Working for the Revolving Door

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Abstract

Government connections are crucial for revolving-door lobbyists, however, their value depends on former colleagues remaining in government. We analyze how this interdependence shapes lobbying careers in a model of revolving-door lobbyists. In equilibrium, although most revolvers exit government relatively early, a few stay longer and become highly-productive *superstars* due to their extensive connections. However, their superstardom quickly fades as their connections also exit government. We show that this mechanism generates a right-skewed distribution of lobbying revenue. Furthermore, the interdependent nature of connections alters how workers respond to changes in the environment, such as higher government wages or longer cooling-off periods. We highlight how these individual responses impact aggregate outcomes which are relevant for policy interventions aimed at curbing the revolving door.

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1 Introduction

Lobbying firms actively recruit former government workers, such as legislative staffers and bureaucrats, as *revolving-door lobbyists*. These individuals have government experience that makes them effective lobbyists, and thus highly valuable.[1] Consequently, this lucrative opportunity impacts career decisions by attracting workers to government (Salisbury and Shepsle, 1981), motivating them to leave government for lobbying (Egerod, 2022; Luechinger and Moser, 2024), or influencing their in-government behavior (Shepherd and You, 2020). Furthermore, revolving-door lobbyists may exert excessive influence on policy after leaving government (Baumgartner et al., 2009; McKay and Lazarus, 2023). Overall, the actions of revolving-door lobbyists impact governance and markets beyond their own personal welfare.[2] As such, understanding how the revolving door shapes individual career choices and, in turn, aggregate outcomes is essential.

The main selling point of revolving-door lobbyists is arguably their *government connections* (Levine, 2009; Bertrand et al., 2014; Luechinger and Moser, 2024).[3] These connections facilitate lobbying by securing meetings with politicians (Levine, 2009), understanding their tastes (Drutman, 2015; Strickland, 2023), and providing trust that facilitates information transmission (McCrain, 2018b; Hirsch et al., 2023). Crucially, however, those connections are only valuable to lobbyists while their former colleagues remain in government (Blanes i Vidal et al., 2012; McCrain, 2018b). Thus, the value of government connections is interdependent and dynamic (Holman and Esser, 2019; Luechinger and Moser, 2024). This 'contingent value of connections' (Strickland, 2020, 2023) distinguishes the revolving door from most other industries where contacts retain value even after those contacts switch jobs.

In this paper, we explore how the interdependent nature of connections impacts the labor dynamics of revolving-door lobbyists. We integrate government connections into a dynamic

[1] According to a veteran lobbyist, "[w]e like to hire people who have in-depth experience either in the executive branch or in the legislative branch[...]" (Leech, 2013, pg. 26).

[2] On the negative side: (i) government turnover is associated with worse performance by Congressional staff (Crosson et al., 2018; McCrain, 2018a; Ommundsen, 2023) and bureaucrats (Lee, 2018; Akhtari et al., 2022; Lewis et al., 2022), and (ii) potential revolvers may favor their prospective employers (Cornaggia et al., 2016; Tabakovic and Wollmann, 2018; Tenekedjieva, 2021; Li, 2021). Additionally, their effectiveness as lobbyists may also lead to detrimental policies, e.g., Silicon Valley Bank extensively used revolvers to lobby for weaker banking regulations (Giorno, 2023), contributing to its ultimate collapse. But on the positive side: (i) more workers may be willing to join government and require lower compensation while there, and (ii) they may work harder to impress future employers or build human capital (deHaan et al., 2015; Kempf, 2020; Shepherd and You, 2020).

[3] Among others, (Rosenthal, 2000, pg. 218) claims that "[r]elationships are the primary vehicle of influence for the contract lobbyist" and (Cain and Drutman, 2014, pg. 42) conclude "[t]hough retiring staffers may be valuable for many reasons, the evidence here points to their personal relationships being their most valuable attribute."

model of career decisions by (potential) revolving-door lobbyists. At the beginning of their careers, workers choose whether to enter the private sector or government. Those who join the public sector then face an ongoing decision of whether to stay in government, or exit to become a revolving-door lobbyist. Once a worker joins either the private or lobbying sector, she remains there for the rest of her career. Although the private sector may be more lucrative, some workers enter government due to intrinsic public service motivation and to build human capital that is valuable for lobbying. This human capital is determined by two components: experience in government and connections in government.

The key feature of our model is the endogenous nature of a revolver's government connections. Specifically, two workers in the model are *connected* if they have concurrent government service at any point during their careers. These connections improve a lobbyist's human capital, so a revolver's output depends on the decisions of other workers. This generates a contingent value of connections where lobbying human capital decreases over time as former colleagues leave the public sector. Consequently, in equilibrium, there is endogenous feedback between the flow of revolving-door lobbyists and their wages. Parsing the effects of this interdependence is the core of our main analysis. To emphasize this central feature, we set aside several other relevant features—e.g., electoral turnover, labor market frictions, and policymaking dynamics. As such, our model best applies to unelected government workers, such as bureaucrats or Congressional staffers, who form the bulk of revolving-door lobbyists.[4]

We find that connections shape the revolving door in several important ways. First, revolving-door lobbyists experience declining revenue over time as their former colleagues also exit government. Second, this fuels the emergence of superstar lobbyists who generate significantly more revenue than other revolvers. Finally, connections create novel indirect effects on behavior when considering comparative statics on the underlying environment.

We show the existence of a steady-state equilibrium and characterize the distribution of workers across sectors. In equilibrium, different workers make different career choices for two reasons. First, workers vary in their public service motivation — i.e., how much they intrinsically value government service. Second, all else equal, more government experience increases any worker's value in the lobbying sector, so an individual's calculus varies over time. We identify who enters government and how long they stay. Since workers with higher public service motivation enjoy working in government more, they are both more inclined to

[4]Although ex-politicians are prominent, revolving-door lobbyists are overwhelmingly former staffers or bureaucrats (LaPira and Thomas, 2014). Former staffers are particularly sought after: across a wide range of political actors, they "received uniformly high praise as lobbyists" (Levine, 2009, pg. 239). However, our general insights about the effects of connections should still form a useful starting point for understanding the incentives of politicians. Likewise, they should also apply to revolvers in other domains, such as former credit ratings analysts who transition to investment banking.

enter and more inclined stay. Specifically, workers with low public service motivation join the private sector; those in an intermediate range enter government but revolve after a moderate stint; and those with the highest motivation remain in government so long that most retire before they are willing to revolve. In particular, government tenures are monotonic and convex in public service motivation. Consequently, most revolving-door lobbyists have moderate levels of public service motivation.

We investigate how these equilibrium dynamics influence lobbyists' revenues. Each lobbyist's revenue depends on her government tenure and connections, but declines over time as her connections also exit. Most revolvers leave government relatively quickly in equilibrium, so an individual lobbyist's revenue is decreasing and convex in her lobbying experience. This creates two key patterns. First, the revolvers at the top of the revenue distribution produce substantially more revenue than other lobbyists, as recent revolvers with extensive government experience possess more remaining connections *and* each of these contacts is more valuable. Connections thus make the distribution of revenue more right-skewed than it would be otherwise, and put greater probability on the tail. Second, few lobbyists remain in government long enough to build highly valuable connections, and their status at the top of the distribution is fleeting. Thus, we find that connections fuel inequality among lobbyists and produces a small group of *superstars*.

We then analyze how connections mediate the effects of changes to the value of working in government, which could reflect policy changes to public sector wages, variation across different government sectors, or shocks to public service motivation, e.g., due to electoral turnover. Increasing the value of government work has a *direct* effect that attracts workers to the public sector and discourages revolving. However, this slows the outflow of workers from government and increases the durability of connections, generating an *indirect* effect that incentivizes revolving. The indirect effect creates variation in how workers respond. Low public-service motivated workers, who otherwise revolved quickly, stay longer. High public-service motivated workers instead respond by revolving sooner. Thus, increasing public sector wages, for example, limits the prevalence of superstar lobbyists but drives highly public-service motivated workers through the revolving door earlier.

By altering workers' behavior, raising public sector wages offers an avenue to address broader welfare issues created by the revolving door. Intuitively, higher wages increase the size of government by incentivizing more workers to join. However, this is at the cost of lowering the average public service motivation among government workers. Furthermore, conditional on leaving, the long-run value of a revolving door lobbyist increases, because each worker builds more experience by staying longer in government and connections in government less likely to leave. Thus, higher public sector wages may amplify concerns related to the influence of revolving door lobbyists.

Next, we extend the model to study how revolving-door opportunities impact in-government behavior. We allow workers to take a costly in-government action to increase their lobbying payoff, capturing in reduced form various behaviors like granting policy favors or exerting greater effort. We show that each worker's in-government behavior depends on the value of their connections in equilibrium, with the aggregate pattern hinging on whether actions complement or substitute for connections. With complementarity, revolvers with longer government tenures take greater action, since their highly valuable connections amplify their action's impact on their wages, making superstars more pronounced in this case. With substitutability, short-tenure revolvers distort their behavior more. Additionally, changes in the value of government service have indirect effects on in-government action through connections, and the sign of this indirect effect also depends on whether the action complements or substitutes for connections.

Finally, we extend the baseline model to analyze cooling-off periods and endogenous wage rates. First, we characterize how longer cooling-off periods— a prominent and widespread revolving-door regulation—indirectly affect behavior through their impact on connections. Additionally, we contrast the effects of cooling-off periods to public sector wages, and emphasize that aggregate outcomes respond very differently to each type of policy intervention. Second, we allow wage rates in the lobbying sector to respond to the aggregate human capital of revolvers, highlighting how standard equilibrium wage effects differ from those introduced by dynamic connections.

Our results provide implications about aggregate patterns of career choices and lobbying revenues that can explain existing empirical findings. Consistent with earlier work, our model implies (i) substantial revenue inequality among revolving-door lobbyists (Blanes i Vidal et al., 2012; McCrain, 2018b; Ban et al., 2019), with superstars who have extensive government experience (Drutman, 2015) but who lose their luster as their government connections degrade (Strickland, 2023; Luechinger and Moser, 2024); and (ii) most revolvers should be relatively young.[5] We build on this previous work by showing empirically that the distribution of revenue is heavy tailed, and is well-approximated by a log-normal or power law distribution. Additionally, we provide preliminary empirical evidence that revolvers with more lobbying experience generate less revenue, supporting our connections-driven theory as a plausible mechanism for the emergence of superstar lobbyists.

[5] Empirically, "[c]ongressional offices are mostly filled with 20- and 30-somethings, the vast majority of whom will only spend a few years in government before moving onto something else" (Cain and Drutman, 2014, pg. 29).

2 Connections with the Literature

We contribute to understanding how post-government employment opportunities influence who enters the public sector, how they behave, and their subsequent lobbying outcomes.[6] While some existing theories emphasize government service as a means to signal ability to potential employers (Mattozzi and Merlo, 2008; Bond and Glode, 2014), we emphasize its role for building human capital through government experience and connections. Other models which incorporate human capital accumulation in the context of revolving-door workers (Bar-Isaac and Shapiro, 2011; Bond and Glode, 2014; De Chiara and Schwarz, 2021; Kalmenovitz et al., 2022) have abstracted from connections, or lump them in with other forms of human capital. In contrast, our analysis centers on how the contingent value of connections shapes equilibrium outcomes. This interdependence across workers also differentiates our work from other models of the revolving door that focus on the interaction between a single regulator and firm (Che, 1995; Salant, 1995). Additionally, these previous papers have studied how the revolving-door distorts in-government actions and the design of post-government employment regulations. In two extensions, we begin to unpack how connections interact with individuals' incentives to alter their in-government behavior and the impact of cooling-off periods.

We also shed light on political selection into government careers.[7] Our model features heterogeneous intrinsic motivation for public service, which scholars have emphasized in their efforts to understand public-sector careers (e.g., Besley, 2005; Perry and Hondeghem, 2008). We study how these motives combine with instrumental motives for building connections and lobbying human capital, rather than signaling ability (Mattozzi and Merlo, 2007; Delfgaauw and Dur, 2010) or impacting policy implementation (Forand et al., 2023). Previous work has also investigated how public-sector compensation (e.g., Francois, 2000; Besley and Ghatak, 2005; Delfgaauw and Dur, 2008; Prendergast, 2007, 2008; Dal Bó et al., 2013) and bureaucratic discretion (Gailmard and Patty, 2007) influence selection into government when workers have intrinsic public service motivations. We contribute to this strand of research by showing that revolvers' need for connections alters how higher wages affect government entry and retention.

Our approach to modeling the careers of revolving-door lobbyists connects more generally to the literatures on occupational choice (Roy, 1951) and occupation-specific human capital (Becker, 1962). In our model, workers have perfect information but build human capital over time in one occupation (government) that, unique to this paper, (i) pays off

[6] We focus on the incentives of workers to *exit* from government into lobbying. This differentiates our work from theories of *entry* into government from the private sector (e.g., Hübert et al., 2023).

[7] Specifically, we trace different workers' incentives to enter and stay in government jobs, rather than run for elected office (as in, e.g., Osborne and Slivinski, 1996; Diermeier et al., 2005; Mattozzi and Merlo, 2007).

only after transitioning to a different occupation (lobbying) and (ii) depreciates endogenously as former colleagues leave. Point (i) makes an individual worker's problem similar to the canonical model of schooling choice in Mincer (1958), where time in government building valuable connections plays the role of schooling. However, point (ii) contrasts with the schooling literature, which typically assumes that human capital increases with work experience. Instead, revolvers' human capital endogenously decreases with lobbying experience.[8] Moreover, in our setting, revolving incentives also depend on expectations about others' decisions through connections in a way that is particular to the revolving door. Thus, we highlight the interplay between individual career incentives and broader labor market forces (as in, e.g, Moscarini, 2001, 2005).

Finally, we provide an explanation for *rainmaker* lobbyists (Ban et al., 2019) — i.e., *superstars* who generate substantially more revenue than their peers. While such top-end inequality exists in a number of contexts and has a variety of explanations (see Gabaix, 2009, for a discussion), our mechanism relates most closely to talent-based explanations for wage inequality. Within industries, superstars emerge when talented workers access complementary tools magnifying innate differences (Sattinger, 1975), allowing them to attract substantially more consumers (Rosen, 1981) or charge substantially higher prices (Gabaix and Landier, 2008; Terviö, 2008). Our mechanism, also driven by innate differences, shows how small differences in public-service motivation create large differences in human capital, enabling substantially higher lobbying revenues. This rationale emerges naturally from the interdependence and dynamics of connections in the revolving door context.

3 The Model

We study a dynamic model in which individual workers choose whether to enter government and, if so, whether to transition into lobbying through the revolving door. Our key innovation is to account for the dynamic and interdependent nature of government connections. To isolate how these connections impact equilibrium behavior and outcomes, we deliberately keep most elements of the economy stark—e.g., we abstract from market frictions and political uncertainty.

Players and Timing. Time flows continuously and is indexed by $t \in [0, \infty)$. At each date there is a continuum of workers. Workers die according to a Poisson process with arrival

[8] An additional difference is that heterogeneity in individuals' payoffs while working in government play a central role in our model, whereas costs of schooling are often taken as negligible (see Heckman et al., 2006, for a discussion.).

rate $\delta > 0$ and are replaced by a new worker with *age* 0.[9] Each newly born worker i has *public service motivation* ψ_i drawn from a distribution G that is strictly increasing, twice-differentiable, and has full support on $\mathbb{R}$. Thus, workers in our model are heterogeneous in their age and public service motivation. Specifically, the total worker population size is always $\frac{1}{\delta}$, with (i) the share of age-a workers being $e^{-\delta a}$ and (ii) public service motivation distributed according to G.

Each worker i initially chooses whether to enter government or the private sector. Subsequently, at each instant t that worker i is in government she decides whether to remain in government or revolve and become a lobbyist. Once i enters the private sector, or revolves after working in government, she makes no further decisions for the remainder of the game. Let $\mathbb{I}^g_{it} \in \{0, 1\}$ indicate with value 1 if worker i is in government at time t, and otherwise take the value 0.

Connections. At each date, a worker's connections are the current government workers who overlapped with them while in government. Formally, we say that worker i and j are *connected* if there exists a time t such that $\mathbb{I}^g_{it} = 1$ and $\mathbb{I}^g_{jt} = 1$. Accordingly, i's *government connections at time* t are the set of workers who are connected to i and still in government at t, i.e., it is given by $\{j \mid \mathbb{I}^g_{jt} = 1 \wedge \exists t' \leqslant t \text{ s.t. } \mathbb{I}^g_{it'} = \mathbb{I}^g_{jt'} = 1\}$. Then, we define q_{it} as the Lebesgue measure of this set of workers.[10] Thus, q_{it} represents the amount of i's connections at time t.

Revolver Human Capital. After any worker revolves, their human capital as a lobbyist depends on their (i) government tenure and (ii) remaining government connections. Specifically, if worker i enters government at time t_1 and exits government at t_2, then i's lobbying human capital at $t \geqslant t_2$ is

$$h(q_{it}, \tau_g) = q_{it} \cdot v(\tau_g), \tag{1}$$

where $\tau_g \equiv t_1 - t_2$ is i's government tenure and q_{it} is the amount of i's connections at time t. Thus, i's government tenure and connections each increase her lobbying human capital and, moreover, complement each other. Additionally, we impose the following assumptions on the impact of government tenure: $v' > 0, v'' \leqslant 0, 0 \leqslant v'''$, $\lim_{\tau \to \infty} v(\tau) = \infty$, $\lim_{\tau \to \infty} v'(\tau) < \infty$, and $v''(\tau)$ is uniformly continuous.

[9]Attrition with replenishment is a common feature of labor market models (see, e.g., Moscarini, 2005; Rogerson et al., 2005; Shi, 2009).

[10]Implicitly we are assuming workers use strategies such that the set of i's connections is measurable.

Payoffs. Workers receive wages throughout their career, along with enjoying public service motivation while in government. Letting z_{it} denote i's income at time t and $\rho > 0$ denote the discount rate, worker i's cumulative dynamic payoff is:

$$\int_0^\infty e^{-(\delta+\rho)t}\Big[z_{it} + \mathbb{I}_{it}^g\,\psi_i\Big]\,dt. \tag{2}$$

Income varies across sectors and time. When revolver i works as a lobbyist she generates revenue $w_\ell \cdot h(q_{it}, \tau)$, where w_ℓ is the price of human capital in the lobbying sector. We assume i's income as a lobbyist is simply equivalent to her revenue, $z_{it} = w_\ell \cdot h(q_{it}, \tau)$, which is consistent with the assumption that lobbyists' incomes are related to their revenues. Instead, $z_{it} = w_p$ if i is in private sector, and $z_{it} = w_g$ if i is in government.[11] We take the wage rates $w_p, w_g, w_\ell > 0$ as exogenous — a point we return to later. Furthermore, we assume that revolving immediately always yields a lower income than the private sector, i.e., $w_\ell \cdot h(\frac{1}{\delta}, 0) < w_p$.

Equilibrium. We look for a steady state equilibrium in which the distribution of worker characteristics in each sector is constant over time.[12] For the composition of each sector to be constant, each worker of type (ψ, a) must choose the same sector to work in at each point in time. Additionally, since all newly born workers have age 0, the decision to enter government must only depend on public service motivation. Thus, the choices of workers in the steady state can be determined by two functions $\gamma : \mathbb{R} \to \{0, 1\}$ and $\eta : \mathbb{R} \times [0, \infty) \to \{0, 1\}$, where $\gamma(\psi) = 1$ indicates whether a worker with public service motivation ψ enters government or the private sector, and $\eta(\psi, a) = 1$ indicates whether a worker of public service ψ is in government at age a. Let $\sigma = (\gamma, \eta)$.

Given a σ, we can characterize continuation payoffs from working in each sector. The continuation value from revolving after government tenure τ_g, or equivalently at age τ_g, is

$$V_r(\tau_g; \sigma) = \int_0^\infty e^{-(\delta+\rho)\tau_\ell} w_\ell \cdot h\big(q_{\tau_\ell}(\sigma), \tau_g\big)\, d\tau_\ell,$$

[11] Because the worker makes no further choices after entering the private sector, our results are unaltered if we allow w_p to vary over time and interpret $\int_0^\infty e^{-\delta t} w_p dt$ as i's expected lifetime income from the private sector.

[12] If the economy is not in a steady state then workers will decide whether to revolve or not based on anticipated changes in the fundamental characteristics of the population. These considerations seem unlikely to play a prominent role for potential revolvers who work in well-established public sectors.

where

$$q_{\tau_\ell}(\sigma) = \int_{-\infty}^{\infty} \int_{\tau_\ell}^{\infty} e^{-\delta a} \gamma(\psi) \eta(\psi, a) \, da \, dG(\psi).$$

Then the value to a worker with public service motivation ψ from entering government and revolving after tenure τ_g is

$$V_g(\tau_g; \psi, \sigma) = \frac{1 - e^{-(\delta+\rho)\tau_g}}{\delta + \rho}(\psi + w_g) + \frac{e^{-(\delta+\rho)\tau_g}}{\delta + \rho} V_r(\tau_g; \sigma).$$

Finally, the continuation value from entering the private sector is $V_p = \frac{w_p}{\delta+\rho}$.

Considering the optimization problem of a newly born worker, define $\tau_g^*(\psi) = \arg\max_{\tau_g} V_g(\tau_g; \psi, \sigma)$ and $V_g^*(\psi; \sigma) = \max_{\tau_g} V_g(\tau_g; \psi, \sigma)$. Then $\sigma^* = (\gamma^*, \eta^*)$ is an equilibrium if:

$$\gamma^*(\psi) = \begin{cases} 1 & \text{if } V_g^*(\psi; \sigma^*) \geqslant V_p \\ 0 & \text{otherwise} \end{cases}$$

and

$$\eta^*(\psi, a) = \begin{cases} 1 & \text{if } a \leqslant \tau_g^*(\psi) \\ 0 & \text{otherwise.} \end{cases}$$

Discussion of the Model. Although our baseline model is constructed to parse the impact of government connections on the revolving door, it still captures other relevant features such as experience or expertise. Specifically, the function v can represent various factors that grow with government tenure and complement the value of connections.[13] While such factors may also separately impact or substitute for connections, those effects do not affect our main insights. Throughout, we compare our model to one where the value of connections is shut down. To do so while facilitating comparisons, we consider the same model, but fix q_{it} as an exogenous scalar $q_{it} = \overline{q} > 0$ for all i and t. This setting can then be interpreted as a pure expertise/experience benchmark.

To emphasize the role of endogenous connections in the revolving-door labor market, our

[13] Egerod et al. (2024) argues that "connections and information are likely to complement each other." For instance, a longer tenure may facilitate stronger relationships or more expertise that enable persuasive arguments and additional leverage with contacts after revolving (Drutman, 2015; Strickland, 2023). Likewise, a longer tenure can lead to older relationships that "allow you to cut through things" (Dale Florio, NJ lobbyist, in Rosenthal, 2000, pg. 120), as well as more relationships or more power in them (LaPira and Thomas, 2014). Alternatively, it could capture in reduced form that an individual meets more people over time (LaPira and Thomas, 2014)

baseline model has several simplifying assumptions. First, we use a reduced-form lobbying value to capture various ways that revolvers can lobby effectively, rather than explicitly modeling lobbying—which can take many different forms (see, e.g., Grossman and Helpman, 2001; Bombardini and Trebbi, 2020; Schnakenberg and Turner, 2023, for overviews) depending on the context (Rosenthal, 2000; Levine, 2009). Thus, our insights are not tied to any particular lobbying approach and are applicable across various contexts. Second, we assume that all of a lobbyist's connections are equally valuable. However, our main results are robust to including a function that weights connections by their tenure, thus allowing, for example, a connection to a more senior worker to be more valuable.[14] Third, we do not model involuntary turnover (e.g., due to elections) since many relevant lobbying issues are not partisan or electorally salient, and bipartisan connections are fairly common.[15] Moreover, most revolving-door lobbyists are former staffers who primarily lobby current staffers, so many current and prospective revolvers have discretion over their government tenure.

More substantively, we do not model lobbyists re-entering government, since re-entry is not a primary consideration in the standard lobbyist calculus and government jobs are often seen as "a way station to wealth" (Levine, 2009, pg. 65).[16,17] In practice, a very small percentage of revolving-door lobbyists ever reenter government (Kalmenovitz et al., 2022; Luechinger and Moser, 2024) and those who do may have significantly different motives than building connections or human capital—e.g., influencing policy (Hübert et al., 2023) or regulatory capture (Dal Bó, 2006).

Finally, the connections in our model are between workers, rather than between the workers and one valuable connection, such as a politician. Although connections to politicians are valuable, connections to staffers are critical since they control access to legislators, draft critical policy details, and "make the wheels go round" (Leech, 2013, pg. 180).[18]

We later extend our baseline model in several directions. First, we incorporate in-government behavior into the model by allowing government workers to choose an action that affects their revolving-door payoff. This extension flexibly captures actions that are produc-

[14] Our approach to modeling the value of connections captures well differences that depend on an individual worker's government tenure. However, it abstracts from other dimensions of a connection's value, e.g., two workers are better connected if they spent more time together or share similar characteristics.

[15] "Most lobbyists manage to develop connections on both sides of the aisle because Democrats and Republicans can go either way on many issues of interest" (Rosenthal, 2000).

[16] For instance, the lobbyist Lyle Dennis notes that "[t]he concept of the revolving door is interesting. My experience is that it often only revolves one way" (Leech, 2013, pg. 98).

[17] We also assume that workers cannot enter the private sector after revolving. This simplifies the presentation but does not affect our qualitative results. In this case, the revolving payoff would now be $\max\{w_p, q \cdot v(\tau)\}$, which raises the minimum observed revolver revenue but does not affect the emergence of inequality due to the effect of connections on top-end revenues.

[18] Echoing the widespread view, a veteran lobbyist observed that "[w]e need to deal with staff because legislators rely on them" (Rosenthal, 2000, pg. 190).

tive (exerting effort, building expertise) or not (corruption). Second, we introduce cooling-off periods into the model, and characterize how connections alter the impact of revolving-door restrictions. Third, our baseline setup abstracts from general equilibrium effects between the labor markets in our model (i.e., government, private sector, and lobbying wages are fixed). This assumption clarifies the role of interdependent and dynamic connections. In an extension, we relax this assumption by allowing the lobbying sector's wage rate to be set in a competitive equilibrium. Our main insights about career paths and revolver revenues are unaffected. However, we show it introduces new effects when considering comparative statics, which differ from the effects due to connections.

4 Characterization of Equilibrium

We establish existence of equilibrium, characterize who enters government, and how long they stay. We show that: (i) workers with sufficiently low public service motivation never enter government, (ii) the rest will revolve and their government tenure is monotonic in ψ_i — workers on the lower end leave earlier, while those on higher end stay longer — and (iii) tenure is convex is public service motivation, thus, workers with very high ψ_i are "government lifers" who are likely to exit due to exogenous attrition before revolving. Crucially, these individual decisions depend on expectations about lobbying wages, which in turn depend on aggregate revolving behavior through connections. Omitted proofs can be found in the Appendix.

4.1 Exit decision

To begin, we analyze exit for each age cohort of government workers. Intuitively, workers weigh their value from continued government service against their potential lobbying wages. Specifically, staying in government provides utility through two channels: (i) direct benefits from further public service and wages (through $\psi_i + w_g$), and (ii) higher option value due to more valuable connections, through higher $v(\tau_g)$. On the other hand, leaving through the revolving door provides a flow of revolving wages.

Each worker forecasts their flow of lobbying wages based on their government tenure and anticipated flow of connections. Given a strategy profile, each prospective revolver can forecast their expected remaining connections at each future date. For our analysis, it suffices to write those expectations as a function of lobbying tenure. Specifically, let $q(\tau_\ell)$ denote i's expected remaining connections given lobbying tenure τ_ℓ. Then, i's cumulative expected payoff from revolving after government tenure τ_g is:

$$V_r(\tau_g; Q) = w_\ell \cdot v(\tau_g) \cdot Q,$$

where

$$Q = \int_0^\infty e^{-(\delta+\rho)\tau_\ell} q_i(\tau_\ell) d\tau_\ell \tag{3}$$

represents the accumulation of i's flow of connections after revolving. Each connection lasts until the contact leaves government, either exogenously or endogenously. Thus, Q depends on expectations about i's lobbying career and the government careers of her time-τ connections. Specifically, it accumulates the expected (discounted) duration for each of i's government connections with her time-τ colleagues.

Consequently, for each worker i beginning her career, her continuation payoff from working in government and then revolving after a tenure τ_g is

$$V_g(\tau_g; \psi_i, Q) = \frac{1 - e^{-(\delta+\rho)\tau_g}}{\delta + \rho} (\psi_i + w_g) + \frac{e^{-(\delta+\rho)\tau_g}}{\delta + \rho} w_\ell \cdot v(\tau_g) \cdot Q. \tag{4}$$

When worker i enters government, she stays until she attains her optimal government tenure τ_g, which solves $\max\limits_{\tau_g \geqslant 0} V(\tau_g; \psi_i, Q)$. Each worker's optimal government tenure balances their anticipated lobbying wages against their benefits from continued government service. In equilibrium, if i enters government, then τ_g^* must solve

$$w_\ell \cdot v(\tau_g) \cdot Q = \psi_i + w_g + \frac{v'(\tau_g)}{\delta + \rho} \cdot w_\ell \cdot Q. \tag{5}$$

The left-hand side of (5) is i's total discounted lobbying wages after tenure τ_g^*. The right-hand side is i's benefits from continued government employment: additional public service and wage, as well as the marginal increase to the flow of lobbying wages. The characterization of τ_g^* implies that i stays in government at each age $a < \tau_g^*$ and then exits when $a = \tau_g^*$.

All government workers in the same cohort anticipate the same lobbying wages if they revolve at time t, but they differ in their public service motivation. Inspecting equation (5), the gain from remaining is government is greater for workers with higher public service motivation. This observation yields the following characterization of exit behavior.

Lemma 1. *In every equilibrium, there exists a function $\overline{\psi}^* : \mathbb{R}_+ \to \mathbb{R}$ such that worker i with government tenure τ_g revolves if and only if $\psi_i \leqslant \overline{\psi}^*(\tau_g)$.*

All else equal, workers with greater ψ_i are more motivated to remain in government. Consequently, exit behavior in equilibrium is fully characterized by a function $\overline{\psi}^*$ mapping government tenure to public service motivation. In equilibrium, this function must be consistent with the optimal decision to exit, and is therefore determined from equation (5):

$$\overline{\psi}^*(\tau_g) = -w_g + w_\ell \cdot Q \cdot \Big(v(\tau_g) - \frac{v'(\tau_g)}{\delta + \rho}\Big). \tag{6}$$

For a given Q, worker i's equilibrium tenure τ_g^* satisfies:

$$\overline{\psi}^{*-1}(\tau_g) = \tau_g^*(\psi_i) = \arg\max_{\tau_g \geqslant 0} V_g(\tau_g; \psi_i, Q).$$

The function $\overline{\psi}^*$ depends on Q, so i's expectation about her flow of connections impacts her decision to revolve. Furthermore, the quantity of connections a revolver has left in government will depend on the connections' government tenures. Thus, Q is endogenous to $\overline{\psi}^*$ in equilibrium.

4.2 Entry Decision

Next, we characterize who enters government. Entering government provides workers the opportunity to build human capital that is valuable for lobbying, whereas the private sector yields a fixed flow of the wage w_p. For worker i, government employment is worthwhile if

$$\max_{\tau_g} V_g(\tau_g; \psi_i, Q) \geqslant \frac{w_p}{\delta + \rho}. \tag{7}$$

Otherwise, i prefers to enter the private sector.

Lemma 2 establishes that, in equilibrium, workers enter government if and only if their public service motivation is high enough.

Lemma 2. *In every equilibrium, there exists a cut-point $\underline{\psi}^* \in \mathbb{R}$ such that worker i enters government if and only if $\psi_i \geqslant \underline{\psi}^*$.*

Importantly, entry is affected by expectations about aggregate revolving behavior through its impact on lobbying wages. In turn, higher entry increases the quantity of connections, all else equal. Thus, in equilibrium, $\underline{\psi}^*$ and Q influence each other.

4.3 Equilibrium Career Trajectories

To summarize, a worker's behavior in any equilibrium is characterized by: (i) an entry threshold $\underline{\psi} \in \mathbb{R}$, and (ii) an exit function $\overline{\psi} : \mathbb{R}_+ \to \mathbb{R}$ mapping tenure to public service motivation. Given this characterization, a worker's connections after lobbying tenure τ_ℓ are:

$$q_i(\tau_\ell) = \int_{\tau_\ell}^{\infty} e^{-\delta a}\Big[1 - G\Big(\max\{\underline{\psi}, \overline{\psi}(a)\}\Big)\Big]da. \tag{8}$$

Each revolver's government connections must be old enough to have coincided with the revolver, but also young enough to still be working there. Thus, connections diminish for two reasons. First, they do not have connections to recent entrants: a revolver i with lobbying tenure τ_g is not connected to any workers with ages 0 to τ_g. Second, their connections have attrition as former colleagues (exogenously) die or (endogenously) leave for lobbying: among workers of each age $a \geqslant \tau_g$, only a fraction $e^{-\delta a}$ are still working at all and only those with public service motivation $\psi_j \geqslant \max\{\underline{\psi}, \overline{\psi}(a)\}$ are still in government. Consequently, the amount of i's connections who have age $a \geqslant \tau_g$ is $e^{-\delta a}\Big(1 - G\big(\max\{\underline{\psi}, \overline{\psi}(a)\}\big)\Big)$. An entry threshold $\underline{\psi}$ and exit function $\overline{\psi}$ jointly determine equation (8) and, in turn, the total discounted connections Q.

Proposition 1 delivers existence and characterization of equilibrium. In particular, there is a solution $\big(\underline{\psi}^*, \overline{\psi}^*(\tau), Q^*\big)$ to equations (3), (6), and, (7) that characterizes equilibrium behavior.

Proposition 1. *An equilibrium exists and is characterized by a* $\big(\underline{\psi}^*, \overline{\psi}^*(\tau_g), Q^*\big)$ *that solves*

$$\underline{\psi} = \frac{w_p - e^{-(\delta+\rho)\overline{\psi}^{-1}(\underline{\psi})} v\big(\overline{\psi}^{-1}(\underline{\psi})\big) \cdot w_\ell \cdot Q}{1 - e^{-(\delta+\rho)\overline{\psi}^{-1}(\underline{\psi})}} - w_g, \tag{9}$$

$$\overline{\psi}(\tau_g) = -w_g + w_\ell \cdot Q \cdot \left(v(\tau_g) - \frac{v'(\tau_g)}{\delta + \rho}\right), \tag{10}$$

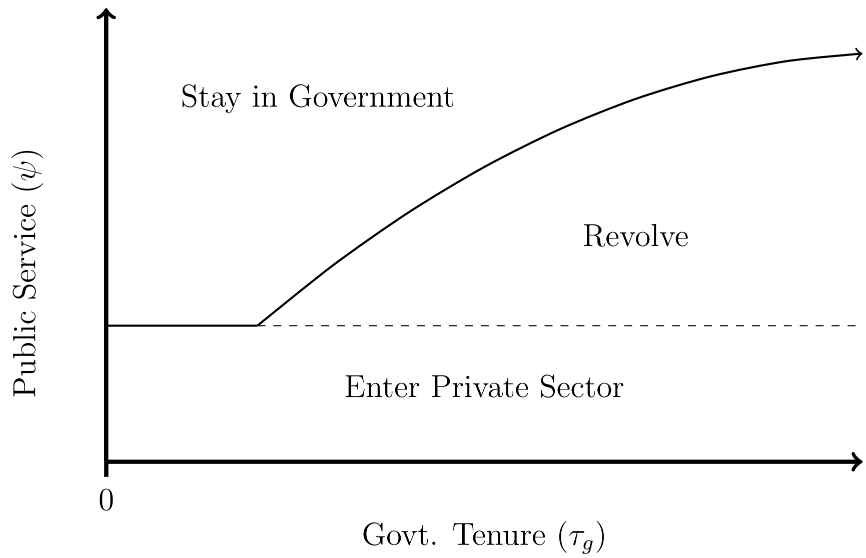
$$Q = \int_0^{\infty} e^{-(\delta+\rho)\tau_\ell} \int_{\tau_\ell}^{\infty} e^{-\delta a}\Big[1 - G\Big(\max\{\underline{\psi}, \overline{\psi}(a)\}\Big)\Big]\, da\, d\tau_\ell. \tag{11}$$

Next, Proposition 2 leverages Proposition 1 to sharpen the characterization of entry and exit behavior in equilibrium. Figure 1 illustrates the result by labeling which sector each (ψ, τ_g) worker is in at a date t.

Proposition 2. *In equilibrium, (i) the entry threshold is* $\underline{\psi}^* \in \big(\overline{\psi}^*(0), w_p - w_g\big)$ *and (ii) the exit function* $\overline{\psi}^*$ *is strictly increasing and concave in* τ_g.

Proposition 2 derives a lower bound on each cohort's government entry and shows that none of them revolve immediately. First, since the option value of revolving must be weakly positive, everyone who prefers government service to private wages will enter. Second, government workers need to build the value of their connections, which initially occurs quickly

Figure 1: Equilibrium Career Choices



Note: Figure 1 shows equilibrium sorting of workers across sectors based on their public service motivation (vertical axis) and government tenure (horizontal axis). Workers with low public service motivation enter the private sector directly. Those with moderate motivation enter government but revolve after building sufficient connections. Workers with the highest motivation remain in government for extended periods, with many retiring before revolving.

and justifies waiting.[19] Third, government tenure is increasing and convex in public service motivation. Over time waiting has less impact on wages because the increase in human capital via experience diminishes, so longer government tenure increases the appeal of revolving for any worker. Moreover, since the marginal gain in v diminishes, they stay much longer. Thus, although every government worker could in principle serve a long government tenure to increase their value as a lobbyist, in practice the highest ψ workers stay much longer.

Propositions 1 and 2 have implications for the career dynamics of each cohort of workers. After an initial period to build up valuable connections, the least public-minded government workers start to leave for lobbying. Most government workers leave fairly quickly and only a select few stay much longer. Specifically, each cohort's flow out of government slows gradually once it starts, but it never stops. Consequently, each cohort of government workers gets more homogeneous and increasingly public-minded over time.

Finally, these results also have implications for the composition of revolvers at each date. Specifically, they are mostly young and have relatively low ψ. Of course, there are more young workers—since they have had less time to already leave due to revolving or

[19]Even if $w_\ell \cdot h(0, 1/\delta) > w_p$, workers entering government will wait a positive amount of time before revolving as long as $v'(0)$ is sufficiently large.

attrition. Additionally, however, younger revolvers have low ψ and are particularly sensitive to waiting. Thus, conditional on government tenure, the share of revolvers decreases over time. Together, these factors produce a relatively large and diverse (in ψ) wave of young revolvers that coincides with a trickle of more senior revolvers.

5 Revolver Dynamics and Lobbying Revenue

Our model provides a framework for analyzing the revenues of revolving-door lobbyists, shedding light on the financial incentives and illuminating the empirical distribution of revenues. Unlike standard human capital models, in our setting, revolver human capital peaks immediately following government service before gradually declining. We show that these dynamics align with empirical evidence and provide insight into how political connections shape revolver revenue inequality and contribute to the emergence of 'superstar' lobbyists.

5.1 Revenue, Government Tenure, and Connections

In equilibrium, lobbying revenues vary across lobbyists and over time during their careers. Thus, we can study the relationship between lobbying revenues and the human-capital of revolving-door lobbyists within our model. In this section, we examine how lobbying revenue relates to both government and lobbying tenure. We first detail the theoretical relationships. We then provide preliminary empirical evidence about the relationship between lobbying revenue and lobbying experience.

The revenue y of a lobbyist with government tenure τ_g^* and lobbying experience τ_ℓ^* is given by:

$$y(\tau_g^*, \tau_\ell^*) \coloneqq w_\ell \cdot v(\tau_g^*) \cdot q(\tau_\ell^*).$$

Recall that the optimal choice of government tenure for a revolver solves (5). Integrating both sides of (5) to obtain $v(\tau^*)$ and taking logs yields:

$$\ln y(\tau_g^*, a) = \ln(w_\ell) + \ln\left(constant_i \cdot e^{(\delta+\rho)\tau_g^*} + \frac{\psi_i + w_g}{Q^*}\right) + \ln q(\tau_\ell^*) \tag{12}$$

First, consider the predicted relationship between lobbying revenue and government tenure *holding connections constant*. Equation (12) implies that log-revenue is increasing in government tenure, a relationship that the empirical literature has previously documented (McCrain, 2018b). Moreover, equation (12) provides further guidance for the empirical analysis of this relationship, as it predicts that log-revenue should specifically be convex in government tenure. This reflects that individuals with longer government tenures have higher public service motivation and, as characterized previously, those with greater public service motivation will stay in government for increasingly longer periods.

Next, consider the relationship between lobbying revenues and connections. All else equal, a negative shock to a worker's connections leads to lower revenue.[20] Specifically, log-revenue is increasing and concave with respect to exogenous increases in connections. However, this log-log relationship may not hold in the cross-section due to equilibrium behavior. In equilibrium, a revolver's connections are determined by their lobbying experience. For a given revolver, q decreases with τ_ℓ as their government connections diminish over time due to turnover or attrition (see Appendix C in McCrain, 2018b, which plots the empirical decline in connections for revolvers).

This implies that an individual revolver's equilibrium revenue decreases as their time out of government increases. This negative relationship between lobbying experience and revenue contrasts with the standard assumption in the human capital literature, which typically supposes that human capital, and hence wages, increase with work experience. Instead, in the setting where connections are not valuable then $y(\tau_g^*, \tau_\ell^*) = w_\ell \cdot v(\tau_g^*) \cdot \overline{q}$. Absent connections, we would expect revenues to be constant in lobbying experience — or even increasing if work experience increases human capital.

Thus, a key prediction of our model is that revenue should decline with lobbying tenure, and this is due to the endogenous nature of revolvers' connections. This relationship between individuals' lobbying revenue and their lobbying tenure has not previously been studied. Here, we take a preliminary step to assess it empirically, using data obtained from Blanes i Vidal et al. (2012) on individual lobbyists' annual revenues from 1998-2008. We use their variable *weighted revenue*, which is viewed as a reasonable proxy for salaries (Brush, 2010; Blanes i Vidal et al., 2012). It measures the total dollar value of lobbying services reported by each individual lobbyist in their annual mandatory federal lobbying disclosure reports, adjusted for the number of other lobbyists listed on those same reports.

We regress individual yearly revenues—logged, inflation adjusted, and individually normalized using their first year revenues—on years of lobbying experience. We estimate our specification separately for lobbyists with different career lengths (from 3 to 9 years) to address potential concerns about selection, composition, or attrition effects.[21] Specifically, for

[20] This captures the case in Blanes i Vidal et al. (2012) where there is exit of a politician.

[21] The minimum number of observations is 840 in the subset who lobbied exactly 9 years. The other subsets have between 1136 and 1589 observations.

each subset of individuals whose lobbying career lasted exactly k years, we estimate:

$$\frac{\ln(\text{Revenue}_{it})}{\ln(\text{Revenue}_{i1})} = \beta_k \text{Tenure}_{it} + \gamma_t + \epsilon_{it},$$

where Revenue_{it} is individual i's revenue in year t, Revenue_{i1} is i's revenue in their initial year as a lobbyist, and γ_t is a year-t fixed effect. The coefficient β_k captures the average percentage change in normalized revenue associated with an additional year of lobbying experience for lobbyists who had a k-year lobbying career. Our normalization controls for unobserved individual differences in productivity or relationships and facilitates comparisons between cohorts. Additionally, our sample construction addresses several potential concerns about measuring lobbying experience, such as left-censoring or mid-career gaps.[22]

We provide evidence that lobbying tenure is negatively correlated with revenue for revolving-door lobbyists (see Figure 2). The effect is economically meaningful: each additional year of lobbying experience is associated with a 2–4 percentage point decline in normalized revenue, relative to first-year earnings. This pattern persists across different career lengths, suggesting that the decline represents a structural feature of the revolving-door labor market rather than selection effects. Moreover, in the appendix, we also provide estimates from separate regressions on only staffers and only non-staffers, with similar results (see Table 1). Given that our model highlights the potential for substantial equilibrium effects on lobbying wages, a more rigorous empirical investigation of revolver revenue dynamics is an important direction for future work.[23]

Our finding diverges from the typical empirical pattern across industries, where wages increase with industry tenure (Topel, 1991; Altonji and Williams, 2005). Although revenue is distinct from a lobbyist's income, it is often interpreted as a reasonable proxy for unobserved lobbying salaries (e.g., Brush, 2010; Blanes i Vidal et al., 2012; McCrain, 2018b; Ban et al., 2019).

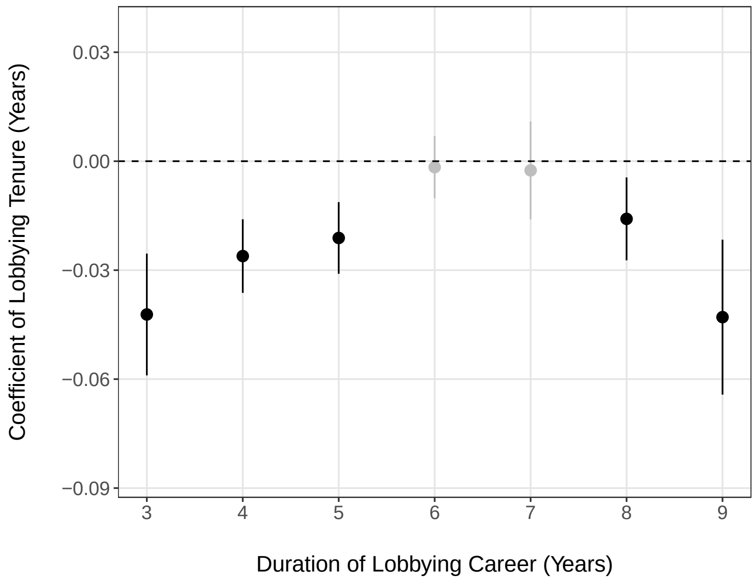
5.2 Superstar Lobbyists

Having studied how government tenure and connections independently generate wage variation among revolving-door lobbyists, we now turn to study how together they shape the

[22] Specifically, we focus on revolving-door lobbyists who began their lobbying careers after 1998 to avoid left-censoring of career histories in our data. Furthermore, to improve the validity of our experience measure as reflecting time in the lobbying industry, we exclude individuals whose lobbying activity has gaps longer than one year.

[23] Given our measure, we cannot distinguish sources of revenue changes, e.g., lobbying activity versus effectiveness per hour. However, the former is still consistent with our argument if individuals are reallocating their efforts because their effectiveness has decreased after their connections leave government.

Figure 2: Effect of Lobbying Experience on Lobbying Revenues



Note: Each point represents the estimated coefficient of lobbying tenure from separate OLS regressions for lobbyists with careers of different lengths (3–9 years). The dependent variable is $\frac{\log(\text{Current Year Revenue})}{\log(\text{First Year Revenue})}$, using inflation-adjusted values. All specifications include year fixed effects and exclude first-year observations. Vertical bars represent 95% confidence intervals, using heteroskedasticity-robust standard errors with a finite-sample correction (MacKinnon and White, 1985). Black (gray) points indicate estimates that are (not) statistically significant at the 5% level. Sample includes only lobbyists with continuous, non-truncated tenures beginning after 1998. See Table 1 in Appendix B for further details.

distribution of lobbying revenue. Specifically, we analyze the steady-state distribution of lobbying revenues induced in equilibrium by the steady-state distribution of workers. We show that the dynamics of connections fuel inequality and can produce a small, but transient, group of superstar lobbyists who command much higher wages. More broadly, our results suggest that the importance of connections can (i) concentrate influence among a select few lobbyists and (ii) explain the substantial inequality observed empirically in lobbyists' revenues (Blanes i Vidal et al., 2012; McCrain, 2018b; Ban et al., 2019).

Before addressing revenue, it is instructive to first consider the distribution of government tenure among revolving-door lobbyists. For the age-a cohort of workers, we have:

$$Pr\big[\tau_g^* \leqslant T|\text{Age} = a\big] = \frac{G\big(\overline{\psi}^*(T)\big) - G\big(\underline{\psi}\big)}{G\big(\overline{\psi}^*(a)\big) - G\big(\underline{\psi}\big)} \tag{13}$$

for $T \in [\tau_g^*(\underline{\psi}), a]$, whereas the probability is 0 for $T < \tau_g^*(\underline{\psi})$ and 1 for $T > a$. Looking across cohorts we have:

$$Pr\big[\tau_g^* \leqslant T\big] = \int_{\tau_g^*(\underline{\psi})}^{T} \frac{e^{-\delta a}}{e^{-\delta \tau_g^*(\underline{\psi})}} da + \int_{T}^{\infty} \frac{e^{-\delta a}}{e^{-\delta \tau_g^*(\underline{\psi})}} Pr\big[\tau_g^* \leqslant T | \text{Age} = a\big] da. \tag{14}$$

The distribution in (13) evidently depends on the shapes of G and v, separately from any economic forces. As such, an especially important benchmark for understanding the effects of connections is the case where v is linear. If v is linear then $\overline{\psi}^*$ is linear, and the distribution of τ_g^* for a given cohort resembles the distribution of public service motivation G.

We now use this distribution to study revenues. Recall that the revenue of a worker with government tenure τ_g and lobbying experience τ_ℓ is given by $y(\tau_g, \tau_\ell) = w_\ell \cdot v(\tau_g) \cdot q(\tau_\ell)$. For a fixed age a, an increase in τ_g increases y through two channels: directly via v *and* indirectly through q, since lobbying tenure $\tau_\ell = a - \tau_g$ is decreasing in τ_g^*. Within each age cohort, the most recent revolving-door lobbyists possess both more connections *and* connections of higher value. Thus, revenue can grow very rapidly with government tenure. Specifically, the revenue function can be strictly convex in τ_g:

$$\frac{\partial^2 y}{\partial \tau_g^2} \propto v''(\tau_g) \cdot q(a - \tau_g) - 2v'(\tau_g) \cdot q'(a - \tau_g) + v(\tau_g) \cdot q''(a - \tau_g). \tag{15}$$

In (15), the second term is positive, since both v and q are increasing functions—indicating that later revolvers have both a greater quantity and more valuable connections. Furthermore, the third term is positive since q is convex. The first term, however, is negative, due to the diminishing value of connections—i.e., v is strictly concave in τ_g.

Lemma 3 builds on these observations, establishing that revenues are convex in government tenure once τ_g is sufficiently large.

Lemma 3. *Fixing age-a, lobbying revenues $y(\tau_g, a - \tau_g)$ are increasing in government tenure, τ_g. Moreover, if τ_g is sufficiently large, then y is convex.*

The convexity of the revenue function for large τ_g implies that small differences in government tenure lead to large differences in revenue. This effect is further amplified when looking at workers with different ψ_i, since τ_g^* is convex in public service motivation. Thus, the distribution of revolver revenue has *superstars* who generate substantially more revenue than other revolving-door lobbyists. In equilibrium, this group consists of recent revolvers from older cohorts with extensive government experience, as they have many remaining connections that are also more valuable. However, their superstardom is fleeting because connections are decreasing and convex in experience. Their revenues decline quickly as they are surpassed by peers who worked marginally longer *and* have not yet experienced the early exodus of their former colleagues.

The size of the superstar group is constrained by two important dynamics in our model. First, the convex survival rate $e^{-\delta a}$ implies that most workers (exogenously) exit the workforce before generating upper-tail revenues. Second, the concavity of the exit function $\overline{\psi}^*$ implies that government tenures are convex in ψ, causing most workers to (endogenously) leave government too early to achieve superstar status.

To see how connections shape the revenue distribution, we juxtapose our model against a setting where lobbying human capital depends on government tenure but not connections. In this alternative setting, we define lobbying revenue as $y(\tau_g, \tau_\ell) = w_\ell \cdot v(\tau_g) \cdot \overline{q}$, where $\overline{q}$ is a constant chosen such that $\overline{Q} \equiv \int_0^\infty e^{-(\delta+\rho)a}\overline{q}da = Q^*$, ensuring the two settings are comparable.

Across both settings, the equilibrium entry condition $\underline{\psi}^*$ and exit function $\overline{\psi}^*$ are equivalent, resulting in identical distributions of government tenure that are characterized as in our main model. However, the endogeneity of connections in our primary model generates distinct revenue distributions.

In the setting without connections, revenue variation is determined solely by the shape of v. Thus, the revenue distribution for each cohort is a concave transformation of that cohort's tenure distribution. In particular, if v is linear, then y is linear in τ_g. Therefore, the revenue distribution would be a linear transformation of the τ_g^* distribution, preserving its skewness.

The setting with connections is more nuanced, as revenues also depend on the evolution of connections over time. To highlight the impact of connections, consider a linear v, which shuts down the effect of v's curvature on revenue. Then, the first term in (15) is 0, so (15) is strictly positive. Consequently, the revenue distribution is an increasing and convex transformation of the τ_g^* distribution. This transformation yields a more right-skewed distribution (van Zwet, 1964) with greater probability in the right tail (Chan et al., 1990). Thus, when connections matter for lobbying, the revenue distribution has more right-skewness and decays slower than in the setting where connections are inconsequential.

Proposition 3 summarizes this argument.

Proposition 3. *Assume v is linear. If connections matter, then the distribution of revolver revenues is more right-skewed. Furthermore, for $\overline{Y}$ sufficiently large, $Pr(y \geqslant \overline{Y})$ is greater when connections matter.*

Even under the linear v assumption, the precise distribution of revenues depends on the shape of G, the distribution of public service motivation. Furthermore, the exogenous exit rate limits the number of workers capable of generating top revenues. Thus, inequality in revolver revenue may exist even if connections are inconsequential. Nevertheless, Lemma 3 and Proposition 3 show how connections either amplify existing differences in the underlying primitives, or could generate inequality that would not otherwise exist.

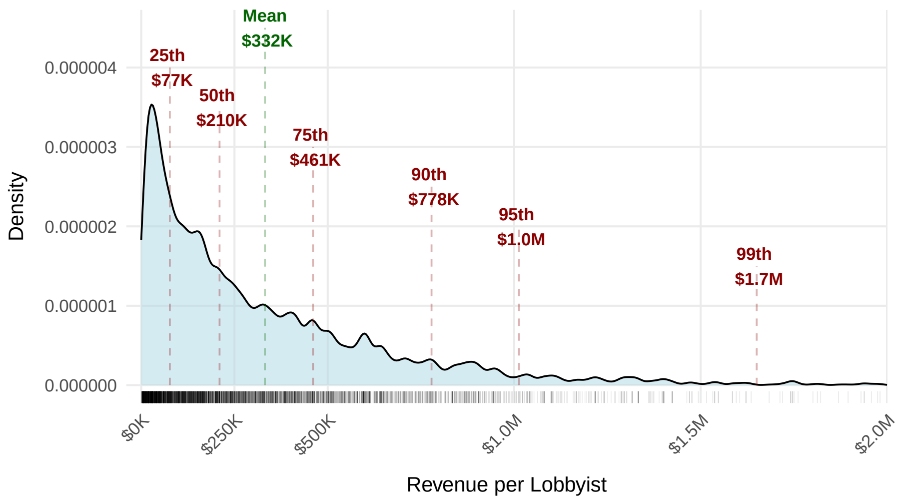
Hence, we expect the revenue distribution among revolving-door lobbyists to have a pronounced right skew, with the mean substantially greater than the median. This pattern aligns with the empirical distribution of revolver-lobbyist revenues observed in existing work, which has a long right tail where the mean wage is much higher than the median (Blanes i Vidal et al., 2012; McCrain, 2018b). Again using the individual revenue measure from Blanes i Vidal et al. (2012), Figure 3 plots the revenue distribution for revolving-door lobbyists in 2008. That year, the median revenue was \$210,046 and the mean revenue was \$331,714, yielding a ratio of ≈ 1.57, and the Gini coefficient was .53. For comparison, the ratio of mean to median salaries for lawyers, a profession traditionally exhibiting high inequality (Rosen, 1992), was ≈ 1.2 in 2023 (Bureau of Labor Statistics, 2025), while the Gini coefficient for United States income that year was .47.

Furthermore, the empirical revenue distribution is heavy-tailed—specifically, consistent with a log-normal distribution in 2008 (but not with a power law that year, see Appendix B). To formally characterize the right tail's shape, we estimate parameters of log-normal and power-law distributions for each year 1998-2008 and test goodness-of-fit using bootstrap methods (Clauset et al., 2009). These patterns persist throughout 1998-2008: each year, (i) the mean substantially exceeded the median, and (ii) the distribution was subexponential and consistent with a log-normal or power-law distribution (see Appendix C for details). This heavy-tailed pattern supports our theoretical prediction that connections generate a small group of highly paid superstars. Moreover, its persistence over years suggests that it reflects structural features of the revolving-door labor market rather than temporary phenomena.

6 Value of Government

We now study the effects of changing the government wage rate, w_g, on worker behavior. This analysis is useful for understanding how the revolving door phenomenon may vary across different contexts, and for studying the impact of policy on incentives to enter and exit government. More broadly, w_g can be interpreted as any common change in the payoff from government service, e.g., a shift in the distribution G. For instance, in a federal agency with a predominantly liberal workforce, a decrease in w_g can capture a common shock that lowers the attractiveness of government service for Democrats, such as loss of the presidency. Alternatively, our results can be used to compare the effects of the revolving door across policy areas, e.g., if workers in the environmental sector have higher average public service

Figure 3: Density of Annual Revenues for Revolving-door Lobbyists in 2008



Note: Kernel density estimate of revenue distribution, with markers indicating key percentiles. Median revenue was $210,000, while mean revenue was $332,000, reflecting substantial right skew.

motivation than those in finance.

The effect of increasing w_g has direct and indirect components. The *direct* effect increases the individual benefit of government service, simultaneously encouraging entry into government and discouraging exit to lobbying. However, when aggregated across workers, these direct effects increase both the number of government employees and their tenures, leading to an increase in the discounted expected number of connections (Q^*). This, in turn, produces an *indirect* effect on behavior by altering the value of revolving.

More precisely, consider the total effect of w_g on entry for i:

$$\frac{\partial V_g^*}{\partial w_g} = \underbrace{1 - e^{-(\delta+\rho)\tau_g^*(\psi_i)}}_{\text{Direct Effect } > 0} + \underbrace{e^{-(\delta+\rho)\tau_g^*(\psi_i)} v\big(\tau_g^*(\psi_i)\big) \cdot w_\ell \frac{\partial Q^*}{\partial w_g}}_{\text{Indirect Effect } > 0 \ (\rho \text{ large})} . \tag{16}$$

If workers are not too forward-looking (i.e., ρ is large) then the direct effects determine the aggregate effect, and an increase in w_g leads to an increase in Q^*. Thus, the indirect effect on entry is positive and always reinforces the direct effect. That is, a negative shock to public service will discourage entry, which then further discourages entry through fewer connections.

The total effect of w_g on exit, however, varies across workers and can be positive or negative. Formally, the exit effect is:

$$\frac{\partial\overline{\psi}^*}{\partial w_g} = \underbrace{-1}_{\text{Direct Effect} < 0} + \underbrace{\frac{\partial Q^*}{\partial w_g} w_\ell \left(v(\tau_g) - \frac{v'(\tau_g)}{\delta + \rho} \right)}_{\text{Indirect Effect} > 0 \ (\rho \text{ large})}. \tag{17}$$

While the direct effect always encourages longer government tenures, the indirect effect is always positive (when ρ is high) and encourages exit. However, since $v(\tau_g) - \frac{v'(\tau_g)}{\delta+\rho}$ increases with government tenure, the indirect effect on $\overline{\psi}^*$ strengthens as τ_g increases. Workers with long government tenures have highly valuable connections (through $v(\tau_g)$) and thus even a small increase in Q^* incentivizes them to revolve. Conversely, workers with shorter tenures have a low $v(\tau_g)$ and an increase in Q^* has relatively little impact on their revolving payoff. For these workers, the direct effect of w_g dominates their decision calculus.

Consequently, the overall effect in (17) is positive if and only if τ_g is sufficiently high. In equilibrium, τ_g^* depends on public service motivation, with high-ψ workers revolving sooner and low-ψ workers staying longer in government.

These observations are collected in Proposition 4.

Proposition 4. *If ρ is sufficiently large, then there is a unique equilibrium and increasing w_g: (i) increases Q^*, (ii) decreases $\underline{\psi}^*$, and (iii) decreases $\tau_g^*(\psi_i)$ if and only if ψ_i is sufficiently large.*

Moreover, the magnitude of exit effects varies across workers:

$$\frac{\partial^2\overline{\psi}^*}{\partial w_g \partial \tau_g} = \frac{\partial Q^*}{\partial w_g} \left(v'(\tau_g) - \frac{v''(\tau_g)}{\delta + \rho} \right) > 0.$$

Workers with the longest and shortest tenures are the most responsive to changes in government wages. Those who would have revolved fairly quickly instead stay much longer than they would have, while those who would have revolved slowly now leave much sooner. In sum, increasing w_g creates forces for compressing the distribution of government tenure, dampening the emergence of superstar lobbyists.

The endogenous nature of connections plays a crucial role in how w_g affects behavior. To clarify this, consider our earlier benchmark where connections are inconsequential and q_{it} is fixed at some $\overline{q}$ for comparability. In that setting, w_g has no indirect effects, eliminating feedback between entry, exit, and connections. For instance, the exit effect is $\frac{\partial\overline{\psi}^*}{\partial w_g} = -1 < 0$ and $\frac{\partial^2\overline{\psi}^*}{\partial w_g \partial \tau_g} = 0$. Thus, higher w_g uniformly extends the tenures of all government workers. In contrast, if connections are valuable for revolvers, then we observe heterogeneity in both the direction and magnitude of the effect. Regarding entry, higher w_g decreases $\underline{\psi}^*$ regardless of whether connections are valuable. However, as discussed, this effect is amplified if connections are valuable: raising w_g induces even more entry than would otherwise occur.

6.1 Policy Implications

Changing the government wage alters the behavior and flow of revolvers. As such, one tool to discourage workers from revolving is to raise public sector wages. Given the multitude of ways in which revolving-door lobbyists can impact welfare, policymakers confront a number of different objectives when trying to address the revolving door. Here, we study the effects of w_g on three outcomes of interest.

First, we analyze the size of government. One worry about low wages is that they make it difficult to attract workers to the public sector and retain existing employees. The size of government in equilibrium is characterized by

$$S^* = \int_0^\infty e^{-\delta n}\Big(1 - G(\max\{\underline{\psi}, \overline{\psi}(n)\})\Big)dn. \tag{18}$$

Second, we analyze the composition of workers in government. In particular, we study the average public service motivation of a government worker, $\mathbb{E}[\psi_i | i \text{ in government}]$. Given weak monetary incentives in the public sector, it is frequently argued that high public service motivation workers are crucial to government performance (James, 1989; Perry and Wise, 1990).[24] As such, this quantity can be considered as a measure of the quality of the government labor force.

Finally, a significant worry about revolving door lobbyists is that they will have excessive influence on policy due to their connections. To address this concern we analyze how raising public sector wages impact a revolving-door lobbyist's influence. Specifically, we study the (expected) lifetime revenue $v\big(\tau^*(\psi)\big) \cdot Q^*$ generated by a revolver with public service motivation ψ_i, as this reflects both the quantity and value of a lobbyist's connections.

Proposition 5 leverages the insights from our earlier analysis to characterize the effects of w_g on each of these outcomes.

Proposition 5. *If ρ is sufficiently large, then increasing w_g...*

1. *increases the size of government S^*,*

[24] Likewise, models of the bureaucracy highlight the importance of intrinsic policy motivations for generating productive effort (Gailmard and Patty, 2007; Prendergast, 2007). Empirically, much of the public administration literature has confirmed a positive relationship between performance and public service motivation (see Ritz et al. (2016) for a review) and ideological alignment between civil servants and politicians improves procurement outcomes (Spenkuch et al., 2023).

2. *decreases* $\mathbb{E}[\psi_i | i \text{ in govt}]$,

3. *and increases* $v\big(\tau^*(\psi)\big) \cdot Q^*$ *for all* ψ.

By drawing new workers into government and incentivizing most existing workers to wait longer before revolving, increasing w_g is effective at increasing the size of government. However, the higher wage attracts lower ψ_i workers to enter government. Moreover, the workers remaining in government longer are those with lower public service at a given tenure, who would otherwise have revolved. Thus, the average public service motivation of a government worker decreases. Additionally, by increasing Q^* and the time (most) workers spend in government, this increases the value of workers who do revolve. Furthermore, the increase in Q^* is also sufficient to offset the shorter tenure of late revolvers. As such, higher public sector wages may inadvertently make revolving door lobbyists better connected and more effective.

7 Extensions

7.1 Behavior in Government

We first extend our model so that before revolving government workers can engage in activities that enhance their appeal to lobbying firms. These actions can take various forms, such as supporting or enforcing industry-favorable policies (Cornaggia et al., 2016; Tabakovic and Wollmann, 2018; Tenekedjieva, 2021; Li, 2021), or investing in effort to build human capital that is valuable or impresses potential employers (deHaan et al., 2015; Kempf, 2020; Shepherd and You, 2020).

To model this in-government behavior, we take a deliberately stark approach. We modify the model so that before exiting, each worker i can take an action $x \geqslant 0$ at cost $c(x)$, where $c' > 0, c'' > 0, c(0) = 0, c'(0) = 0$, and $\lim_{x \to \infty} c(x) = \infty$. We define i's lobbying value after choosing x as $F(h_i, x)$, assuming that $F_x > 0$, $F_{xx} \leqslant 0$, $F_h > 0$, and $F_{hh} \leqslant 0$. Thus, higher actions increase the worker's value as a lobbyist but incur a cost—e.g., higher effort, worse performance, or getting caught misbehaving—in their current role. This reduced-form setup captures a range of behaviors that government workers may pursue to enhance their revolving-door appeal, such as building expertise, catering to industry, or misallocating their time.

In equilibrium, a worker i exiting at tenure τ_g chooses her action x^* to maximize her revolving payoff. Specifically, i chooses her tenure and action (τ_g^*, x^*) to solve:

$$\int_0^\infty e^{-(\delta+\rho)t} w_\ell F\big(h(q_t,\tau_g),x\big)dt = \psi_i + w_g + \frac{v'(\tau_g)}{\delta+\rho}\int_0^\infty e^{-(\delta+\rho)t} w_\ell q_t F_h\big(h(q_t,\tau_g),x\big)dt \tag{19}$$

$$\int_0^\infty e^{-(\delta+\rho)t} w_\ell F_x\big(h(q_t,\tau_g),x\big)dt = c'(x) \tag{20}$$

The incentives for workers to distort their behavior prior to revolving will evolve over time, due to changes in the value of their connections. A key factor in this evolution is whether connections and in-government behavior are complements or substitutes in determining lobbying output, which will depend on the context.

For example, working hard and building expertise raises the value of connections by enabling more effective lobbying arguments or facilitating more favorable receptions by former colleagues, and thus can be captured by the complements scenario. Conversely, if granting policy favors acts as a quid-pro-quo in exchange for a higher salary after revolving, then the action acts a substitute for developing extensive connections.[25] It is plausible, however, that policy favors also complement connections by raising the probability of job offers.

Distinguishing between these scenarios is important, as they have divergent implications for the revolving-door labor market and how revolvers will behave in different contexts. If h and x are complements, then greater action becomes more appealing as the value of i's connections grows. In contrast, if they are substitutes, choosing a larger x becomes relatively less appealing. Thus, an implication of this relationship is that revolvers with longer tenures will choose higher actions if h and x are complements, but will choose lower actions if they are substitutes.

This relationship between government tenures and in-government behavior is formalized in Proposition 6.

Proposition 6. *If worker i revolves at later tenure than worker j in equilibrium, then: (i) $F_{xh} > 0$ implies $x_i^* > x_j^*$; whereas (ii) $F_{xh} < 0$ implies $x_i^* < x_j^*$.*

Proposition 6 has an important implication for the distribution of revolver revenues. It implies that complementarities between connections and expertise/effort will amplify the connection-driven superstar feature of lobbying output. If they are substitutes, however, superstars will be less pronounced.

We can also study the impact of changing the value of government service (w_g) on behavior in government. Consider a worker who revolves after a fixed tenure $\overline{\tau}_g$. The effect of

[25] Of course, the firms cannot commit to making this payment in practice, however, this behavior can be be sustained by long-run incentives (see Salant, 1995).

increasing w_g on their equilibrium action is:

$$\frac{\partial x^*}{\partial w_g} \propto \int_0^\infty e^{-(\delta+\rho)t} v(\overline{\tau}_g) \frac{\partial q_t}{\partial w_g} F_{xh}(h, x^*) dt. \tag{21}$$

For a fixed $\overline{\tau}_g$, changes in w_g affect actions only through their impact on connections. This suggests that changing w_g will induce different levels of in-government behavior among workers who are observed exiting at the same date. If connections are inconsequential, i.e., q_{it} is exognously fixed at $\overline{q}$, then $\frac{\partial x^*}{\partial w_g} = 0$, so workers observed revolving at the same time before and after the change in w_g will have similar in-government behavior.

The effect of increasing w_g depends critically on two factors: (i) the interaction between h and x in lobbying output, and (ii) whether increasing w_g enhances or diminishes connections. Consider the case where in general $\frac{\partial q_t}{\partial w_g} > 0$, implying that there are more connections — due to increased entry and most workers having longer careers. If h and x are substitutes, then (21) is negative, and higher w_g dampens the in-government behavior of an $\overline{\tau}$-tenured worker. Conversely, if h and x are complements, then higher government wages encourage a $\overline{\tau}$-tenured worker to take higher actions. Thus, by disentangling the interaction between connections and government behavior for lobbying outcome, we can shed new light on how workers will respond to policy changes. In particular, consider the case where x and h are substitutes because the action is a policy favor determined through a quid-pro-quo exchange. In this case, our discussion suggests that higher public sector wages may be an effective tool for limiting the amount of in-government distortion by revolvers.

7.2 Cooling-off Periods

The revolving door phenomenon has prompted many attempts to mitigate its potential downsides. Many governments have implemented targeted regulations, with one of the most prominent being *cooling-off periods*. This approach restricts former government employees from engaging in certain lobbying activities for a designated duration after they leave.[26]

To study the effects of cooling-off periods on revolvers' incentives, we modify our model to incorporate a waiting period of length λ before a former government worker can generate revenue as a lobbyist.[27] For simplicity, we assume that revolving-door lobbyists receive zero flow payoff during this waiting period. Thus, the dynamic payoff for worker i who revolves

[26] For instance, in the US there is a one-year ban for House members and senior staff, and a two-year ban for Senators. At the state level, periods range from six months to six years, with most states imposing one year (Holman and Esser, 2019). Similarly, bureaucrats in the United States also face restrictions, e.g., there is a one-year ban for senior regulators lobbying on issues related to their former agency.

[27] Although lobbying restrictions can be difficult to enforce, there is evidence that workers alter their behavior to account for regulations (Cain and Drutman, 2014; Kalmenovitz et al., 2022; Wirsching, 2023).

after a government tenure τ_g is:

$$w_\ell \cdot v\big(\tau_g\big) \cdot Q(\lambda), \text{ where } Q(\lambda) = \int_\lambda^\infty e^{-(\delta+\rho)s} q(s) ds. \tag{22}$$

The equilibrium of this model is characterized analogously to the baseline model, but with Q^* now defined according to (22).

The duration of the cooling-off period impacts the appeal of lobbying careers, thereby affecting incentives for both entering government service and subsequently transitioning to lobbying roles. As revolving-door lobbyists lose connections during the mandatory waiting period, λ directly decreases Q^*. Since Q^* determines lobbying payoffs, λ indirectly impacts both entry and exit decisions: by lowering the potential returns from revolving, it discourages both entry and exit. Moreover, since entry and exit dynamics shape the flow of government workers, λ also has competing indirect effects on Q^*. The overall effect of λ on Q^* is:

$$\frac{\partial Q^*}{\partial \lambda} = \underbrace{-e^{-\delta\lambda} q(\lambda)}_{\text{Direct Effect} < 0} + \underbrace{\int_\lambda^\infty e^{-\delta\tau_\ell} \frac{\partial q(\tau_\ell)}{\partial \lambda} d\tau_\ell}_{\text{Indirect Effect}}.$$

If workers are sufficiently impatient then the direct effect dominates and Q^* overall decreases. However, while the overall effect is negative when ρ is large, the indirect effect is ambiguous and depends on whether government connections increase or decrease. On one hand, tighter restrictions reduce the payoff from lobbying, thus discouraging each individual from *exiting*, and keeping more workers in government. This, in turn, means that any individual who does revolve will have more government contacts remaining after they leave, which encourages revolving. On the other hand, the reduced lobbying payoff also discourages workers from *entering* government in the first place, diminishing the number of potential connections for a revolver. Thus, whether the indirect effect of connections reinforces or dampens the direct effect depends on whether the entry or exit response dominates.

These direct and indirect effects of λ through Q^* determine how workers respond to a longer cooling-off period. In particular, the effect on exit is given by:

$$\frac{\partial \overline{\psi}^*(\tau_g)}{\partial \lambda} = w_\ell \frac{\partial Q^*}{\partial \lambda} \Big(v(\tau_g) - \frac{v'(\tau_g)}{\delta + \rho} \Big).$$

Although the magnitude of this effect varies across workers, its direction is the same. As noted earlier, $v(\tau_g^*) - \frac{v'(\tau_g^*)}{\delta+\rho} > 0$ for all workers who join government, so the sign of $\frac{\partial \overline{\psi}^*(\tau_g)}{\partial \lambda}$ is determined by whether Q^* increases or decreases.

As noted, when workers are not too patient, the feedback effects of λ are muted enough to sign the overall effects. For high ρ, the direct effect of extending the cooling-off period erodes connections enough to reduce entry and increase government tenures for all workers. Lemma 7 formally states these effects.

Proposition 7. *If ρ is sufficiently large, then increasing λ will: (i) increase $\underline{\psi}^*$, (ii) decrease Q^*, and (iii) increase $\tau_g^*(\psi)$ for all ψ.*

The impact of increasing λ on government tenure is always positive, but the size of this exit effect varies. Notably, the long-tenured 'superstar' revolvers are most responsive, as:

$$\frac{\partial^2 \overline{\psi}^*}{\partial \lambda \partial \tau} = \frac{\partial Q^*}{\partial \lambda}\left(v'(\tau) - \frac{v''(\tau)}{\delta + \rho}\right) < 0.$$

Thus, extending the cooling-off period exacerbates the disparity between the shortest and longest government tenures, thereby amplifying the wage premium for superstar lobbyists.

We now discuss the effects of cooling-off periods on our policy outcomes of interest from Section 6. To start, notice that increasing the length of the cooling-off period has cross-cutting effects on the size of government. Increasing λ lowers the value of revolving, which drives out low ψ workers and shrinks the size of government. However, the higher ψ workers in government now stay for a longer period of time before revolving. Thus, whether longer cooling-off periods increase or decrease the size of government depends on if the effect on *entry* or on *exit* dominates. Similarly, the relative magnitudes of the entry and exit effects determine whether the average public sector motivation increases or not. Although a longer cooling-off period cuts off the workers with the lowest public service motivation, it also encourages workers to remain in government longer. Because of the death rate δ, the bulk of this increased tenure effect is on younger revolvers who have relatively lower public service motivation. As such, whether a longer cooling-off period increases the average public service motivation depends of if it primarily prevents the entry of low public service motivated workers, or keeps moderately low public service workers from exiting.

In the context of our model, whether entry or exit is more sensitive to changes in the cooling-off period will be highly dependent on where we are in the parameter space. More generally, whether the entry or exit effect is greater may depend on factors outside the model. For example, features of the specific sector or government entity, how informed prospective government workers are about regulations relative to current workers, and the time horizon. Additionally, when designing regulations, whether entry or exit is more important will depend on the specific goals of policymakers.

Finally, due to the endogeneity of connections, cooling-off periods also have contrasting effects on a lobbyist's long-run value, $v(\tau^*) \cdot Q^*$. Increasing λ decreases Q^*, which all else equal lowers the lifetime revenues of lobbyists. On the other hand, workers choose to stay longer in government, which increases their effectiveness through $v(\tau^*)$. However, when workers are sufficiently impatient, it is never optimal to stay sufficiently longer to completely offset the decreased value of revolving through Q^*.[28] Thus, while the endogeneity of connections dampens the effectiveness of cooling-off periods, ultimately they still hamper the ability of revolvers to leverage their connections.

Our model suggests that a longer cooling-off period has a significantly different impact on equilibrium outcomes than increasing the public sector wage. This is especially true when the entry response of new workers into government is greater than the exit response of workers. On one hand, increasing w_g bolsters the size of the government workforce, while increasing λ can decrease it. On the other hand, higher government wages lowers the average quality of the government workforce, while longer cooling-off periods can increase it. Moreover, unlike w_g, increasing λ lowers the lifetime influence of revolving door lobbyists. Finally, the equilibrium effects due to the value of connections can reinforce the responsiveness of workers to longer cooling-off periods, while they always work against the direct effect of increasing the government wage. As such, the two policy instruments should not be considered substitutes for addressing concerns about the revolving door, and which is more effective will depend on the objectives of the policymaker.

7.3 Endogenous Wage Rates

Our analysis has treated wage rates in each sector as exogenous, allowing us to isolate how connections affect human capital acquisition and occupational choices by revolvers. We now modify the model to allow w_ℓ to respond to the supply of human capital in the lobbying sector. We continue to assume government wages are exogenous, determined by factors outside market forces, and for simplicity, we keep w_p exogenous as well.

Consider an economy where output in the lobbying sector is $Y\big(H\big)$, with H representing the aggregate stock of revolver human capital. The production function Y satisfies the usual Inada conditions, and H is the sum of human capital across all lobbyists.

In the lobbying sector, workers have heterogeneous human capital based on their connections and government experience. For instance, if all workers with $\psi \geqslant \underline{\psi}$ enter government, and all worker with public service motivation ψ revolve after tenure $\tau_g(\psi)$, then the total

[28] See the Appendix for a formal statement and proof.

stock of human capital in the lobbying sector is:

$$H = \int_0^\infty e^{-\delta a} \int_{\underline{\psi}}^{\max\{\overline{\psi}(a), \underline{\psi}\}} v\big(\tau_g^*(\psi)\big) q_a\big(\tau_g^*(\psi)\big) g(\psi) d\psi da. \tag{23}$$

Notice this specification assumes perfect substitutes among different levels of human capital.[29] Assuming a perfectly competitive labor market, the wage rate in the lobbying sector is:

$$w_\ell = Y'\big(H\big). \tag{24}$$

An equilibrium is a solution to the original system (9) – (11) augmented with the wage equation (24). Since workers take the wage rates as given when making decisions, our baseline characterization of behavior extends to this setting. Specifically, entry and exit decisions are determined by entry ($\underline{\psi}$) and exit $\big(\overline{\psi}(\tau)\big)$ thresholds, where $\overline{\psi}(\tau)$ is increasing and concave in tenure. Similar to before, a revolver's revenue is $w_\ell^* \cdot v(\tau_g) \cdot q_i(a - \tau_g)$, and our within-equilibrium comparisons regarding revolver revenues are unchanged because they hold w_ℓ^* fixed.

Therefore, our results on the composition of workers in each sector, and revolvers' revenues are not affected by endogenous lobbying wages. In particular, connections continue to play a central role in driving the emergence of superstars. When connections are absent ($q_{it} = \overline{q}$), each revolver's revenue is constant in their lobbying experience, even with endogenous wages. In contrast, with connections revenues still decrease with lobbying experience.

When analyzing the effects of w_g studied in Section 6, endogenous wage rates can introduce new forces. To disentangle the equilibrium effects of wages from those of connections, consider a model where w_ℓ is endogenous and connections are absent ($q_{it} = \overline{q}$). Then, the effect of w_g on the exit function is:

$$\frac{\partial \overline{\psi}^*}{\partial w_g} = \underbrace{-1}_{\text{Direct Effect } < 0} + \underbrace{\frac{\partial w_\ell^*}{\partial w_g} Q\Big(v(\tau_g) - \frac{v'(\tau_g)}{\delta + \rho}\Big)}_{\text{Indirect Effect } < 0}.$$

A higher value of government directly affects behavior and, in turn, the total stock of lobbyist human capital (H). This creates an indirect equilibrium effect through w_ℓ^*. Higher w_g has competing effects on H: it extends government tenures, reducing the number of

[29] This efficiency units assumption is common in the human capital literature. Further investigation of the production structure in the lobbying sector and its feedback into revolvers' decisions remains an interesting topic for future work.

lobbyists and lowering H, but this also raises revolvers' human capital via $v(\tau_g)$. Additionally, higher w_g attracts more workers to government who revolve quickly, further increasing H. Though these opposing effects make it difficult to sign the overall impact of w_g, when ρ is large there is always an equilibrium where the latter effects dominate.[30] Thus, increasing w_g raises H and lowers the lobbying wage w_ℓ^*. The indirect effect of higher w_g through endogenous wages therefore reinforces the direct effect in discouraging revolving.

This contrasts with the indirect effect of increasing w_g when connections are valuable, which encourages revolving because more workers stay in government. While both mechanisms create indirect effects through equilibrium responses, connection-driven effects differ from wage effects which are driven by changes in the labor supply. Notably, they have different implications for how long-tenured government workers respond to an increase in the value of government employment.

8 Conclusion

We studied a model of the labor market for revolving-door lobbyists, providing new insights into the impact of government connections. Although the importance of these connections is well-known, their complex nature has obscured their overall impact. Specifically, the value of a revolver's connections is dynamic and interdependent, potentially eroding as their contacts leave government. Our model explicitly allows the dynamics of connections to depend on other workers' choices, uncovering important implications for aggregate patterns of career choices and lobbying revenues.

Our paper is an initial attempt to understand how government connections shape the revolving door and lobbying industry. In our analysis, we have abstracted from many important political and economic details that arise in different applications. Future work could build on our framework to incorporate political turnover, a richer model of lobbying, and labor market frictions. Additionally, we only considered the impact of two blunt public-personnel policies — government wages and cooling-off periods — on behavior, and abstracted from welfare considerations. Another valuable direction for future work would be to study more flexible or intricate regulations and their optimal design under different welfare considerations.

[30] These effects are hard to parse even if connections are absent. Consider solving for the equilibrium wage w_ℓ^* from (24), holding all else fixed. Higher w_ℓ increases the left-hand side. On the right-hand side, H may move either way since higher w_ℓ causes more workers to revolve but with lower human capital (ignoring entry effects). This can create multiple equilibria. However, the Inada conditions on Y ensure that an equilibrium exists where w_ℓ crosses from above, which is then sufficient to sign the comparative static of w_g on w_ℓ^* in this equilibrium.

A Appendix

Lemma 1. *In every equilibrium, there exists a function* $\overline{\psi}^* : \mathbb{R}_+ \to \mathbb{R}$ *such that a worker* i *with tenure* τ_g *revolves if and only if* $\psi_i \leqslant \overline{\psi}^*(\tau_g)$.

Proof. Fix an equilibrium σ^*. By definition, $\eta^*(\psi', a) = 1$ if and only if $\tau_g^*(\psi') > a$. Since $\tau_g^*(\psi_i) = \arg\max_{\tau_g} V_g(\tau_g; \psi_i, \sigma^*)$, then individual i's choice τ_g^* must solve:

$$\begin{aligned} 0 =& - w_g - \psi_i + w_\ell v(\tau_g) \int_0^\infty e^{-(\delta+\rho)s} \int_{-\infty}^\infty \int_s^\infty \gamma^*(\psi)\eta^*(\psi, a) e^{-\delta a} da\, dG(\psi)\, ds \\ &- w_\ell \frac{v'(\tau_g)}{\delta+\rho} \int_0^\infty e^{-(\delta+\rho)s} \int_{-\infty}^\infty \int_s^\infty \gamma^*(\psi)\eta^*(\psi, a) e^{-\delta a} da\, dG(\psi)\, ds. \end{aligned}$$

Applying the implicit function theorem yields:

$$\frac{\partial \tau_g^*}{\partial \psi_i} = \frac{1}{w_\ell Q^* \big(v'(\tau_g^*) Q^* - v''(\tau_g^*)\big)} > 0.$$

Thus, τ_g^* is a strictly increasing function of ψ_i. Letting $\overline{\psi}^*$ denote the inverse of τ_g^* completes the proof. □

Lemma 2. *In every equilibrium, there exists a* $\underline{\psi}^* \in \mathbb{R}$ *such that each worker* i *enters government if* $\psi_i \geqslant \underline{\psi}^*$ *and enters the private sector otherwise.*

Proof. Fix an equilibrium σ^*. It is straightforward that each worker i will not enter government if ψ_i is sufficiently low, but will enter if ψ_i is sufficiently high. To complete the proof, we show there is a unique $\underline{\psi}^* \in \mathbb{R}$ that distinguishes these cases. First, note that i's payoff of not entering government, V_p, is constant in ψ_i. Second, applying the envelope theorem, i's payoff from entering government, $V_g^*(\psi, \sigma^*)$, is strictly increasing in ψ. □

Proposition 1. *An equilibrium exists and is characterized by a* $(\underline{\psi}^*, \overline{\psi}^*(\tau), Q^*)$ *that solves:*

$$\underline{\psi} = \frac{w_p - e^{-(\delta+\rho)\overline{\psi}^{-1}(\underline{\psi})} v\big(\overline{\psi}^{-1}(\underline{\psi})\big) \cdot w_\ell \cdot Q}{1 - e^{-(\delta+\rho)\overline{\psi}^{-1}(\underline{\psi})}} - w_g, \tag{25}$$

$$\overline{\psi}(\tau_g) = -w_g + w_\ell \cdot Q \cdot \left(v(\tau_g) - \frac{v'(\tau_g)}{\delta+\rho} \right), \tag{26}$$

$$Q = \int_0^\infty e^{-(\delta+\rho)\tau_\ell} \int_{\tau_\ell}^\infty e^{-\delta a} \Big[1 - G\Big(\max\{\underline{\psi}, \overline{\psi}(a)\} \Big) \Big]\, da\, d\tau_\ell. \tag{27}$$

Proof. First, note, by construction, any solution to the above system of equations is an equilibrium.

Second, we show that any equilibrium must be characterized by solutions to the above system. By Lemma 2, in any equilibrium there exists $\underline{\psi}$ such that i enters government if and only if $\psi_i \geqslant \underline{\psi}$. Furthermore, by Lemma 1, there exists $\overline{\psi}(a)$ such that each worker i is in government at age a if and only if $\psi_i > \max\{\overline{\psi}(a), \underline{\psi}\}$. Thus, we must have:

$$Q = \int_0^\infty e^{-(\delta+\rho)s} \int_s^\infty e^{-\delta a} \Big[1 - G(\max\{\underline{\psi}, \overline{\psi}(a)\})\Big] da ds.$$

In equilibrium, each newly born worker i will revolve after a tenure that solves:

$$\max_\tau \frac{1 - e^{-(\delta+\rho)\tau}}{\delta+\rho}(\psi_i + w_g) + \frac{e^{-(\delta+\rho)\tau}}{\delta+\rho} w_\ell v(\tau) \cdot Q.$$

Each worker's objective is concave in τ, so i's optimal stopping time, $\tau^*(\psi)$, is the unique solution to:

$$e^{-(\delta+\rho)\tau}(\psi_i + w_g) + \frac{e^{-(\delta+\rho)\tau}}{\delta+\rho} w_\ell v'(\tau) \cdot Q - e^{-(\delta+\rho)\tau} w_\ell v(\tau) \cdot Q = 0. \tag{28}$$

Next, we prove that a solution exists. To start, we show there is a $(\underline{\psi}^*, Q^*)$ that solves

$$\underline{\psi} = \frac{w_p - e^{-(\delta+\rho)\overline{\psi}^{-1}(\underline{\psi})} v(\overline{\psi}^{-1}(\underline{\psi})) w_\ell Q}{1 - e^{-(\delta+\rho)\overline{\psi}^{-1}(\underline{\psi})}} - w_g \tag{29}$$

$$Q = \int_0^\infty e^{-(\delta+\rho)s} \int_s^\infty e^{-\delta n}\Big[1 - G\Big(\max\Big\{v(n)\cdot Q - \frac{v'(n)}{\delta+\rho}\cdot Q - w_g, \underline{\psi}\Big\}\Big)\Big] dn ds. \tag{30}$$

Consider (30). First, at $Q = 0$ the RHS is $\int_0^\infty e^{-(\delta+\rho)s}\int_s^\infty e^{-\delta n}\Big[1 - G\Big(\max\{-w_g, \underline{\psi}\}\Big)\Big] dn ds > 0$. Second, $1 - G(\cdot) < 1$ implies that the RHS is strictly less than $\int_0^\infty e^{-(\delta+\rho)s}\int_s^\infty e^{-\delta n} dn ds = \frac{1}{\delta(2\delta+\rho)}$, so the RHS is smaller than the LHS at $Q = \frac{1}{\delta(2\delta+\rho)}$. Since each side is continuous in Q, the intermediate value theorem yields a solution, which we denote $Q^*(\underline{\psi})$. Moreover, Q^* is unique because—given a fixed $\underline{\psi}$—the LHS is strictly increasing in Q while the RHS is is decreasing.

Plugging $Q^*(\underline{\psi})$ into (29) implies that $\underline{\psi}^*$ solves

$$\underline{\psi} = \frac{w_p - e^{-(\delta+\rho)\overline{\psi}^{-1}(\underline{\psi}; Q^*(\underline{\psi}))} v\big(\overline{\psi}^{-1}(\underline{\psi}; Q^*(\underline{\psi}))\big) \cdot Q^*(\underline{\psi}) w_\ell}{1 - e^{-(\delta+\rho)\overline{\psi}^{-1}(\underline{\psi}; Q^*(\underline{\psi}))}} - w_g. \tag{31}$$

Note that $Q(\psi) \in [0, \frac{1}{\delta(2\delta+\rho)}]$ always holds. Recall that $\overline{\psi}^{-1}(\psi; Q) = \tau(\psi; Q)$, so $\tau(\underline{\psi}; Q)$

is the solution to $v(\tau) - v'(\tau)/(\delta+\rho) = \frac{\psi + w_g}{Q \cdot w_\ell}$. Thus, there exists $\psi^- \in \mathbb{R} \cup \{-\infty\}$ such that $\lim_{\underline{\psi} \to \psi^-} \overline{\psi}^{-1}(\underline{\psi}; Q) = 0$. In turn, $\underline{\psi} \to \psi^- < \infty$ also implies that the RHS of (31) goes to $\frac{w_p - e^0 \cdot v(0)}{1 - e^0} = \infty$. On the other hand, as $\underline{\psi} \to \infty$ we have $\lim_{\underline{\psi} \to \infty} \overline{\psi}^{-1}(\underline{\psi}, Q) > 0$ and therefore the limit of the RHS of (31) is finite. Thus, since both sides of (31) are continuous in $\underline{\psi}$, the intermediate value theorem yields existence of a solution $\underline{\psi}^*$.

To demonstrate uniqueness when ρ is large (in anticipation of Proposition 4), if we rearrange (31) then any $\underline{\psi}^*$ must solve:

$$\left(1 - e^{-(\delta+\rho)\overline{\psi}^{-1}(\underline{\psi}, Q^*(\underline{\psi}))}\right)\left(\underline{\psi} + w_g\right) - w_p \\ + e^{-(\delta+\rho)\overline{\psi}^{-1}(\underline{\psi}, Q^*(\underline{\psi}))} w_\ell \cdot v\left(\overline{\psi}^{-1}(\underline{\psi}, Q^*(\underline{\psi}))\right) \cdot Q^*(\underline{\psi}) = 0. \quad (32)$$

Differentiating and taking limits yields $\lim_{\rho\to\infty} \frac{\partial LHS(32)}{\partial \underline{\psi}} = \lim_{\rho\to\infty} 1 - e^{-(\delta+\rho)\overline{\psi}^{-1}(\underline{\psi}, Q^*(\underline{\psi}))} + e^{-(\delta+\rho)\overline{\psi}^{-1}(\underline{\psi}, Q^*(\underline{\psi}))} w_\ell \cdot v\left(\overline{\psi}^{-1}(\underline{\psi}, Q^*(\underline{\psi}))\right) \cdot \frac{\partial Q^*}{\partial \underline{\psi}} = 1 > 0$. Thus, there is a unique solution $\underline{\psi}^*$ to (32).

To complete the argument, define $\overline{\psi}^*(\tau) = -w_g + w_\ell \cdot v(\tau) \cdot Q^* - w_\ell \cdot \frac{v'(\tau)}{\delta+\rho} \cdot Q^*$. □

Proposition 2. *In equilibrium, (i) the entry threshold is* $\underline{\psi}^* \in \left(\overline{\psi}^*(0), w_p - w_g\right)$ *and (ii) the exit function* $\overline{\psi}^*$ *is strictly increasing and concave in* τ_g.

Proof. First, $\overline{\psi}^*$ is strictly increasing in τ since $\frac{\partial \overline{\psi}^*}{\partial \tau} = w_\ell Q\left(v'(\tau) - \frac{v''(\tau)}{\delta+\rho}\right) > 0$ follows from $v' \geqslant 0$ and $v'' \leqslant 0$.

Second, $\overline{\psi}^*$ is concave in τ since $\frac{\partial^2 \overline{\psi}}{\partial \tau^2} = Q \cdot w_\ell\left(v''(\tau) - \frac{v'''(\tau)}{\rho+\delta}\right) \leqslant 0$ follows from $v'' \leqslant 0$ and $v''' \geqslant 0$.

Finally, we prove that $\overline{\psi}^*(0) < \underline{\psi}^* < w_p - w_g$. For the second inequality, note that in equilibrium $V_g^* > \frac{\psi + w_g}{\delta+\rho}$. Thus, $\psi_i + w_g \geqslant w_p$ implies $V_g^* > V_p$, so i would enter in equilibrium. To verify the first inequality, we proceed by contradiction. Suppose $\overline{\psi}^*(0) \geqslant \underline{\psi}^*$. Then, workers with $\psi_i \in [\underline{\psi}^*, \overline{\psi}^*(0)]$ will revolve immediately after joining government. Thus, for these workers we must have $V_g^* = w_\ell \cdot Q \cdot v(0) < \frac{w_\ell \cdot h(\frac{1}{\delta}, 0)}{\delta+\rho} \leqslant \frac{w_p}{\delta+\rho} = V^p$, where the last inequality follows from our assumption that $w_\ell \cdot h(\frac{1}{\delta}, 0) \leqslant w_p$. Combining these observations yields $\underline{\psi}^* \leqslant \psi_i < \underline{\psi}^*$, a contradiction. □

Lemma 3. *Fixing age-a, lobbying revenues* $y(\tau_g, a - \tau_g)$ *are increasing in government tenure,* τ_g*. Moreover,* y *is convex if* τ_g *is sufficiently large.*

Proof. Equation (15) implies that y is convex in τ_g if

$$\frac{\partial^2 y}{\partial \tau_g^2} \propto v''(\tau_g)q_i(s) - 2v'(\tau_g)q_i'(s) + v(\tau_g)q_i''(s) > 0.$$

We have:

$$q_i'(s) = -e^{-\delta s}\Big(1 - G(\max\{\overline{\psi}^*(s), \underline{\psi}^*\})\Big) < 0,$$

$$q_i''(s) = \delta e^{-\delta s}\Big(1 - G(\max\{\overline{\psi}^*(s), \underline{\psi}^*\})\Big) + e^{-\delta s} g(\max\{\overline{\psi}^*(s), \underline{\psi}^*\}) \cdot \left\{\begin{matrix} \frac{\partial \overline{\psi}^*}{\partial s} & \text{if } \overline{\psi}^*(s) \geqslant \underline{\psi}^*, \\ 0 & \text{otherwise.} \end{matrix}\right\} > 0.$$

Thus, for all τ_g we have $-2v'(\tau_g)q_i'(s) \geqslant 0$ and $v(\tau_g)q_i''(s) \geqslant 0$, whereas $v''(\tau_g)q_i(s) \leqslant 0$.

To complete the proof, we verify two limits. First, $\lim_{\tau \to \infty} v''(\tau) = 0$ because we have assumed that $\lim_{\tau \to \infty} v'(\tau)$ is finite and $v''(\tau)$ is uniformly continuous. Applying Barbălat's Lemma yields $\lim_{\tau \to \infty} v''(\tau) = 0$, as required. Second, $\lim_{\tau \to \infty} v(\tau) \cdot q_i''(s) > 0$ since $q_i''(s) > 0$ is constant in τ and $v(\tau) > 0$ for all $\tau > 0$. □

We now introduce two functions which are useful for proving the comparative statics results in Section 6. Additionally, we now incorporate the cooling-off period λ into the expressions to prove the statements in Section 7.2.

Define the following two functions:

$$\begin{aligned} \phi_1(Q, \underline{\psi}) = &\int_{\min\{\lambda, \overline{n}\}}^{\overline{n}} e^{-(\delta+\rho)s} \Big\{ \int_s^{\overline{n}} e^{-\delta n}\Big(1 - G(\underline{\psi})\Big)dn + \int_{\overline{n}}^{\infty} e^{-\delta n}\Big(1 - G(\overline{\psi}(n))\Big)dn \Big\} ds \\ &+ \int_{\max\{\lambda, \overline{n}\}}^{\infty} e^{-(\delta+\rho)s} \int_s^{\infty} e^{-\delta n}\Big(1 - G(\overline{\psi}(n))\Big)dnds - Q, \end{aligned} \tag{33}$$

$$\phi_2(Q, \underline{\psi}) = w_p - e^{-(\delta+\rho)\tau^*(Q,\underline{\psi})} \cdot v\big(\tau^*(Q, \underline{\psi})\big) \cdot Q \cdot w_\ell - \Big(1 - e^{-(\delta+\rho)\tau^*(Q,\underline{\psi})}\Big)(\underline{\psi} + w_g), \tag{34}$$

where $\overline{n}$ is the unique n that solves

$$-w_g + v(n) \cdot Q \cdot w_\ell - \frac{v'(n)}{\delta + \rho} \cdot Q \cdot w_\ell = \underline{\psi}. \tag{35}$$

Lemma A.1. *We have* $\frac{\partial \phi_1}{\partial Q} < 0$, $\frac{\partial \phi_1}{\partial \underline{\psi}} < 0$, $\frac{\partial \phi_2}{\partial Q} < 0$, *and* $\frac{\partial \phi_2}{\partial \underline{\psi}} < 0$.

Proof. First,

$$\begin{aligned}\frac{\partial \phi_1}{\partial Q} &= -1 - \int_{\min\{\lambda,\overline{n}\}}^{\overline{n}} e^{-(\delta+\rho)s} \int_{\overline{n}}^{\infty} e^{-\delta n} \cdot \left(v(n) - \frac{v'(n)}{\delta+\rho}\right) w_\ell \, g(\overline{\psi}(n))\, dn\, ds \\ &\qquad - \int_{\max\{\lambda,\overline{n}\}}^{\infty} e^{-(\delta+\rho)s} \int_{s}^{\infty} e^{-\delta n} \cdot \left(v(n) - \frac{v'(n)}{\delta+\rho}\right) w_\ell \, g(\overline{\psi}(n))\, dn\, ds \\ &< 0,\end{aligned}$$

where the inequality follows because $v(n) > \frac{v'(n)}{\delta+\rho}$ for all $n > \overline{n}$.

Second, $\frac{\partial \phi_1}{\partial \underline{\psi}} = -\int_{\min\{\lambda,\overline{n}\}}^{\overline{n}} e^{-(\delta+\rho)s} \left(\int_s^{\overline{n}} e^{-\delta n}\, g(\underline{\psi})\, dn \right) ds < 0$.

Third, $\frac{\partial \phi_2}{\partial Q} = -e^{-(\delta+\rho)\tau^*(\underline{\psi})} v(\tau^*(\underline{\psi})) w_\ell < 0$.

Finally, $\frac{\partial \phi_2}{\partial \underline{\psi}} = -\left(1 - e^{-(\delta+\rho)\tau^*(Q,\underline{\psi})}\right) < 0$. □

Lemma A.2. *For ϕ_1, we have $\lim\limits_{\rho\to\infty} \frac{\partial \phi_1}{\partial Q} = -1$ and $\lim\limits_{\rho\to\infty} \frac{\partial \phi_1}{\partial \underline{\psi}} = 0$. And for ϕ_2, we have $\lim\limits_{\rho\to\infty} \frac{\partial \phi_2}{\partial Q} = 0$ and $\lim\limits_{\rho\to\infty} \frac{\partial \phi_2}{\partial \underline{\psi}} = -1$.*

Proof. First, we have

$$\begin{aligned}\lim_{\rho\to\infty} \frac{\partial \phi_1}{\partial Q} &= -1 - \lim_{\rho\to\infty} \Bigg(\int_{\min\{\lambda,\overline{n}\}}^{\overline{n}} e^{-(\delta+\rho)s} \int_{\overline{n}}^{\infty} e^{-\delta n} \cdot \left(v(n) - \frac{v'(n)}{\delta+\rho}\right) w_\ell \, g(\overline{\psi}(n))\, dn\, ds \\ &\qquad - \int_{\max\{\lambda,\overline{n}\}}^{\infty} e^{-(\delta+\rho)s} \int_{s}^{\infty} e^{-\delta n} \cdot \left(v(n) - \frac{v'(n)}{\delta+\rho}\right) w_\ell \, g(\overline{\psi}(n))\, dn\, ds \Bigg) \\ &= -1,\end{aligned}$$

which follows because (i) $\lim\limits_{\rho\to\infty} e^{-(\delta+\rho)s} = 0$, (ii) $\lim\limits_{\rho\to\infty} g(\overline{\psi}(n)) < \infty$,

$$\begin{aligned}&\text{(iii)} \lim_{\rho\to\infty} \int_{\overline{n}}^{\infty} e^{-\delta n} \left(v(n) - \frac{v'(n)}{\delta+\rho}\right) w_\ell g(\overline{\psi}(n)) < \infty, \text{ and} \\ &\text{(iv)} \lim_{\rho\to\infty} \int_{\overline{s}}^{\infty} e^{-\delta n} \left(v(n) - \frac{v'(n)}{\delta+\rho}\right) w_\ell g(\overline{\psi}(n)) < \infty.\end{aligned}$$

To see why (iii) and (iv) hold, note that $e^{-\delta n} \cdot \left(v(n) - \frac{v'(n)}{\delta+\rho}\right) \leqslant e^{-\delta n} v(n)$ for all n. Then $\lim\limits_{n\to\infty} e^{-\delta n} v(n) = 0$, since $\lim\limits_{n\to\infty} v'(n) < \infty$ and L'Hopital's rule together yield $\lim\limits_{n\to\infty} e^{-\delta n} v(n) = \lim\limits_{n\to\infty} \frac{v'(n)}{\delta e^{\delta n}} = 0$.

Second, we have

$$\lim_{\rho\to\infty}\frac{\partial \phi_1}{\partial \underline{\psi}} = \lim_{\rho\to\infty} -\int_{\min\{\lambda,\overline{n}\}}^{\overline{n}} e^{-(\delta+\rho)s}\Big(\int_s^{\overline{n}} e^{-\delta n}\, g(\underline{\psi})\, dn\Big) = 0,$$

which follows because (i) $\lim_{\rho\to\infty} e^{-(\delta+\rho)s} = 0$ and (ii) $\lim_{\rho\to\infty}\int_s^{\overline{n}} e^{-\delta n} g(\underline{\psi}) < \infty$, since $g(\underline{\psi}^*) < \infty$ implies that $e^{-\delta n} g(\underline{\psi}^*) < \infty$ for all $n \geqslant 0$.

Third, we have

$$\lim_{\rho\to\infty}\frac{\partial \phi_2}{\partial Q} = \lim_{\rho\to\infty} - e^{-(\delta+\rho)\tau^*(\underline{\psi})} v(\tau^*(\underline{\psi}))w_\ell = 0,$$

which follows because $e^{-(\delta+\rho)\tau^*(Q,\underline{\psi})} \to 0$ as $\rho\to\infty$, since $\tau^* > 0$.

Finally,

$$\lim_{\rho\to\infty}\frac{\partial \phi_2}{\partial \underline{\psi}} = \lim_{\rho\to\infty} -\Big(1 - e^{-(\delta+\rho)\tau^*(Q,\underline{\psi})}\Big) = -1,$$

which also follows because $e^{-(\delta+\rho)\tau^*(Q,\underline{\psi})} \to 0$ as $\rho\to\infty$, since $\tau^* > 0$.

□

Proposition 4. *If ρ is sufficiently large, then there is a unique equilibrium and increasing w_g: (i) increases Q^*, (ii) decreases $\underline{\psi}^*$, and (iii) increases $\tau_g^*(\psi_i)$ if and only if ψ_i is sufficiently large.*

Proof. See the proof of Proposition 1 for the uniqueness argument.

To sign the comparative statics we apply the implicit function theorem, which yields

$$\begin{bmatrix} \frac{\partial Q^*}{\partial w_g} \\ \frac{\partial \underline{\psi}^*}{\partial w_g} \end{bmatrix} = \frac{-1}{\frac{\partial \phi_1}{\partial Q}\frac{\partial \phi_2}{\partial \underline{\psi}} - \frac{\partial \phi_1}{\partial \underline{\psi}}\frac{\partial \phi_2}{\partial Q}} \begin{bmatrix} \frac{\partial \phi_2}{\partial \underline{\psi}}\cdot\frac{\partial \phi_1}{\partial w_g} + \Big(-\frac{\partial \phi_1}{\partial \underline{\psi}}\Big)\cdot\frac{\partial \phi_2}{\partial w_g} \\ -\frac{\partial \phi_2}{\partial Q}\cdot\frac{\partial \phi_1}{\partial w_g} + \frac{\partial \phi_1}{\partial Q}\cdot\frac{\partial \phi_2}{\partial w_g} \end{bmatrix}.$$

By Lemma A.1, we have $\frac{\partial \phi_1}{\partial Q} < 0$, $\frac{\partial \phi_1}{\partial \underline{\psi}} < 0$, $\frac{\partial \phi_2}{\partial Q} < 0$, and $\frac{\partial \phi_2}{\partial \underline{\psi}} < 0$. Additionally, $\frac{\partial \phi_2}{\partial w_g} = -\Big(1 - e^{-(\delta+\rho)\tau^*(\underline{\psi},Q)}\Big) < 0$ and

$$\frac{\partial \phi_1}{\partial w_g} = \int_0^{\overline{n}} e^{-(\delta+\rho)s}\int_{\overline{n}}^{\infty} e^{-\delta n} g(\overline{\psi}(n))dnds + \int_{\overline{n}}^{\infty} e^{-(\delta+\rho)s}\int_s^{\infty} e^{-\delta n} g(\overline{\psi}(n))dnds > 0.$$

Thus, we have $\frac{\partial \phi_2}{\partial \underline{\psi}}\cdot\frac{\partial \phi_1}{\partial w_g} - \frac{\partial \phi_1}{\partial \underline{\psi}}\cdot\frac{\partial \phi_2}{\partial w_g} < 0$ and $-\frac{\partial \phi_2}{\partial Q}\cdot\frac{\partial \phi_1}{\partial w_g} + \frac{\partial \phi_1}{\partial Q}\cdot\frac{\partial \phi_2}{\partial w_g} > 0$. Therefore, $\frac{\partial \underline{\psi}^*}{\partial w_g} < 0 < \frac{\partial Q^*}{\partial w_g}$

holds if and only if

$$\frac{\partial\phi_1}{\partial Q}\frac{\partial\phi_2}{\partial\underline{\psi}} - \frac{\partial\phi_1}{\partial\underline{\psi}}\frac{\partial\phi_2}{\partial Q} > 0.$$

This inequality holds if ρ is sufficiently large, since the LHS is continuous in ρ and Lemma A.2 implies $\lim_{\rho\to\infty} \frac{\partial\phi_1}{\partial Q}\frac{\partial\phi_2}{\partial\underline{\psi}} - \frac{\partial\phi_1}{\partial\underline{\psi}}\frac{\partial\phi_2}{\partial Q} = 1$. $\square$

Proposition 5. *If ρ is sufficiently large, then increasing w_g...*

1. *increases the size of government S^*,*

2. *decreases $\mathbb{E}[\psi_i | i \text{ in govt}]$,*

3. *and increases $v\big(\tau^*(\psi)\big) \cdot Q^*$ for all ψ.*

Proof. For part 1, differentiating we obtain

$$\frac{\partial S^*}{\partial w_g} = \int_0^{\overline{n}} -e^{-\delta n}\frac{\partial\underline{\psi}^*}{\partial w_g}g(\underline{\psi}^*)dn + \int_{\overline{n}}^{\infty} -e^{-\delta n}\frac{\partial\overline{\psi}^*}{\partial w_g}g(\overline{\psi}^*(n))dn.$$

We further decompose this derivative into the terms where $\frac{\partial\overline{\psi}^*}{\partial w_g}$ is positive and where it is negative. Specifically, define $\tilde{n}$ as the unique n that solves $\frac{\partial\overline{\psi}^*(n)}{\partial w_g} = 0$, which can be written as:

$$\frac{\partial Q^*}{\partial w_g} = \frac{1}{v(n) - \frac{v'(n)}{\delta+\rho}}. \tag{36}$$

Then,

$$\frac{\partial S^*}{\partial w_g} = \int_0^{\overline{n}} -e^{-\delta n}\frac{\partial\underline{\psi}^*}{\partial w_g}g(\underline{\psi}^*)dn + \int_{\overline{n}}^{\tilde{n}} -e^{-\delta n}\frac{\partial\overline{\psi}^*}{\partial w_g}g(\overline{\psi}^*(n))dn + \int_{\tilde{n}}^{\infty} -e^{-\delta n}\frac{\partial\overline{\psi}^*}{\partial w_g}g(\overline{\psi}^*(n))dn.$$

By Lemma 4, sufficiently large ρ implies $\frac{\partial\underline{\psi}^*}{\partial w_g} < 0$. Furthermore, for $n \in (\overline{n}, \tilde{n})$ $\frac{\partial\overline{\psi}^*}{\partial w_g} < 0$ by construction of $\tilde{n}$. For the final term, recall from the proof of A.2 that $\lim_{\rho\to\infty} -e^{-\delta n}\frac{\partial\overline{\psi}^*}{\partial w_g}g(\overline{\psi}^*(n)) < \infty$ for all n. Thus, to establish $\frac{\partial S^*}{\partial w_g} < 0$ it is sufficient to verify that $\lim_{\rho\to\infty}\tilde{n} = \infty$. Towards a contradiction, suppose not. Then $\lim_{\rho\to\infty}$ RHS (36) $= \frac{1}{v(\tilde{n})} > 0$. To derive the contradiction we now show that $\lim_{\rho\to\infty}\frac{\partial Q^*}{\partial w_g} = 0$. From Lemma 4,

$$\frac{\partial Q^*}{\partial w_g} = \frac{-1}{\frac{\partial\phi_1}{\partial Q}\frac{\partial\phi_2}{\partial\underline{\psi}} - \frac{\partial\phi_1}{\partial\underline{\psi}}\frac{\partial\phi_2}{\partial Q}} \cdot \Big[\frac{\partial\phi_2}{\partial\underline{\psi}} \cdot \frac{\partial\phi_1}{\partial w_g} + \Big(-\frac{\partial\phi_1}{\partial\underline{\psi}}\Big) \cdot \frac{\partial\phi_2}{\partial w_g}\Big].$$

Notice that $\frac{\partial \phi_1}{\partial w_g} = 0$, hence

$$\frac{\partial Q^*}{\partial w_g} = \frac{\frac{\partial \phi_1}{\partial \underline{\psi}}\frac{\partial \phi_2}{\partial w_g}}{\frac{\partial \phi_1}{\partial Q}\frac{\partial \phi_2}{\partial \underline{\psi}} - \frac{\partial \phi_1}{\partial \underline{\psi}}\frac{\partial \phi_2}{\partial Q}}.$$

By Lemma A.2 $\lim_{\rho\to\infty} \frac{\partial \phi_1}{\partial Q}\frac{\partial \phi_2}{\partial \underline{\psi}} - \frac{\partial \phi_1}{\partial \underline{\psi}}\frac{\partial \phi_2}{\partial Q} = 1$. Thus,

$$\lim_{\rho\to\infty} \frac{\partial Q^*}{\partial w_g} = \lim_{\rho\to\infty} \frac{\partial \phi_1}{\partial \underline{\psi}}\frac{\partial \phi_2}{\partial w_g} = 0,$$

which contradicts $\lim_{\rho\to\infty} \tilde{n} < \infty$, as desired.

For part 2 let F^{w_g} be the equilibrium distribution of ψ for workers in government, given a wage w_g. To prove the result it is sufficient to show that if $w_g' > w_g$ then F^{w_g} first-order stochastically dominates $F^{w_g'}$. Specifically, we show that $F^{w_g}(\psi) \leqslant F^{w_g'}(\psi)$ for all ψ and it is strict for some ψ. By Lemma 4 we have that $\underline{\psi}_{w_g} > \underline{\psi}_{w_g'}$ for ρ large. Thus, for any $\psi < \underline{\psi}_{w_g'}$ we have $F^{w_g}(\psi) = 0 \leqslant F^{w_g'}(\psi) = 0$. For $\psi \in (\underline{\psi}_{w_g'}, \underline{\psi}_{w_g}]$ we have $F^{w_g}(\psi) = 0 < F^{w_g'}(\psi)$. Finally, consider $\psi > \underline{\psi}_{w_g}$. For a wage w we have that F^w is given by

$$F^w(\psi) = \int_{\tau^*(\psi)}^{\infty} e^{-\delta\alpha} F_\alpha^w(\psi) d\alpha,$$

$$\text{where } F_\alpha^w(\psi) = \frac{G(\psi) - G(\overline{\psi}(\alpha))}{1 - G(\overline{\psi}(\alpha))}.$$

Letting $\tilde{n}$ be defined as in part 1 of the proof, we can write F^w as

$$F^w(\psi) = \int_{\tau^*(\psi)}^{\tilde{n}} e^{-\delta\alpha} F_\alpha^w(\psi) d\alpha + \int_{\tilde{n}}^{\infty} e^{-\delta\alpha} F_\alpha^w(\psi) d\alpha.$$

By construction of $\tilde{n}$ for $n \leqslant \tilde{n}$ $\frac{\partial \overline{\psi}^*}{\partial w_g} < 0$, thus $\tau^*_{w_g'}(\psi) < \tau^*_{w_g}(\psi)$. Therefore,

$$\int_{\tau^*_{w_g}(\psi)}^{\tilde{n}} e^{-\delta\alpha} F_\alpha^{w_g'} d\alpha + \int_{\tilde{n}}^{\infty} e^{-\delta\alpha} F_\alpha^w(\psi) d\alpha \leqslant F^{w_g'}(\psi).$$

Recall that $\lim_{\rho\to\infty} \tilde{n} = \infty$. On the other hand, $\lim_{\rho\to\infty} \tau^*(\psi) < \infty$ for $\psi < \infty$. Thus, for any government wage w

$$\lim_{\rho\to\infty} F^w(\psi) = \lim_{\rho\to\infty} \int_{\tau^*(\psi)}^{\tilde{n}} e^{-\delta\alpha} F_\alpha^w(\psi) d\alpha.$$

Therefore, a sufficient condition for $\lim_{\rho\to\infty} F^{w_g}$ FOSD $\lim_{\rho\to\infty} F^{w'_g}$ is

$$\begin{aligned} & F^{w_g}_\alpha < F^{w'_g}_\alpha \text{ for all } \alpha \in [\tau^*_{w_g}(\psi), \tilde{n}] \\ & \Leftrightarrow G\Big(\overline{\psi}_{w'_g}(\overline{\psi}(\alpha))\Big) < G\Big(\overline{\psi}_{w_g}(\overline{\psi}(\alpha))\Big) \\ & \Leftrightarrow \overline{\psi}_{w'_g}(\overline{\psi}(\alpha)) < \overline{\psi}_{w_g}(\overline{\psi}(\alpha)), \end{aligned}$$

where the final inequality holds by $\frac{\partial \overline{\psi}^*}{\partial w_g} < 0$ for all $\alpha \in [\tau^*_{w_g}(\psi), \tilde{n}]$ and $w'_g > w_g$. Because F^w is continuous in ρ, we have that if $w'_g > w_g$ then F^{w_g} FOSD $F^{w'_g}$ for all ρ sufficiently large.

For part 3, differentiating yields

$$\frac{\partial}{\partial w_g}\Big\{v(\tau^*)\cdot Q^*\Big\} = Q^*\frac{\partial \tau^*}{\partial w_g}v'(\tau^*) + v(\tau^*)\frac{\partial Q^*}{\partial w_g}.$$

Substituting for $\frac{\partial \tau^*}{\partial w_g}$ and simplifying this reduces to

$$v'(\tau^*) + \frac{\partial Q^*}{\partial w_g}\frac{v'(\tau^*)^2}{\delta+\rho} - v(\tau^*)\frac{v''(\tau^*)}{\delta+\rho}\frac{\partial Q^*}{\partial w_g} > 0.$$

□

Proposition 6. *If worker i revolves at later tenure than worker j in equilibrium, then: (i) $F_{xh} > 0$ implies $x^*_i > x^*_j$; whereas (ii) $F_{xh} < 0$ implies $x^*_i < x^*_j$.*

Proof. Applying the implicit function theorem yields:

$$\frac{\partial x^*}{\partial \tau_g} = -\frac{\int_0^\infty e^{-(\delta+\rho)t} q_t v'(\tau_g) F_{xh}\big(h(q_t,\tau_g), x^*\big)dt}{\int_0^\infty e^{-(\delta+\rho)t} q_t v'(\tau_g) F_{xx}\big(h(q_t,\tau_g), x^*\big)ds - c''(x)}.$$

The denominator is negative by assumption that $F_{xx} < 0$ and $c''(x) > 0$. Thus, $\frac{\partial x^*}{\partial \tau^*} \geqslant 0$ if $F_{xh} > 0$ and $\frac{\partial x^*}{\partial \tau_g} < 0$ if $F_{xh} < 0$. □

Proposition 7. *If ρ is sufficiently large, then increasing λ will: (i) increase $\underline{\psi}^*$, (ii) decrease Q^*, and (iii) increase $\tau^*_g(\psi)$ for all ψ.*

Proof. Applying the implicit function theorem yields

$$\begin{bmatrix} \frac{\partial Q^*}{\partial \lambda} \\ \frac{\partial \underline{\psi}^*}{\partial \lambda} \end{bmatrix} = \frac{-1}{\frac{\partial \phi_1}{\partial Q}\frac{\partial \phi_2}{\partial \underline{\psi}} - \frac{\partial \phi_1}{\partial \underline{\psi}}\frac{\partial \phi_2}{\partial Q}} \begin{bmatrix} \frac{\partial \phi_2}{\partial \underline{\psi}}\cdot\frac{\partial \phi_1}{\partial \lambda} + \Big(-\frac{\partial \phi_1}{\partial \underline{\psi}}\Big)\cdot\frac{\partial \phi_2}{\partial \lambda} \\ -\frac{\partial \phi_2}{\partial Q}\cdot\frac{\partial \phi_1}{\partial \lambda} + \frac{\partial \phi_1}{\partial Q}\cdot\frac{\partial \phi_2}{\partial \lambda} \end{bmatrix}.$$

Since $\frac{\partial \phi_2}{\partial \lambda} = 0$ and $\frac{\partial \phi_1}{\partial \lambda} = -e^{-\delta\lambda} \int_\lambda^\infty e^{-\delta n} \Big(1 - G(\overline{\psi}(n))\Big) dn < 0$, Lemma A.1 implies $\frac{\partial \phi_2}{\partial \underline{\psi}} \cdot \frac{\partial \phi_1}{\partial \lambda} - \frac{\partial \phi_1}{\partial \underline{\psi}} \cdot \frac{\partial \phi_2}{\partial \lambda} > 0$ and $-\frac{\partial \phi_2}{\partial Q} \cdot \frac{\partial \phi_1}{\partial \lambda} + \frac{\partial \phi_1}{\partial Q} \cdot \frac{\partial \phi_2}{\partial \lambda} < 0$. Thus, $\frac{\partial Q^*}{\partial \lambda} < 0 < \frac{\partial \underline{\psi}^*}{\partial \lambda}$ holds if and only if

$$\frac{\partial \phi_1}{\partial Q} \frac{\partial \phi_2}{\partial \underline{\psi}} - \frac{\partial \phi_1}{\partial \underline{\psi}} \frac{\partial \phi_2}{\partial Q} > 0.$$

This condition holds for sufficiently large ρ, as shown in the proof of Lemma 4. □

Lemma A.3. *If ρ is sufficiently large, then increasing λ decreases $v\big(\tau^*(\psi)\big) \cdot Q^*$ for all ψ.*

Proof. Differentiating yields

$$\frac{\partial}{\partial \lambda} \Big\{ v(\tau^*) \cdot Q^* \Big\} = Q^* \frac{\partial \tau^*}{\partial \lambda} v'(\tau^*) + v(\tau^*) \frac{\partial Q^*}{\partial \lambda}.$$

Substituting for $\frac{\partial \tau^*}{\partial \lambda}$ and simplifying this reduces to

$$\frac{\partial Q^*}{\partial \lambda} \frac{v'(\tau^*)^2}{\delta + \rho} Q^* - v(\tau^*) \frac{v''(\tau^*)}{\delta + \rho} \frac{\partial Q^*}{\partial \lambda} Q^* < 0.$$

□

B Empirical Analysis of Lobbying Revenue Dynamics

Table 1: Coefficient of Lobbying Experience on Yearly Revenues

Lobbying Career	Group	Coefficient (SE)	95% CI	N
3 Years				
	All	−0.042 (0.008)	[−0.059, −0.025]	1136
	No Staffers	−0.048 (0.016)	[−0.081, −0.016]	288
	Staffers	−0.040 (0.010)	[−0.060, −0.020]	848
4 Years				
	All	−0.026 (0.005)	[−0.036, −0.016]	1485
	No Staffers	−0.036 (0.011)	[−0.057, −0.015]	240
	Staffers	−0.022 (0.006)	[−0.034, −0.011]	1245
5 Years				
	All	−0.021 (0.005)	[−0.031, −0.011]	1144
	No Staffers	−0.028 (0.008)	[−0.044, −0.011]	256
	Staffers	−0.018 (0.006)	[−0.030, −0.006]	888
6 Years				
	All	−0.002 (0.004)	[−0.010, 0.007]	1475
	No Staffers	−0.006 (0.007)	[−0.020, 0.007]	345
	Staffers	−0.001 (0.006)	[−0.012, 0.010]	1130
7 Years				
	All	−0.003 (0.007)	[−0.016, 0.011]	1230
	No Staffers	−0.022 (0.013)	[−0.048, 0.004]	360
	Staffers	0.004 (0.008)	[−0.012, 0.020]	870
8 Years				
	All	−0.016 (0.006)	[−0.027, −0.004]	1589
	No Staffers	0.005 (0.010)	[−0.015, 0.025]	525
	Staffers	−0.032 (0.006)	[−0.044, −0.020]	1064
9 Years				
	All	−0.043 (0.011)	[−0.064, −0.022]	840
	No Staffers	−0.044 (0.013)	[−0.069, −0.018]	328
	Staffers	−0.046 (0.021)	[−0.087, −0.005]	512

C Empirical Distribution of Revolver Revenues

Table 2: Descriptive Statistics by Year of Revolver Revenue (in 2008 dollars)

Year	Mean	Median	Gini Coefficient
1998	$213,535	$127,500	0.548
1999	$196,188	$120,000	0.547
2000	$211,547	$128,436	0.550
2001	$232,159	$137,045	0.554
2002	$243,245	$155,000	0.541
2003	$265,398	$158,639	0.547
2004	$273,172	$167,000	0.545
2005	$295,611	$180,000	0.548
2006	$307,121	$186,927	0.544
2007	$326,836	$211,685	0.531
2008	$331,714	$210,046	0.532

Table 3: Tests of Power Law and Log-Normal Distributions for Annual Lobbying Revenue

Year	Power Law (p-value)	Log-Normal (p-value)	PL vs. LN (p-value)
1998	0.123	0.410	0.676
1999	0.001	0.040	–
2000	0.481	0.113	0.585
2001	0.527	0.112	0.566
2002	0.443	0.001	–
2003	0.098	0.050	–
2004	0.164	0.061	0.936
2005	0.105	0.080	0.856
2006	0.563	0.117	0.466
2007	0.348	0.050	–
2008	0.007	0.216	–

Note: This table reports tests of whether annual lobbying revenues follow power law or log-normal distributions. For each year 1998-2008, we conduct bootstrap tests following Clauset et al. (2009) with the null hypothesis that revenues follow each distribution (columns 1 and 2). P-values below 0.05 indicate rejection of the null. Where neither distribution is rejected individually, we conduct a one-sided test comparing power law versus log-normal fit (column 3). Both distributions provide reasonable fits in most years, with neither consistently dominating the other. If at least one distribution is rejected, then "–" indicates that the comparison test was not applicable.

Figure 4: Density of Annual Revenues for Revolving-door Lobbyists (in 2008 dollars)

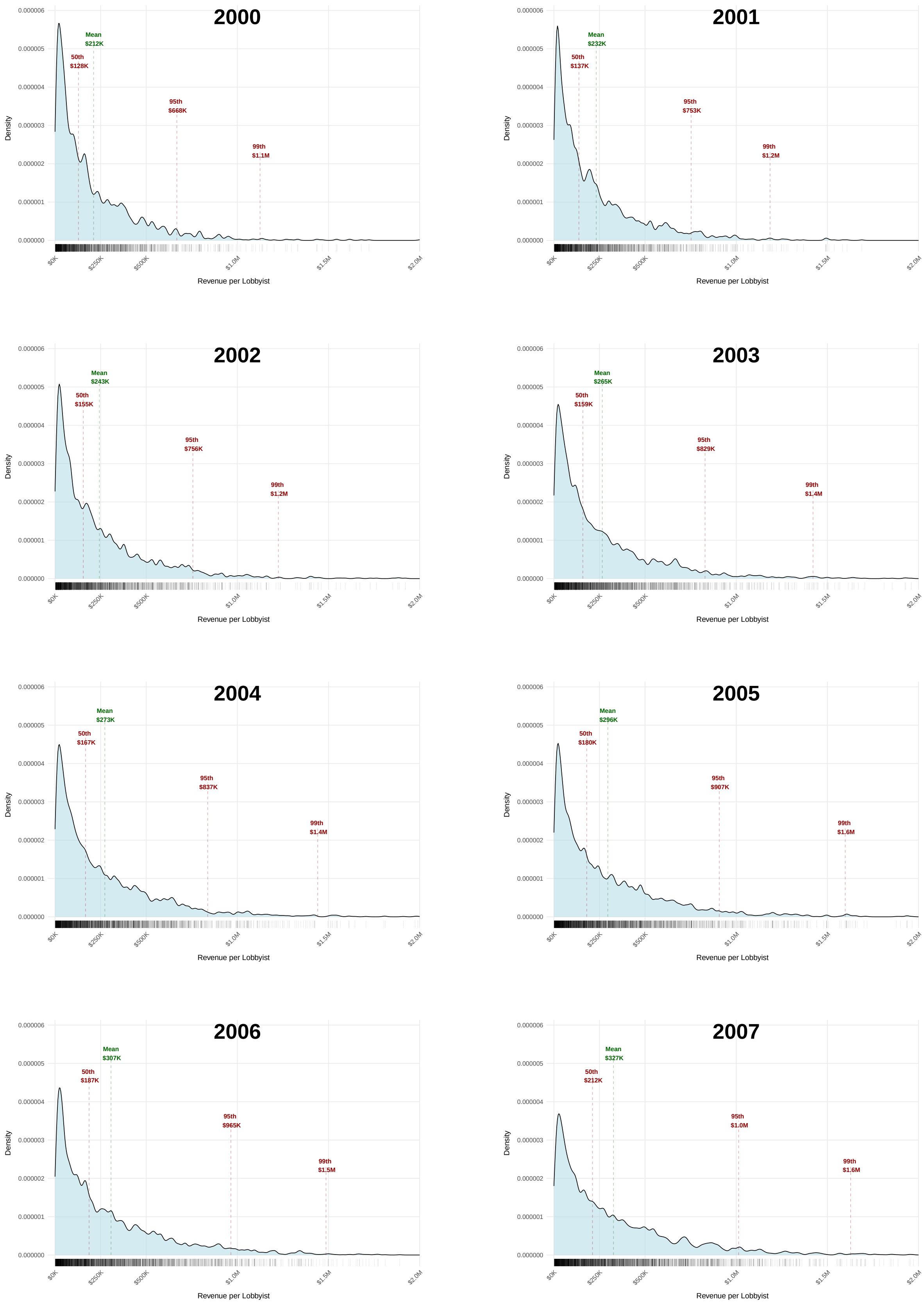


Figure 5: Distributions of Annual Revenue in 2001–2008 (in 2008 dollars)

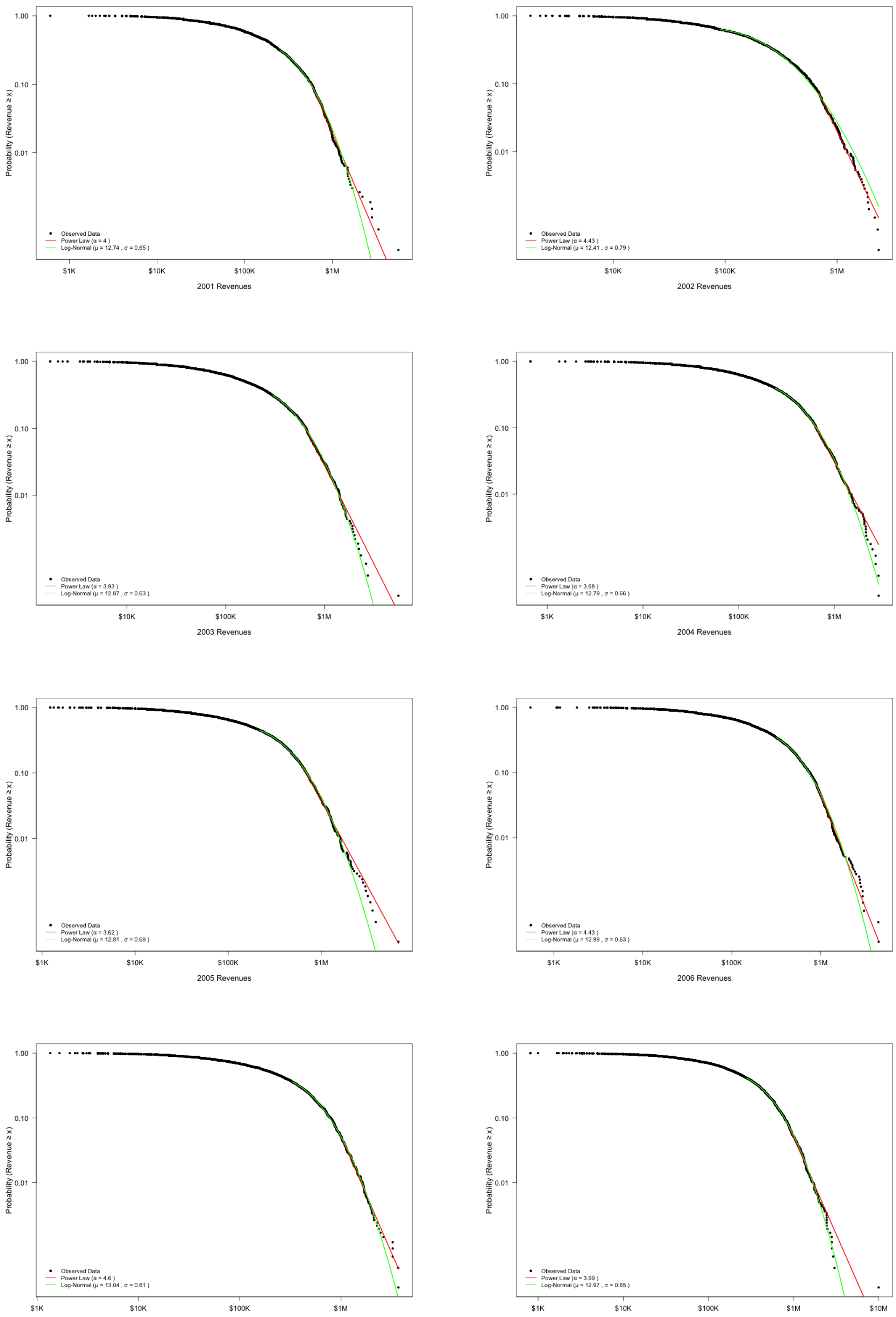


Figure 5 plots the complementary cumulative distribution of annual lobbying revenues on log-log scales for each year from 2001–2008. For each year, we show the observed data (points) and fitted power law (red line) and log-normal (green line) distributions. The plots are created using the **poweRlaw** package implementing methods from Clauset et al. (2009), with minimum tail thresholds estimated to optimize distributional fit. The x-axis shows revenue levels from \$10 to \$10,000,000 on a logarithmic scale, while the y-axis shows the probability of observing revenue greater than or equal to x on a logarithmic scale from 0.01 to 1.00. Each panel includes fitted parameter values.

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