0.0261) | (0.0548) | (0.0452) |
| *N* | 1991 | 1991 | 1991 | 1991 |
| R-squared | 0.0100 | 0.0100 | 0.190 | 0.0700 |
| Mean Log Pre Start Comp Cluster50 | 8.260 | | | |
| Mean Log Start Pre Comp Cluster100 | | 8.260 | | |
| Mean Log Pre Start Comp Title | | | 8.220 | |
| Mean Top Start Compensation Quartile | | | | 0.350 |
| Year FE | X | X | X | X |

Notes: This table presents estimates of the effect of the Classification Act on starting job quality for women relative to men using the within DC difference-in-differences specification. All specifications only include individuals in DC who appear in the registers before the Classification Act. The dependent variable in column (1) is the average pre-period log compensation for the individual's cluster in the 50 position groups, column (2) the average pre-period log compensation for the individual's cluster in the 100 position groups, column (3) is the average pre-period log compensation for the individual's job titles, and column (4) is an indicator for being in the top 25% of a given year's compensation distribution. All specifications include year fixed effects. Standard errors are clustered at the unit level and reported in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$

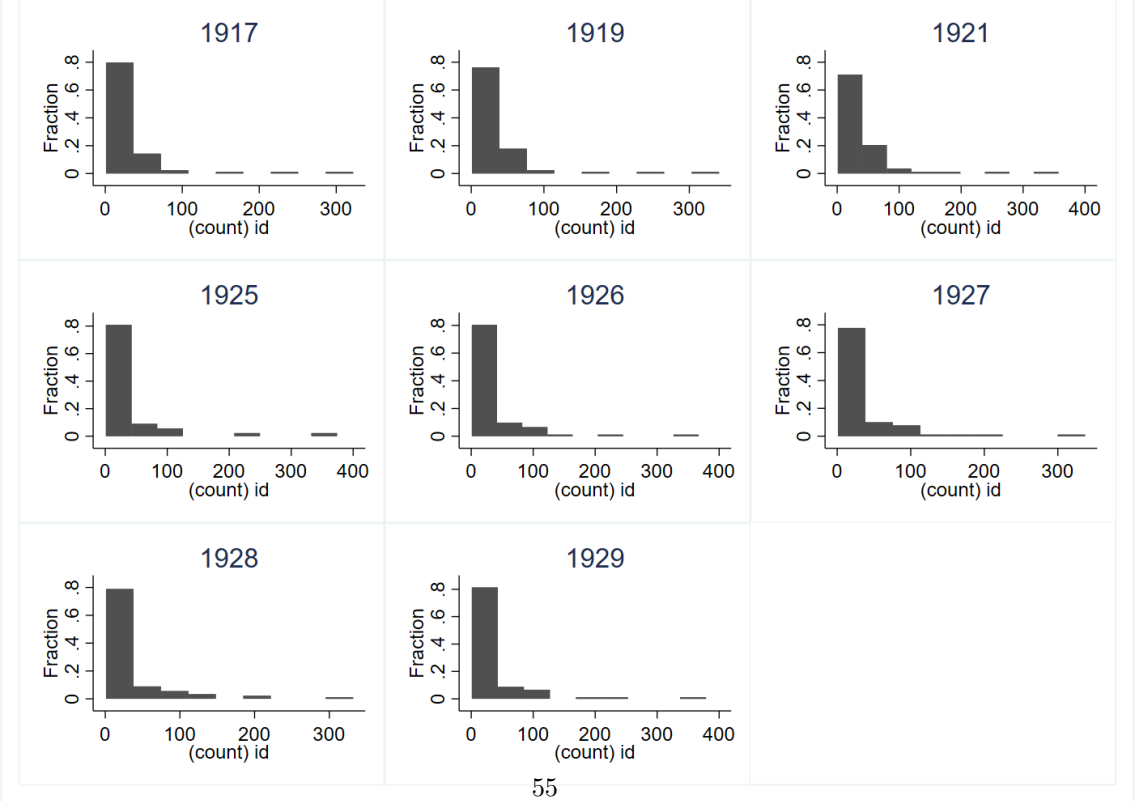
# Supplementary Appendix Figures and Tables

Figure A1: Number of observations Per Cluster Over Time

50 CLusters




100 Clusters






Notes: This figure presents histograms of cluster sizes for each year, resulting from K-means clustering of job titles. The top panel displays cluster sizes for the 50 position groups and the bottom for the 100 position groups.

Table A1: Descriptive Statistics for Matched Sample 1917-1921 by Gender

| | (1) | (2) | (3) |
|---|---|---|---|
| Variable | Male | Female | Diff |
| retention | 0.790 | 0.694 | -0.096 |
| | (0.409) | (0.464) | (0.059) |
| log_compensation | 7.775 | 7.694 | -0.081** |
| | (0.375) | (0.376) | (0.036) |
| rank_log_title | 1,820.790 | 1,814.643 | -6.147 |
| | (663.564) | (623.215) | (61.248) |
| FBindexlast | 0.265 | 0.266 | 0.001 |
| | (0.220) | (0.244) | (0.022) |
| Observations | 275 | 168 | 443 |

Notes: This table displays mean characteristics for men in column (1) and women in column (2) for the matched sample of individuals. Women and men in the pre-period were matched on position cluster, job title rank, foreignness index, and department. The difference in means is presented in column (3). Observations are at the person-year level. Standard deviations are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$

Table A2

| | (1) | (2) |
|---|---|---|
| | log compensation | log change compensation |
| DC X POST X FEMALE | 0.462** | -0.391 |
| | (0.206) | (0.832) |
| DC X POST | 0.128 | -0.00155 |
| | (0.137) | (0.580) |
| DC X FEMALE | 0.00291 | 0.241 |
| | (0.196) | (0.631) |
| POST X FEMALE | -0.297* | 0.615 |
| | (0.177) | (0.784) |
| DC | 0.125 | 0.392 |
| | (0.126) | (0.424) |
| FEMALE | -0.0847 | -0.296 |
| | (0.171) | (0.589) |
| *N* | 724 | 208 |
| R-squared | 0.400 | 0.0300 |
| Mean Log Comp | 7.930 | |
| Mean Log Comp Delta | | |
| Year FE | X | X |

Table A3

| | (1) | (2) | (3) |
|---|---|---|---|
| | log compensation | log change compensation | retention |
| POST X FEMALE | 0.165* | 0.222 | -0.102 |
| | (0.0877) | (0.330) | (0.0993) |
| FEMALE | -0.0819 | -0.0551 | -0.0689 |
| | (0.0726) | (0.203) | (0.0636) |
| *N* | 575 | 168 | 323 |
| R-squared | 0.420 | 0.0100 | 0.0900 |
| Mean Log Comp | 7.960 | | |
| Mean Log Comp Delta | | | |
| Year FE | X | X | X |

Table A4

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_pre_cluster50 | log_pre_cluster100 | log_pre_title | compensation_top |
| DC X POST X FEMALE | 0.0417 | 0.0397 | 0.275 | 0.109 |
| | (0.0561) | (0.0715) | (0.291) | (0.172) |
| DC X POST | -0.0474 | 0.00678 | 0.0571 | 0.210* |
| | (0.0437) | (0.0551) | (0.146) | (0.114) |
| DC X FEMALE | -0.0152 | 0.0252 | 0.0215 | 0.00234 |
| | (0.0324) | (0.0469) | (0.173) | (0.107) |
| POST X FEMALE | -0.0176 | -0.0641 | -0.209 | 0.0147 |
| | (0.0368) | (0.0589) | (0.239) | (0.0883) |
| DC | -0.00819 | -0.0247 | 0.0596 | -0.0163 |
| | (0.0297) | (0.0443) | (0.0958) | (0.0987) |
| FEMALE | -0.00573 | 0.0102 | -0.0191 | -0.0257 |
| | (0.0174) | (0.0384) | (0.144) | (0.0877) |
| *N* | 724 | 724 | 724 | 724 |
| R-squared | 0.0100 | 0.0100 | 0.190 | 0.0200 |
| Mean Log Pre Comp Cluster50 | 8.250 | | | |
| log_pre_cluster100 Mean Log pre Comp Cluster100 | | | | |
| Mean Log Pre Title | | | 8.030 | |
| Mean Top Compensation Quartile | | | | 0.160 |
| Year FE | X | X | X | X |

Table A5

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_pre_cluster50 | log_pre_cluster100 | log_pre_title | compensation_top |
| POST X FEMALE | 0.0235 | -0.0248 | 0.0662 | 0.124 |
| | (0.0310) | (0.0408) | (0.111) | (0.151) |
| FEMALE | -0.0210 | 0.0354 | 0.00241 | -0.0236 |
| | (0.0279) | (0.0301) | (0.0666) | (0.0565) |
| *N* | 575 | 575 | 575 | 575 |
| R-squared | 0.0100 | 0.0100 | 0.200 | 0.0200 |
| Mean Log Pre Comp Cluster50 | 8.240 | | | |
| log_pre_cluster100 Mean Log pre Comp Cluster100 | | | | |
| Mean Log Pre Title | | | 8.040 | |
| Mean Top Compensation Quartile | | | | 0.170 |
| Year FE | X | X | X | X |

Table A6

| | (1) | (2) | (3) |
|---|---|---|---|
| Variable | Male | Female | Diff |
| retention | 0.770 | 0.694 | -0.076 |
| | (0.424) | (0.464) | (0.071) |
| log_compensation | 7.761 | 7.694 | -0.067* |
| | (0.316) | (0.376) | (0.039) |
| rank_log_title | 1,875.722 | 1,814.643 | -61.079 |
| | (609.362) | (623.215) | (69.897) |
| FBindexlast | 0.275 | 0.266 | -0.009 |
| | (0.231) | (0.244) | (0.027) |
| Observations | 143 | 168 | 311 |

Notes: This table displays mean characteristics for men in column (1) and women in column (2) for the matched sample of new hires. Women and men were matched separately in the pre- and post-periods based on position cluster, job title rank, foreignness index, and department. The difference in means is presented in column (3). Observations are at the person-year level. Standard deviations are in parentheses. $*p < 0.10, **p < 0.05, ***p < 0.01$

Table A7

| | (1) | (2) | (3) |
|---|---|---|---|
| | log compensation | log start compensation | log change compensation |
| DC X POST X FEMALE | -0.301 | -0.207 | -0.825 |
| | (0.216) | (0.193) | (0.584) |
| DC X POST | 0.0267 | 0.185 | 0.335 |
| | (0.163) | (0.174) | (0.298) |
| DC X FEMALE | 0.0656 | 0.0435 | 0.825* |
| | (0.193) | (0.182) | (0.436) |
| POST X FEMALE | 0.180 | 0.103 | 0.242 |
| | (0.203) | (0.156) | (0.506) |
| DC | 0.0613 | -0.0977 | -0.236 |
| | (0.144) | (0.170) | (0.188) |
| FEMALE | -0.123 | -0.0551 | -0.684* |
| | (0.179) | (0.149) | (0.366) |
| *N* | 782 | 240 | 253 |
| R-squared | 0.400 | 0.240 | 0.0500 |
| Mean Log Comp | 8.010 | | |
| Mean Log Start Comp | | 7.950 | |
| mean log comp delta | | | |
| Year FE | X | X | X |

Table A8

| | (1) | (2) | (3) |
|---|---|---|---|
| | log compensation | log change compensation | retention |
| POST X FEMALE | -0.123* | -0.124 | -0.577** |
| | (0.0688) | (0.122) | (0.241) |
| FEMALE | -0.0570 | -0.0116 | 0.138 |
| | (0.0661) | (0.102) | (0.229) |
| *N* | 636 | 193 | 210 |
| R-squared | 0.390 | 0.280 | 0.0500 |
| Mean Log Comp | 8 | | |
| Mean Log Start Comp | | 7.940 | |
| mean log comp delta | | | |
| Year FE | X | X | X |

Table A9

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_pre_cluster50 | log_pre_cluster100 | log_pre_title | compensation_top |
| DC X POST X FEMALE | -0.0476 | -0.113* | -0.362 | -0.273 |
| | (0.0561) | (0.0671) | (0.221) | (0.166) |
| DC X POST | 0.0218 | 0.0223 | 0.0194 | 0.211 |
| | (0.0529) | (0.0704) | (0.130) | (0.158) |
| DC X FEMALE | -0.0168 | 0.0487 | 0.0863 | 0.0852 |
| | (0.0394) | (0.0534) | (0.178) | (0.133) |
| POST X FEMALE | 0.0312 | 0.0555 | 0.272 | 0.162 |
| | (0.0370) | (0.0559) | (0.189) | (0.140) |
| DC | -0.00626 | -0.0476 | -0.00566 | -0.1000 |
| | (0.0387) | (0.0554) | (0.100) | (0.135) |
| FEMALE | 0.00248 | 0.0184 | -0.0487 | -0.0613 |
| | (0.0232) | (0.0418) | (0.156) | (0.117) |
| *N* | 782 | 782 | 782 | 782 |
| R-squared | 0.0100 | 0.0600 | 0.170 | 0 |
| Mean Log Pre Comp Cluster50 | 8.240 | | | |
| log_pre_cluster100 Mean Log pre Comp Cluster100 | | | | |
| Mean Log Pre Title | | | 8.050 | |
| Mean Top Compensation Quartile | | | | 0.120 |
| Year FE | X | X | X | X |

Table A10

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_pre_cluster50 | log_pre_cluster100 | log_pre_title | compensation_top |
| POST X FEMALE | -0.0159 | -0.0567 | -0.0912 | -0.110 |
| | (0.0352) | (0.0415) | (0.0780) | (0.0788) |
| FEMALE | -0.0145 | 0.0672* | 0.0378 | 0.0238 |
| | (0.0297) | (0.0391) | (0.0610) | (0.0523) |
| *N* | 636 | 636 | 636 | 636 |
| R-squared | 0.0100 | 0.0500 | 0.130 | 0 |
| Mean Log Pre Comp Cluster50 | 8.240 | | | |
| log_pre_cluster100 Mean Log pre Comp Cluster100 | | | | |
| Mean Log Pre Title | | | 8.040 | |
| Mean Top Compensation Quartile | | | | 0.110 |
| Year FE | X | X | X | X |

Table A11

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_compensation | log_compensation | log_start_compensation | log_start_compensation |
| DC X FEMALE X POST | -0.268* | -0.260 | -0.145 | -0.105 |
| | (0.137) | (0.232) | (0.162) | (0.183) |
| DC X POST | 0.180*** | 0.145*** | 0.240*** | 0.157** |
| | (0.0542) | (0.0427) | (0.0651) | (0.0604) |
| DC X FEMALE | 0.0143 | -0.0395 | -0.159 | -0.224 |
| | (0.132) | (0.216) | (0.161) | (0.167) |
| FEMALE X POST | 0.265** | 0.196 | 0.132 | 0.0591 |
| | (0.128) | (0.228) | (0.141) | (0.168) |
| DC | 0.0994* | 0.0871** | 0.0450 | 0.0538 |
| | (0.0541) | (0.0348) | (0.0592) | (0.0479) |
| FEMALE | -0.309*** | -0.241 | -0.190 | -0.114 |
| | (0.116) | (0.205) | (0.139) | (0.143) |
| *N* | 21094 | 16232 | 4833 | 3978 |
| R-squared | 0.357 | 0.447 | 0.271 | 0.333 |
| Mean Log Compensation | 8.180 | 8.170 | | |
| Mean Log Start Compensation | | | 8.130 | 8.110 |
| Year FE | X | X | X | X |
| Cluster 50 FE | X | X | X | X |
| Panel Sample | X | | X | |
| Flag Flags Dropped | | X | | X |

Table A12

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_compensation | log_compensation | log_start_compensation | log_start_compensation |
| DC X FEMALE X POST | -0.224** | -0.218 | -0.242* | -0.261** |
| | (0.105) | (0.150) | (0.129) | (0.128) |
| DC X POST | 0.161*** | 0.197*** | 0.233*** | 0.271*** |
| | (0.0410) | (0.0412) | (0.0586) | (0.0609) |
| DC X FEMALE | 0.0424 | 0.00252 | -0.0576 | -0.0636 |
| | (0.107) | (0.160) | (0.137) | (0.131) |
| FEMALE X POST | 0.205** | 0.189 | 0.166 | 0.171 |
| | (0.0914) | (0.142) | (0.101) | (0.105) |
| DC | 0.119*** | 0.0607 | 0.0576 | 0.0118 |
| | (0.0424) | (0.0403) | (0.0571) | (0.0540) |
| FEMALE | -0.335*** | -0.272* | -0.256** | -0.229** |
| | (0.0922) | (0.148) | (0.117) | (0.111) |
| *N* | 20306 | 19185 | 4649 | 4561 |
| R-squared | 0.401 | 0.436 | 0.311 | 0.352 |
| Mean Log Compensation | 8.180 | 8.190 | | |
| Mean Log Start Compensation | | | 8.130 | 8.120 |
| Year FE | X | X | X | X |
| Cluster 100 FE | X | X | X | X |
| Panel Sample | X | | X | |
| Flag Flags Dropped | | X | | X |

Table A13

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_compensation | log_compensation | log_start_compensation | log_start_compensation |
| FEMALE X POST | 0.00107 | -0.0578 | -0.00495 | -0.0474 |
| | (0.0438) | (0.0496) | (0.0589) | (0.0643) |
| FEMALE | -0.264*** | -0.248*** | -0.294*** | -0.278*** |
| | (0.0446) | (0.0461) | (0.0508) | (0.0525) |
| *N* | 9261 | 7158 | 1960 | 1588 |
| R-squared | 0.438 | 0.512 | 0.375 | 0.421 |
| Mean Log Compensation | 8.250 | 8.210 | | |
| Mean Log Start Compensation | | | | |
| Year FE | X | X | X | X |
| Cluster 50 FE | X | X | X | X |
| Panel Sample | X | | X | |
| Flag Flags Dropped | | X | | X |

Table A14

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | log_compensation | log_compensation | log_start_compensation | log_start_compensation |
| FEMALE X POST | -0.0242 | -0.0578 | -0.0690 | -0.0851 |
| | (0.0460) | (0.0496) | (0.0724) | (0.0697) |
| FEMALE | -0.260*** | -0.248*** | -0.277*** | -0.258*** |
| | (0.0515) | (0.0461) | (0.0552) | (0.0547) |
| *N* | 8855 | 7158 | 1883 | 1869 |
| R-squared | 0.447 | 0.512 | 0.400 | 0.437 |
| Mean Log Compensation | 8.250 | 8.210 | | |
| Mean Log Start Compensation | | | | |
| Year FE | X | X | X | X |
| Cluster 100 FE | X | | X | X |
| Panel Sample | X | | X | |
| Flag Flags Dropped | | X | | X |