Closing the Revolving Door

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Abstract

Using granular payroll data on 22 million federal employees, we study how regulators respond to revolving door incentives: the option to obtain a job in the private sector. We document bunching of salaries just below a threshold that triggers post-government employment restrictions, indicating a deliberate effort to preserve private sector opportunities. Individuals just below the threshold are more likely to exit and become lobbyists. Agencies with significant bunching regulate high-paying industries, initiate fewer enforcement actions, and issue less costly rules, suggesting regulatory capture. Estimating a structural model, we show that eliminating the restriction will increase incentive distortion by 1.7%.

Keywords: revolving doors, regulatory burden, bunching estimation, compensation incentives

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1 Introduction

Regulators can leave their government position for a job in a regulated firm. This flow, often labeled the revolving door, is at the center of an intense public debate. On one hand, the option to switch sides could incentivize government officials to regulate markets differently, for example, show excess leniency toward regulated firms. On the other hand, closing the revolving door could deter qualified candidates from entering public service in the first place. Despite the importance of the topic, there is little evidence on the prevalence of the revolving door incentive, its causal impact on the behavior of regulators, and the efficacy of policies which aim to limit that effect.

In this paper, we use a new data set and a unique legal setting to start filling the gap. We obtain the employment records of 22 million federal employees over two decades, and exploit the fact that post-employment restrictions on federal employees trigger when the employee's base salary exceeds a threshold. We document significant bunching of employees just below the threshold, consistent with a deliberate effort to preserve their outside options. We further find that bunching regulators show leniency by pursuing fewer enforcement actions and reducing the compliance costs of many rules. Finally, we incorporate our findings into a structural model and evaluate the consequences of alternative policies.

Our analysis is centered on the post-employment restrictions which cover senior government employees (18 U.S.C. §207(c) and §207(f)). Regulators are barred for one year from communicating on matters that pertain to their former agency and from representing or advising foreign entities. Any violation is subject to criminal and civil fines and up to five years in prison. Crucially, the restrictions are triggered by a salary threshold that equals 86.5% of level II of the Executive Schedule, which amounts to $172,400 as of 2021. This offers a rare opportunity to study how federal regulators respond to the revolving door: if they wish to preserve their outside option, they should stay below the cutoff salary and thus avoid triggering the post-employment restrictions. We test this possibility using a new data set which covers the entire civilian workforce in the federal government. Obtained through repeated Freedom of Information Act requests, it contains comprehensive information on 22 million employees who worked in the federal government at any point between 2004 and 2021.

In the first part of the paper, we uncover causal evidence for revolving door incentives in the federal government. We exploit the discrete change in the value of the revolving door incentive around the salary threshold of §207: crossing the threshold triggers a one-year ban, which reduces the value of the outside option. If employees care about that outside option, they would avoid crossing the threshold and instead create a significant cluster just below the threshold. Using a formal bunching estimator, we identify statistically significant bunching in 33 federal agencies. This group includes financial regulatory agencies such as the Commodity Futures Trading Commission (CFTC), Securities and Exchange Commission (SEC), and Federal Deposit Insurance Corporation (FDIC), and agencies responsible for managing and distributing government funds such as the the Farm Credit Administration (FCA), Overseas Private Investment Corporation (OPIC), and the Federal Retirement Thrift Investment Board (FRTIB). On average, 49% of the revolving agencies personnel respond to revolving door incentives and accept a $6,400 pay cut in order to stay below the threshold (7.4% of the average salary). Digging deeper into the heterogeneity, we use data from Selin (2015) to study the structural differences between agencies. We find that revolving agencies have greater autonomy to exercise their regulatory powers. For example, they enact regulations without OMB review, file enforcement lawsuits independently, communicate directly with Congress, and independently manage their budget. Moreover, using lobbying data from OpenSecrets, we find that revolving agencies attract more lobbying expenditures and are lobbied by industries that offer higher average pay.

Subsequent tests confirm that bunching is a strategic response by agents who wish to preserve their outside option. First, we exploit the fact that the SEC was exempt from the restriction until 2013. If employees bunch to escape post-employment restrictions, we should see substantial bunching at the SEC only after 2013. We conduct our formal bunching estimation separately for the 2003-2013 and 2014-2021 periods, and find a significant bunching at the SEC only in the latter period. Second, the incentive to bunch should increase when the agency is suddenly equipped with broader regulatory powers. We exploit the passage of the Dodd-Frank Act in 2010, which directed 25 agencies to develop 451 new regulations. In a difference-in-differences setting, we show that bunching increased among treated agencies following Dodd-Frank by 6-10%. Third, we turn to employee-level analysis and find that bunchers exhibit superior performance during their government stint by earning more promotions and bonuses. However, as they come closer to the threshold, they accept fewer promotions and a slower salary progression. Finally, we show that bunchers are more likely to exit from the government and, conditional on exiting, they are more likely to turn to the lobbying industry. Combined, those tests confirm that bunching is a strategic choice of regulators who seek to preserve the value of their outside option.

In the second part of the paper, we examine whether the revolving door motivates regulators to impose a different level of regulatory burden. Existing studies posit that the outside option provides a powerful incentive, but offer mixed evidence on the direction of the effect. On one hand, it could lead to regulatory leniency, for example if regulators seek to carry favor with potential future employers (*regulatory capture* hypothesis). On the other hand, regulators might choose to vigorously fulfill their duties, in order to build their reputation and human capital (*schooling* hypothesis). We compare the regulatory burden imposed by revolving agencies with indifferent ones and find that a typical revolving agency imposes 8.9 fewer rules, and those rules are associated with 9.5 million fewer paperwork forms filed and 2.1 million fewer hours measured monthly. This evidence is more consistent with *regulatory capture* theories, which predict that revolving door incentives lead to regulatory leniency. To sharpen the identification, we exploit the introduction of the post-employment restriction at the SEC in 2014, which limited the outside job opportunities of SEC employees who were above the salary threshold. In a difference-in-differences setting, we find that the restriction led to increased enforcement activities by SEC attorneys who were above the threshold and thus had fewer outside options. This is consistent with capture theories, which suggest that revolving door incentives can lead to regulatory leniency.

In the last part of the paper, we analyze possible policy responses to the revolving door incentives using a structural model calibrated to our estimates. We show that imposing post-employment restrictions lead to a trade-off between labor supply and incentive distortion: it alleviates the incentive distortion while reducing labor supply to the public sector. A counterfactual policy that increases the post-employee restriction to two years would reduce the leniency by 0.5% while decreasing the labor supply by 0.13%. This occurs as the attractiveness of the private sector option diminishes with a longer restriction period, making government roles less enticing. Conversely, eliminating these restrictions might boost recruitment by 0.2%, but it would escalate regulatory leniency by 1.7%. However, the broader economic implications of these policies remain limited, given that employees can strategically position themselves just below the set thresholds. As a result, alternate strategies, like strengthening the internal governance of regulators, may prove more impactful.

Our work primarily contributes to the literature on the revolving door phenomenon, providing the first systematic evidence of revolving door incentives in the federal government. Concretely, we offer three contributions. *First*, existing studies typically observe the revolving door only after the employee leaves the government. This complicates the analysis of how regulators respond to revolving door incentives while still working in the government. For instance, several studies show that regulators who eventually moved to the private sector behaved differently during their government tenure (deHaan et al., 2015; Lucca et al., 2014; Tabakovic and Wollmann, 2018). However, this would also be consistent with certain behavior attracting job offers and with matching between private employers and pro-business regulators. An alternative strategy is to show that firms change their policies after hiring hire ex-regulators (Correia, 2014; Lambert, 2019; Heese, 2022; Hendricks et al., 2022). However, this would also be consistent with firms actively recruiting ex-regulators in anticipation of future events. In contrast, ours is the first paper to identify the causal response to the outside option, in a broad sample of federal employees who are still employed in the government.

Second, existing papers usually focus on revolving doors between specific agencies and specific industries. Notable examples are bank regulators (Lucca et al., 2014), patent examiners (Tabakovic and Wollmann, 2018), lawmakers (Blanes i Vidal et al., 2012), sell-side analysts (Cohen et al., 2012; Cornaggia et al., 2016; Kempf, 2020), and auditors (Geiger et al., 2005, 2008; Bhattacharjee and Brown, 2018). This leaves open the question of how widespread the revolving door phenomenon is in the government. We utilize employment records of the entire federal workforce and document novel heterogeneity across agencies. Additionally, whereas prior research often zeroes in on agency-specific regulatory actions like bank supervision, we connect revolving door incentives to more general metrics of regulatory burden. This allows us to highlight the more extensive impact of revolving door incentives on overall regulatory burden for firms.

Third, we assess the efficacy of policies related to the revolving door. Studies found limited impact of post-employment restrictions on public utility commissioners (Law and Long, 2012) and assemblymen (Strickland, 2020), but a significant impact on Congressional staffers (Cain and Drutman, 2014). Against this background, we offer two novel insights. First, threshold-based revolving door policies are prone to manipulation if agents can alter their position relative to the threshold. In fact, a more stringent policy (for example, a longer cool-off period) will lead to even more strategic manipulation. Second, we quantify the consequences of alternative policies using a structural model, which we calibrate based on the full employment records and our reduced-form results. We document the joint impact of various policies on labor supply to the public sector, strategic manipulation of salaries, and regulatory leniency. Our results can inform the debate on how to improve the performance of regulatory agencies further.

Our work also contributes to rich literature which links the outside option to regulatory burden. One view is that regulators decrease regulatory burden to curry favor with potential employers, an idea rooted in the "regulatory capture" theory (Stigler, 1971; Peltzman, 1976; Shleifer and Vishney, 1993). For example, senior regulators adjust policies favorably for regulated firms (Hilton, 1972), and regulators show leniency towards firms toward firms they ultimately join (Correia, 2014; Lambert, 2019; Heese, 2022; Hendricks et al., 2022; Tabakovic and Wollmann, 2018). Conversely, the "regulatory schooling" hypothesis suggests that regulators intensify their efforts to enhance their reputation and marketability (Bond and Glode, 2014; Bar-Isaac and Shapiro, 2011). Empirical findings, such as the absence of pro-industry biases at the Federal Communications Commission (Gormley Jr, 1979; Cohen, 1986), and the hiring of stringent inspectors and lawyers by private firms (deHaan et al., 2015; Lucca et al., 2014; Agarwal et al., 2014; Shive and Forster, 2016), corroborate this perspective. Our findings are mostly consistent with theories of regulatory capture, as they demonstrate that the outside option can lead to a reduced regulatory burden on companies.

More broadly, our work relates to the literature on incentives and the performance of regulatory agencies. The prior studies have explored the role of salaries (Dal Bó et al., 2013), bonuses (Ashraf et al., 2014), promotions (Kalmenovitz, 2021), intrinsic motivation (Bénabou and Tirole, 2006), and lifetime experiences (Malmendier et al., 2021; Kalmenovitz and Vij, 2021). A related literature studies organizational features such as fee schedules (Kisin and Manela, 2018), field offices (Gopalan et al., 2021), supervision (Hirtle et al., 2020; Eisenbach et al., 2016), and jurisdictional overlap (Kalmenovitz et al., 2021). We focus on a powerful incentive, the option to work in a regulated firm, and illustrate how this incentive may draw individuals into public service while also possibly distorting their regulatory decisions.

Finally, our work also relates to the bunching literature in public finance and labor economics. Classic studies document bunching in the income distribution, driven by discrete changes in the income tax rates (Saez, 2010; Chetty, Friedman, Olsen, and Pistaferri, 2011; Kleven and Waseem, 2013). Our paper features a novel setting: bunching in the public sector wage distribution, driven by discrete changes in the revolving door incentive. Aside from documenting a new stylized fact, we illustrate how to use the bunching pattern to estimate structural parameters which affect the revolving door incentive. By doing so, we contribute to a growing literature that extends the bunching estimation technique to broader settings in economics and finance (DeFusco and Paciorek, 2017; DeFusco, Johnson, and Mondragon, 2020; Bachas, Kim, and Yannelis, 2021; Antill, 2021; Dagostino, 2018; Alvero, Ando, and Xiao, 2023; Ewens, Xiao, and Xu, 2021; Pan, Pan, and Xiao, 2021; Anagol, Lockwood, Davids, and Ramadorai, 2022).

2 Background and setting

2.1 Institutional setting

Our analysis is centered on the post-employment restrictions specified in Title 18 of the U.S. Code, Section 207. The section was enacted by the Bribery, Graft, and Conflicts of Interest Act of 1962, and revised by the Ethics in Government Act of 1978 and the Ethics Reform Act of 1989.[1] Section 207 includes various restrictions, and we focus on the two which apply specifically to *senior* government employees: §207(c) and §207(f). The details that follow are based on public sources and legal articles (especially Gerlach (1991) and Congressional Research Service (2012)), and on interviews we conducted with two long-serving ethics attorneys in the federal government, who are responsible for implementing section 207 in their respective agencies.

Senior personnel are barred for one year from communicating with or appearing before their former agency in connection with any matter (§207(c)).[2] Additionally, they are barred for one year from representing, aiding, or advising foreign entities (§207(f)). Crucially, seniority depends on a salary threshold: senior employee is one whose basic pay, excluding other components such as bonus and locality pay, is greater or equal to 86.5% of level II of the Executive Schedule (EX-II).[3] The cutoff salary for seniority was originally set at level 17 of the General Schedule. It was later changed to level V of the Executive Schedule (1991), level 5 of the Senior Executive Service (1996), and finally to level II of the Executive Schedule (2003).[4] For simplicity, our main analysis will begin

[1] Pub. L. 87-849, 76 Stat. 1119 (1962), Pub. L. 95-521, 92 Stat. 1824 (1978), and Pub. L. 101-194, 103 Stat. 1716 (1989), respectively.

[2] "[A]ny person who is an officer or employee... of the executive branch of the United States..., who is referred to in paragraph (2), and who, within 1 year after the termination of his or her service or employment as such officer or employee, knowingly makes, with the intent to influence, any communication to or appearance before any officer or employee of the department or agency in which such person served within 1 year before such termination, on behalf of any other person (except the United States), in connection with any matter on which such person seeks official action by any officer or employee of such department or agency, shall be punished as provided in section 216 of this title."

[3] EX-II is associated with Deputy Secretaries and Administrators of programs such as the Environmental Protection Agency (5 U.S.C. §5313).

[4] Pub. L. 101-509, 104 Stat. 1441 (1990); Pub. L. 104-179, 110 Stat. 1568 (1996); and Pub. L. 108-

in 2004, when the final benchmark has been selected. Note that the Executive Schedule salaries are updated annually through an Executive Order. Consequently, the definition of seniority for the purpose of Section 207 is updated annually as well.

The §207(c) restriction applies to any matter, from specific regulatory actions to broad policy discussions, even if those were initiated after the senior employee left the government. It applies only to appearances and communications with the regulator's former agency. For example, suppose an ex-SEC attorney is hired by a law firm that defends clients in SEC proceedings. The attorney cannot litigate any case in court, even if it was initiated after she left the SEC. She cannot correspond with SEC employees or sit in a room where a meeting with the SEC employees is being held. The attorney can, however, provide behind-the-scenes advice to the firm's clients. If the firm also has a lobbying shop, the attorney cannot meet with SEC employees to discuss broad policies, nor can she write comment letters to the SEC with comments on specific SEC rule proposals, even if those rules are unrelated to her former position and were initiated after she has left the SEC. However, the attorney can advise other attorneys as they prepare to have such meetings or write such rules. She can also meet with other government agencies and with members of Congress to discuss SEC matters.

Each agency has a designated ethics office which monitors compliance and promotes awareness to the restrictions. That includes briefing new employees during the onboarding process and offering ethics counseling sessions for employees who are about to leave. Across the government, the restrictions fall under the purview of the Office of Government Ethics (OGE). The OGE publishes the implementing regulations (Title 5 of the CFR, Section 2641), and circulates an annual bulletin with legal updates. The Department of Justice, in coordination with the OGE, enforces the provisions of §207. Any violation is subject to criminal fines and additionally carries a maximum sentence of one year in prison, five for a willful violation. Moreover, a District Court may impose a civil penalty of up to $50,000 or the amount of compensation which the person received in violation

136, 117 Stat. 1639 (2003). A transition period was set between 11/24/2003 and 11/24/2005. During that time, the restriction applied to any person whose pay exceeded SES-5, even if it was less than 86.5% of EX-II.

of §207, whichever amount is greater.

In sum, the seniority-based restrictions reduce the value of the outside option of senior government officials. We exploit this fact to identify how regulators respond to revolving door incentives. Several things should be noted. First, we cannot separate 207(c) from 207(f), given that they both apply at the exact same cutoff. Second, we can identify only the marginal effect of seniority-based restrictions. The true effect of revolving door incentives is likely larger, because additional post-employment restrictions apply uniformly for all employees.[5] Moreover, the seniority-based restrictions do not necessarily set the outside option's value to zero. For example, the ex-senior regulator can still provide advice behind the scenes.[6] For those reasons, we believe that our estimates provide a lower bound to the true effect of revolving door incentives.

2.2 Data and descriptive statistics

Our pivotal data set covers the entire civilian workforce in the federal government. We obtained it through repeated Freedom of Information Act requests submitted to various federal entities. It contains comprehensive information on any employee who worked in the federal government at any point between 2004 and 2021. We observe each employee's agency, occupation and date of accession, and annual information on location (state, county, city), salary, pay plan and pay grade, tenure, and bonus. To the best of our knowledge, the data set is free of selection bias and includes the universe of federal employees from that period.

The original data set consists of 21,903,100 employee×year observations working in 263 federal agencies. As we explain below in Section 4.1, for the formal bunching estimation we remove small agencies with insufficient amount of observations. That leaves a sample of 19,707,232 employee×year observations working in 166 federal agencies. Table 1

[5] A permanent bar (§207(a)(1)) prohibits communication with the former agency on matters on which the employee worked personally. A two-years bar (§207(a)(2)) applies to matters which were pending under the employee's official responsibility during his last year of government service, even if he did not work on that personally. A one-year bar (§207(b)) refers to employees who participated in international trade negotiations, and another one-year bar (§203) refers to ex-post sharing in profits earned by the private employer while the former regulator was still working at the government.

[6] We return to this point in Section 6 (see Footnote 41).

reports descriptive statistics. The average employee has 14.7 years of government service and earns $68,230 (or $86,423 in constant 2022 USD). The post-employment restriction applies to 2.2% of the employees, whose basic pay exceeds the regulatory threshold. The bunching methodology utilizes observations within ±$100,000 of the threshold, and 59% of the employees fall within that range.

In Section 4.3, we conduct employee-level analysis based on a sample of employees who can be unambiguously tracked over time (regardless of how many employees work in that agency). To that end, we remove observations with incomplete names or names that appear more than once in a given year. This subsample includes 2,850,460 unique employees working in 257 agencies, total of 22,326,986 employee×year observations. In this subsample, the annual pay raise is 4.1%, the promotion rate is 15.7%, and the exit rate is 9.7%. We rely on those statistics to assess the economic magnitude of our findings, and to evaluate counterfactual scenarios in Section 6.

To get a better understanding of how binding the threshold is, we compute the number of ranks (pay grades) affected by it. Recall that each pay grade has a lower and upper bound, which are updated every year (as is the threshold). For each rank, we check whether it was at least in one year affected by the threshold. This happens if the rank's lower bound was above the threshold (fully affected), or if the threshold was nested between the rank's lower and upper bound. Out of 1,152 ranks, 20.9% (241) are potentially affected by the threshold. Managerial ranks are more likely to be affected by the threshold, relative to non-managerial ranks (29.7% versus 19.6%). Similarly, we find that 32% of the occupations in our sample (218 out of 682) are potentially affected by the threshold. In all 218 occupations, employees who hold them can be found either below or above the threshold. We list some examples in Table 1, Panel C. Some of the most populated occupations affected by the threshold include General Attorney, Financial Institution Examining, and Criminal Investigation. Unaffected occupations include Forestry Technician, Practical Nurse, and Custodial Working. We return to the rank-level and occupation-level analysis in Section 4.6.

3 Theoretical framework

In this section we develop a simple wage model, to understand which factors influence the employee's decision to bunch. We consider an extension to this model in Section 6.1, allowing agents to choose a regulatory action.

3.1 Setting

The agent's type at time t is defined as z_t, which measures earning potential (based on various factors such as ability and experience). While the agent is working at the government, z_t follows a geometric Brownian motion with growth rate μ and standard deviation σ:

$$dz_t/z_t = \mu dt + \sigma dB_t.$$

The agent's wage at the regulator is $w(z_t) \leq z_t$. In the absence of any manipulation, the agent will receive $w(z_t) = z_t$. However, the agent can manipulate their wage by passing on a promotion or a pay raise, such that $w(z_t) < z_t$.

The agent's potential wage at the private sector is $\theta_t z_t$, where θ is the attractiveness of the private sector job relative to the public one. We can decompose θ into a wage multiplier of working in the private sector (m) and a subjective discount factor of working in the private sector (δ), such that $\theta = m\delta$. The subjective discount factor δ captures non-pecuniary factors such as the loss of intrinsic motivation and prestige. Note that, in the extreme case where $\theta = 0$, agents would never consider private sector jobs. Lastly, if the agent's wage in the public sector exceeds the regulatory threshold, $\underline{w}$, then the agent becomes subject to the §207 post-employment restriction. We define a state variable, x_t, which equals 1 if the agent's wage has crossed the threshold and 0 otherwise. If the restriction has been triggered, it reduces the effective private sector wage by a fraction τ. In sum, the effective wage in the private sector is $\theta z_t \cdot (1 - \tau x_t)$. We assume that the agent's flow utility is given by the effective wage:

$$u_t = w_t.$$

Define $V_g(x_t, z_t)$ and $V_p(x_t, z_t)$ as the value functions of working at the government and the private sector, respectively. x_t indicates whether the post-employment restriction has been triggered. z_t is a state variable which indicates the earning potential at time t. The value of lifetime wage at the private sector can be written as the present value of a growing annuity:

$$V_p(x_t, z_t) = \mathbb{E}_t \left[\int_t^{\infty} e^{-r(s-t)} \theta z_s \left(1 - \tau x_t\right) ds \right] = \frac{1}{r - \mu} \theta z_t (1 - \tau x_t), \tag{1}$$

where r is the discount rate. Note that, once an agent quits the public sector, they are unable to come back.[7]

3.2 Bunching decision

To formulate the value of staying in the public sector, one should consider the decision to bunch. When the agent's earning potential exceeds the threshold ($z_t > \underline{w}$), they have an option to bunch below the threshold. The benefit of bunching is to avoid the imminent post-employment restriction, a restriction which reduces the future value of the private sector option by $\frac{\tau}{r-\mu} \theta z_t = V_p(0, z_t) - V_p(1, z_t)$. The cost of bunching is a lower salary in the public sector relative to the agent's earning potential, a reduction which equals to $z - \underline{w}$. If the agent has already triggered the restriction, $x_t = 1$, then the agent has no reason to bunch and hence $w_t(z_t) = z_t$. We assume that an offer to work in the private sector arrives with a Poisson rate of λ.[8] If the agent does not accept the outside offer, or does not receive any, they stay in the public sector for an additional period.

We distinguish between two scenarios. In the first case, the agent has already triggered the post-employment restriction ($x_t = 1$). If they now decide to stay in the public sector, their wage equals to their type (z_t), and the recursive form of the value function is:

$$V_g(1, z_t) = z_t + (1 + r dt)^{-1} \left((1 - \lambda dt) V_g(1, z_{t+dt}) + \lambda dt V_p(1, z_{t+dt}) \right) \tag{2}$$

[7] Indeed, 1.2% of the agents return to government service after a stint in the private sector. Conditional on returning, the median time spent in the private sector is 3 years. For simplicity, we assume that wage growth in the private sector mirrors the public sector.

[8] For simplicity, we assume a constant λ which does not vary by factors such as age and talent.

Note that for simplicity we assume that, once the post-employment restriction has been triggered, the agent cannot fall back below the threshold.[9]

In the alternative scenario, which is the focus of this paper, the agent has not yet triggered the post-employment restriction ($x_t = 0$). If they wish to stay in the public sector, they have two options. One is to trigger the post-employment restriction, an option whose value is given by Equation (2). The second option is to avoid triggering the restriction. In that case, their wage equals the threshold ($\underline{w}$) and they have the option to trigger the restriction in the next period.[10] The recursive form of the value function is:

$$V_g(0, z_t) = \max \left\{ \underline{w} + (1 + rdt)^{-1} \left((1 - \lambda dt) V_g(0, z_{t+dt}) + \lambda dt V_p(0, z_{t+dt}) \right), V_g(1, z_t) \right\} \quad (3)$$

The marginal agent $\overline{w}$ is indifferent between the two options: bunching (reducing the present wage in exchange for potentially higher private sector wage), or not bunching (a higher present wage in exchange for potentially lower private sector wage). In the simplest case of zero uncertainty, the marginal agent's indifference condition derived from Equation (3) is:[11]

$$\frac{\overline{w} - \underline{w}}{\overline{w}} = \frac{\Delta w}{\overline{w}} = \frac{1}{r - \mu} \lambda \theta \tau. \quad (4)$$

The intuition of Equation (4) is the following. The left-hand side represents the fraction of the wage that an agent is willing to given up to avoid crossing the threshold. The right-hand side is the expected cost of the post-employment restriction. It increases with the probability of receiving an offer from the private sector (λ), the revolving door incentive (θ), and the restrictiveness of the post-employment restriction (τ). Multiplying by $\frac{1}{r-\mu}$ yields the present value of the lifetime restriction, which should equal the foregone wages. As mentioned above, θ measures the overall strength of the revolving door

[9] In the data, 1.1% of the employees fell below the threshold at some point in their career, meaning that they were above the threshold at time t but fell below at time $t+1$. Additional 1.3% climbed above the threshold, meaning that they were below the threshold at time t but above it at time $t+1$.

[10] In the data, the restriction will be triggered if the wage is greater or equal to the threshold while the model assumes the wage has to be strictly greater. This assumption does not affect the results because we can assume the threshold in the model is the real threshold minus an infinitely small positive number.

[11] The derivation can be found in Appendix A.1.1. We consider the case of zero uncertainty because (1) we can obtain closed-form solution for the optimal strategy; (2) it is a good approximation for the wage growth of public sector employees. We also provide the solution in the general case with uncertainty in Appendix A.1.2.

incentive. It bundles the wage multiplier (m) and the non-pecuniary discount factor (δ). If either one is zero, for instance, if human capital is non-transferable ($m = 0$), then there will be no bunching at the threshold and $\overline{w} = \underline{w}$. Formally, we can establish the following result:

Proposition 1: The optimal strategy $w(x, z)$ is given by the following equations:

$$w(0,z) = \begin{cases} z, & z \notin [\underline{w}, \overline{w}] \\ \underline{w}, & z \in [\underline{w}, \overline{w}], \end{cases}$$

and

$$w(1, z) = z,$$

where the marginal agent is determined by Equation (4).

Proof. See Appendix A.1.3.

We can also derive the value function of an agent working at the public sector. In the simple case in which there is no uncertainty in the growth of wage potential, we can derive the following expression:

Proposition 2: The value function of working at the public sector, if the post-employment restriction has not been triggered yet, is given by the following equation:

$$V_g(0, z) = \frac{\lambda\theta + r - \mu}{(r + \lambda - \mu)(r - \mu)} z - \left(\frac{1}{r + \lambda - \mu} - \frac{1}{r + \lambda} \right) \left[1 - (1 - \lambda\Omega\tau)^{\frac{r+\lambda}{\mu}} \right] \underline{w}^{1 - \frac{r+\lambda}{\mu}} z^{\frac{r+\lambda}{\mu}}, \tag{5}$$

for $z \leq \underline{w}$.

Proof. See Appendix A.1.1.

The first term of equation (5) is the discounted value of lifetime wages, taking into account the opportunity to transfer to the private sector in the future. Naturally, this term increases with the earning potential (z). Additionally, if there are no transitions to the private sector, then the first term becomes $\frac{1}{r-\mu} z$ which is the simple Gordon Growth formula for the wages earned in the public sector. This could happen if the arrival rate of the private sector job is zero ($\lambda = 0$) or if the private sector wage equals the public sector wage ($\theta = 1$). More broadly, the first term increases with the transition probability λ and with the wage differential θ (if $\theta > 1$), reflecting the possibility of moving to the private sector and earning a better wage.

The second term of Equation (5) captures the disutility of facing the post-employment restrictions. The disutility increases with the duration of the restriction (τ), because even when the employee transfers to the private sector, he would be forced to sit on the sidelines until the restrictions expires. For instance, if there is no restriction ($\tau = 0$), then the second terms becomes zero as there is no disutility anymore. In Section 6, we will build on those intuitions to assess how alternative policies affect the agent's value function and the outcomes associated with it. Additionally, the disutility decreases with the threshold $\underline{w}$ (note that $1 - \frac{r+\lambda}{\mu} < 0$), because a higher threshold means that the agent will be subject to the restrictions later on in their career. It increases with the probability of a private sector offer λ, since the likelihood of suffering from the restriction is higher, and with the earning potential z, because the agent will face the restriction sooner.

4 Evidence on bunching

In this section we provide causal evidence for response to outside job opportunities. We focus on the discrete change in post-employment restriction for senior employees, outlined in §207. This restriction creates an incentive for employees to remain below the specified compensation threshold. If regulators respond to outside job opportunities, they will be more likely to remain below the threshold where the post-employment restrictions are more lenient. If regulators are indifferent, they will not alter their behavior. Specifically, an elastic response will lead to "bunching" at the threshold, with excess mass below the threshold where the Section 207 restriction does not apply and missing mass above the threshold where the Section 207 restriction prevails.

4.1 Bunching estimation

To formally quantify the existence and extent of bunching, we follow the methodology outlined in Kleven and Waseem (2013) (see also Bachas et al. (2021) and Pan et al. (2021)). The key parameter we estimate is Δw, defined as the difference between the counterfactual compensation of the marginal buncher ($\overline{w}$) and the restriction threshold ($\underline{w}$). The marginal buncher is the employee who is indifferent between bunching at the threshold, thus avoiding the restriction, and being above the threshold. In other words, we ask how much was the marginal employee willing to forego in order to escape the post-employment restriction. To estimate Δw, we need to estimate the counterfactual distribution in the absence of the threshold. We follow the standard approach of fitting a flexible polynomial to the observed distribution while excluding a range around the threshold. This excluded range should incorporate the region affected by bunching responses. The fitted distribution is then extrapolated to the excluded region.

Concretely, we start by modeling each agency's pay distribution as:

$$N_j = \sum_{k=0}^{K} \beta_k (w_j)^k + \sum_{i=w_l}^{w_u} \delta_{i,j} \mathbb{1}(w_j = i) + \tau_j + \epsilon_j, \tag{6}$$

where N_j is the number of employees in salary bin j, w_j is the wage at the midpoint of interval j, and $K = 5$ is the degree of polynomials of the salary distribution. w_l and w_u are the lower and upper bound of the excluded region, and $\delta_{i,j}$ are dummies for bins in the excluded region. The counterfactual distribution, $\hat{N}_j$, is the predicted values from Equation (6). We use \$1,000 bins and restrict the analysis to employees with base pay within \$100,000 of the threshold. Thus, our sample is symmetric with 100 bins on either side of the threshold. The estimation is conducted at the agency level, based on how agencies are defined in the payroll data. For example, the Treasury Department consists of the Internal Revenue Service, the Comptroller of the Currency, the Secret service, and other sub-agencies. We treat each sub-agency as a separate unit.[12] We include in

[12] In unreported test we used the parent agency (Treasury) as the unit. The advantage is that we "lose" less agencies due to insufficient number of observations. However, as the example illustrates, many sub-agencies are independent from each other.

the analysis only agencies that satisfy two conditions: at least 1,000 observations in the estimation range (±$100,000 around the threshold), and at least 1% of the observations are above the threshold. In other words, we exclude agencies where too few workers are being compensated enough to be near the threshold. While there may be bunching in the excluded agencies, we do not have sufficient statistical power to identify it.

Federal employees may cluster at the top of their pay grade, awaiting promotion to the next pay grade. As an illustration, we plot the distribution of pay for all General Schedule (GS) employees in 2007 (Figure A.1). The visible peaks in the distribution are all aligned with the top of grades GS-7 through GS-15. We also plot the distribution of pay for our entire sample, and we still observe the two prominent peaks which represent the top pay in GS-14 and GS-15.[13] Some agencies have agency-specific pay scales but face a similar phenomenon of clustering at the top of the pay grades. To address this feature, we first verify that the threshold of §207 does not overlap with the top pay of any specific pay grade.[14] Moreover, we augment Equation (6) with τ_j, and indicator which equals 1 if one of the agency's max pay grades is nested within bin j. With that, our counterfactual distribution accounts for mechanical clustering at those max points.[15] We have also estimated a version in which the clustering at pay grades can vary with the local densities. This could happen, for instance, in pay grades which mark a transition to managerial positions. Those are considered competitive and perhaps too cumbersome for many career employees, leading to more intense clustering at their maximum pay. The results are nearly identical (see Table A.3, Panel B).

The lower bound of the excluded region (w_l) is slightly below $\underline{w}$, to accommodate the diffusion of bunching mass since agents may not set their wage precisely at $\underline{w}$. Following the bunching literature, it is determined by visual inspection. Based on inspecting the excess mass to the left of the threshold, we choose w_l as being $5,000 below the threshold.[16]

[13]For instance, the max salary for GS-15 is $23,000-$29,000 below the threshold, which corresponds to the peak around $25,000 below the threshold.

[14]We return to this point in Section 4.6.

[15]Note that the top pay changes every year, while our estimation pools all years. Additionally, some agencies have multiple pay grades and some pay grades are scarcely populated. To address all those issues, we weight the indicators by the number of employees that work in that pay rank at the agency in a given year.

[16]Using $6,000 instead yields similar results.

The upper bound (w_u) corresponds to the wage of the marginal buncher. To identify it, we require that the excess mass equals to the missing mass. The reason for this condition is that, in the region affected by bunching responses, there is excess mass created at or just below the threshold by agents who would otherwise be just above the threshold in the absence of restrictions. Excess mass ($\hat{E}$) is defined as the difference between observed and counterfactual bin counts, from the lower bound (w_l) to the threshold. Equivalently, missing mass ($\hat{M}$) is the difference between counterfactual and observed bin counts in the area between the threshold and the upper bound (w_u).

$$\hat{E} = \frac{1}{N} \sum_{j=w_l}^{\underline{w}} (N_j - \hat{N}_j),$$

$$\hat{M} = \frac{1}{N} \sum_{j>\underline{w}}^{w_u} (\hat{N}_j - N_j),$$

where N is the total number of observations in the sample. We determine w_u by varying the number of excluded bins to the right of the threshold, estimating Equation (6), obtaining $\hat{N}_j$, and calculating $\hat{E}$ and $\hat{M}$. Following this iterative process, we choose the w_u for which $\hat{E} - \hat{M}$ converges to 0.

At the end of the iterative process, we obtain an estimate of Δw: the number of excluded bins to the right of the threshold multiplied by bin size ($1,000 in the base case). Dividing Δw by the threshold ($\underline{w}$) yields the key parameter on the left side of Equation (4). This methodology also yields an estimate of the fraction of strategic agents who respond to the revolving door incentive. We first compute the fraction of *nonstrategic* agents, defined as the actual mass in the dominated region $(\underline{w}, \overline{w})$ divided by the counterfactual mass in the same region. The intuition is that all the agents in this region should prefer to bunch at the threshold, and those who remain there are nonstrategic. Therefore, the fraction of strategic agents is given by one minus the fraction of nonstrategic agents:

$$\hat{\alpha} = 1 - \frac{\frac{1}{N} \sum_{j>\underline{w}}^{w_u} N_j}{\frac{1}{N} \sum_{j>\underline{w}}^{w_u} \hat{N}_j},$$

where the second term is the fraction of nonstrategic agents.

To calculate standard errors, we follow the bootstrapping approach in Chetty et al. (2011). We sample with replacement the residuals from Equation (6) and add them to $\hat{N}_j$ to get a new distribution of pay. We then estimate Equation (6) with this new distribution and undertake the iterative process described above to estimate Δw and $\hat{\alpha}$. We repeat this resampling process 500 times. The standard deviations of the estimates from these 500 samples are the standard errors of the respective estimates.

The validity of the bunching estimate relies on several assumptions. *First*, the counterfactual distribution would be smooth in the absence of the §207 threshold. It effectively means that there are no other policies at the threshold that would induce employees to move. *Second*, other employment terms do not change at the threshold due to the presence of the post-employment restriction. To the best of our knowledge, both assumptions are correct.[17] *Third*, bunchers come from a continuous set such that there exists a well defined marginal buncher. This is a fairly weak assumption as we require the sample to have a minimum number of observations above the threshold.

4.2 Main results

We conduct the bunching estimation separately for each agency. Figure 1 demonstrates the output of our bunching estimator for four agencies: the Bureau of Economic Analysis (BEA), the Federal Deposit Insurance Corporation (FDIC), the Federal Aviation Administration (FAA), and the Department of Energy (DOE). We plot the empirical distribution of salaries (in black line) and the counterfactual distribution based on Equation (6) (in red dotted line). Salaries are expressed as the difference from the cutoff salary which triggers the post-employment restriction. For example, the value \$0 is for employees whose salary equals the threshold. At the BEA and the FDIC, there is an unusual spike just below the threshold relative to the counterfactual distribution. This suggests that employees are willing to sacrifice a portion of their salary, in order to stay

[17]We search the entire text of the U.S. Code for the term "86.5" (which specifies the regulatory threshold), and find only two results: our §207, as well as a measure of engine efficiency (42 U.S. Code 6313). We further search the entire text of the Code of Federal Regulations for the terms "86.5" and "pay" (jointly). Aside from the regulations implementing §207 (5 CFR 730 and 5 CFR 2641), we find no relevant regulations using this pay threshold.

just below the threshold and preserve the value of their outside option. We then denote the lower bound (w_L) and the upper bound (w_U) of bunching agents, that is, the group of employees who give up a portion of their salary to stay below the threshold. Note that at FDIC, the counterfactual distribution also features spikes due to substantial clustering at the top of the pay grades. However, the bunching at the threshold is over and above the spikes predicted by the counterfactual distribution, implying additional bunching resulted from post-employment restriction. Contrarily, the salary distributions for both the FAA and the DOE show no excess bunching resulted from post-employment restrictions. For the case of the FAA, the actual distribution is smooth around the threshold. For the case of the DOE, although a small spike is present around the threshold, it can be fully explained by the clustering at the top of the pay grades. Therefore, no excess bunching is detected for this agency.

Repeating the estimation for each of the 166 agencies in our sample, we differentiate between two groups of agencies. In one group the bunching is statistically significant, using standard 10% confidence intervals. This means that the t-statistic of the estimated bunching range (Δw) is greater or equal to 1.645. The statistically significant clustering reveals that those agencies are highly responsive to revolving door incentives, and we therefore refer to those as the *revolving group*. The second group consists of agencies for which we cannot reject the null that the distribution around the threshold is smooth (no bunching).[18] In contrast to the first group, those agencies appear largely indifferent to revolving door incentives. Consequently, we refer to those as the *indifference group*.

Table 2 reports the detailed output of the bunching estimation. In Panel A, we list the composition and size of the two groups. The revolving group includes 2.5 million employees across 33 federal agencies. Several financial agencies belong to this group, including the Commodity Futures Trading Commission, Office of Comptroller of Currency, and the Securities and Exchange Commission, as well as agencies that are responsible for managing and distributing government funds such as the the Farm Credit Administration, Overseas Private Investment Corporation, and the Federal Retirement Thrift

[18] Figure A.2 in the Appendix plots the distribution of the t-statistic across agencies. Among the indifferent agencies, the median is 0 and the 90^{th} percentile is 0.74.

Investment Board. The indifference group is larger, with 17.1 million employees across 133 agencies. This group includes, for instance, the Social Security Administration and the Environmental Protection Agency.

Focusing on revolving agencies, Panel B of Table 2 summarizes the magnitude of the response to post-employment restrictions (for brevity we list only 15 agencies; the full list is in Table A.3, Panel A). For each revolving agency, we report two key parameters. The first is the salary which the marginal employee is willing to give up, in order to stay just below the legal threshold (Δw). The second is the fraction of strategic employees, who are willing to sacrifice portion of their salary in order to preserve their outside job opportunities (α).[19] For example, at the Internal Revenue Service, 32.9% of the population respond to revolving door incentives and accept a $4,000 pay cut in order to stay below the threshold (which is 5.7% of the average salary at the agency). Taking weighted average across all revolving agencies, we find that the marginal employee is willing to give up $6,388 in annual salary or 7.4% of the average salary in their agency, to avoid triggering the post-employment restrictions. The average share of strategic agents is 49.8%, which means that nearly a half of the employees in revolving agencies are actively considering the private sector jobs.

We report several robustness tests in Table A.3, Panels B through D. *First*, our counterfactual estimation (Equation (6)) includes an indicator which equals 1 if one of the agency's max pay grades is nested within bin j. This effectively assumes that clustering at the top of the pay grade is constant across grades. For robustness, we estimate a version in which the clustering at pay grades varies with the local densities. *Second*, employees may struggle to keep their salary precisely below the threshold, and thus some employees who are further below the threshold could in fact be strategic bunchers. To address this concern, we use $6,000 below the threshold as an alternative lower bound for the bunching region (a 20% increase relative to the baseline specification). *Third*, some employees may quit their job to avoid the §207 restriction, rather than bunch.[20]

[19] Note that even if the bunching range (Δw) is statistically significant, the bunching fraction (α) can be insignificant. This is because the estimation of α relies on the estimation of Δw, which inflates the standard errors.

[20] As discussed below (Section 4.3), bunchers are more likely to exit.

Kleven and Waseem (2013) show that these extensive margin responses mainly enter via functional form misspecification, and following their recommendation we estimate bunching with 6 degree of polynomials (rather than the baseline 5). Across specifications, our results remain similar and the bulk of agencies exhibit the same patterns.

Note that we rely on the statistical significance of the estimated bunching range. One might be concerned that those results simply reflect noise in the payroll data. As explained in Section 4.1, we restrict the analysis to agencies with sufficient statistical power and our methodology also accounts for the unique features of the federal payroll. That includes clustering at the top of the pay grades, switching to managerial positions, and fuzzy bunching at different ranges. To add another benchmark, we test how many agencies would be identified as bunching due to noise, under the null of no bunching. To that end, we define a pseudo-threshold at $20,000 below the true threshold (this is also 10% lower than the true threshold in 2021). Repeating the bunching estimator for each agency around the pseudo-threshold, we identify only two agencies with statistically significant bunching. This bolsters our confidence that our estimates based on the true threshold reflect strategic response rather than statistical noise.

Finally, we investigate the cross-agency heterogeneity. First, we use data from Selin (2015) and Selin and Lewis (2018), who list structural characteristics of various agencies.[21] Our findings are summarized in Figure 2. We find that revolving agencies are more likely to have statutory powers such as rulemaking, adjudication, and in-house administrative judge system. Moreover, revolving agencies enjoy greater autonomy to exercise those powers. They can enact regulations without OMB review,[22] file enforcement lawsuits independently,[23] and communicate directly with Congress.[24] From an opera-

[21]The studies were written in collaboration with the Administrative Conference of the United States, an agency tasked with studying administrative processes and procedures within the federal government. The characteristics do not vary over time during our sample period.

[22]They are exempt from submitting all regulatory actions to the administrator of Office of Information and Regulatory Affairs (Exec. Order No. 12866, 58 Fed. Reg. 51735 (1993); 44 U.S.C. §3502).

[23]The Attorney General (Department of Justice) has the default authority over all litigation to which the United States government is a party, unless otherwise authorized by law.

[24]Legislative bypass authority means that the agency does not have to submit its communications to Congress to OMB for coordination and clearance prior to transmittal to Congress (OMB Circular A-19). All agencies are subject to Congressional oversight, and there are no meaningful differences in terms of number of agency reports and number of committees overseeing the agency.

tional point of view, revolving agencies are authorized to independently manage their communication and budget. Finally, Selin (2015) develops two comprehensive scores, which represent the independence of the agency's leadership from political influence and its independence to make regulatory decisions. Each score is a weighted average of a subset of the above-mentioned individuals parameters. We find that revolving agencies have a significantly higher independence scores than indifferent ones. Additionally, we use data from OpenSecrets to study lobbying activity. Among other things, the data set reports the agencies which were lobbied.[25] Aggregating the form-level data to the agency level, we find that revolving agencies attracted \$9,627,792 in annual lobbying on average, compared to \$6,597,202 for indifferent agencies. Moreover, we find that the average pay among industries that lobby revolving agencies is \$92,252, compared to \$83,635 average pay in industries that lobby indifferent agencies.[26]

In sum, revolving agencies have broader discretion to exercise their regulatory powers, and they regulate industries with better pay who spend more on lobbying. Those differences are consistent with the predictions of our model (Section 3),[27] and suggest that the bunching behavior increases with regulatory power and independence. To be clear, we do not provide causal evidence in either direction. For instance, agency independence could could incentivize bunching behavior among individual regulators, and intensive bunching could create a push for more independence. We cannot separate those possibilities and leave that for future studies.

4.3 Employee-level heterogeneity

In this section, we exploit the granularity of our data and turn to employee-level analysis of strategic bunching. Our goal is to study the mechanisms of bunching and the unique characteristics of employees who choose to bunch. To that end, we focus on employees who can be unambiguously identified and tracked over time (as in Kalmenovitz and Vij

[25] For simplicity, we assume that the lobbying budget is spread equally across all agencies mentioned in the disclosure form.

[26] We obtain those numbers via the average annual wage from the Quarterly Census of Employment and Wages (QCEW).

[27] If the agency has broad powers and the discretion to exercise those at its will, it should increase the rate of outside offers (λ) and the potential private sector pay (θ).

(2021)), a sample of 2,616,742 unique employees and 19,402,227 employee×year observations. We define a potential buncher in a reduced form manner as someone within $[-\$5,000, -\$0)$ of the post-employment threshold. This value corresponds to w_l in our formal bunching estimator. Out of 2,374,319 unique employees, 21,276 or about 0.9% bunched at least once during their career. Within revolving agencies, 8,504 or 4.3% are bunchers, compared to 13,427 or 0.66% in indifferent agencies. The differences are statistically significant at the 1% level.[28] Conditional on ever bunching, the average employee spends 2.2 years in the bunching region.

Table 3 compares the career trajectories of bunchers (employees who were at least once in the bunching region) and non-bunchers (employees who never entered the bunching region). We restrict the sample to employees who were within $\pm\$50,000$ of the threshold at least once. Overall, bunchers appear to exhibit better performance relative to non-bunchers. They receive more promotions and more bonuses that are also larger. All the differences are statistically significant and economically large. For instance, bunchers receive nearly 30% more promotions and 22% higher bonuses. These univariate comparisons suggest that bunchers appears to be doing better than those who never bunch.[29]

Next, we turn to study the dynamic of bunching. Our interviews with ethics attorneys, as well as informal conversations with multiple federal employees, point toward two key mechanisms: passing on promotions and accepting lower pay raises. We test those mechanisms in the following OLS specification:

$$y_{i,a,t} = \alpha + \beta_1 \cdot \Delta Threshold_{i,t} + \beta_2 \cdot \Delta Threshold_{i,t} \cdot \mathbb{1}(Above) + \lambda \tag{7}$$

where $y_{i,a,t}$ is the outcome for employee i at agency a at time t. One outcome is a promotion indicator, which equals one if the employee was promoted between $t-1$ and t. Conditional on no promotion, we compute the percentage change in salary between time

[28]The sum of bunchers across agencies is greater than 21,276, since some employees move across agencies and bunch in both.

[29]In the Appendix (Table A.1) we split the sample of never-bunchers into two subsamples: those who cross the threshold and those who never crossed the threshold. We find that bunchers have better performance than employees in both these two groups. Note that the pay is mechanically higher for those who crossed the threshold.

$t-1$ and time t. The sample incudes only employees within $\pm\$5,000$ of the threshold, and we thus compare employees who are just above and just below the threshold. The two primary independent variables are $\Delta Threshold$ and $\mathbb{1}(Above)$. The former is the difference between the employee's salary and the legal threshold (expressed in $50,000 units), and the latter equals 1 if the employee is above the threshold. We add rank and year×agency fixed effects, comparing employees at the same hierarchy level and within the same agency. This is important, to rule out the possibility of mechanical clustering at the top of certain pay grades. Finally, we control for tenure, an important determinant of both pay and promotion. Standard errors are clustered at the employee level.

Table 4 reports the results, revealing substantial difference in behavior around the threshold. In the bunching region (below the threshold), promotion and pay raises all tend to decline with salary. The coefficient implies that, for every $5,000 pay increase, promotions decline by 2.8% and pay raises decline by 0.9-1.1%, which are approximately a third of the sample mean. In contrast, above the threshold, the relation between promotions and pay raises to salary is either positive or insignificant. Interestingly, there is no difference in the probability of receiving a performance-based bonus. This provides a nice placebo test, since the bonus is a measure of performance but has no role in the bunching decision. From another perspective, it shows that bunchers do not alter their performance significantly as they approach the threshold.

In sum, the analysis highlights the likely mechanisms for bunching: as employees come closer to the threshold, they accept fewer promotions and a slower salary progression. This is despite the fact that overall bunchers exhibit superior performance during their government stint. Taken together, the results provide additional evidence to our central argument: bunching below the threshold is a strategic choice by regulators, to preserve the value of their outside options.

4.4 Exercising the outside option

We interpret bunching behavior as a strategic effort to maintain the value of the outside option. In this section, we turn to the moment when regulators exercise their outside option and exit the government. Our goal is to see whether the exit behavior of bunchers is different from the exit behavior of non-bunchers.

We start by looking into the decision to exit. On one hand, if bunchers make a strategic choice to preserve their outside option, they should be more likely to exercise that option and exit. On the other hand, staying for a longer period of time may increase their option value by accumulating human capital and, possibly, engaging in regulatory capture with potential employers. We first test the opposing predictions in a dynamic panel, estimating Equation (7) with an outcome that equals 1 if the regulator exited between time t and time $t+1$. Those results are in the last column of Table 4. We find that employees who are just below the threshold are significantly more likely to exit the government, as they get closer to the threshold. In contrast, employees who are just above the threshold are less likely to exit. Next, we turn to the cross-section of employees in our sample (rather than dynamic panel). We estimate a linear probability model:

$$y_{i,a,o,c,l} = \alpha + \beta \cdot JustBelow_i + \overrightarrow{X}_i + \lambda \tag{8}$$

where $y_{i,a,o,c,l}$ is the outcome for employee i who worked at agency a, occupation o, cohort c, and location l. Cohort is the year in which the employee joined the government, and location is at the city level. The outcome equals 1 if the employee exited the public sector. The primary independent variable, $JustBelow$, equals 1 if the employee never crossed the the post-employment threshold but was at least once within $[-\$5,000, -\$0)$ of the threshold. We remove agencies, occupations, locations, and cohorts where no employee has ever bunched.[30] We are left with a sample of 1,829,355 unique employees, with unconditional exit probability of 64.5%, and 0.7% bunchers. We control for the employee's average pay, bonuses, promotions, and pay raises, as well as an indicator for male employees (based on first name). The results are in Table 5. Without fixed effects, bunchers are 20.3% more likely to exit, which is 36% of the unconditional probability. In the remaining columns we add multiplicative fixed effects for the employee's last known agency, cohort, occupation, and location. Our tightest specification shows that bunchers

[30] This excludes units with low average salaries that do not present an opportunity to bunch.

are 5% more likely to exit which is 9% of the sample average.

Next, we study transitions into the lobbying industry. This industry is known to attract former regulators, and the post-employment restriction (especially §207(c)) is particularly relevant for ex-regulators who wish to lobby their former agency: if the restriction is triggered, it severely limits the ex-regulator's ability to act as a lobbyist. Therefore, we expect to see higher transition rates to the lobbying industry among bunchers, who strategically stayed below the threshold and did not trigger the restriction. Indeed, at the agency level, we find that revolving agencies attract far more lobbying activity than indifferent ones (see Section 4.2). Turning to employee-level data, we estimate Equation (8) with an outcome variable that equals 1 for employees who exited and became lobbyists. We restrict the sample to employees who surely exited and further remove agencies, occupations, locations, and cohorts where no employee has ever moved into the lobbying industry. We are left with a sample of 1,064,908 unique employees, with unconditional lobbying probability of 0.2%. The results are in the last five columns of Table 5. Across all specifications, bunchers are substantially more likely to become lobbyists compared to non-bunchers, conditional on exiting the government. While the point estimates appear smaller relative to the exit results, the economic magnitudes are much larger. In the tightest specification, bunchers are 0.24% more likely to become lobbyists, which is 126% higher than the sample average of 0.19%.

In sum, the analysis highlights two key aspects of bunchers. They are more likely to exit from the government and, conditional on exiting, they are more likely to turn lobbyists. Those effects are conditional on large set of controls and fixed effects, and are statistically significant and economically large. Combined, the results support the conclusions that bunching is a strategic choice of regulators who seek to preserve their outside option. Equipped with better outside options, regulators who bunched are more likely to exit and especially more likely to move into the lobbying industry, free of the post-employment restrictions.

4.5 Additional validation tests

In this section, we present additional evidence that bunching is a strategic response of employees who wish to preserve their outside option. We start by presenting two broad tests, and then proceed to discuss specific concerns.

The OGE can exempt certain positions from the restrictions, if they create an undue hardship on the agency. During our sample period, the only agency receiving such exemption was the SEC in 2003. The agency has been transitioning to a new pay system and gave substantial pay raises across the board, which could have subjected employees to the post-employment restrictions (Kalmenovitz, 2021).[31] In June 2013, however, the agency requested to revoke all those exemptions. The request was granted and the exemptions expired effective on April 2, 2014.[32] Those changes serve as a useful validation test. If employees bunch to escape post-employment restrictions, we should see substantial bunching at the SEC after 2013, but not during 2003-2013 when employees were exempt from the restrictions. We divide the SEC sample into two periods, 2003-2013 and 2014-2021, and conduct our formal bunching estimation separately for each group. Indeed, we find a significant bunching only in the latter period. Those results are summarized in Figure 3. In the early period, the observations are scattered around both sides of the threshold with no obvious bunching. In the latter period, on the other hand, there is significant clustering just below the threshold. This is reassuring, because it shows that employees cluster below the threshold only when that threshold triggers post-employment restrictions.[33]

In a separate test, we exploit the time-series variation in the incentive to bunch. Lucca et al. (2014), who trace career transitions of banking regulators, find greater flows between

[31] The first exemption was granted in November 2003 and covered the position of Deputy Chief Litigation Counsel in the Division of Enforcement, all SK-17 positions, and SK-16 and lower-graded SK positions if supervised by employees in SK-17 positions. In December 2003, the exemption was broadened to include all other SK positions (even those who are not supervised by SK-17 employees).

[32] See announcements in the Federal Register on March 8, 2007, October 3, 2013, and January 2, 2014. The original effective date was January 2014, but it was pushed to April to allow the SEC to educate its employees on the subject. The exempted positions are listed in Appendix A to 5 CFR 2641.

[33] In May 2012, the SEC updated the pay-setting process for new employees. We believe this does not affect the analysis here; if anything, the pay raises in 2012 should have increased the mass near the threshold. For robustness, in Figure A.4 we repeat the test without the year 2013 which was potentially affected by the pay reform; the results remain similar.

the public and private sectors during periods of intense enforcement. One possible reason is that regulators accumulate more human capital during such periods, which increases the attractiveness of a government job and improves the value of their outside option. Using a similar logic, we hypothesize that the incentive to bunch increases when the agency is suddenly equipped with broader regulatory powers. We exploit the passage of the Dodd-Frank Act in 2010, which directed several federal agencies to develop new regulations as part of a broad overhaul of the financial system. Using data from (Chang et al., 2023), we identify 25 agencies working on 451 draft regulations related to Dodd-Frank. We then estimate the following regression in the employee-level sample:

$$Distance^X_{i,a,t} = \alpha + \beta \cdot DoddFrank_a \times Post_t + tenure_{i,t} + \lambda \tag{9}$$

The key independent variable is $DoddFrank \times Post$, where $DoddFrank = 1$ if the agency formulates rules implementing the Dodd-Frank Act, and $Post = 1$ for years after the agency started formulating the rules. $Distance^X$ takes the value 1 if the difference between the employee's pay and the threshold is between 0 and X, where X takes a range of values between -10,000 to -2,000. We expect to find that $\beta > 0$, meaning that bunching increases among treated agencies. We include fixed effects for agency-rank, employee, and year. The results are reported in Table 6. The estimates in the first three columns provide strong support for our hypothesis. Regardless of the distance below the threshold chosen, there is a strong positive and significant coefficient on the key independent variable. Following Dodd-Frank, an employee in a treated agency is 6-10% more likely to bunch. This is after controlling for the agency and rank, the year, as well as the employee's own time-invariant characteristics. In the last three columns, we look at symmetric windows on the other side of the threshold, and test if, following Dodd-Frank, there is an increase in employees with salaries just above the threshold in affected agencies. We find no evidence to this effect. This placebo test provides further support for our hypothesis since there is no strategic benefit to being just above the threshold. At the same time, this test rules out that our prior results are merely due to increased salaries in affected agencies.

In sum, we find that bunching responds to exogenous shifts in the incentive to bunch. It appears if and only if the threshold becomes binding, and it intensifies when the agency's portfolio expands which opens up more private sector opportunities. Both results are consistent with bunching as a strategic response to outside job opportunities, and any alternative explanation must be consistent with those results. We now turn to discuss two such alternative explanations. One possibility is that bunching is not strategic, but is rather driven by an omitted variable (quality): poor performers receive lower pay raises and stay below the threshold, regardless of their outside option. We believe this is inconsistent with our findings. First, as shown in Section 4.3, bunchers are in fact top performers relative to their peers and appear to strategically slow down their progression as they approach the threshold. This is inconsistent with the concern that bunchers are merely poorer-performing employees, who are unable to climb higher in the government hierarchy due to lack of available positions. Moreover, if bunching is simply a collection of poor performers, we should have observed similar clusters at values close to the threshold. We find no such clusters in our placebo exercises, suggesting that the bunching is driven entirely by the specific threshold value, and not by an omitted variable. Finally, if poor performance drives bunching, then the exogenous changes in the incentive to bunch should have had no impact on the observed bunching.

A separate possibility is that bunching is driven by a promotion bottleneck: there are too few available positions above the threshold, or those positions are cumbersome. Either way, lack of suitable opportunities force excess number of employees to stay below the thresholds. We believe this explanation is insufficient. First, our counterfactual distribution already accounts for clustering at the top of the agency's pay grades due to promotion bottlenecks. It also accounts for the fact that some pay grades are reserved for managerial positions, which are more competitive and perhaps too cumbersome for many career employees (see Section 4.1). Thus, the excess clustering we identify cannot be attributed to those bottlenecks. Second, to our knowledge, there are no material changes in responsibilities specifically around the threshold. Recall that the threshold itself does not overlap with the top of any pay rank, and moreover it applies to many non-managerial ranks (Section 2.2). Third, bunching occurs only below the threshold, not at a pseudo-threshold slightly below it. If promotion bottlenecks were the concern, we should see significant bunching even further away from the true threshold. Fourth, bunching responds to exogenous changes in the applicability of the threshold (SEC post-2013) and in the allure of the private sector (Dodd-Frank). To our knowledge, those exogenous events did not affect the promotion patterns in the treated agencies, only the incentive to bunch strategically.

4.6 Agency and employee choice

In this section, we discuss the possibility that senior management plays a role in the bunching decisions of individual employees. One question is whether managers are aware of their subordinates' behavior. Our conversations with government officials from various agencies give mixed evidence.[34] While we cannot directly test this, some of our findings above suggest that bunching is at least somewhat visible to managers. Bunching employees are in general more successful, but as they approach the threshold they appear to be passing on promotions and pay raises. At the SEC, imposing the threshold in 2014 caused a significant bunching below it. Moreover, it changed the intensity of enforcement by bunching attorneys (see Section 5).

A follow-up question is whether agencies encourage bunching behavior, by designing a compressed pay system which keeps many employees just below the threshold. This will protect the value of the outside option, and might even yield an optimal contract, where an artificially low government pay in the present helps secure a higher pay in the private sector in the future. It should be noted, thought, that most agencies do not have the autonomy to set their own pay structure and follow standardized pay schedules. For example, 70% of our sample is governed by the General Schedule. Therefore, any attempt to compress the pay system would require a coordinated effort spanning numerous agencies, a scenario which appears unlikely. A more nuanced possibility is that agencies with their own pay schedules, such as the SEC, can compress their pay system to encourage

[34] Granted, it might seem unreasonable to expect an explicit reply.

bunching below the threshold. To investigate this possibility, we collapse the data into rank×year units (for example, SK-10 in 2010). We focus on ranks that are available only among indifferent agencies or only among revolving agencies. This leaves a sample of 1,044 unique ranks and 11,207 rank×year observations. For each rank×year, we compute the distance between the rank's maximum pay and the post-employment restriction threshold. Finally, for each group of agencies (revolving and indifferent), we compute the fraction of ranks whose top pay falls within [-$X, $0) of the threshold, where $X ranges from $10,000 to $1,000. If revolving agencies set their pay system intentionally below the threshold, we expect to see more ranks with a max pay just below the threshold. The results are plotted in Figure 4. Clearly, some ranks in revolving agencies are just below the threshold. For example, 1.8% of ranks are within $5,000 of the threshold, and 3.6% are within $10,000 of the threshold.[35] However, ranks at indifferent agencies are *more likely* to be just below the threshold, and the differences in means between the groups are statistically significant for $5,000 or lower.

From a different perspective, if bunching is a result of an agency-wide effort to compress the pay system, some employees will be forced to bunch even though the threshold is irrelevant for their outside options. To investigate this, we turn to occupation-level analysis. We restrict the sample to occupations with at least 1,000 observations within $\pm\$50,000$ of the threshold, and compute the fraction of employees who were within $[-\$5,000, -\$0)$ of the threshold. The mean and median bunching intensity are 1.7% and 1.15%, respectively. The distribution is right-skewed, with few occupations exhibiting unusually large bunching (see Figure A.3). Judging by their titles, some of those are mission-critical and have better outside job opportunities. For example, Securities Compliance Examining, Accounting, Financial Institution Examining, Patent Attorney, and General Attorney. Other top-bunching occupations, however, such as Program Management and Forestry, are less obvious. It is worth noting that occupations which are not mission-critical could exhibit some bunching as well. This is because many occupations possess critical knowledge which is valuable for outside employers. HR specialists, for

[35] One example is SK-14 at the SEC, which has been within that range most of the sample period.

instance, can identify colleagues who are unsatisfied with their job and therefore more likely to accept a private sector job. Additionally, the occupation title does not always reflect the employee's full skill set. As an illustration, out of 2,373,476 employees for whom we have occupation information, 22% switched occupations at least once during their government stint. Out of 53,172 employees who were tagged as General Attorney at some point, 16.4% or 8,711 individuals held other occupations such as Human Resources Management and Information Technology Management.[36]

5 Impact on regulatory burden

So far, we have shown that employees protect the value of the outside option by bunching below the post-employment restriction. In this section, we examine whether the outside option motivates regulators to impose a different level of regulatory burden.

To examine this question empirically, we turn to employee-level data on SEC enforcement attorneys (Kalmenovitz, 2021). The author hand-collects data on all civil enforcement actions filed by the SEC between 2002-2017, including the alleged violations and case outcomes. Crucially, the author identifies the litigation team for each case. As explained in Section 4.5, the post-employment restriction was imposed on the SEC only in 2014. This unique setting allows us to examine how regulators respond to the introduction of a post-employment restriction which reduces the value of their outside option. We merge the data from Kalmenovitz (2021) with our payroll records. That yields a sample of 1,288 individual enforcement attorneys between 2004-2017 and 10,701 employee×year observations. We focus on the years 2010-2017, obtaining a symmetric window of ±4 years before and after the 2014 reform, and restrict the sample to attorneys who are within $\pm\$5,000$ of the threshold in any given year. That leaves a sample of 609 attorneys and 1,502 attorney×year observations. In this sample, 82.8% are just below the threshold and the remaining 17.2% are just above the threshold. We then estimate

[36] Also note that the restriction in §207(f), which prohibits working for a foreign entity, applies to non-mission-critical occupations. Additionally, spikes in a raw density plot could potentially be attributed to clustering at the top of the pay grade.

the following difference-in-differences specification:

$$y_{i,t} = JustAbove_{i,t} + \beta \cdot Post_t \times JustAbove_{i,t} + tenure_{i,t} + \lambda \tag{10}$$

where $y_{i,t}$ represent the enforcement portfolio of attorney i at time t. $JustAbove_{i,t}$ equals 1 (0) if the attorney is just above (just below) the threshold, and $Post = 1$ from 2014 onwards, when the SEC became subject to the restriction. The focus is on the interaction, $Post \times JustAbove$. We hypothesize that, after 2013, employees who are just above the threshold should change their enforcement intensity: now their outside option is less valuable, relative to their peers who are just below the threshold. If the regulatory capture theory holds, the negative shock to the outside option should discourage regulatory leniency. Therefore, we expect attorneys above the threshold to increase their enforcement activity post-2013, relative to those below the threshold ($\beta > 0$).[37] However, if the schooling hypothesis holds, the negative shock should encourage regulatory leniency. Therefore, we expect those above the threshold to have less enforcement post-2013 ($\beta < 0$). If bunching is unrelated to the value of the outside option, we expect to see no change post-2013.[38]

Our tightest specification includes year×office fixed effect, comparing enforcement attorneys who work at the same regional office and are within a narrow $\$10,000$ band around the threshold. We also control for tenure, an important determinant of pay and enforcement. Furthermore, we show above (Section 4.5) that the number of bunching employees has increased post-2013. This is also true in the current sample, where the share of bunching employees ($JustAbove = 0$) has increased from 64% until 2013 to 94% after 2014. If attorneys compete for a fixed pool of potential violations, the growing number of bunchers post-2013 could lead to a decline in the average number of enforcement actions below the threshold, even if attorneys exert similar effort. We therefore control for the number of "competitors," that is, number of attorneys in the year×office who are

[37] This is consistent with our counterfactual model (Section 6), where longer post-employment restriction reduces leniency.

[38] In particular, one could argue that $JustBelow$ is function of the employee's salary and therefore reflects the relative rank of enforcement attorneys. If that is true, there should be no change after 2013 (insignificant β), since the reform did not change the ordinal ranking.

also just below (just above) the threshold, if the attorney is just below (just above) the threshold. Standard errors are clustered at the employee level.

The results are reported in Table 7, Panel A. Before the reform, there were no statistically significant differences around the threshold (coefficient on *JustAbove*). After the reform, attorneys above the threshold increase enforcement activity relative to those below the threshold (coefficient on $Post \times JustAbove$). The effect is identified within office×year, and conditional on the attorney's tenure and number of potential competitors. In the remaining columns we utilize the breadth of data from (Kalmenovitz, 2021) to investigate the decline. We find that treated attorneys are more likely to lead a litigation team (lead attorneys) and to request a freeze on the defendants' assets. They are more likely to file a complaint related to criminal activities or to allegations of fraud, two accepted indicators of important and complicated SEC actions. Finally, they are more likely to file contested enforcement actions, as opposed to settled actions.

Overall, introducing the post-employment restriction significantly changed the behavior of SEC enforcement attorneys. Following the reform, attorneys above the threshold increased their enforcement activities, and in particular showed eagerness to file contested lawsuits against severe financial misconduct. In other words, the negative shock to the value of their outside option led to a substantial increase in their enforcement activities. Those results help validate our central hypothesis: the threshold has a crucial impact on revolving door incentives. Moreover, the results are more consistent with regulatory capture, whereby the outside option incentivizes regulators to exhibit leniency.

Finally, we compare the regulatory burden imposed by revolving agencies to the burden imposed by indifferent agencies, using data from Kalmenovitz (2023). Based on proprietary administrative data, the author tracks the costs of compliance with each of the 36,702 federal paperwork regulations since 1981. We download from the author's website the four basic measures of regulatory burden, for each agency a at month t: number of active regulations, number of responses ("how much paperwork"), and hours spent on compliance. According to the *regulatory capture* hypothesis, we expect revolving agencies to impose lighter burden. According to the *schooling hypothesis*, we expect revolving agencies to impose heavier burden. The results in Table 7, Panel B, show that revolving agencies impose significantly fewer rules. Since the outcome variables are in logs, the coefficient indicates that revolving agencies have 15% fewer regulations ($\exp(-0.16)-1$) than indifferent agencies. The average agency has 60 regulations, which means that revolving agencies have 8.9 fewer rules. Moreover, regulations managed by revolving agencies are associated with 9.5 million fewer paperwork forms filed and 2.1 million fewer hours (measured monthly). The differences are statistically significant at the 1% level. In the remaining columns we examine several derivations of the baseline measures. We find that the average regulation of a revolving agency is less burdensome: it requires 12.5 thousand fewer paperwork forms and 6.7 thousand fewer hours.

In sum, our evidence in this section highlights the link between the outside option and regulatory burden. Revolving agencies impose lower costs of compliance, and imposing the post-employment restriction at the SEC increased enforcement activity. Combined, those findings are more consistent with theories of regulatory capture. We caution, though, that other findings in the paper suggest a more nuanced picture. For instance, bunchers seem to be on average better performers in terms of internal promotions and bonuses (Section 4.3), although those differences disappear as the employee approaches the threshold from below.

6 Policy implications

In the previous sections, we documented the extent of strategic bunching (Section 4) and its impact on regulatory burden (Section 5). A natural question is whether a different revolving door policy would change this behavior. To answer this question, we combine the empirical findings with an extended version of the model from Section 3, and conduct a series of counterfactual exercises. Our results are summarized in Table 8.[39] As before, for brevity we display the results for 15 selected agencies, but the employment-weighted

[39]The analysis crucially relies on the results from the bunching estimation, especially the bunching region Δw, which are available only for revolving agencies. We also remove the Internal Revenue Service, where employees' names are masked and thus key parameters cannot be computed. Thus, the analysis here is based on 32 agencies.

average outcomes are calculated across all revolving agencies.

6.1 Methodology

In this section we describe our methodology to conduct the counterfactual analysis. First, we extend the model from Section 3 by allowing the agent to choose a costly action l. Note that the model extension is agnostic about the nature of the action. However, we denote it with l based on our findings in Section 5, which show that revolving doors are associated with regulatory leniency (reduced regulatory burden). The leniency increases the expected pay in the private sector (m), and hence we denote the revolving door incentive as $\theta(l)$ with $\theta' > 0$. However, leniency is costly for the agent because it could be discovered by a government watchdog. The expected cost is an increasing convex function of the leniency, $c(l)$, with $c' > 0$ and $c'' > 0$. The agent chooses leniency to maximize the expected utility:

$$\max_{l} V_g(l) - c(l), \tag{11}$$

where $V_g(l)$ is the value function of working in public sector defined in Equation (5) with $\theta = \theta(l)$. With this extension, we estimate the model in the following way. We start with the pay cut agents accept to stay below the threshold (Δw) and the fraction of strategic agents (α) for each agency estimated from the bunching estimation in Section 4. Then, for all agencies, we calibrate the discount rate r to 10%, the regulatory threshold ($\underline{w}$) to \$185,000, which is the 2021 threshold expressed in 2022 dollar, and the wage potential (z) is calibrated to be the same as $\underline{w}$. For each agency,[40] we compute the agency's exit rate (λ) and average salary growth (μ) from the data. The restriction penalty, τ, is calibrated to $1/(65 - 23 - T)$, where T is the agency-specific average tenure upon exit.[41] With those calibrations, we obtain from Equation (4) the revolving door incentive $\theta(l)$, which we parameterize as $\theta(l) = l$. We then parametrize the cost as a quadratic function

[40] The agency-specific parameters are summarized in Table A.2.

[41] Intuitively, τ is one year (the duration of the post-employment restrictions) divided by the present value of the remaining lifetime earnings. We assume that the employee starts the government career at the age of 23 and his/her final retirement age is 65. Note that we do not observe the employee's age. As explained in Section 2.1, the ex-senior regulator can still work during that year. To reflect that, we consider an alternative calibration where $\tau = 0.5/(65 - 23 - T)$. The results are available upon request.

of the leniency, $c(l) = \frac{1}{2}\gamma l^2 z$.[42] The parameter γ can be solved using Equation (11), by plugging in the value function and the costs and deriving the first-order condition.

The final piece we consider is the supply of labor to the public sector. This is important, since any revolving door policy affects the willingness of employees to enter government service in the first place. Following Chetty (2012), we define the equilibrium labor supply to the public sector (L_g) as:

$$\ln L_g = \epsilon \ln V_g + \ln \alpha_g. \tag{12}$$

where ϵ is the elasticity of labor supply (calibrated to 0.25), V_g is the expected lifetime wages at the entry level in the public sector, and α_g summarizes other shocks to the labor supply such as preference shocks.[43]

6.2 Results

We start by considering changes to the ban duration (τ). Previous studies provide mixed evidence. Law and Long (2012) find that post-employment restrictions on public utility commissioners temporarily dampen industrial electricity prices, but have no effect on commercial or residential prices. Moreover, the restrictions lead to commissioners serving shorter terms and struggling to find employment in the private sector, suggesting lower quality. Strickland (2020) find that longer cooling-off periods for State lawmakers do not significantly reduce the rates of revolving. Cain and Drutman (2014) study the Honest Leadership and Open Government Act in 2007, which imposed one-year ban on some ex-Congressional staffers. They find that the Act reduced the share of covered staff becoming lobbyists, and equivalently increased the demand for uncovered staffers. On the normative side, advocates argue that post-employment restrictions will limit the harmful impact which the revolving door option has on regulators. Opponents argue that this policy will deter qualified candidates from entering public service in the first place.

[42] We scale the cost function by the wage potential so that the expected cost does not become trivial when the wage potential grows.

[43] For simplicity we focus on quantity, but employment could also adjust in quality (different type of employees attracted to government service).

To shed light on this debate, we examine the impact on three potential outcomes: extent of bunching below the threshold (Δw), regulatory leniency (l in $\theta(l)$), and labor supply to the public sector (L_g). The results are in Table 8. We first consider a longer ban of two years (rather than one). The bunching range (Δw) increases by almost 100% relative to the baseline value. Intuitively, triggering the threshold becomes more costly (more lost wages in the private sector), and therefore agents are willing to sacrifice more of their government paycheck to stay below the threshold. We further find a 0.5% decrease in leniency, reflecting the fact that the longer restriction reduces the expected benefit from leniency.[44] Note that the effect appears to be small. On one hand, those who bunch exert more leniency to compensate for the higher wages they have sacrificed. On the other hand, for those who triggered the threshold, the longer restriction reduces the expected benefit from leniency. Those who are far below the threshold, and still weigh their options, face a genuine dilemma. On balance, the net effect on leniency is close to zero. Finally, the longer restriction has a small negative effect on labor supply (0.13%). This is because only a fraction of agents are strategic (α), meaning that they are sensitive to revolving door incentives, and if they are, they have the option to bunch and thus avoid triggering the restrictions.

For completion, we study the opposite policy: eliminating the post-employment restrictions ($\tau = 0$). Under this policy, no agent would bunch because crossing the threshold is not costly anymore. Moreover, regulatory leniency increases by 1.7%, reflecting the fact that the benefits from the private sector are now more valuable. Finally, labor supply would increase by 0.18%, given that agents can use their government stint to build up their human capital. Again, the effect is rather muted given the ability to bunch in the baseline scenario.[45]

Finally, we examine a policy that strengthens the internal governance mechanisms. If agents who show leniency are more likely to get caught, the amount of leniency will

[44] In the extreme case, where agents are completely barred from working in the private sector, they would have no incentive to exert leniency.

[45] A potential strategy to mitigate the strategic avoidance by agents could be the implementation of a linear contract (Holmstrom and Milgrom, 1987). This contract would entail a continuous, progressive increase in restrictions corresponding to wage increments, rather than imposing discrete jumps at specific thresholds. Further exploration of this approach is a promising avenue for future research.

decline in equilibrium. As before, the risk is that tighter monitoring will discourage employees from joining the public sector in the first place. We investigate this tradeoff in a counterfactual scenario where the cost of leniency doubles (higher γ in $c(l)$). Indeed, we find that leniency declines by 50.2%. Moreover, the tight monitoring reduces the paycheck sacrifice (Δw) by 50%. The intuition is that the higher costs of leniency reduce the benefit of a private sector job ($\theta(l)$), which reduces the incentive to bunch below the threshold. For similar reasons, supply of labor to the public sector declines by 4.1%. Overall, the results suggest that strengthening the internal governance can significantly reduce the incentive distortion resulting from revolving door incentives.

It is interesting to compare the two policies, doubling the restriction (τ) and doubling the monitoring ($c(l)$). The first policy reduces the benefits of regulatory leniency for some agents, while the second one increases the costs of leniency across the board. Thus, in the second policy, we observe a substantial decline in leniency, as regulators do not fully utilize their government position to increase the potential private sector wage (θ). Consequently, in the second policy, fewer candidates will be joining public service in the first place (L_g). Overall, we find that the monitoring-based policy has a significantly larger impact on both regulatory leniency and labor supply. The reason is that agents can engage in bunching to avoid triggering the restriction, but they cannot escape the monitoring mechanism.

7 Conclusion

The revolving door, where employees migrate from regulatory agencies to regulated firms, is a deeply controversial issue. Critics argue that the option to switch sides leads to regulatory leniency, and in extreme cases to explicit quid-pro-quo arrangements, as regulators extend favors to potential future employers. Others contend that the revolving door would encourage more aggressive regulatory behavior, allowing regulators to hone their skills and thus increase their chances of obtaining a job in the private sector. Alas, the incentive effect of the revolving door is unobserved and can only be inferred ex-post, after the regulator quits to join the private sector. This severely complicates any causal inference regarding the impact of the revolving door.

In this paper, we aim to overcome this challenge and provide the first systematic evidence on the response to the revolving door. We assembled a new data set with the full payroll information on all federal employees, nearly 22 million observations over two decades. We then exploit a unique legal setting: the post-employment restrictions on federal employees specified in Title 18, Sections 207(c) and 207(f), of the U.S. Code. Regulators are barred for one year from communicating on matters that pertain to their former agency and from representing or advising foreign entities. Crucially, the restrictions are triggered by a salary threshold. This provides a unique setting to study the impact of the revolving door in a large sample of federal regulators.

We document a significant clustering of employees just below the threshold. This is a clear indication of a deliberate effort by high-ranked employees to escape the post-employment restriction and preserve the value of their outside option. We show that the effect is concentrated among a handful of federal agencies, who have broad regulatory powers but are largely insulated from supervision by elected officials. Those agencies also tend to regulate industries which offer significantly higher pay. In the second part of the paper, we show that the strategic bunching below the threshold is associated with regulatory leniency. For example, agencies with significant bunching initiate fewer regulations and reduce the compliance costs with the remaining regulations. Finally, aided by a structural model and the empirical findings, we evaluate alternative policies that either eliminate or expand the post-employment restrictions. For example, we find that eliminating the post-employment restriction will decrease regulatory burden on companies by 1.7%: the value of a private sector job increases (no cooling-off period), motivating regulators to show more leniency toward regulated companies to improve their chances of landing a job.

Overall, our work improves our understanding of incentives and performance of regulatory agencies. We focus on a major incentive, the revolving door, and provide the first large-sample causal evidence on its existence and implications. We identify a “real-time” response of regulators to the outside option, before any specific offer has been made and before the regulator has chosen to accept it and resign. Using the sharp cutoff which triggers post-employment restriction, we directly observe the response to the outside option. We document the heterogeneous response across federal agencies, and link revolving door incentives to newly-developed measures of regulation which capture the burden borne by all industries and companies. Our findings are mostly consistent with theories of regulatory capture, that view regulation as a rent-seeking process where private actors advance their self-interests at the expense of the public good. We show that the option to switch sides can lead to regulatory capture, as regulators who are sensitive to their outside option choose to impose lighter burden on companies.

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Figure 1: **Sensitivity to outside job opportunities: Bunching estimator**

Bunching behavior in four agencies: the Bureau of Economic Analysis, the Federal Deposit Insurance Corporation, the Federal Aviation Administration, and the Department of Energy. The procedure is described in Section 4.1. For each agency, we plot the distribution of salaries (in black line) and the counterfactual distribution based on Equation (6) (in red dotted line). Salaries are expressed as the difference from the cutoff salary which triggers the post-employment restriction in Section 207. For example, the value \$0 is for employees whose salary equals the threshold. We denote the lower bound ($\underline{w}$) and the upper bound ($\overline{w}$) of the bunching behavior. The latter is the salary at which the marginal buncher is indifferent between bunching and not bunching.

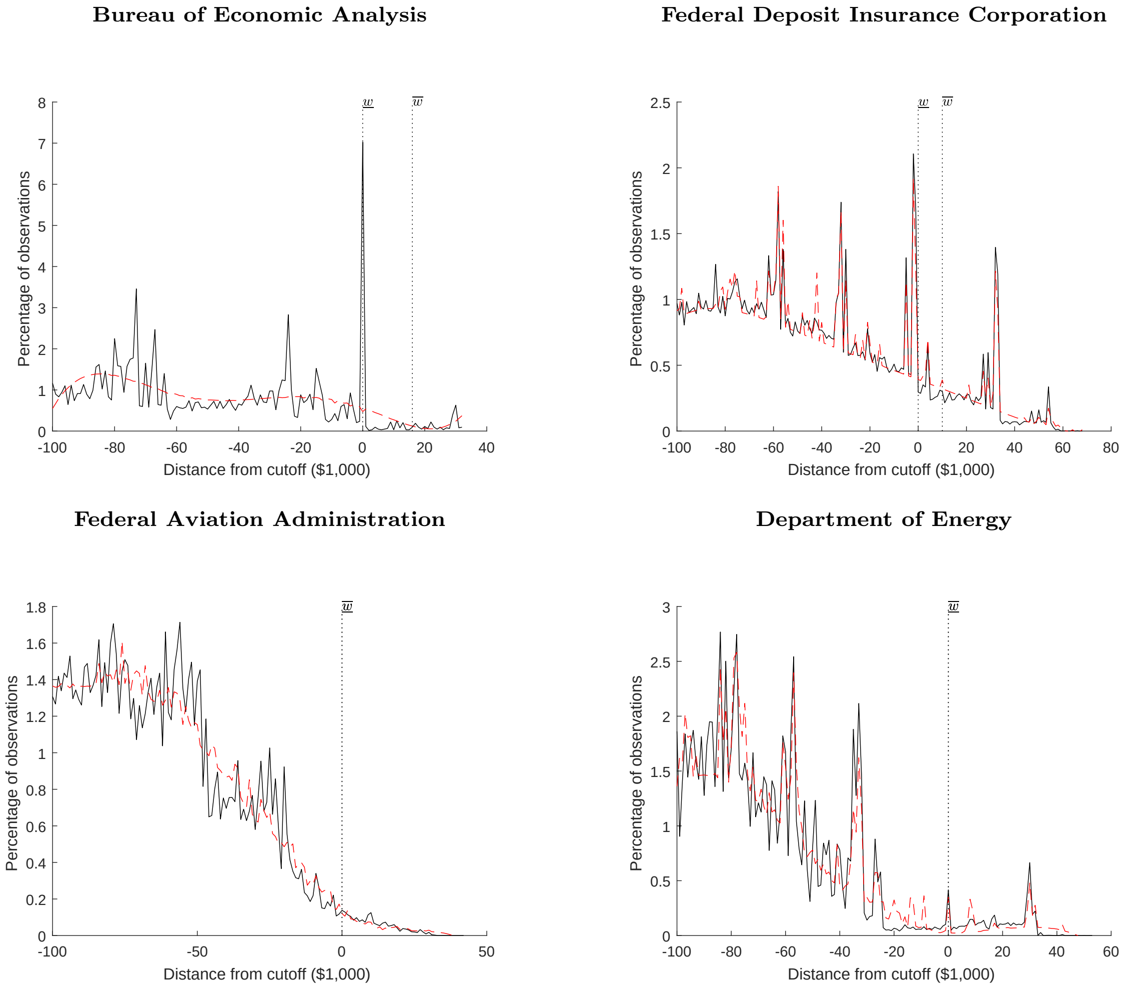

Figure 2: **Structural differences across agencies**

We classify federal agencies based on their response to revolving door incentives, using a formal bunching estimator (Section 4.1). We then import agency-level data from Selin (2015) and Selin and Lewis (2018), and assign a series of indicators which equal 1 if the agency has the following characteristics: in-house judicial process (*Administrative judges*), adjudication powers (*Adjudication*), statutory requirement to establish an advisory committee (*Advisory Commissions*), internal regulations prohibiting conflict-of-interest among its employees (*CoInterest Prohibition*), budget proposal or communications exempt from OMB review (*Independent Budget* and *Independent Communication*), authorization to raise funds on its own (*Independent Funding*), authorization to represent itself in legal proceedings (*Independent Litigation*) and to write rules without OMB supervision (*Independent Rulemaking*), leadership consisting of a multi-member commission or a board of directors (e.g., Chemical Safety and Hazard Investigation Board; *Multimember*), and power to write regulations (*Rulemaking*). *Independence score (1)* and *Independence score (2)* are each a weighted average of a subset of those characteristics, computed by Selin (2015). We report the average characteristics of revolving agencies versus indifferent agencies.

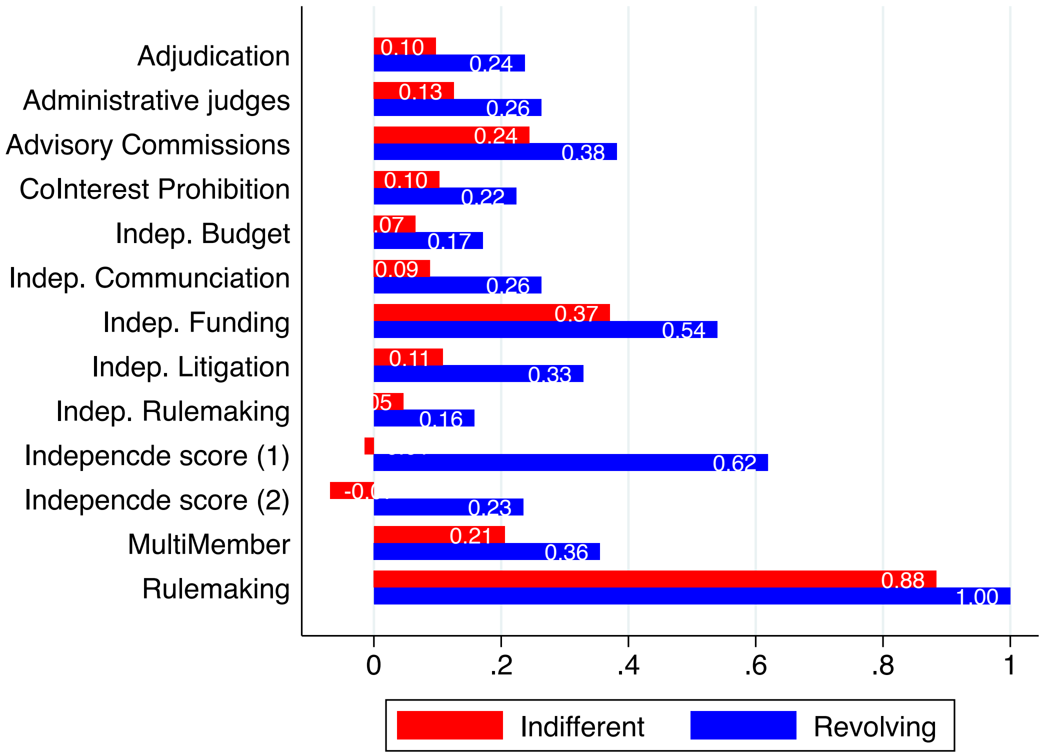

Figure 3: **Bunching to avoid post-employment restrictions: Validation**

The sample includes all SEC employees between 2003-2021, split into two periods: 2003-2013 (left panel) and 2014-2021 (right panel). In the early period, SEC employees were exempt from the post-employment restriction in Section 207 and thus had no reason to bunch below the cutoff salary (see Section 4.5). We validate it by estimating bunching behavior before and after 2013, plotting the realized distribution of salaries (in black line) and the counterfactual distribution based on Equation (6) (in red dotted line). Salaries are expressed as the difference from the cutoff salary which triggers the post-employment restriction in Section 207. For example, the value \$0 is for employees whose salary equals the threshold. We denote the lower bound ($\underline{w}$) and the upper bound ($\overline{w}$) of the bunching behavior, similar to Figure 1.

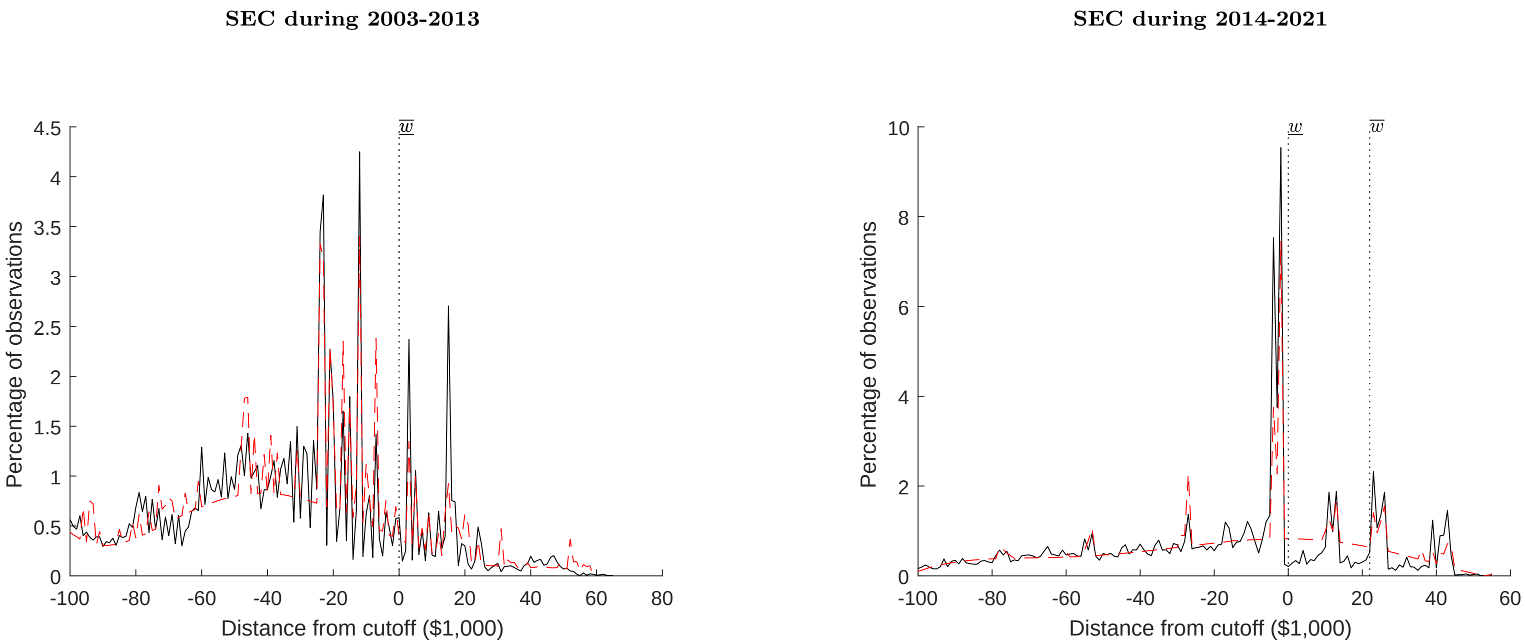

Figure 4: **Agency pay structure and the post-employment threshold**

The sample includes rank×year units (for example, GS-15 in 2010). We focus on ranks that are available only among indifferent agencies or only among revolving agencies, based on the classification in Section 4.2. For each rank×year, we compute the distance between the rank's maximum pay and the post-employment restriction threshold. Finally, for each group of agencies (revolving and indifferent), we compute the fraction of ranks whose top pay falls within [-$X, $0) of the threshold, where $\$X$ ranges from $10,000 to $1,000. See Section 4.6.

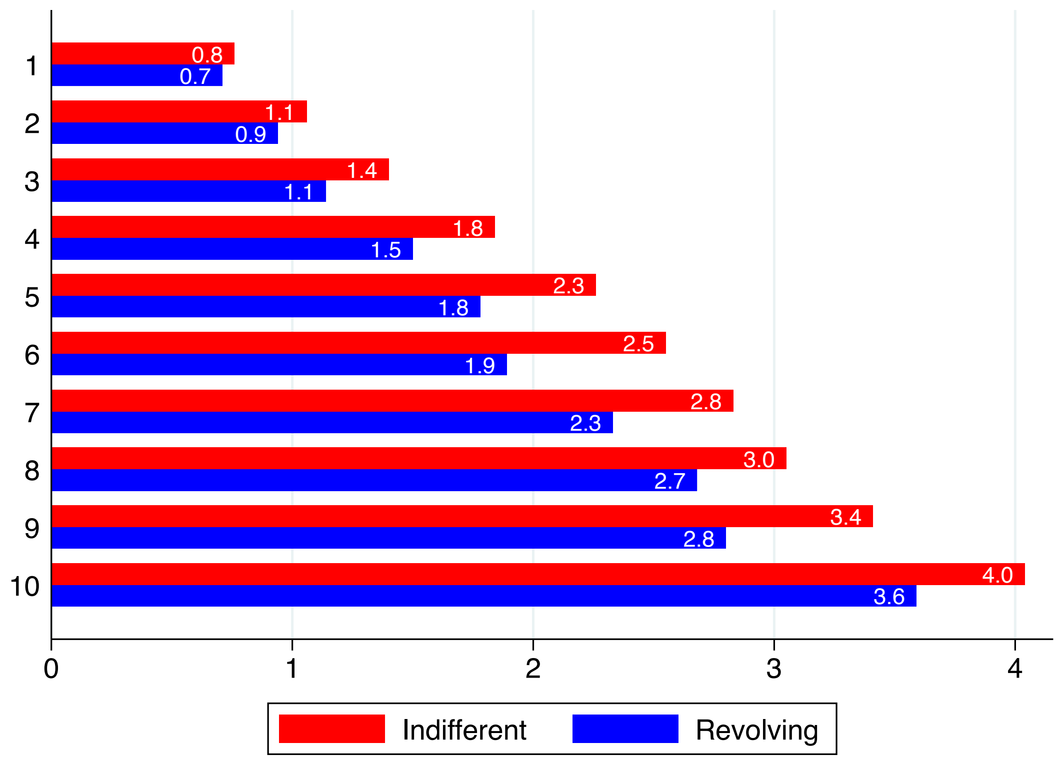

Table 1: **Descriptive statistics**

Panel A. Employee-level payroll data. The sample includes all federal employees from 2004 till 2021. *Below* (*Restricted*) equals one if the employee's base salary is below (above) the regulatory threshold specified in Title 18, Section 207, of the U.S. Code. This threshold triggers the post-employment restriction which is at the center of this paper. $Within^{\pm 100K} = 1$ if the employee's salary falls within \$100,000 of the threshold. $Manager = 1$ if the employee is an executive. $Tenure$ is the number of years in government service. $Salary$ is the employee's base salary, and $Salary^{CPI}$ is $Salary$ in constant 2022 USD.

Statistic:	Avg.	Median	S.D.	Min	Max	Obs.
Below	97.8	100.0	14.5	0.0	100.0	21,691,864
Restricted	2.2	0.0	14.5	0.0	100.0	21,691,864
$Manager$	0.7	0.0	8.1	0.0	100.0	21,691,864
$Within^{\pm 100K}$	59.0	100.0	49.2	0.0	100.0	21,691,864
$Tenure$	14.7	13.0	10.6	1.0	76.0	21,690,853
$Salary$	68,230	62,283	34,659	1	456,028	21,691,864
$Salary^{CPI}$	86,423	79,562	43,232	1	539,464	21,691,864

Panel B. Affected occupations. We identify occupations that are potentially affected by the threshold of §207. For each occupation, we check whether it was ever affected by the threshold, meaning that at least one employee holding that occupation was above the threshold. We report the number of occupation affected and unaffected, and list the 25 most populated occupations in each category.

Group	Occupations	Examples
Affected	218	General Attorney (35791); Program Management (33216); Miscellaneous Administration And Program (29423); Financial Institution Examining (9663); General Engineering (7890); Air Traffic Control (7696); Criminal Investigation (7590); Gen Natural Resources Mgt And Bio Sci (6532); Information Technology Management (6341); General Physical Science (4846); Accounting (3647); Nurse (3549); Nurse Anesthetist (Title 38) (3514); Chemistry (3479); Economist (3384); General Business And Industry (3169); Physics (2841); Financial Administration And Program (2352); Patent Attorney (2327); Management And Program Analysis (2261); Financial Management (1965); Human Resources Management (1901); Microbiology (1765); Foreign Affairs (1754); Computer Science (1671); Contracting (1491)
Unaffected	464	Contact Representative (381859); Forestry Technician (302348); Practical Nurse (251066); Secretary (227087); Nursing Assistant (214492); Custodial Working (209427); Veterans Claims Examining (197352); Tax Examining (169197); Biological Science Technician (141259); Maintenance Mechanic (129340); Legal Assistance (123079); Safety Technician (97957); Financial Clerical And Assistance (90124); Police (88564); Pharmacy Technician (82328); Soil Conservation (77054); Engineering Technical (75481); Mail And File (73989); Diagnostic Radiologic Technologist (68606); Consumer Safety Inspection (68425); Human Resources Assistance (63059); Management & Program Clerical & Assistant (62276); Accounting Technician (58762); Food Inspection (58203); Claims Assistance And Examining (56275); Cooking (56193)

Table 2: **Response to revolving door incentives**

Panel A. Extensive margin. We classify federal agencies based on their response to revolving door incentives. For each agency, we formally estimate the extent of bunching below the salary threshold specified in Title 18, Section 207 of the U.S. Code (Section 4.1). Revolving agencies are those with significant bunching below the threshold, and indifferent agencies are those with smooth distribution around the threshold. For each category, we report the number of agencies and employees and list several of the largest agencies. The full list of agencies is available upon request.

Group	Agencies	Obs.	Examples
Revolving	33	2,652,935	Export-Import Bank of the United States; Department of Treasury; Overseas Private Investment Corporation; Farm Credit Administration; Commodity Futures Trading Commission; Equal Employment Opportunity Commission; Federal Election Commission; Federal Maritime Commission; Federal Retirement Thrift Investment Board; Federal Deposit Insurance Corporation; Office of Comptroller of Currency; Securities and Exchange Commission; Internal Revenue Service; Department of Commerce; National Oceanic and Atmospheric Administration; Department of Agriculture
Indifferent	133	17,115,960	Department of Veterans Affairs; Social Security Administration; Federal Aviation Administration; Transportation Security Administration; Forest Service; Bureau of Prisons; Federal Bureau of Investigation; Department of Justice; National Institutes of Health; National Aeronautics and Space Administration; Environmental Protection Agency; U.S. Census Bureau; Food and Drug Administration; Department of Energy; Indian Health Service; General Services Administration

Panel B. Intensive margin. We focus on revolving federal agencies: agencies with significant bunching just below the threshold salary that triggers post-employment restrictions. For each agency, we report the salary employees are willing to give away in order to stay just below the threshold in constant 2022 USD (Δw), and the fraction of strategic employees who choose to bunch (α). The methodology is described in Section 4.1. For brevity, we selected fifteen prominent agencies; the full list is in Table A.3. We also report the average estimates across *all* revolving agencies.

Agency	**Bunching range (Δw)**	**s.e.**	**Strategic agents (α)**	**s.e.**	**Obs.**
Overseas Private Investment Corporation	\$5,000	(1,630)	100.0%	(0.447)	4,517
Farm Credit Administration	\$32,000	(1,250)	11.0%	(0.441)	5,137
Federal Deposit Insurance Corporation	\$10,000	(3,470)	18.7%	(0.469)	111,705
Federal Retirement Thrift Investment Board	\$8,000	(1,220)	52.3%	(0.441)	3,044
Export-Import Bank of the United States	\$7,000	(1,330)	35.3%	(0.418)	7,251
Federal Election Commission	\$9,000	(1,320)	63.3%	(0.498)	6,131
Internal Revenue Service	\$4,000	(1,040)	32.9%	(0.485)	1,262,408
Equal Employment Opportunity Commission	\$7,000	(1,870)	23.3%	(0.390)	39,753
Commodity Futures Trading Commission	\$5,000	(2,760)	24.2%	(0.389)	11,324
Securities and Exchange Commission	\$22,000	(10,100)	35.9%	(0.325)	73,625
Office of Comptroller of Currency	\$1,000	(570)	100.0%	(0.487)	62,560
Department of Treasury	\$4,000	(1,350)	20.8%	(0.436)	36,362
Federal Maritime Commission	\$4,000	(1,460)	65.7%	(0.456)	2,169
Department of Commerce	\$5,000	(1,240)	100.0%	(0.497)	355,937
National Oceanic and Atmospheric Administration	\$16,000	(3,470)	75.3%	(0.495)	217,948
Mean (all revolvers)	\$6,388		49.8%		2,652,935

Table 3: **Difference in means: employee types**

We compute the difference in means between two groups: employees who were within $[-\$5,000, -\$0)$ of the threshold at least once (*Bunched*), versus employees who were never within $[-\$5,000, -\$0)$ of the threshold (*Never Bunched*). The sample is restricted to employees who were within $\pm\$50,000$ of the threshold at least once. The first two columns present the means in each group and the third column has the point estimate and standard error (in parentheses) for a t-test comparing the means of the two groups.

	Bunched	Never Bunched	Diff of Means
Tenure (years)	21.32	21.22	0.10
			(0.08)
Number of promotions	1.07	0.83	0.24***
			(0.01)
Number of relocations	0.45	0.36	0.09***
			(0.01)
Base Pay ($)	143,409	117,919	25,490***
			(118.85)
Adjusted Pay ($)	156,559	134,721	21,838***
			(153.82)
Base Pay Raise (%)	4.30	4.74	-0.45
			(0.27)
Adjusted Pay Raise (%)	4.57	5.37	-0.80**
			(0.26)
Years with Bonus	2.71	2.26	0.45***
			(0.02)
Bonus ($) | Bonus>0	2,577	2,100	477***
			(28.01)
Bonus (%) | Bonus>0	1.94	1.93	0.01
			(0.02)
Observations	20,440	257,971	278,411

Table 4: **Employee bunching behavior**

Results from estimating Equation (7). $\mathbb{1}(Promotion) = 1$ if the employee was promoted between time $t-1$ and time t. $\Delta BasePay(\%)$ ($\Delta AdjPay(\%)$) is the percentage growth in the employee's base (adjusted) salary, conditional on not receiving a promotion. $\mathbb{1}(Bonus) = 1$ if the employee received a bonus in year t. $\mathbb{1}(Exit) = 1$ if the employee exited government service in year $t+1$. The sample incudes only employees within $\pm\$5,000$ of the threshold. $\Delta Threshold$ is the difference between the employee's salary and the legal threshold, expressed in \$50,000 units. $\mathbb{1}(Above) = 1$ if the employee is above the threshold. We include employee tenure as a control in all specifications. Fixed effects are as indicated. Standard errors are clustered at the employee level.

Measure:	$\mathbb{1}(Promotion)$	$\Delta BasePay(\%)$	$\Delta AdjPay(\%)$	$\mathbb{1}(Bonus)$	$\mathbb{1}(Exit)$
$\Delta Threshold$ (β_1)	-0.28***	-9.47***	-10.73***	-0.05	0.14***
	(0.04)	(0.42)	(0.42)	(0.04)	(0.04)
$\Delta Threshold \cdot \mathbb{1}(Above)$ (β_2)	0.25***	14.34***	14.13***	0.14*	-0.25***
	(0.07)	(0.81)	(0.79)	(0.08)	(0.07)
$Tenure$	-0.00***	-0.02***	-0.02***	-0.00	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Obs.	117,911	107,208	107,041	117,911	117,911
R^2	0.28	0.39	0.35	0.48	0.14
Mean	0.09	2.91	2.91	0.22	0.10
Agency × Year FE	Yes	Yes	Yes	Yes	Yes
Rank FE	Yes	Yes	Yes	Yes	Yes
$p(\beta_1 + \beta_2 = 0)$	.598	0	0	.047	.009

Table 5: **Revolving door, exits, and lobbying**

Results from estimating Equation (8). $\mathbb{1}(Exit) = 1$ if the employee left the government during the sample period. Conditional on $\mathbb{1}(Exit) = 1$, $\mathbb{1}(Lobbyists) = 1$ if the employee registered as a federal lobbyists. Employee controls include an indicator for male and the average pay, bonuses, promotions, and pay raises. We gradually add tight fixed effects for the employee's last known agency, cohort (year of joining the government), occupation, and location (city level). $JustBelow = 1$ if the employee never crossed the the post-employment threshold but was at least once within $[-\$5,000, -\$0)$ of the threshold. We exclude from the sample agencies, cohorts, occupations, and locations without any bunching and without any exits. In columns (6)-(10), we further exclude agencies, cohorts, occupations, and locations without any bunching and without any lobbyists.

Measure:	$\mathbb{1}(Exit)$					$\mathbb{1}(Lobbyist)\|\mathbb{1}(Exit) = 1$				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$JustBelow$	0.203***	0.189***	0.064***	0.060***	0.050***	0.004***	0.003***	0.003***	0.002***	0.002***
	(0.005)	(0.004)	(0.004)	(0.004)	(0.005)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Obs.	1,446,794	1,446,793	1,444,522	1,375,303	1,078,806	739,714	739,714	738,301	690,026	515,690
R^2	0.07	0.11	0.40	0.47	0.54	0.00	0.00	0.04	0.10	0.21
Effect (%)	0.36	0.33	0.11	0.11	0.09	1.92	1.80	1.76	1.15	1.26
Employee controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Agency FE	-	Yes	-	-	-	-	Yes	-	-	-
Agency×cohort FE	-	-	Yes	-	-	-	-	Yes	-	-
Agency×cohort×occ. FE	-	-	-	Yes	-	-	-	-	Yes	-
Agency×cohort×occ.×city FE	-	-	-	-	Yes	-	-	-	-	Yes

Table 6: **Time-series of bunching behavior**

Results from estimating Equation (9). *DoddFrank=1* if the agency formulates rules related to the Dodd-Frank Act, and 0 otherwise. *Post=1* for years after the agency started formulating the rules. $Distance^X = 1$ if the employee's base pay is X dollars below the threshold. For instance, in column (1), $Distance^X = 1$ if the base pay is within $[-\$10,000, -\$0)$ of the threshold.

Outcome:	$Distance^X$					
X:	-10000	-5000	-2000	2000	5000	10000
	(1)	(2)	(3)	(4)	(5)	(6)
DoddFrank × Post	0.10**	0.08**	0.06**	-0.01	-0.00	0.01
	(0.04)	(0.04)	(0.03)	(0.01)	(0.02)	(0.02)
Tenure	-0.00	-0.00	-0.00	0.00	0.00	0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Obs.	1,969,817	1,969,817	1,969,817	1,969,817	1,969,817	1,969,817
R^2	0.45	0.37	0.26	0.52	0.46	0.50
Mean	0.05	0.03	0.02	0.02	0.03	0.05
Agency-Rank FE	Yes	Yes	Yes	Yes	Yes	Yes
Employee FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 7: **Regulatory burden and revolving door incentives**

Panel A. Enforcement. Results from estimating Equation (10). The sample includes 581 enforcement attorneys at the SEC between 2010-2017, who were within $\pm\$5,000$ of the threshold in a given year. $JustAbove = 1$ if the attorney is within [\$0,\$5,000] of the threshold. $Post = 1$ in 2014 and later, when the SEC became subject to the post-employment restriction. We control for the attorney's tenure ($Tenure$) and number of attorneys in the office who are also above (below) the threshold if $JustAbove = 1$ ($JustAbove = 0$). Outcomes are a set of indicators, which equal one if the attorney filed any enforcement action ($Enforcement$), was a lead attorney on a case ($Lead$), requested to freeze the defendants' assets ($Freeze$), filed a case with allegations of fraud ($Fraud$) or concurrent with criminal charges ($Criminal$), and filed a contested or settled case ($Contest$ and $Settle$, respectively). Standard errors are clustered at the attorney level.

Outcome:	*Enforcement*			*Lead*	*Freeze*	*Fraud*	*Criminal*	*Contest*	*Settle*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$Post \cdot JustAbove$	0.38***	0.28***	0.35***	0.32***	0.16**	0.35***	0.16*	0.31***	0.09
	(0.09)	(0.09)	(0.11)	(0.10)	(0.08)	(0.11)	(0.09)	(0.11)	(0.10)
$JustAbove$	-0.05	-0.06	-0.06	0.04	-0.05	-0.04	-0.04	-0.03	-0.04
	(0.06)	(0.06)	(0.06)	(0.04)	(0.04)	(0.06)	(0.05)	(0.06)	(0.06)
$Post$	-0.40***								
	(0.04)								
$Tenure$		-0.01***	-0.01***	-0.00***	-0.00***	-0.01***	-0.00**	-0.01***	-0.00**
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
$Attorneys$		-0.00***	-0.00	0.00	0.00	-0.00	-0.00	-0.00	-0.00
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Obs.	1,272	1,272	1,265	1,265	1,265	1,265	1,265	1,265	1,265
R^2	0.13	0.17	0.28	0.36	0.24	0.27	0.19	0.28	0.19
Effect (%)	1.15	0.83	1.05	3.24	1.65	1.41	1.24	1.15	0.74
Year FE	-	YES	-	-	-	-	-	-	-
Year×office FE	-	-	YES	YES	YES	YES	YES	YES	YES

Panel B. Compliance costs. Results from a univariate OLS regression. The sample includes 148 federal agencies between 2004-2020, and the unit of observation is agency×month (for example, the SEC in February 2012). *Revolving* = 1 if it is a revolving agency based on bunching estimation (Section 4.2). The outcome variables capture the cost of compliance with the agency's regulations based on (Kalmenovitz, 2023): number of active regulations (*Rules*), total filings by regulated companies (*Filings*), and total hours it takes to comply with the regulations (*Hours*). Dependent variables are in logs. We report the dependent variable's average, the effect in percentage points ($1 - exp(\beta)$), and the effect's economic magnitude multiplied by the average.

Measure:	Rules	Filings	Hours	$\frac{Filings}{Rules}$	$\frac{Hours}{Rules}$	$\frac{Hours}{Filings}$
Revolving	-0.160***	-0.175***	-0.425***	-0.015	-0.265***	-0.249***
	(0.022)	(0.063)	(0.049)	(0.049)	(0.035)	(0.032)
Obs.	27,760	27,760	27,760	27,760	27,760	27,760
R^2	0.00	0.00	0.00	0.00	0.00	0.00
Mean	60.02	59.09	6.18	827.72	28.77	6.72
Effect	-0.15	-0.16	-0.35	-0.02	-0.23	-0.22
Effect (%)	-8.87	-9.50	-2.14	-12.55	-6.69	-1.48
		(mill)	(mill)	(thou)	(thou)	

Table 8: **Policy implications**

Results from counterfactual analysis (Section 6). We consider three sets of counterfactual policies, and for each one report three outcomes: the percentage changes in the bunching range (Δw), in regulatory leniency (l), and in the supply of labor to the public sector (L_g), all relative to the baseline calibration. We focus on 32 revolving agencies which are highly sensitive to outside job opportunities (the IRS is not part of the analysis; see Footnote 39). For brevity we display the results for 15 selected agencies and the employment-weighted average outcomes across all revolving agencies.

Counterfactual:	Tighter restriction ($\tau^* = 2$)			No restriction ($\tau^* = 0$)			Monitoring ($\gamma^* = 2\gamma$)		
Outcome:	$\Delta \ln \Delta w$	$\Delta \ln l$	$\Delta \ln L_g$	$\Delta \ln \Delta w$	$\Delta \ln l$	$\Delta \ln L_g$	$\Delta \ln \Delta w$	$\Delta \ln l$	$\Delta \ln L_g$
Agency:									
Export-Import Bank of the United States	100.043	0.022	-0.050	-100.000	1.405	0.103	-50.290	-50.290	-2.561
Federal Election Commission	100.284	0.142	-0.080	-100.000	1.373	0.204	-50.325	-50.325	-4.969
Overseas Private Investment Corporation	99.655	-0.172	-0.167	-100.000	1.562	0.261	-50.263	-50.263	-6.203
Securities and Exchange Commission	100.879	0.440	0.004	-100.000	0.743	0.117	-50.387	-50.387	-3.642
Federal Maritime Commission	98.516	-0.742	-0.167	-100.000	2.066	0.173	-50.221	-50.221	-3.430
Equal Employment Opportunity Commission	100.132	0.066	-0.032	-100.000	1.449	0.070	-50.315	-50.315	-1.651
Commodity Futures Trading Commission	97.886	-1.057	-0.085	-100.000	2.176	0.074	-50.175	-50.175	-1.460
Federal Retirement Thrift Investment Board	99.667	-0.166	-0.110	-100.000	1.645	0.174	-50.278	-50.278	-3.926
Office of Comptroller of Currency	94.728	-2.636	-0.204	-100.000	2.886	0.112	-50.034	-50.034	-1.897
Department of Treasury	98.046	-0.977	-0.062	-100.000	2.042	0.055	-50.168	-50.168	-1.145
Federal Deposit Insurance Corporation	99.712	-0.144	-0.042	-100.000	1.628	0.067	-50.278	-50.278	-1.531
Farm Credit Administration	100.788	0.394	0.004	-100.000	0.518	0.033	-50.377	-50.377	-1.198
Department of Commerce	100.619	0.309	-0.022	-100.000	0.805	0.196	-50.314	-50.314	-6.522
Department of Agriculture	96.948	-1.526	-0.075	-100.000	2.449	0.056	-50.138	-50.138	-1.019
National Oceanic and Atmospheric Administration	100.621	0.310	-0.069	-100.000	1.247	0.283	-50.360	-50.360	-7.042
Mean (all revolvers)	98.974	-0.513	-0.130	-100.000	1.736	0.179	-50.245	-50.245	-4.131

Internet Appendix

A.1 Derivations

A.1.1 Value function with no uncertainty

A.1.1.1 Value function after triggering restrictions

We first solve $V_g(1, z)$, the value function after an agent triggered post-employment restrictions. To simplify notation, we drop the subscript g. Equation (2) implies

$$(r + \lambda)V = z + V'\mu z + V''\frac{1}{2}\sigma^2 z^2 + \lambda\Omega(1 - \tau)z,$$

where $\Omega(1 - \tau)z$ is the value of working in the private sector after triggering restrictions, with $\Omega \equiv \frac{\theta}{r-\mu}$.

The solution takes the form of $V = A_1 z + B_1 + a_1 z^{b_1}$. First, we plug the general solution $a_1 z^{b_1}$ into the reduced equation

$$(r + \lambda)V = V'\mu z + V''\frac{1}{2}\sigma^2 z^2.$$

We get the following

$$(r + \lambda) = b_1\mu + b_1(b_1 - 1)\frac{1}{2}\sigma^2.$$

Under the special case of zero uncertainty, $\sigma = 0$, we can get

$$b_1 = \frac{r + \lambda}{\mu} > 1.$$

Second, we plug the particular solution $A_1 z + B_1$ into the full differential equation:

$$(r + \lambda)(A_1 z + B_1) = z + A_1\mu z + \lambda\Omega(1 - \tau)z.$$

We can derive

$$A_1 = \frac{1 + \lambda\Omega(1 - \tau)}{r + \lambda - \mu},$$

$$B_1 = 0.$$

Third, a regularity condition is that the marginal impact of the wage potential on the value function will not diverge when the wage potential goes to infinity:

$$\lim_{z \to \infty} V' = \lim_{z \to \infty} A_1 + b_1 a_1 z^{b_1 - 1} < \infty,$$

Because $b_1 - 1 > 0$, this implies

$$a_1 = 0.$$

In summary, the value function after an agent triggered the post-employment restriction is

$$V(1, z) = \frac{1 + \lambda\Omega(1 - \tau)}{r + \lambda - \mu} z.$$

A.1.1.2 Value function above the regulatory threshold before triggering restriction

We now solve $V(0, z)$, the value function before an agent triggered the post-employment restriction. First, consider the case in which $z \geq \underline{w}$. Suppose the agent is in the continuation region. Equation (3) implies

$$(r + \lambda)V = \underline{w} + V'\mu z + V''\frac{1}{2}\sigma^2 z^2 + \lambda\Omega z.$$

The solution again takes the form of $V = A_2 z + B_2 + a_2 z^{b_2}$. First, similar to Appendix A.1.1.1, the general solution is $a_2 z^{b_2}$ with

$$b_2 = \frac{r + \lambda}{\mu},$$

when there is no uncertainty.

Second, we plug the particular solution $Az + B$ into the full differential equation:

$$(r + \lambda)(A_2 z + B_2) = \underline{w} + A_2 \mu z + \lambda\Omega z.$$

We can derive

$$A_2 = \frac{\lambda\Omega}{r+\lambda-\mu},$$
$$B_2 = \frac{\underline{w}}{r+\lambda}.$$

Third, the smooth pasting condition at $\overline{w}$ is that

$$V'(0,\overline{w}) = V'(1,\overline{w}),$$

which implies

$$\frac{\lambda\Omega}{r+\lambda-\mu} + b_2 a_2 \overline{w}^{b_2-1} = \frac{1+\lambda\Omega(1-\tau)}{r+\lambda-\mu}. \tag{A.1}$$

The value matching condition at $\overline{w}$ is that

$$V(0,\overline{w}) = V(1,\overline{w}),$$

which implies

$$\frac{\lambda\Omega}{r+\lambda-\mu}\overline{w} + \frac{\underline{w}}{r+\lambda} + a_2\overline{w}^{b_2} = \frac{1+\lambda\Omega(1-\tau)}{r+\lambda-\mu}\overline{w}. \tag{A.2}$$

Combining equations (A.1) and (A.2), we can derive

$$\frac{\underline{w}}{\overline{w}} = \frac{b_2-1}{b_2}\frac{r+\lambda}{r+\lambda-\mu}(1-\lambda\Omega\tau).$$

Plugging in $b_2 = \frac{r+\lambda}{\mu}$, we have

$$\frac{\underline{w}}{\overline{w}} = 1-\lambda\Omega\tau.$$

Given $\Omega \equiv \frac{1}{r-\mu}\theta$, we have

$$\frac{\overline{w}-\underline{w}}{\overline{w}} = \frac{1}{r-\mu}\lambda\theta\tau.$$

Combining equations (A.2) and (A.1.1.2), we can derive

$$a_2 = \left(\frac{1}{r+\lambda-\mu} - \frac{1}{r+\lambda}\right)(1-\lambda\Omega\tau)^{b_2}\underline{w}^{1-b_2}.$$

In summary, the value function of an agent whose wage potential is above the regulatory threshold but has not triggered the post-employment restriction is given by:

$$V(z,0) = A_2 z + B_2 + a_2 z^{b_2},$$

where

$$A_2 = \frac{\lambda\theta}{(r+\lambda-\mu)(r-\mu)},$$

$$B_2 = \frac{w}{r+\lambda},$$

$$b_2 = \frac{r+\lambda}{\mu},$$

$$a_2 = \left(\frac{1}{r+\lambda-\mu} - \frac{1}{r+\lambda}\right)\left(1 - \frac{\theta\lambda\tau}{r-\mu}\right)^{b_2} \underline{w}^{1-b_2}.$$

A.1.1.3 Value function below the regulatory threshold

Next, consider the case in which $z < \underline{w}$. Since the restriction cannot be triggered yet, the HJB equation is simply

$$(r+\lambda)V = z + V'\mu z + V''\frac{1}{2}\sigma^2 z^2 + \lambda\Omega z.$$

The solution again takes the form of $V = A_3 z + B_3 + a_3 z_3^b$. First, similar to Appendix A.1.1.1, the general solution is $a_3 z^{b_3}$ with

$$b_3 = \frac{r+\lambda}{\mu},$$

when there is no uncertainty.

Second, we plug the particular solution $A_3 z + B_3$ into the full differential equation:

$$(r+\lambda)(A_3 z + B_3) = z + A_3\mu z + \lambda\Omega z.$$

We can derive

$$A_3 = \frac{\lambda\Omega + 1}{r+\lambda-\mu},$$

$$B_3 = 0.$$

Third, the value matching condition at $\underline{w}$ is that

$$\lim_{z \to \underline{w}^+} V(0,z) = \lim_{z \to \underline{w}^-} V(0,z),$$

which implies

$$a_3 = \left(\frac{1}{r+\lambda-\mu} - \frac{1}{r+\lambda} \right) \left[(1-\lambda\Omega\tau)^{b_3} - 1 \right] \underline{w}^{1-b_3} < 0.$$

In summary, the value function of an agent whose wage potential is below the regulatory threshold is given by:

$$V(0,z) = A_3 z + a_3 z^{b_3},$$

where

$$A_3 = \frac{\lambda\theta + r - \mu}{(r+\lambda-\mu)(r-\mu)},$$

$$b_3 = \frac{r+\lambda}{\mu},$$

$$a_3 = \left(\frac{1}{r+\lambda-\mu} - \frac{1}{r+\lambda} \right) \left[(1-\lambda\Omega\tau)^{b_3} - 1 \right] \underline{w}^{1-b_3}.$$

A.1.1.4 Value function without uncertainty: summary

In summary, the pre-trigger value function is

$$V_g(0,z) = \begin{cases} \frac{\lambda\theta+r-\mu}{(r+\lambda-\mu)(r-\mu)} z + \left(\frac{1}{r+\lambda-\mu} - \frac{1}{r+\lambda} \right) \left[\left(1 - \frac{\theta\lambda\tau}{r-\mu} \right)^{\frac{r+\lambda}{\mu}} - 1 \right] \underline{w}^{1-\frac{r+\lambda}{\mu}} z^{\frac{r+\lambda}{\mu}}, & z \in [0, \underline{w}] \\ \frac{\lambda\theta}{(r+\lambda-\mu)(r-\mu)} z + \frac{\underline{w}}{r+\lambda} + \left(\frac{1}{r+\lambda-\mu} - \frac{1}{r+\lambda} \right) \left(1 - \frac{\theta\lambda\tau}{r-\mu} \right)^{\frac{r+\lambda}{\mu}} \underline{w}^{1-\frac{r+\lambda}{\mu}} z^{\frac{r+\lambda}{\mu}}, & z \in [\underline{w}, \overline{w}] \\ \frac{(1-\tau)\lambda\theta+r-\mu}{(r+\lambda-\mu)(r-\mu)} z & z \in [\overline{w}, +\infty] \end{cases},$$

A.1.2 Value function with uncertainty

A.1.2.1 Value function after triggering restrictions

The HJB of the post-trigger value function is:

$$(r+\lambda)V = z + V'\mu z + V''\frac{1}{2}\sigma^2 z^2 + \lambda\Omega(1-\tau)z$$

The solution takes the form of $V = Az + B + a_1 z^{b_1} + a_2 z^{b_2}$. We first solve the nonliner part az^b first by plugging $V = az^b$ into the reduced equation

$$(r+\lambda)V = V'\mu z + V''\frac{1}{2}\sigma^2 z^2,$$

We get:

$$(r+\lambda) = b\mu + b(b-1)\frac{1}{2}\sigma^2$$

We only keep the positive root to make sure V is finite when z approaches zero:

$$b = \frac{-\left(\mu - \frac{1}{2}\sigma^2\right) + \sqrt{\left(\mu - \frac{1}{2}\sigma^2\right)^2 + 2\sigma^2(r+\lambda)}}{\sigma^2}$$

Second, we plug the particular solution $V = Az + B$ into the full differential equation:

$$(r+\lambda)(Az+B) = z + A\mu z + \lambda\Omega(1-\tau)z$$

We get:

$$A = \frac{1+\lambda\Omega(1-\tau)}{r+\lambda-\mu},$$

$$B = 0.$$

So

$$V = \frac{1+\lambda\frac{\theta(1-\tau)}{r-\mu}}{r+\lambda-\mu}z + a_1 z^{\frac{-\left(\mu-\frac{1}{2}\sigma^2\right)+\sqrt{\left(\mu-\frac{1}{2}\sigma^2\right)^2+2\sigma^2(r+\lambda)}}{\sigma^2}}$$

Notice that we have to assume $r > \mu$ to rule out infinite derivative of the value function with respect to wage potential. Then,

$$
\begin{aligned}
r + \lambda - \mu &> 0 \\
2\sigma^2(r+\lambda) &> 2\sigma^2\mu \\
(\mu - \frac{1}{2}\sigma^2)^2 + 2\sigma^2(r+\lambda) &> (\mu + \frac{1}{2}\sigma^2)^2 \\
\frac{-\left(\mu - \frac{1}{2}\sigma^2\right) + \sqrt{\left(\mu - \frac{1}{2}\sigma^2\right)^2 + 2\sigma^2(r+\lambda)}}{\sigma^2} &> 1
\end{aligned}
$$

We can apply the boundary condition $\lim_{z \to +\infty} V'(z) < \infty$ to get $a_1 = 0$

A.1.2.2 Value function above the regulatory threshold before triggering restriction

In this case, under the strategy in proposition 1, the HJB Equation of the pre-trigger value function is:

$$(r+\lambda)V = \underline{w} + V'\mu z + V''\frac{1}{2}\sigma^2 z^2 + \lambda\Omega z$$

The solution takes the form of $V = Az + B + a_1 z^{b_1} + a_2 z^{b_2}$.

Therefore, we first solve the nonlinear part az^b by plugging $V = az^b$ into the reduced equation

$$(r+\lambda)V = V'\mu z + V''\frac{1}{2}\sigma^2 z^2.$$

We get:

$$(r+\lambda) = b\mu + b(b-1)\frac{1}{2}\sigma^2$$

We get two roots:

$$
\begin{aligned}
b_1 &= \frac{-\left(\mu - \frac{1}{2}\sigma^2\right) + \sqrt{\left(\mu - \frac{1}{2}\sigma^2\right)^2 + 2\sigma^2(r+\lambda)}}{\sigma^2} > 1 \\
b_2 &= \frac{-\left(\mu - \frac{1}{2}\sigma^2\right) - \sqrt{\left(\mu - \frac{1}{2}\sigma^2\right)^2 + 2\sigma^2(r+\lambda)}}{\sigma^2} < 0
\end{aligned}
$$

Second, we plug the particular solution $V = Az + B$ into the full differential equation:

$$(r+\lambda)(Az+B) = \underline{w} + A\mu z + \lambda\Omega z$$

We get:

$$A = \frac{\lambda\Omega}{r+\lambda-\mu},$$
$$B = \frac{\underline{w}}{r+\lambda}.$$

Therefore, the value function is

$$V(0, z_t) = \frac{\lambda\Omega}{r+\lambda-\mu}z + \frac{\underline{w}}{r+\lambda} + a_1 z^{b_1} + a_2 z^{b_2}, z \in [\underline{w}, \overline{w}].$$

The parameters will be solved below using information from both cases of $V_g(0, z)$.

A.1.2.3 Value function below the regulatory threshold before triggering restriction

In this case, the HJB equation of the pre-trigger value function is

$$(r+\lambda)V = z + V'\mu z + V''\frac{1}{2}\sigma^2 z^2 + \lambda\Omega z$$

The solution takes the form of $V = Az + B + a_3 z^{b_3} + a_4 z^{b_4}$.

Therefore, we first solve the nonlinear part az^b by plugging $V = az^b$ into the reduced equation

$$(r+\lambda)V = V'\mu z + V''\frac{1}{2}\sigma^2 z^2.$$

We get:

$$(r+\lambda) = b\mu + b(b-1)\frac{1}{2}\sigma^2$$

We only keep the positive root to make sure V is finite when z approaches zero:

$$b_3 = b_1 = \frac{-\left(\mu - \frac{1}{2}\sigma^2\right) + \sqrt{\left(\mu - \frac{1}{2}\sigma^2\right)^2 + 2\sigma^2(r+\lambda)}}{\sigma^2} > 1$$

Second, we plug the particular solution $V = Az + B$ into the full differential equation:

$$(r+\lambda)(Az+B) = z + A\mu z + \lambda\Omega(1-\tau)z$$

We get:

$$A = \frac{1+\lambda\Omega(1-\tau)}{r+\lambda-\mu},$$
$$B = 0.$$

Therefore, the value function is

$$V(0, z_t) = \frac{1+\lambda\Omega}{r+\lambda-\mu} z + a_3 z^{b_1}, z \in [0, \underline{w}].$$

A.1.2.4 Solve the parameters

Then we use four boundary conditions to solve the four remaining parameters: a_1,a_2, a_3 and $\overline{w}$. The value matching condition at $\underline{w}$ is that

$$\lim_{z \to \underline{w}^+} V(0,z) = \lim_{z \to \underline{w}^-} V(0,z),$$

which implies

$$\frac{1+\lambda\Omega}{r+\lambda-\mu}\underline{w} + a_3\underline{w}^{b_1} = \frac{\lambda\Omega}{r+\lambda-\mu}\underline{w} + \frac{\underline{w}}{r+\lambda} + a_1\underline{w}^{b_1} + a_2\underline{w}^{b_2},$$

The smooth pasting condition at $\underline{w}$ is that

$$\lim_{z \to \underline{w}^+} V'(0,z) = \lim_{z \to \underline{w}^-} V'(0,z),$$

which implies

$$\frac{1+\lambda\Omega}{r+\lambda-\mu} + b_1 a_3\underline{w}^{b_1-1} = \frac{\lambda\Omega}{r+\lambda-\mu} + b_1 a_1\underline{w}^{b_1-1} + b_2 a_2\underline{w}^{b_2-1},$$

Combining equations (A.1.2.4) and (A.1.2.4), we get

$$a_2 = \frac{\frac{1-b_1}{r+\lambda-\mu} + \frac{b_1}{r+\lambda}}{b_2 - b_1} \underline{w}^{1-b_2},$$

and thus

$$a_3 = \left(\frac{-1}{r+\lambda-\mu} + \frac{1}{r+\lambda} + \frac{\frac{1-b_1}{r+\lambda-\mu} + \frac{b_1}{r+\lambda}}{b_2 - b_1} \right) \underline{w}^{1-b_1} + a_1,$$

The value matching condition at $\overline{w}$ is that

$$\lim_{z \to \overline{w}^+} V(0,z) = \lim_{z \to \overline{w}^-} V(0,z),$$

which implies

$$\frac{\lambda\Omega}{r+\lambda-\mu}\overline{w} + \frac{\underline{w}}{r+\lambda} + a_1\overline{w}^{b_1} + a_2\overline{w}^{b_2} = \frac{1+\lambda\Omega(1-\tau)}{r+\lambda-\mu}\overline{w}.$$

The smooth pasting condition at $\overline{w}$ is that

$$\lim_{z \to \overline{w}^+} V'(0,z) = \lim_{z \to \overline{w}^-} V'(0,z),$$

which implies

$$\frac{\lambda\Omega}{r+\lambda-\mu} + b_1 a_1 \overline{w}^{b_1-1} + b_2 a_2 \overline{w}^{b_2-1} = \frac{1+\lambda\Omega(1-\tau)}{r+\lambda-\mu}$$

Combining equations (A.1.2.4) and (A.1.2.4), we get

$$(b_2 - b_1) a_2 \overline{w}^{b_2} = (1-b_1)\frac{1-\lambda\Omega\tau}{r+\lambda-\mu}\overline{w} + \frac{\underline{w}}{r+\lambda} b_1$$

Plug in a_2, we get

$$F\left(\frac{\overline{w}}{\underline{w}}\right) = \left(\frac{1-b_1}{r+\lambda-\mu} + \frac{b_1}{r+\lambda}\right)\left(\frac{\overline{w}}{\underline{w}}\right)^{b_2} + (b_1 - 1)\frac{1-\lambda\Omega\tau}{r+\lambda-\mu}\frac{\overline{w}}{\underline{w}} - \frac{b_1}{r+\lambda} = 0$$

Recall that we have $b_1 > 1$ and $b_2 < 0$. If we further assume that $1 - \lambda\Omega\tau > 0$, then we get

$$F(1) = (b_1 - 1)\frac{-\lambda\Omega\tau}{r + \lambda - \mu} < 0$$

$$\lim_{w \to +\infty} F(w) = +\infty$$

By the continuity of $F(w)$ and the intermediate value theorem, there exists a valid $\overline{w}$ that is higher than $\underline{w}$. The intuition of the assumption $1 - \lambda\Omega\tau > 0$ is that the expected wage loss due to triggering the wage limit should not be too large in order to prevent the agent from waiting forever.

After solving $\overline{w}$ from (A.1.2.4), we can plug $\overline{w}$ into (A.1.2.4) and get a_1.
In summary, the pre-trigger value function is

$$V_g(0, z) = \begin{cases} \frac{\lambda\theta + r - \mu}{(r+\lambda-\mu)(r-\mu)} z + a_3 z^{b_1}, & z \in [0, \underline{w}] \\ \frac{\lambda\theta}{(r+\lambda-\mu)(r-\mu)} z + \frac{w}{r+\lambda} + a_1 z^{b_1} + a_2 z^{b_2}, & z \in [\underline{w}, \overline{w}] \\ \frac{(1-\tau)\lambda\theta + r - \mu}{(r+\lambda-\mu)(r-\mu)} z & z \in [\overline{w}, +\infty] \end{cases},$$

where

$$a_1 = \frac{r - \mu - \tau\lambda\theta}{(r + \lambda - \mu)(r - \mu)} \overline{w}^{1-b_1} - \frac{w}{r + \lambda} \overline{w}^{-b_1} - a_2 \overline{w}^{b_2 - b_1},$$

$$a_2 = \frac{\frac{1-b_1}{r+\lambda-\mu} + \frac{b_1}{r+\lambda}}{b_2 - b_1} \underline{w}^{1-b_2},$$

$$a_3 = a_1 + \left(\frac{-1}{r + \lambda - \mu} + \frac{1}{r + \lambda} + \frac{\frac{1-b_1}{r+\lambda-\mu} + \frac{b_1}{r+\lambda}}{b_2 - b_1} \right) \underline{w}^{1-b_1},$$

$$b_1 = \frac{-\left(\mu - \frac{1}{2}\sigma^2\right) + \sqrt{\left(\mu - \frac{1}{2}\sigma^2\right)^2 + 2\sigma^2(r + \lambda)}}{\sigma^2} > 1,$$

$$b_2 = \frac{-\left(\mu - \frac{1}{2}\sigma^2\right) - \sqrt{\left(\mu - \frac{1}{2}\sigma^2\right)^2 + 2\sigma^2(r + \lambda)}}{\sigma^2} < 0,$$

$$\overline{w} \text{ solves } \left(\frac{1 - b_1}{r + \lambda - \mu} + \frac{b_1}{r + \lambda} \right) \left(\frac{\overline{w}}{\underline{w}} \right)^{b_2} + (b_1 - 1) \frac{r - \mu - \tau\lambda\theta}{(r + \lambda - \mu)(r - \mu)} \frac{\overline{w}}{\underline{w}} - \frac{b_1}{r + \lambda} = 0.$$

A.1.3 Proof of proposition 1

We will show that the following strategy is optimal:

$$w(0,z) = \begin{cases} z, & z \notin [\underline{w}, \overline{w}] \\ \underline{w}, & z \in [\underline{w}, \overline{w}] \end{cases},$$

and

$$w(1,z) = z.$$

First, in the post-trigger state, people would always choose the highest possible wage as there is no cost related to that.

Next, we prove by contradiction that the above strategy is optimal in the pre-trigger state.

Case 1: Assume that $w(0,z)$ is strictly dominated by the optimal strategy $w'(0,z)$ and $w'(0,z)$ is different from $w(0,z)$ in $z \in (0, \underline{w})$.

Consider the third strategy $w''(0,z)$ that replicates $w'(0,z)$ outside of $z \in (0, \underline{w}]$ but chooses the same as $w(0,z)$ in $z \in (0, \underline{w}]$. As the flow payoff within $z \in (0, \underline{w}]$ is capped by $wdt = zdt$, and the third strategy $w''(0,z)$ provides the same flow payoff as $w'(0,z)$ outside of $z \in (0, \underline{w}]$ for any realization of the shock path, we get that $w'(0,z)$ is dominated by $w''(0,z)$ and is not the optimal strategy.

Case 2: Assume that $w(0,z)$ is strictly dominated by the optimal strategy $w'(0,z)$ and $w'(0,z)$ is different from $w(0,z)$ in $z \in [\underline{w}, \overline{w}]$.

Assume that $w'(0,z)$ is different from $w(0,z)$ at $z_0 \in [\underline{w}, \overline{w}]$. It can only be that $w'(0,z_0) > \underline{w}$, and this leads to a value of $V_g(1, z_0)$ for strategy $w'(0,z)$. However, in the dynamic programming above, switching to $V_g(1, z_0)$ is always an option for $w(0,z)$, and thus the payoff from $w'(0,z)$ can't be strictly higher than that of $w(0,z)$.

Case 3: Assume that $w(0,z)$ is strictly dominated by the optimal strategy $w'(0,z)$ and $w'(0,z)$ is different from $w(0,z)$ in $z \in (\overline{w}, +\infty)$.

Assume that $w'(0,z)$ is different from $w(0,z)$ at $z_1 \in (\overline{w}, +\infty)$. It can only be that $w'(0,z_1) = \underline{w}$. Consider the third strategy $w''(0,z)$ that replicates $w'(0,z)$ outside of z_1, which gives a value of $V_g(1, z_1)$. By the dynamic programming above, $V_g(1, z_1)$ is the highest value that can be obtained starting from z_1 and the no trigger status. Therefore, $w'(0, z)$ is dominated by $w''(0, z)$ and is not optimal.

In summary, if a strategy is the optimal strategy, then it should not be different from $w(0, z)$. In other words, $w(0, z)$ is the optimal strategy.

A.1.4 Labor supply

Following (Chetty, 2012), we consider a representative agent with a quasi-linear utility:

$$u(C, L_g, L_p) = C - \alpha_g^{-1/\epsilon} \frac{L_g^{1+1/\epsilon}}{1 + 1/\epsilon} - \alpha_p^{-1/\epsilon} \frac{L_p^{1+1/\epsilon}}{1 + 1/\epsilon}$$

where C is the life-time consumption, L_g and L_p are labor supply to the public and private sector, and ϵ is the elasticity of labor supply. α represents other shocks to labor supply, such as preference shocks. The representative agent chooses consumption and labor supply to maximize utility, subject to the budget constraint:

$$C \leq W + V_g L_g + V_p L_p,$$

where W is the non-labor income, and V_p and V_g are the expected lifetime wages at the entry level in the private and public sectors, respectively. We assume that the post-employment restrictions have not been triggered yet, so $V_p = \frac{1}{r-\mu}\theta z$ according to Equation (1) and V_g is defined by Equation (5). Based on those assumptions, we obtain the labor supply expression in Equation (12).

Figure A.1: **Distribution of federal salaries**

Many federal employees cluster at the top of their pay grade, awaiting promotion to the next pay grade. On the left, we plot the raw distribution of basic pay in our sample within ±$50,000 of the threshold specified in Section 207. The two marked regions represent the top pay available in pay grades GS-14 and GS-15. On the right, we plot the raw distribution in 2007 of basic pay for GS employees within ±$50,000 of the threshold, marked with the top pay available in GS-7 through GS-15.

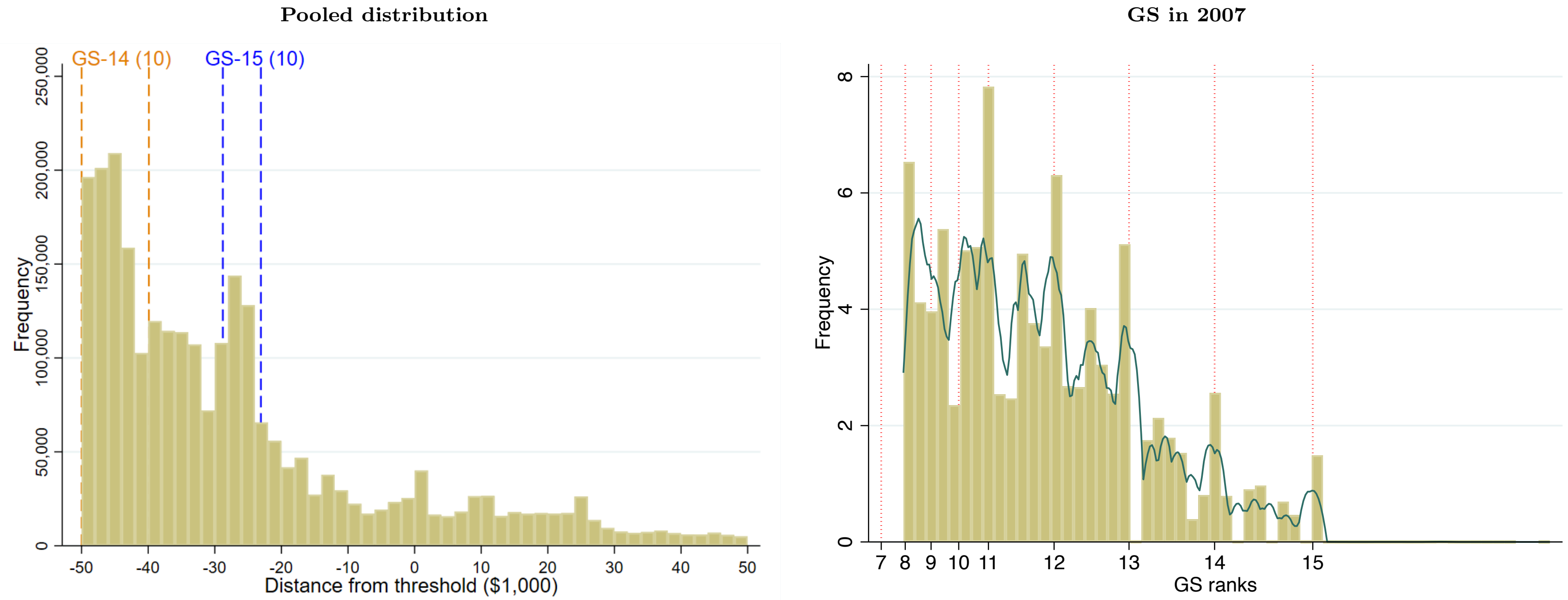

Figure A.2: **Distribution of statistical significance**

We estimate bunching behavior in 166 federal agencies, according to the procedure described in Section 4.1. We then compute the t-statistics of the estimated bunching range (Δw) and plot the distribution below. In the paper, bunching is considered statistically significant if the t-statistics is greater or equal to 1.645 (red line), using standard 10% confidence intervals.

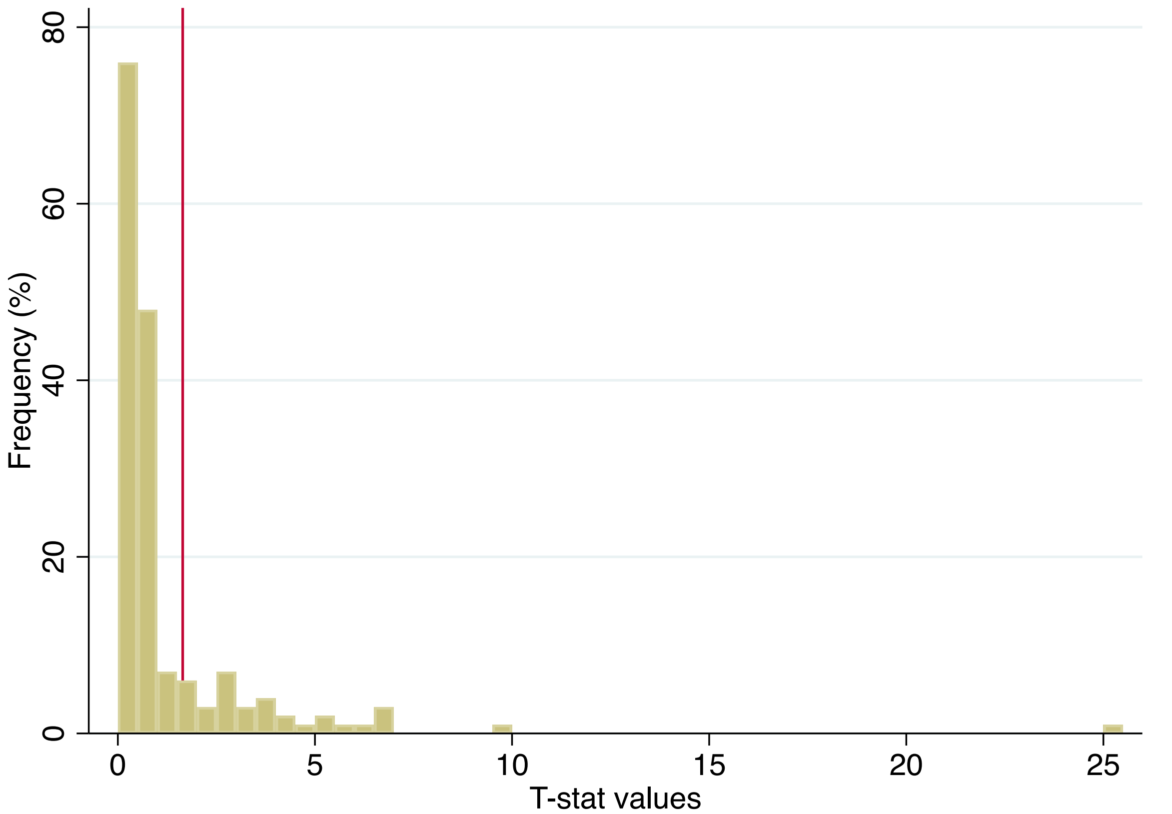

Figure A.3: **Distribution of bunching by occupation**

This figure presents a histogram of occupations based on the fraction of employees who bunch. The sample is restricted to occupations with at least 1,000 observations within $\pm\$50,000$ of the threshold. *Bunch %* refers to employees who were within $[-\$5,000, -\$0)$ of the threshold scaled by the total number of employees.

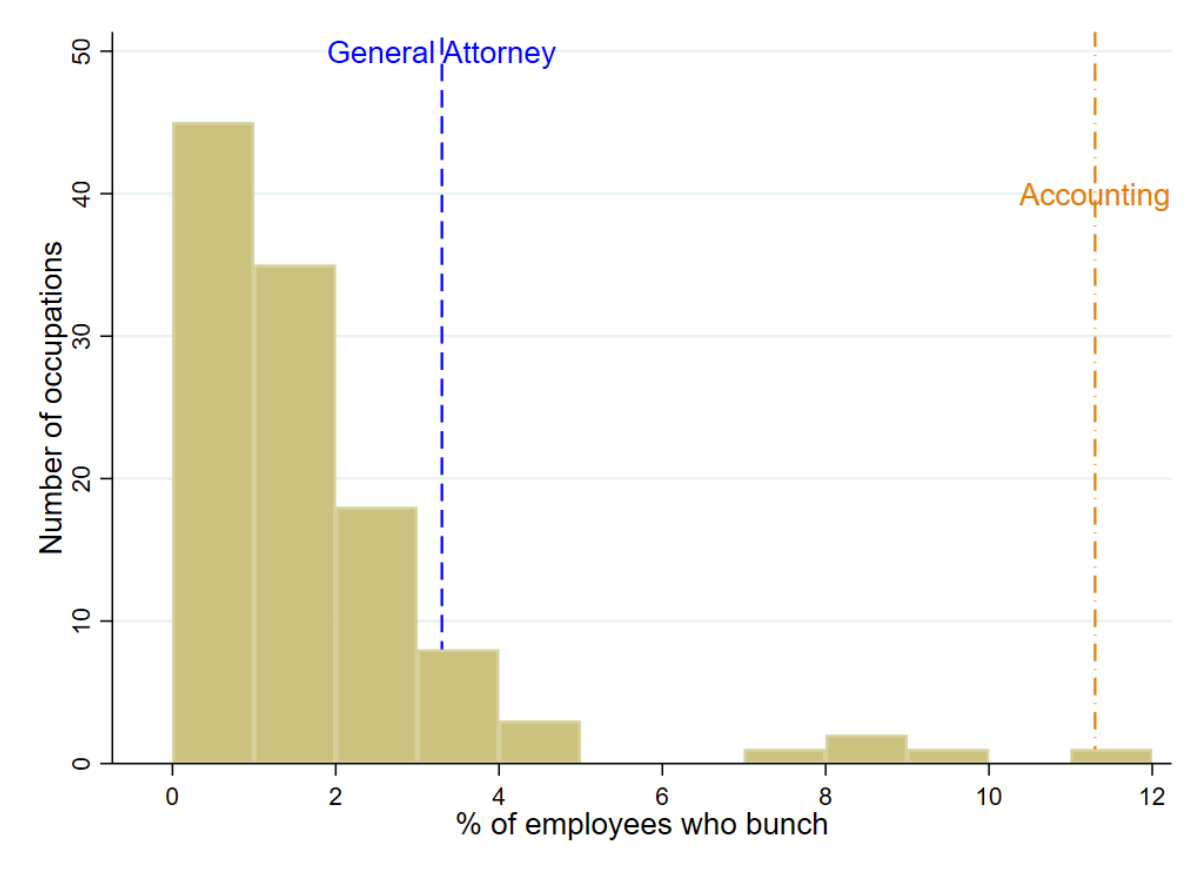

Figure A.4: **SEC reform: robustness**

This figure is similar to Figure 3, except that we omit the year 2013. See Section 4.5.

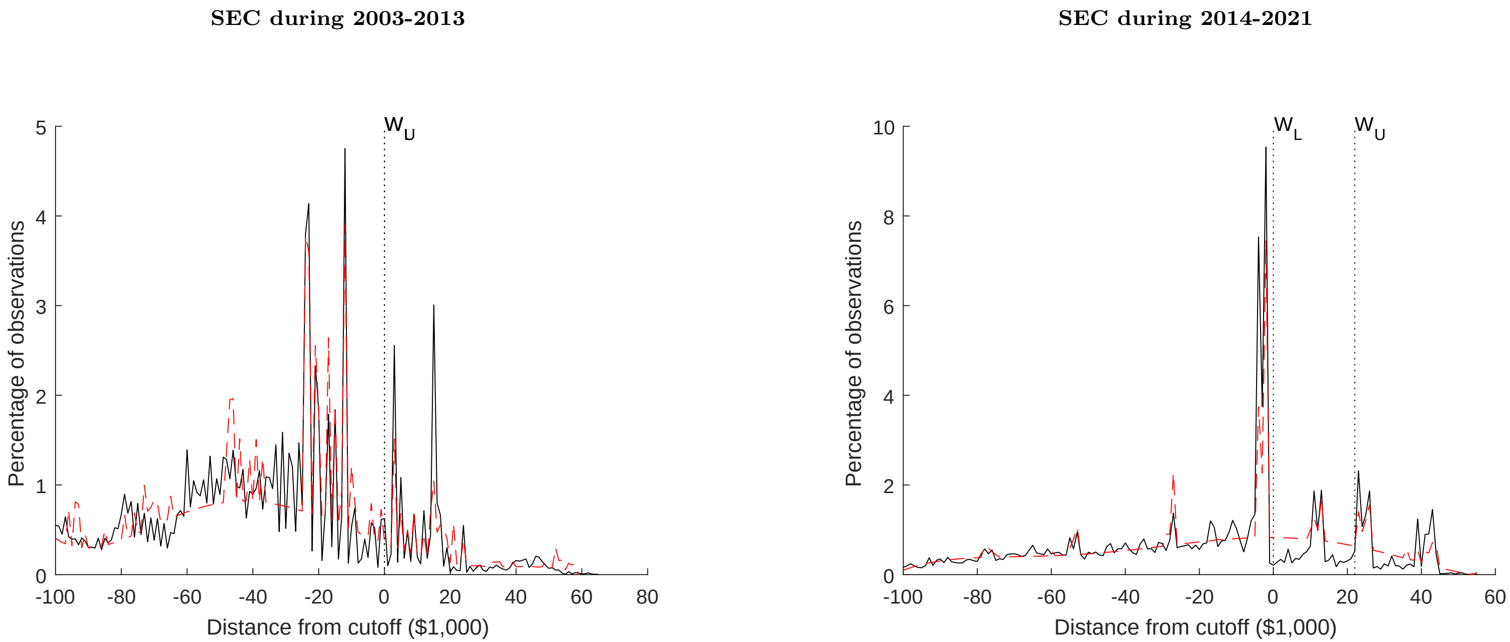

Table A.1: **Difference of Means: employee types - robustness**

Panel A. These are difference of means tests between employees that bunch below the post-employment restriction threshold and those who do not. *Bunched* refers to employees who were within $[-\$5,000, -\$0)$ of the threshold at least once. *Never Bunched, Crossed* are employees who were never within $[-\$5,000, -\$0)$ of the threshold but they were above the threshold at least once. The first two columns present the means for the two groups while the third column has the point estimate and standard error (in parentheses) for a t-test comparing the means of the two groups.

	Bunched	Never Bunched Crossed	Diff of Means
Tenure (years)	21.32	17.02	4.29***
			(0.10)
Number of promotions	1.07	0.74	0.33***
			(0.01)
Number of relocations	0.45	0.32	0.12***
			(0.01)
Base Pay ($)	143408.56	154044.87	-10636.31***
			(155.27)
Adjusted Pay ($)	156559.19	164631.61	-8072.42***
			(181.64)
Base Pay Raise (%)	4.30	4.64	-0.34
			(0.29)
Adjusted Pay Raise (%)	4.57	6.05	-1.48***
			(0.29)
Years with Bonus	2.71	1.30	1.41***
			(0.02)
Bonus ($) | Bonus>0	2576.83	4035.62	-1458.79***
			(57.01)
Bonus (%) | Bonus>0	1.94	2.88	-0.94***
			(0.04)
Observations	20440	41449	61889

Panel B. These are difference of means tests between employees that bunch below the post-employment restriction threshold and those who do not. *Bunched* refers to employees who were within $[-\$5,000, -\$0)$ of the threshold at least once. *Never Bunched, Never Crossed* are employees who were never within $[-\$5,000, -\$0)$ of the threshold and were never above the threshold. The first two columns present the means for the two groups while the third column has the point estimate and standard error (in parentheses) for a t-test comparing the means of the two groups.

	Bunched	Never Bunched Never Crossed	Diff of Means
Tenure (years)	21.32	22.02	-0.70***
			(0.08)
Number of promotions	1.07	0.85	0.22***
			(0.01)
Number of relocations	0.45	0.36	0.09***
			(0.01)
Base Pay ($)	143408.56	111003.37	32405.19***
			(114.69)
Adjusted Pay ($)	156559.19	128995.47	27563.72***
			(152.59)
Base Pay Raise (%)	4.30	4.76	-0.46
			(0.31)
Adjusted Pay Raise (%)	4.57	5.24	-0.68*
			(0.31)
Years with Bonus	2.71	2.44	0.26***
			(0.02)
Bonus ($) | Bonus>0	2576.83	1857.12	719.71***
			(27.46)
Bonus (%) | Bonus>0	1.94	1.81	0.13***
			(0.02)
Observations	20440	216522	236962

Table A.2: **Model Calibration: Agency-specific Parameters**

This table provides the agency-specific parameters for model calibration. The sample includes 35 revolving agencies for which agent-level salary data are available. We report the wage growth (μ), exit rate (λ), restriction (τ), and wage premium (θ). NASA is for National Aeronautics and Space Administration, NOAA is for National Oceanic and Atmospheric Administration. See Section 6.

Agency	μ	λ	τ	θ
Bureau of Economic Analysis	3.2%	11.3%	3.0%	1.8
Commodity Futures Trading Commission	2.0%	13.6%	2.9%	0.6
Defense Nuclear Facilities Safety Board	1.3%	12.2%	2.9%	1.5
Department of Agriculture	1.6%	12.5%	3.0%	0.4
Department of Commerce	1.4%	49.7%	2.5%	0.2
Department of Interior	1.8%	13.1%	3.0%	1.3
Department of Transportation	1.6%	14.6%	2.9%	0.4
Department of Treasury	1.8%	17.2%	2.7%	0.4
Economic Development Administration	1.2%	15.0%	2.8%	0.8
Equal Employment Opportunity Commission	1.1%	11.9%	2.9%	1.0
Export-Import Bank of the United States	1.3%	13.5%	2.7%	0.9
Farm Credit Administration	1.9%	8.7%	2.8%	5.7
Federal Deposit Insurance Corporation	2.1%	13.4%	2.8%	1.1
Federal Election Commission	1.3%	11.7%	2.9%	1.2
Federal Grain Inspection Service	1.1%	19.2%	2.6%	1.0
Federal Maritime Commission	1.1%	11.0%	3.0%	0.6
Federal Retirement Thrift Investment Board	1.7%	14.2%	2.9%	0.9
Health Resources and Services Adm	1.8%	13.5%	2.9%	0.7
National Gallery of Art	1.3%	13.3%	2.8%	0.4
National Labor Relations Board	1.3%	10.1%	3.0%	0.6
National Oceanic and Atmospheric Administration	1.9%	10.6%	3.0%	2.2
Office for Civil Rights	1.3%	10.8%	3.0%	0.4
Office of Comptroller of Currency	2.3%	12.0%	2.9%	0.1
Office of Inspector General	1.9%	12.2%	2.9%	0.4
Office of Management	1.7%	7.4%	2.9%	1.5
Office of Special Counsel	2.0%	18.0%	2.7%	0.4
Overseas Private Investment Corporation	1.3%	19.2%	2.7%	0.4
Railroad Retirement Board	1.3%	9.1%	3.2%	0.5
Securities and Exchange Commission	1.8%	11.8%	2.9%	2.8
Technology Administration	1.9%	13.5%	2.8%	1.8
U.S. Holocaust Memorial Council	1.7%	10.7%	2.9%	1.0
Veterans Employment & Training	1.6%	14.7%	2.8%	0.4

Table A.3: **Intensive margin: full list and robsutness**

Panel A. Baseline. This table provides the full list of revolving agencies, extending the list in Table 2, Panel B.

Agency	Range ($)	Range (%)	Share (α)
Bureau of Economic Analysis	$16,000	14.0%	100.0%
Commodity Futures Trading Commission	$5,000	3.7%	24.2%
Defense Nuclear Facilities Safety Board	$11,000	8.4%	100.0%
Department of Agriculture	$3,000	4.0%	23.3%
Department of Commerce	$5,000	7.1%	100.0%
Department of Interior	$11,000	13.0%	36.7%
Department of Transportation	$4,000	4.0%	100.0%
Department of Treasury	$4,000	3.7%	20.8%
Economic Development Administration	$7,000	7.2%	38.8%
Equal Employment Opportunity Commission	$7,000	8.3%	23.3%
Export-Import Bank of the United States	$7,000	6.9%	35.3%
Farm Credit Administration	$32,000	35.5%	11.0%
Federal Deposit Insurance Corporation	$10,000	8.5%	18.7%
Federal Election Commission	$9,000	9.7%	63.3%
Federal Grain Inspection Service	$10,000	16.0%	83.8%
Federal Maritime Commission	$4,000	3.8%	65.7%
Federal Retirement Thrift Investment Board	$8,000	7.7%	52.3%
Health Resources and Services Adm	$6,000	6.4%	67.9%
Internal Revenue Service	$4,000	5.7%	32.9%
National Gallery of Art	$3,000	4.5%	100.0%
National Labor Relations Board	$4,000	4.1%	31.2%
National Oceanic and Atmospheric Administration	$16,000	16.2%	75.3%
Office for Civil Rights	$3,000	3.2%	100.0%
Office of Comptroller of Currency	$1,000	0.8%	100.0%
Office of Inspector General	$3,000	3.0%	60.9%
Office of Management	$7,000	7.3%	46.5%
Office of Special Counsel	$5,000	5.2%	100.0%
Overseas Private Investment Corporation	$5,000	4.5%	100.0%
Railroad Retirement Board	$3,000	3.9%	48.2%
Securities and Exchange Commission	$22,000	15.3%	35.9%
Technology Administration	$16,000	14.1%	100.0%
U.S. Holocaust Memorial Council	$7,000	8.0%	54.8%
Veterans Employment & Training	$4,000	4.8%	100.0%
Mean (all revolvers)	$6,388	7.4%	49.8%

Panel B. Non-constant clustering. This table is similar to Panel A, except that we allow for non-constant clustering at the top of the pay grade in the counterfactual estimation (Equation (6)).

Agency	Range ($)	Range (%)	Share (α)
Adult Education	$7,000	7.0%	39.5%
Bureau of Economic Analysis	$16,000	14.0%	90.2%
Commodity Futures Trading Commission	$5,000	3.7%	27.0%
Defense Nuclear Facilities Safety Board	$11,000	8.4%	100.0%
Department of Agriculture	$3,000	4.0%	25.9%
Department of Commerce	$5,000	7.1%	100.0%
Department of Energy	$9,000	9.2%	37.7%
Department of Interior	$7,000	8.3%	56.2%
Department of Treasury	$4,000	3.7%	24.8%
Economic Development Administration	$6,000	6.2%	49.7%
Employment Standards Administration	$4,000	5.1%	100.0%
Equal Employment Opportunity Commission	$3,000	3.6%	38.1%
Export-Import Bank of the United States	$11,000	10.9%	28.3%
Farm Credit Administration	$26,000	28.8%	17.1%
Federal Deposit Insurance Corporation	$6,000	5.1%	16.3%
Federal Election Commission	$9,000	9.7%	71.4%
Federal Energy Regulatory Commission	$3,000	2.9%	56.8%
Federal Grain Inspection Service	$10,000	16.0%	71.3%
Federal Labor Relations Authority	$3,000	2.7%	24.7%
Federal Maritime Commission	$3,000	2.9%	86.8%
Federal Retirement Thrift Investment Board	$8,000	7.7%	52.6%
Federal Trade Commission	$7,000	6.2%	100.0%
Internal Revenue Service	$3,000	4.3%	36.9%
National Labor Relations Board	$3,000	3.1%	37.5%
National Oceanic and Atmospheric Administration	$29,000	29.4%	0.0%
National Transportation Safety Board	$4,000	3.6%	100.0%
Office for Civil Rights	$6,000	6.4%	31.7%
Office of Federal Contract Compliance Programs	$4,000	5.0%	100.0%
Office of Inspector General	$3,000	3.0%	62.8%
Office of Special Counsel	$5,000	5.2%	100.0%
Overseas Private Investment Corporation	$5,000	4.5%	100.0%
Railroad Retirement Board	$3,000	3.9%	53.5%
Securities and Exchange Commission	$14,000	9.7%	22.5%
Technology Administration	$16,000	14.1%	100.0%
U.S. Holocaust Memorial Council	$6,000	6.9%	61.2%
Mean (all revolvers)	$7,338	8.2%	47.6%

Panel C. Broader range. This table is similar to Panel A, except that we use $6,000 below the threshold as an alternative lower bound for the bunching region in the counterfactual estimation (Equation (6)).

Agency	Range ($)	Range (%)	Share (α)
Bureau of Economic Analysis	$16,000	14.0%	100.0%
Defense Nuclear Facilities Safety Board	$11,000	8.4%	100.0%
Department of Agriculture	$2,000	2.7%	8.3%
Department of Commerce	$5,000	7.1%	100.0%
Department of Interior	$11,000	13.0%	37.5%
Department of Transportation	$4,000	4.0%	100.0%
Economic Development Administration	$7,000	7.2%	34.4%
Equal Employment Opportunity Commission	$8,000	9.5%	29.2%
Export-Import Bank of the United States	$3,000	3.0%	68.6%
Farm Credit Administration	$26,000	28.8%	16.5%
Federal Deposit Insurance Corporation	$11,000	9.3%	17.7%
Federal Election Commission	$9,000	9.7%	52.3%
Federal Grain Inspection Service	$16,000	25.6%	52.7%
Federal Maritime Commission	$5,000	4.8%	46.7%
Federal Retirement Thrift Investment Board	$7,000	6.7%	56.9%
Health Resources and Services Adm	$5,000	5.4%	59.9%
Internal Revenue Service	$4,000	5.7%	51.2%
National Gallery of Art	$3,000	4.5%	100.0%
National Labor Relations Board	$4,000	4.1%	26.2%
National Oceanic and Atmospheric Administration	$10,000	10.1%	76.8%
Occupational Safety and Health Administration	$2,000	2.4%	100.0%
Office for Civil Rights	$3,000	3.2%	100.0%
Office of Inspector General	$3,000	3.0%	45.2%
Office of Management	$7,000	7.3%	51.2%
Office of Special Counsel	$5,000	5.2%	100.0%
Overseas Private Investment Corporation	$5,000	4.5%	100.0%
Patent and Trademark Office	$2,000	2.1%	38.6%
Railroad Retirement Board	$3,000	3.9%	43.0%
Securities and Exchange Commission	$36,000	25.0%	32.8%
Technology Administration	$16,000	14.1%	100.0%
U.S. Holocaust Memorial Council	$7,000	8.0%	61.1%
Veterans Employment & Training	$4,000	4.8%	100.0%
Mean (all revolvers)	$6,066	6.9%	56.4%

Panel D. 6-Degree polynomial. This table is similar to Panel A, except that we include a 6-degree polynomoal in the counterfactual estimation (Equation (6)).

Agency	Range ($)	Range (%)	Share (α)
Adult Education	$8,000	8.0%	53.0%
Bureau of Economic Analysis	$23,000	20.1%	100.0%
Commodity Futures Trading Commission	$5,000	3.7%	24.2%
Defense Nuclear Facilities Safety Board	$11,000	8.4%	100.0%
Department of Commerce	$8,000	11.4%	100.0%
Department of Interior	$2,000	2.4%	100.0%
Department of Labor	$5,000	4.9%	100.0%
Department of Transportation	$7,000	7.1%	31.1%
Department of Veterans Affairs	$8,000	11.2%	17.3%
Export-Import Bank of the United States	$12,000	11.9%	100.0%
Federal Deposit Insurance Corporation	$10,000	8.5%	18.1%
Federal Election Commission	$9,000	9.7%	87.3%
Federal Grain Inspection Service	$3,000	4.8%	83.9%
Federal Maritime Commission	$3,000	2.9%	43.9%
Federal Motor Carrier Safety Administration	$6,000	7.3%	16.2%
Federal Retirement Thrift Investment Board	$6,000	5.8%	55.6%
Food Safety and Inspection Service	$6,000	10.1%	37.0%
Health Resources and Services Adm	$10,000	10.7%	97.5%
National Gallery of Art	$5,000	7.4%	98.2%
National Labor Relations Board	$3,000	3.1%	29.1%
National Oceanic and Atmospheric Administration	$9,000	9.1%	100.0%
Nuclear Regulatory Commission	$12,000	10.7%	100.0%
Office for Civil Rights	$7,000	7.5%	30.2%
Office of English Language Acquisition	$2,000	2.1%	97.6%
Overseas Private Investment Corporation	$4,000	3.6%	100.0%
Securities and Exchange Commission	$20,000	13.9%	37.0%
Technology Administration	$23,000	20.2%	100.0%
U.S. Census Bureau	$13,000	26.5%	21.0%
Mean (all revolvers)	$8,388	11.6%	27.8%