Working for the Revolving Door*

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Abstract

Government connections are crucial for revolving-door lobbyists, but their value depends on former colleagues remaining in government. We develop a model analyzing how this interdependence shapes revolving-door careers, revenues, and the effects of regulations. We characterize which workers enter government and when they revolve, showing that most revolvers exit fairly quickly while a smaller group exit after much longer government tenures. These senior revolvers become superstars who earn the highest revenues due to their highly valuable connections, but their premium fades as they lose connections. These connection dynamics amplify revenue inequality among lobbyists. Additionally, revolving-door regulations generate indirect effects by altering the flow of connections, which can reinforce or counteract their intended direct effects. Comparing policies, we find that cooling-off periods are particularly effective, both curtailing lobbying output and selecting for more motivated workers who serve longer tenures. Raising government wages can backfire, by raising the value of revolving-door connections while worsening government selection and turnover.

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1 Introduction

Lobbying is a cornerstone for many firms and interest groups aiming to influence policy. In 2024, lobbying spending in the U.S. more than doubled the combined total raised by the campaign committees of the two presidential nominees (OpenSecrets.org). Much of that spending is oriented towards gaining access and influence with policymakers, which requires hiring effective lobbyists.

Accordingly, lobbying firms actively recruit former government workers, such as legislative staffers and bureaucrats, as *revolving-door lobbyists*.[1] Their government experience makes them highly valuable, and the prospect of lucrative lobbying careers shapes the public sector workforce by attracting workers to government (Salisbury and Shepsle, 1981), influencing their behavior while in government (Shepherd and You, 2020), and motivating them to leave for lobbying (Egerod, 2022; Luechinger and Moser, 2024). Moreover, after leaving, revolving-door lobbyists may exert excessive influence on policy (Baumgartner et al., 2009; McKay and Lazarus, 2023). In the aggregate, these individual career decisions affect governance and markets.[2] Yet despite widespread regulatory scrutiny, we lack a clear understanding of how the revolving door is shaped by individual career dynamics.

A key selling point of revolving-door lobbyists is their *government connections* (Levine, 2009; Bertrand et al., 2014; Luechinger and Moser, 2024).[3] These connections facilitate lobbying by securing meetings (Levine, 2009), conveying policymakers' preferences (Drutman, 2015; Strickland, 2023), and building trust for information transmission (McCrain, 2018; 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, 2018). 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 study how the interdependent and dynamic nature of connections shapes revolving-door careers, revenues, and regulations. We develop a dynamic model of career decisions by potential revolvers in which government connections are endogenous—depending

[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, government turnover worsens performance (Crosson et al., 2018; Ommundsen, 2023; Akhtari et al., 2022), and revolvers may favor prospective employers (Cornaggia et al., 2016; Tabakovic and Wollmann, 2018; Li, 2024). On the positive side, revolving-door opportunities may attract workers to government and incentivize effort (deHaan et al., 2015; Kempf, 2020; Shepherd and You, 2020).

[3] (Rosenthal, 2000, pg. 218) claims "[r]elationships are the primary vehicle of influence for the contract lobbyist" and (Cain and Drutman, 2014, pg. 42) provide evidence for retiring staffers' "personal relationships being their most valuable attribute."

on the career choices of other workers—and erode as former colleagues exit government. Workers initially choose whether to enter government or the private sector. Those who enter government then decide when to exit into lobbying. Some workers enter government due to intrinsic public service motivation and to build human capital—government experience and connections—that is valuable for lobbying.

The key feature of our model is that government connections are endogenous. They persist until former colleagues leave government, so each revolver's revenues depend on the career decisions of other workers. Parsing the consequences of this interdependence is the core of our analysis. To emphasize the contingent value of connections, our baseline model abstracts from electoral turnover, labor market frictions, and policymaking dynamics. It applies most directly to unelected government workers, such as congressional staffers or bureaucrats, who form the bulk of revolving-door lobbyists.[4] However, our insights can also apply to politicians and other settings with revolving connections, such as credit ratings analysts who transition to investment banking.

We study how the contingent value of connections affects three sets of outcomes: revolving-door careers, the distribution of lobbyists' revenues, and the effects of regulations intended to curb the revolving door.

We first establish existence of a stationary equilibrium and characterize the distribution of workers across sectors. Workers make different career choices for two reasons. First, workers vary in their public service motivation—i.e., their intrinsic taste for government service. Second, all else equal, more government experience increases a worker's value in the lobbying sector, so each individual's calculus evolves over time. Since workers with higher public service motivation enjoy government more, they are more inclined both to enter and to stay. Workers with low public service motivation join the private sector directly; those in an intermediate range enter government but revolve after a moderate stint; and those with the highest motivation remain so long that most retire before they are willing to revolve. Government tenures are increasing and convex in public service motivation, so revolvers with substantial government experience are drawn from a shrinking set of highly motivated workers.

We analyze how endogenous connections shape lobbyists' revenues, a prominent measure of their output and wages (Blanes i Vidal et al., 2012; Ban et al., 2019; Bombardini and Trebbi, 2020). Because government experience and connections are complements, their interaction amplifies inequality. The top earners are superstars of a particular kind—recent

[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).

revolvers with long government careers—and their elite status is temporary as their connection stocks erode. To isolate how contingent connections contribute to this revenue inequality, we compare against a counterfactual economy in which workers face identical career incentives but connections are fixed. We show that endogenous connections increase any inequality measure consistent with the Lorenz ordering, such as the Gini index. To ground this analysis, we also document two empirical patterns in U.S. lobbyist revenues consistent with the role of depreciating connections: individual revenues do not clearly increase with lobbying tenure, and the revenue distribution exhibits persistently high inequality.

Finally, we study how connections mediate the effects of two policy instruments intended to address the revolving door: government wages and *cooling-off periods*. Higher wages directly attract workers to government and discourage revolving, which slows the outflow of government workers and increases lobbyists' connection stock, generating an indirect effect that incentivizes revolving—particularly among longer-tenured government workers. Under cooling-off periods, lobbyists must wait before generating revenues *and* lose connections while doing so, which directly reduces the value of revolving and, in turn, discourages entry into government but also encourages government workers to stay longer.

We analyze aggregate effects using two objectives capturing prominent considerations for regulating the revolving door: (i) government output, which depends on the intrinsic motivation and experience of the public-sector workforce, and (ii) total lobbying output, which reflects the aggregate influence of revolving-door lobbyists. We show via numerical analyses how the two instruments affect these objectives in distinct ways. We find that higher wages substantially increase lobbying output while having a limited—and potentially negative—effect on government output. In contrast, cooling-off periods both increase government output and reduce lobbying output, as they help retain experienced and highly motivated workers while also directly reducing total lobbying output. Thus, cooling-off periods may be a particularly effective instrument for addressing the revolving door.

We conclude by discussing three extensions: a fixed-size government, in-government actions that affect lobbying payoffs, and a price of lobbying services that depends on the aggregate supply of revolvers. The qualitative characterization of career paths and revenues is unchanged. In-government behavior depends on whether the actions complement or substitute for connections. Endogenous lobbying prices introduce additional equilibrium effects when considering comparative statics, which are distinct from the effects due to endogenous connections.

2 Connections with the Literature

This paper contributes to understanding how post-government employment opportunities influence public sector careers and subsequent lobbying outcomes.[5] 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 incorporating 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) abstract 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 departs from other models of the revolving door studying the interaction between a single regulator and firm (Che, 1995; Salant, 1995).

We also shed light on political selection into government careers.[6] 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 affecting policy implementation (Forand et al., 2023). Previous work investigates how public-sector compensation (e.g., Francois, 2000; Besley and Ghatak, 2005; Delfgaauw and Dur, 2008; Prendergast, 2007; Dal Bó et al., 2013) and bureaucratic discretion (Gailmard and Patty, 2007) influence selection into government when workers have intrinsic public service motivations. We show that revolvers' need for connections alters how wages affect entry and retention.

Complementary to our approach, Fisman et al. (2025) find that revolving-door laws deter entry into state legislatures and reduce incumbent turnover, and Gamalerio and Trombetta (2025) find that longer cooling-off periods in Italy altered the characteristics of political candidates. Our model provides a structural account of an underlying mechanism—the interdependence of career incentives through connections—that can generate such responses.

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

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

3 Model

We study a dynamic model in which workers choose whether to enter government and, conditional on entering, whether to transition to lobbying through the revolving door. Our key contribution is to incorporate the interdependence of government connections. To isolate the role of endogenous connections, we keep the remainder of the environment deliberately parsimonious, abstracting from market frictions and political uncertainty.

3.1 Model Set-up

Players and timing. Time is continuous, indexed by $t \in [0, \infty)$. At each date there is a continuum of workers. Workers exit according to a Poisson process with rate $\delta > 0$ and are immediately replaced by a newborn worker of age 0. A newborn worker i draws *public service motivation* ψ_i (independently of age) from a strictly increasing distribution function G with full support on $\mathbb{R}$ and continuous density g. Workers are thus heterogeneous in age and public service motivation.

Each worker initially chooses between entering government and the private sector. Subsequently, at each instant t in which worker i is in government, she chooses whether to remain in government or to revolve into lobbying. Once worker i enters the private sector or revolves into lobbying, she makes no further choices. Let $\mathbf{1}^g_{it} \in \{0, 1\}$ indicate whether worker i is in government at time t.

Connections. A worker's connections at date t are the other workers who overlapped with her in government and who still remain in government at t. Formally, workers i and j are *connected* if there exists t' such that $\mathbf{1}^g_{it'} = 1$ and $\mathbf{1}^g_{j\,t'} = 1$. Worker i's government connections at time t are given by the set

$$\left\{ j \;\middle|\; \mathbf{1}^g_{j\,t} = 1 \;\text{ and }\; \exists t' \leq t \text{ such that } \mathbf{1}^g_{it'} = \mathbf{1}^g_{j\,t'} = 1 \right\}.$$

Let q_{it} denote the Lebesgue measure of this set. We refer to q_{it} as worker i's *connection stock* at time t. Notice that, after leaving government, a worker's connection stock will depreciate endogenously over time as her connections exit government.

Lobbying output. After revolving, a worker's lobbying output at time t depends on (i) her government tenure and (ii) her connection stock. Specifically, suppose worker i enters government at time t_1 and exits at time $t_2 > t_1$. Her government tenure is then $\tau_g \equiv t_2 - t_1$,

and for $t \geq t_2$, her lobbying output is

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

where $v : \mathbb{R}_+ \to \mathbb{R}_+$ captures the effect of government tenure on the productivity of a given connection stock. Thus, government tenure and connections both raise lobbying output and they are complements.

We impose the following assumptions on v: $v'(\tau_g) > 0$, $v''(\tau_g) \leq 0$, and $v'''(\tau_g) \geq 0$ for all τ_g; $\lim_{\tau_g \to \infty} v(\tau_g) = \infty$ and $\lim_{\tau_g \to \infty} v'(\tau_g) < \infty$.

Payoffs. Workers receive wage income throughout their careers and, while in government, derive flow utility from public service motivation. Let z_{it} denote worker i's income at time t and let $\rho > 0$ denote the discount rate. Thus, the effective discount rate is $\delta + \rho$, and worker i's expected lifetime payoff is

$$\int_0^\infty e^{-(\delta+\rho)t} \cdot \left(z_{it} + \mathbf{1}_{it}^g \, \psi_i \right) dt. \tag{2}$$

The flow payoff from income in the private sector is $z_{it} = w_p > 0$ and in government $z_{it} = w_g > 0$, both exogenous. In lobbying, income equals output, $z_{it} = y_\ell(q_{it}, \tau_g)$, with the price of lobbying output exogenous and normalized to 1 (we relax this in Section 7.1). We refer to y_ℓ as a worker's *lobbying revenue*.

Finally, we assume that revolving immediately always yields lower income than entering the private sector, $y_\ell(\frac{1}{\delta}, 0) < w_p$.

3.2 Equilibrium

We focus on stationary equilibrium in which: (i) a worker's decisions only depend on her public service motivation and government tenure, and (ii) the cross-sectional distribution of worker characteristics across sectors is constant over time.

Stationary strategies. A stationary strategy in our model is a pair $\sigma = (\gamma, \eta)$. A worker's entry decision is characterized by a function $\gamma : \mathbb{R} \to \{0, 1\}$, with $\gamma(\psi) = 1$ indicating that a newborn of type ψ enters government. The function $\eta : \mathbb{R} \times [0, \infty) \to \{0, 1\}$ is the exit rule, which is nondecreasing in τ_g with $\eta(\psi, \tau_g) = 1$ denoting that a worker with public service motivation ψ has exited into lobbying by government tenure τ_g.[7]

[7] We assume throughout that players use measurable strategies. Since exit is irreversible, a worker revolves at the first tenure at which $\eta(\psi, \tau_g) = 1$.

Steady state. Normalizing the inflow of newborn workers to one, the time-invariant mass of workers with age in $[a, a + da]$ is $e^{-\delta a} da$, which gives total population mass $1/\delta$. With stationary strategies, the steady state mass of government workers with public service motivation and government tenure in $[\psi, \psi + d\psi] \times [\tau_g, \tau_g + d\tau_g]$ is

$$d\mu^g(\psi, \tau_g; \sigma) = e^{-\delta \tau_g} \cdot \gamma(\psi) \cdot (1 - \eta(\psi, \tau_g))\, dG(\psi)\, d\tau_g. \tag{3}$$

This then implies that worker masses and characteristics in the private and lobbying sectors are constant over time as well.

The *lobbying tenure* of a worker age a who revolved after government tenure τ_g is $\tau_\ell \equiv a - \tau_g$. After revolving, a worker does not overlap with any new government workers. Fixing a strategy σ, the connection stock of a worker in the steady state only depends on her lobbying tenure τ_ℓ and satisfies

$$q(\tau_\ell; \sigma) = \int_{\mathbb{R} \times [\tau_\ell, \infty)} d\mu^g(\psi, \tau_g; \sigma). \tag{4}$$

Continuation values. Given a σ, the continuation value to a worker from revolving after government tenure τ_g is

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

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

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

Finally, the continuation value to entering the private sector is

$$V_p = \frac{w_p}{\delta + \rho}.$$

Equilibrium definition. For each ψ, define the worker's optimal government tenure and associated continuation value under strategy profile σ as:[8]

$$\tau_g^*(\psi; \sigma) \equiv \arg\max_{\tau_g \in [0,\infty]} V_g(\tau_g, \psi; \sigma) \qquad \text{and} \qquad V_g^*(\psi; \sigma) \equiv \max_{\tau_g \in [0,\infty]} V_g(\tau_g, \psi; \sigma).$$

[8]We use $\tau_g = \infty$ to denote never revolving, with $V_g(\infty, \psi; \sigma) = \frac{\psi + w_g}{\delta + \rho}$. The objective extends continuously to $[0, \infty]$ for any profile σ (see the proof of Proposition 1).

An *equilibrium* is a strategy profile $\sigma^* = (\gamma^*, \eta^*)$ that satisfies:

(i) *optimal entry*: $\gamma^*(\psi) = \mathbf{1}\{V_g^*(\psi; \sigma^*) \geq V_p\}$ for all ψ;

(ii) *optimal revolving*: $\eta^*(\psi, \tau_g) = \mathbf{1}\{\tau_g \geq \tau_g^*(\psi)\}$ for all (ψ, τ_g); and

(iii) *connections consistency*: the mass of government workers satisfies condition (3) and $q(\tau_\ell; \sigma^*) = \int_{\mathbb{R}\times[\tau_\ell,\infty)} d\mu^g(\psi, \tau_g; \sigma^*)$ for all τ_ℓ.

3.3 Discussion of the Model

Upon joining government, a worker immediately connects to current government workers, but connections are only valuable if she stays and builds tenure. Experience complements connections through v, which captures various factors: workers with longer tenures may hold more influence, maintain better reputations with former colleagues, or possess specific expertise.[9] Including a separate additive term for experience would not change the main forces we analyze. Furthermore, our results are robust to weighting connections by their tenure (e.g., allowing a connection to a more senior worker to be more valuable). More broadly, our model abstracts from other aspects of building connections (e.g., time spent together, meeting others gradually), but the key forces driving our main results—that time in government raises the value of connections and that this value is contingent on the connection remaining in government—arise under these alternative specifications.

Throughout, we compare our model to one where the endogenous aspect of connections is shut down. To facilitate 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 fixed-connections setting can also be interpreted as a pure expertise/experience benchmark. In Section 5.3, we choose $\overline{q}$ to ensure workers face identical incentives in both settings, enabling a clean comparison of distributional effects.

To emphasize the role of endogenous connections, our model deliberately streamlines several aspects. We model lobbying payoffs in reduced form, without tying our insights to any particular lobbying approach (see, e.g., Grossman and Helpman, 2001; Bombardini and Trebbi, 2020; Schnakenberg and Turner, 2023, for overviews). We do not model involuntary turnover (e.g., elections) since many lobbying issues are not electorally salient and bipartisan connections are common.[10] We do not model re-entry into government, since it is empirically rare (Kalmenovitz et al., 2022; Luechinger and Moser, 2024) and not a primary consideration in the standard lobbyist calculus in which government jobs are often seen as "a way station

[9] Egerod et al. (2024) argues that "connections and information are likely to complement each other." Longer tenure may facilitate stronger relationships or greater expertise (Drutman, 2015; Strickland, 2023), and lead to older relationships that "allow you to cut through things" (Dale Florio, NJ lobbyist, in Rosenthal, 2000, pg. 120).

[10] "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).

to wealth" (Levine, 2009, pg. 65).[11] Finally, our model emphasizes connections between workers, rather than between workers and politicians, since connections to staffers are critical as they control access to legislators, draft critical policy details, and "make the wheels go round" (Leech, 2013, pg. 180).[12]

After our main analysis, we discuss three extensions. First, we fix the size of the government workforce. Second, we allow workers to choose actions in government—capturing effort or corruption—that affect their future lobbying wages. Third, we endogenize the price of lobbying services by allowing it to be set in a competitive sector.

4 Characterization of Equilibrium

We establish existence of equilibrium and characterize entry and exit decisions. We show that: (i) workers with sufficiently low public service motivation never enter government, (ii) among those who enter, government tenure is strictly increasing in ψ_i—lower-motivation workers leave earlier, while higher-motivation workers stay longer—and (iii) tenure is convex in public service motivation, so workers with very high ψ_i are "government lifers" likely to exit through exogenous attrition rather than revolving. Crucially, these individual decisions depend on expectations about lobbying wages, which in turn depend on aggregate revolving behavior through connections. Proofs can be found in the Appendix.

4.1 Exit decision

To begin, we analyze the exit decision for a government worker, taking as given the expected evolution of connections. Intuitively, workers weigh their value from continued government service against their potential lobbying wages. Specifically, staying in government provides utility through two channels. The first is the direct benefit from further public service and wages (through $\psi_i + w_g$), and the second is the increased future benefit because a longer tenure increases the effectiveness of the connection stock through $v(\tau_g)$. On the other hand, leaving through the revolving door provides a flow of lobbying income.

Each worker's payoff from revolving depends on her government tenure and anticipated

[11] For instance, the lobbyist Lyle Dennis notes that "it often only revolves one way" (Leech, 2013, pg. 98). Models of re-entry emphasize distinct motives such as influencing policy (Hübert et al., 2023) or regulatory capture (Dal Bó, 2006). Relatedly, we assume workers cannot enter the private sector after revolving. This simplifies the presentation but does not affect our key insights. The revolving payoff would be $\max\{w_p, q(\tau_\ell)v(\tau_g)\}$, which increases minimum revolver revenue but does not substantially alter our inequality results.

[12] 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).

flow of connections. Given a strategy profile σ, each prospective revolver can forecast her connection stock at each future date. Recall that, under stationarity, $q(\tau_\ell; \sigma)$ denotes a worker's connection stock and this only depends on her lobbying tenure τ_ℓ. When a worker is deciding whether to exit, what matters is not just today's connection stock, $q(0; \sigma)$, but the entire lifetime discounted connection stock. Suppressing dependence on σ, we denote this cumulative quantity as Q, where

$$Q = \int_0^\infty e^{-(\delta+\rho)\tau_\ell} q(\tau_\ell; \sigma) d\tau_\ell. \tag{5}$$

Each connection lasts until the contact leaves government, either exogenously or endogenously. Thus, Q depends on how many workers choose to enter government and the duration of their government tenures, as well as the effective discount rate.

Therefore the dynamic payoff from revolving after government tenure τ_g is

$$V_r(\tau_g; Q) = v(\tau_g) \cdot Q.$$

Consequently, the continuation payoff to a type ψ_i worker from entering government and then revolving after a tenure τ_g is

$$V_g(\tau_g, \psi_i; Q) = \frac{1 - e^{-(\delta+\rho)\tau_g}}{\delta + \rho} \cdot (\psi_i + w_g) + e^{-(\delta+\rho)\tau_g} \cdot v(\tau_g) \cdot Q. \tag{6}$$

When worker i enters government, she stays until reaching her optimal government tenure τ_g^*. Each worker's optimal government tenure balances her anticipated lobbying wages against her benefits from continued government service. In equilibrium, if i enters government, then τ_g^* solves the first-order condition

$$(\delta + \rho) \cdot v(\tau_g) \cdot Q = \psi_i + w_g + v'(\tau_g) \cdot Q. \tag{7}$$

Each worker's optimal tenure balances two forces. The left-hand side of (7) is the marginal cost of remaining in government for an additional instant: the worker risks losing the revolving payoff $v(\tau_g) \cdot Q$ due to exogenous attrition (at rate δ) and delays the return on this value (at rate ρ). The right-hand side is the corresponding marginal benefit: the direct flow utility from continued government service, $\psi_i + w_g$, and the rate at which additional tenure increases the present value of the revolving payoff, $v'(\tau_g) \cdot Q$. 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 entering cohort anticipate the same lobbying wages if they revolve at the same time, but they differ in their public service motivation. Inspecting

equation (7), the gain from remaining in 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* $\psi_i \leq \overline{\psi}^*(\tau_g)$.

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. For convenience, we define the function $c(\tau_g) \equiv (\delta+\rho)\, v(\tau_g) - v'(\tau_g)$, which is strictly increasing and satisfies $c'(\tau_g) = (\delta+\rho)\, v'(\tau_g) - v''(\tau_g) > 0$ and $\lim_{\tau_g \to \infty} c(\tau_g) = \infty$. Then, equation (7) yields:

$$\overline{\psi}^*(\tau_g) = Q \cdot \Big((\delta + \rho) \cdot v(\tau_g) - v'(\tau_g) \Big) - w_g = Q \cdot c(\tau_g) - w_g. \tag{8}$$

For a given Q and any $\psi_i > \overline{\psi}^*(0)$, worker i's equilibrium tenure τ_g^* satisfies:

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

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, in equilibrium, Q must also be consistent with $\overline{\psi}^*$ through the steady-state connections condition.

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

$$\max_{\tau_g} V_g(\tau_g; \psi_i, Q) \geq \frac{w_p}{\delta + \rho}. \tag{9}$$

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* $\psi_i \geq \underline{\psi}^*$.

Notably, 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 are jointly determined.

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:

$$q(\tau_\ell) = \int_{\tau_\ell}^{\infty} e^{-\delta a} \cdot \Big(1 - G\Big(\max\{\underline{\psi}, \overline{\psi}(a)\}\Big)\Big)\, da, \tag{10}$$

and notice that for workers currently in government age a and tenure τ_g are equivalent.

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_ℓ does not overlap with any workers with ages 0 to τ_ℓ. Second, their connections are lost via attrition as former colleagues (exogenously) die or (endogenously) leave for lobbying: among workers of each age $a \geq \tau_\ell$, only a mass $e^{-\delta a}$ are still alive and only those with public service motivation $\psi \geq \max\{\underline{\psi}, \overline{\psi}(a)\}$ are still in government. Consequently, the measure of i's connections who have age $a \geq \tau_\ell$ is $e^{-\delta a} \cdot \Big(1 - G\big(\max\{\underline{\psi}, \overline{\psi}(a)\}\big)\Big)$. An entry threshold $\underline{\psi}$ and exit function $\overline{\psi}$ jointly determine equation (10) and, in turn, the total discounted connections Q.

Proposition 1 delivers existence and characterization of equilibrium.

Equilibrium behavior is characterized by a triple $\big(\underline{\psi}^*, \overline{\psi}^*(\tau_g), Q^*\big)$ that solves equations (11)–(13), which express the entry indifference condition (9) for the marginal entrant, the exit cutoff (8), and the discounted value of connections given their steady-state dynamics (10).

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

$$\underline{\psi} = \frac{w_p - (\delta+\rho) \cdot e^{-(\delta+\rho)\overline{\psi}^{-1}(\underline{\psi})} \cdot v\big(\overline{\psi}^{-1}(\underline{\psi})\big) \cdot Q}{1 - e^{-(\delta+\rho)\overline{\psi}^{-1}(\underline{\psi})}} - w_g, \tag{11}$$

$$\overline{\psi}(\tau_g) = Q \cdot \Big((\delta+\rho) \cdot v(\tau_g) - v'(\tau_g)\Big) - w_g, \tag{12}$$

$$Q = \int_0^{\infty} e^{-(\delta+\rho)\tau_\ell} \int_{\tau_\ell}^{\infty} e^{-\delta a} \cdot \Big(1 - G\Big(\max\{\underline{\psi}, \overline{\psi}(a)\}\Big)\Big)\, da\, d\tau_\ell. \tag{13}$$

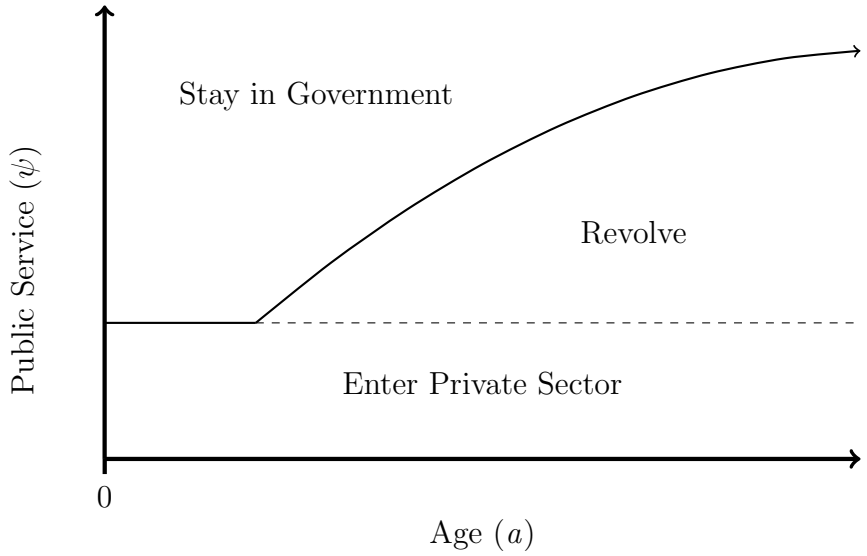
In equation (11), $\overline{\psi}^{-1}(\underline{\psi})$ denotes the optimal tenure of the marginal entrant, which is well

defined because—as shown next in Proposition 2—we have $\underline{\psi}^* > \overline{\psi}^*(0)$ in any equilibrium.

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, a) worker is in at a date t.

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.

Figure 1. Equilibrium Career Choices



Note: Figure 1 shows the sector of each worker at a given date, as a function of public service motivation ψ and age a.

Proposition 2 derives a lower bound on ψ for government entry and shows that no workers revolve immediately. First, since the option value of revolving must be weakly positive, everyone who prefers government service to private-sector wages will enter. Second, government workers need to build the value of their connections, which initially occurs quickly and justifies waiting.[13] Third, government tenure is increasing and convex in public service motivation. As tenure grows, the marginal gain from waiting longer diminishes (through v'), so revolving becomes relatively more appealing at longer tenures, and offsetting this force requires higher public service motivation. Consequently, although every government worker could in principle serve a long tenure to raise her value as a lobbyist, workers with greater ψ stay longer—disproportionately so if $v'' < 0$.

[13] More generally, no entrant revolves immediately if immediate revolving is worth less than a private-sector career, i.e., $v(0) \cdot Q^* < \frac{w_p}{\delta+\rho}$, which holds under the maintained assumption $y_\ell(1/\delta, 0) < w_p$ (see Lemma 2).

Propositions 1 and 2 characterize cohort career dynamics. After an initial period building connections, the least public-minded entrants begin revolving, and more motivated workers exit at increasingly longer tenures. Because G has full support, revolving never stops, and the remaining government workers in each cohort are those with sufficiently high public service motivation. Exits at very long tenures come only from the scarce upper tail of the motivation distribution.

Finally, these results also shape the composition of revolvers at each date. Among workers of the same age, revolvers have lower public service motivation than those still in government, and revolvers with longer government tenures have higher motivation than those who exited earlier. Because long-tenure revolvers come only from the upper tail of G, the flow of new revolvers includes younger workers with a comparatively wide range of ψ alongside a trickle of more senior, high-ψ workers.

5 Revolver Revenues

We now analyze how endogenous connections shape lobbying revenues. Revenues are a widely used measure of revolvers' output and wages (Blanes i Vidal et al., 2012; Ban et al., 2019; Bombardini and Trebbi, 2020) and, by extension, their influence or value. We characterize how individual revenues evolve, establish the emergence of temporary superstars, and show that endogenous connections amplify revenue inequality.

Existing empirical work suggests that connections dynamics may impact revenues, as they decrease when revolvers lose specific government connections (Blanes i Vidal et al., 2012) and depreciate as their connections erode over time (McCrain, 2018; Strickland, 2023). To further ground our theoretical analysis, we begin by documenting two additional empirical patterns in revolvers' revenues. First, individual revenues do not clearly increase with lobbying tenure. Second, the revenue distribution has very high inequality. These patterns differ from most industries and do not clearly follow from standard human capital explanations, but we show they are consistent with connections being a depreciating asset.

5.1 Empirical Patterns: Revenue Dynamics and Inequality

We analyze revenues of U.S. federal lobbyists from 1999–2008 using data from Blanes i Vidal et al. (2012), which cover the universe of registered federal lobbyists. The data derive from semi-annual disclosure reports filed under the Lobbying Disclosure Act (LDA) of 1995. Each observation is an individual lobbyist by six-month reporting period, with measures of total

lobbying revenue.[14] We focus on revolving-door lobbyists, defined as those with prior federal government employment.

Pattern 1: *Individual lobbyist revenues do not clearly increase with lobbying tenure.* We estimate how individual lobbyist revenue evolves over their careers, accounting for differences in lobbying ability. Our dependent variable is $\log\left(\frac{y_{it}}{\tilde{y}_i}\right)$, where y_{it} denotes lobbyist i's revenue in period t and $\tilde{y}_i$ denotes the average of i's first two reported revenues.[15] Our independent variable of interest is *tenure*: the number of periods since i's first positive-revenue period.

Our baseline sample consists of lobbyists who: (i) did not start lobbying in 1998 (addressing left-censoring), (ii) exited before 2008 (addressing right-censoring), (iii) lobbied for at least 3 years, and (iv) have no gaps in their lobbying careers.[16] To address potential selection on lobbying ability, we both subset by career length (comparing only lobbyists who remain in the industry for the same duration) and pool across career lengths with career-length fixed effects. Our primary specification is:

$$\log\left(\frac{y_{it}}{\tilde{y}_i}\right) = \alpha + \beta \cdot \text{Tenure}_{it} + \gamma_t + \varepsilon_{it}, \tag{14}$$

where γ_t are reporting-period fixed effects.

Table 1 reports estimates. We do not find clear evidence for positive returns to lobbying tenure, and some estimates suggest modestly negative returns. In Appendix C, we provide evidence that this pattern is robust to various adjustments to the sample, revenue measures, and specifications.

[14] Specifically, we use the variable `revw_worper` from Blanes i Vidal et al. (2012) and adjust revenues for inflation to 2008 dollars. For further discussion, see their paper.

[15] This normalization stabilizes the baseline revenue measure since lobbyists may only be active for part of their first reporting period. We drop the first two observations, require at least three years of lobbying, and show robustness to alternate normalizations in the Appendix (see Table C.4).

[16] Restriction (ii) conditions on exit, which could bias toward lobbyists with declining revenues if revenue declines prompt exit. In Appendix Table C.2, however, we relax this restriction and estimates are qualitatively similar.

Table 1. Revenue-Tenure Relationship for Revolving-Door Lobbyists

	By Career Length		Pooled
	3 yrs	4 yrs	3–6 yrs
Tenure coefficient ($\hat{\beta}$)	−0.062	−0.084	−0.039
	(0.063)	(0.076)	(0.028)
Lobbyists	62	37	135
Observations	241	214	780

Note: Estimates of β from equation (14). All specifications include period fixed effects; pooled specification includes career-length fixed effects. Standard errors clustered by individual.

This pattern contrasts with other labor markets, where wages typically increase with tenure as workers accumulate industry-specific human capital (Topel, 1991; Altonji and Williams, 2005). The absence of positive returns to lobbying tenure is consistent with a downward force offsetting any gains from accumulated lobbying experience. If government connections are a key asset for lobbyists, then the erosion of connections as former colleagues exit government provides one such force.

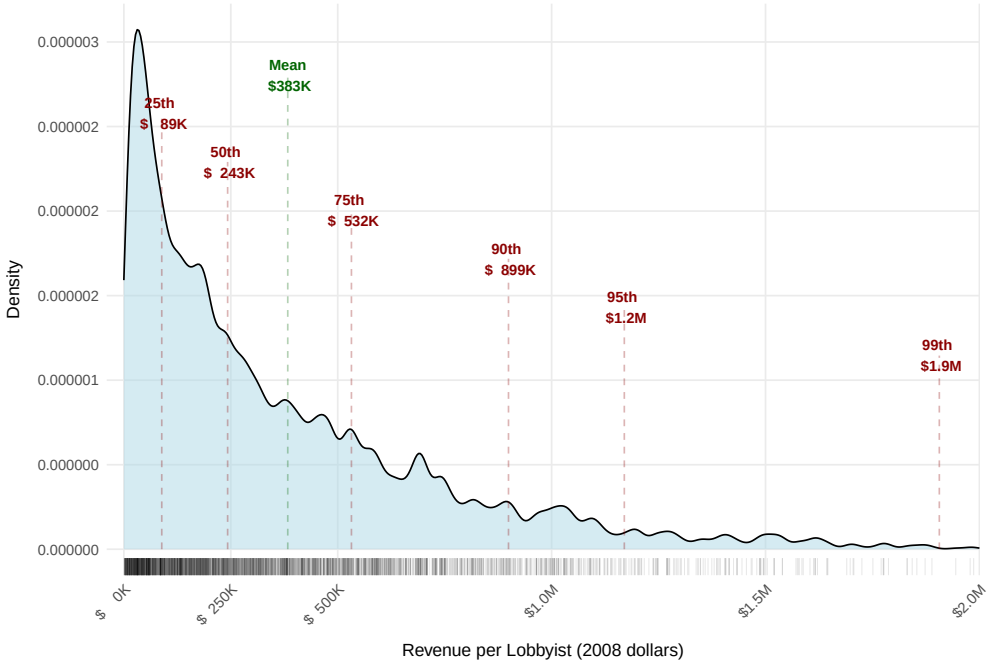
Pattern 2: *Persistently high inequality in revolvers' revenues.* We analyze the cross-sectional distribution of revenues. Figure 2 displays the 2008 distribution of individual revolver revenues, which exhibits pronounced right skew: mean revenue ($383,000) exceeds median revenue ($243,000) by 58%, and the Gini coefficient is 0.53. This level of inequality is not unusual. From 1999–2008, the Gini coefficient ranges from 0.53 to 0.55, mean-to-median ratios range from 1.54 to 1.69, and the distribution is consistently heavy-tailed.[17]

This inequality is high even among professions with skewed compensation. For a rough comparison, the Gini coefficient for U.S. lawyer salaries was approximately 0.47 in 2023, with mean-to-median ratios typically below 1.3.[18] Moreover, the revolver revenue distribution is highly concentrated despite lacking the canonical mechanisms that generate superstars in other contexts—scale effects from reaching larger audiences (Rosen, 1981) or complementarities between talent and firm size (Gabaix and Landier, 2008)—since individual lobbyists face natural limits on how many clients they can serve.

[17] See Appendix D for more details.

[18] Data from the Bureau of Labor Statistics Occupational Employment and Wage Statistics.

Figure 2. Distribution of Annual Revenues for Revolving-Door Lobbyists, 2008



Note: Kernel density estimate with markers indicating key percentiles. The 2008 distribution is heavy-tailed and cannot reject a log-normal form (see Appendix D).

5.2 Individual Revenues: Dynamics and Superstars

We begin by considering how an individual revolver's revenue varies over time. In equilibrium, a revolver's revenue depends on government tenure τ_g through v and lobbying tenure, $\tau_\ell = a - \tau_g$, through q. Specifically, to emphasize this dependence and suppress dependence on σ, we can rewrite (1) in terms of tenures as:

$$y_\ell(\tau_g, \tau_\ell) = v(\tau_g) \cdot q(\tau_\ell). \tag{15}$$

Holding age a fixed, revenue increases in τ_g through two complementary channels: greater experience, through v; and more remaining connections, through q, since higher τ_g implies lower τ_ℓ.

For a given revolver, revenue is highest immediately upon entering lobbying, $y_\ell(\tau_g, 0)$, and this maximum is increasing in government tenure τ_g. After revolving, her revenue decreases as τ_ℓ increases because the connection stock steadily erodes as former colleagues exit government. Moreover, y_ℓ is convex in τ_ℓ. A revolver's remaining connections at lobbying tenure τ_ℓ are the remaining government workers older than τ_ℓ. Therefore the connections she loses at the

margin are those of age exactly τ_ℓ, which is a mass that decreases with age via attrition and revolving (Proposition 2). Thus, the connection stock diminishes fastest at the beginning of lobbying careers. These revenue dynamics are endogenous via the equilibrium flow of workers through the revolving door. The resulting decline in individual revenues is consistent with the first empirical pattern documented above: revenues need not increase with lobbying tenure because connection decay can offset gains from accumulated lobbying experience.

Turning to the cross-section, revenues are highest among recent revolvers with long government tenure—i.e., low τ_ℓ and high τ_g. Lemma 3 sharpens this intuition. For sufficiently old cohorts, revenue is strictly convex in government tenure among the most recent revolvers, so revenues stretch out at the top of each cohort and the highest-τ_g revolvers earn substantially more than their cohort peers.

Lemma 3. *For all sufficiently large a, revenue $y_\ell(\tau_g, a-\tau_g)$ is strictly convex in τ_g for τ_g sufficiently close to a.*

Convexity arises for older workers because the marginal return to government tenure eventually diminishes (through v) while the marginal loss of connections accelerates (through q). Since $y_\ell(\tau_g, \tau_\ell) = v(\tau_g) \cdot q(a-\tau_g)$, we have:

$$\frac{d^2\, y_\ell}{d\tau_g^2} = v''(\tau_g) \cdot q(a-\tau_g) - 2v'(\tau_g) \cdot q'(a-\tau_g) + v(\tau_g) \cdot q''(a-\tau_g). \tag{16}$$

The first term is negative, reflecting diminishing returns to experience, but the latter two terms are positive since $q' < 0$ and (wherever it exists) $q'' > 0$.[19] The middle term captures the benefit of more remaining connections due to having stayed longer in government. The last term reflects that connections decay fastest immediately after revolving, so the marginal benefit of fresher connections is largest at low τ_ℓ.

Lemma 3 implies pronounced differences between the high revenue revolvers within the age cohorts that contain the highest revenue revolvers. This revenue inequality within these particular cohorts suggests that more broadly, across age cohorts, the highest revenue revolvers may earn substantially more than the others.

We next study the steady-state revenue distribution. Since revenues vary only through tenures τ_g and τ_ℓ, it is a transformation of the steady-state distribution of (τ_g, τ_ℓ). Lemma 4 establishes that τ_g and τ_ℓ are independent in the steady-state—τ_ℓ depends only on calendar time since revolving and the exogenous exit rate δ is constant—which facilitates the analysis.

Lemma 4. *In equilibrium, government tenure τ_g and lobbying tenure τ_ℓ are independent in the cross-section of revolvers.*

[19] The function q is twice differentiable except at $\tau_\ell = \overline{a}$, with $q'' > 0$ on both sides.

The preceding observations combine to yield several key properties for any upper tail of the revenue distribution, which are stated precisely in Proposition 3. To state them, for $\alpha \in (0,1)$, let y_α denote the revenue level such that a fraction α of revolvers earn more than y_α, and define TopShare_α as the share of total revenue earned by these top-α earners.

Proposition 3 establishes three key properties of high-revenue lobbyists: they are *superstars* who receive disproportionately large revenues, they have high government tenure τ_g *and* low lobbying tenure τ_ℓ, and their elite status fades over time as their connections erode.

Proposition 3. *For the top $\alpha \in (0,1)$ fraction of earners, we have: (i) $\text{TopShare}_\alpha > \alpha$, and $\frac{\text{TopShare}_\alpha}{\alpha}$ is strictly decreasing in α; (ii) $\mathbb{E}[\tau_g | \, y_\ell > y_\alpha] > \mathbb{E}[\tau_g]$ and $\mathbb{E}[\tau_\ell | \, y_\ell > y_\alpha] < \mathbb{E}[\tau_\ell]$; and (iii) every revolver with $y_\ell(\tau_g, 0) > y_\alpha$ eventually has $y_\ell(\tau_g, \tau_\ell) < y_\alpha$ for some finite $\tau_\ell > 0$.*

5.3 Connections and Revenue Inequality

We compare the equilibrium revenue distribution to a *fixed-connections* counterfactual in which individual lobbying revenues are $y_0(\tau_g) \equiv v(\tau_g) \cdot \overline{q}$, where $\overline{q} = (\delta + \rho) \cdot Q^*$ is a normalizing constant chosen so that $\int_0^\infty e^{-(\delta+\rho)\tau_\ell} \overline{q} \, d\tau_\ell = Q^*$. This normalization equates the discounted value of a lobbying career across the two settings, so workers face identical incentives and make identical entry and exit decisions. In the counterfactual, revenues depend only on τ_g and are constant in lobbying tenure τ_ℓ. Superstars are simply high-τ_g revolvers and their revenues remain constant until retirement. With endogenous connections, revenues instead vary through both τ_g and τ_ℓ, as connection decay introduces an additional source of variation. Superstars have long government tenure *and* revolved recently.

Proposition 4 shows that endogenous connections amplify revenue inequality. Specifically, the counterfactual fixed-connections revenue distribution *Lorenz dominates* the revenue distribution with endogenous connections. Thus, endogenous connections increase standard inequality measures, such as the Gini coefficient.

Proposition 4. *The revenue distribution in the fixed-connections counterfactual, R_0, strictly Lorenz dominates the revenue distribution with endogenous connections, R_ℓ. Thus, $\text{Gini}(R_\ell) > \text{Gini}(R_0)$ and $\text{TopShare}_\alpha(R_\ell) > \text{TopShare}_\alpha(R_0)$ for all $\alpha \in (0,1)$.*

Essentially, connection decay introduces an additional, independent source of revenue variation that compounds the inequality due to differences in government tenure by widening the gap between recent high-tenure revolvers at the top and longer-tenured lobbyists whose connections have eroded.

6 Revolving Door Regulations

Now we study the effects of policies that regulate the revolving door. The movement of workers between the public sector and lobbying affects government performance. On one hand, the prospect of lucrative lobbying opportunities can help draw workers into the public sector. On the other, those same opportunities lead to additional turnover as workers exit government. Moreover, by leveraging their connections, revolving-door lobbyists may be particularly successful at influencing policy in favor of their clients.

Given these potential impacts, there is significant interest in understanding how to alter the incentives of revolvers. In this section, we study two policy instruments for doing so: government wages w_g and *cooling-off periods*. Raising government wages is frequently highlighted as crucial for attracting and retaining public-sector workers,[20] and cooling-off periods restrict former government employees from certain lobbying activities for a designated duration.[21]

To incorporate cooling-off periods, we modify the model so that a revolver must wait λ units of time before generating revenue. For simplicity, we assume that a revolver's flow payoff during this waiting period is 0.[22] Thus, under a cooling-off period, the dynamic payoff for worker i who revolves after a government tenure τ_g is $v\big(\tau_g\big) \cdot Q(\lambda)$, where:

$$Q(\lambda) = \int_{\lambda}^{\infty} e^{-(\delta+\rho)\tau_\ell} \cdot q(\tau_\ell)\, d\tau_\ell. \tag{17}$$

The stationary equilibrium of the modified model is characterized analogously to the baseline model, but with Q^* now defined according to (17).

6.1 Effects on Individual Behavior

We start by studying how workers respond to a change in w_g or λ. Our analysis highlights that the equilibrium effects of connections can alter, and sometimes even reverse, the direct effects of increasing w_g or λ.

For government wages, the *direct* effect of increasing w_g encourages entry into government and discourages exit to lobbying. In the aggregate, these responses alter connection stock Q^*

[20] Low government wages have been explicitly linked to revolving-door turnover. See (McGehee, 2021) for recent Congressional testimony.

[21] Executive branch employees in the United States are banned from lobbying their former agency or colleagues for one or two years, depending on their level of seniority, and certain Congressional staffers are subjected to a one-year ban. Cooling-off periods are also often used outside the US.

[22] Although enforcement is imperfect, evidence suggests regulations alter behavior (Cain and Drutman, 2014; Kalmenovitz et al., 2022; Wirsching, 2023). The analysis extends to partial enforcement by allowing a reduced lobbying payoff during the cooling-off period.

and thus the value of revolving, producing *indirect* effects on behavior.

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

$$\frac{\partial V_g^*}{\partial w_g} = \underbrace{\frac{1 - e^{-(\delta+\rho)\tau_g^*(\psi_i)}}{\delta + \rho}}_{\text{Direct Effect} > 0} + \underbrace{e^{-(\delta+\rho)\tau_g^*(\psi_i)} \cdot v\big(\tau_g^*(\psi_i)\big) \cdot \frac{\partial Q^*}{\partial w_g}}_{\text{Indirect Effect}}. \tag{18}$$

If workers are sufficiently impatient (ρ large) then the direct effect determines the aggregate effect, so increasing w_g increases Q^*. Essentially, increasing government wages encourages entry, which then further encourages entry through greater connections.

The exit effects of w_g, however, are heterogeneous. Formally,

$$\frac{\partial \overline{\psi}^*}{\partial w_g} = \underbrace{-1}_{\text{Direct Effect} < 0} + \underbrace{\frac{\partial Q^*}{\partial w_g} \cdot \Big((\delta + \rho) \cdot v(\tau_g) - v'(\tau_g)\Big)}_{\text{Indirect Effect}}. \tag{19}$$

The direct effect encourages longer government tenures, but when ρ is large the indirect effect—via higher Q^*—encourages revolving and this force increases with government tenure. That is, the indirect effect on $\overline{\psi}^*$ strengthens as τ_g increases. Workers with long government tenures have highly valuable connections, through $v(\tau_g)$, so even a small increase in Q^* incentivizes them to revolve. Conversely, for low-tenure workers, the direct effect dominates. Consequently, for high ρ, increasing w_g shortens government tenures for high-ψ workers and, when the direct wage effect dominates near the entry margin, lengthens them for the lowest-ψ entrants.

Proposition 5 collects these observations.[23]

Proposition 5. *If ρ is sufficiently large then, at any equilibrium, a marginal increase in w_g: (i) increases Q^*, (ii) decreases $\underline{\psi}^*$, and (iii) decreases $\tau_g^*(\psi_i)$ for all ψ_i above a cutoff $\hat{\psi} \geq \underline{\psi}^*$ and increases it for all $\psi_i \in (\underline{\psi}^*, \hat{\psi})$. Moreover, the interval $(\underline{\psi}^*, \hat{\psi})$ is nonempty if and only if $\frac{\partial Q^*}{\partial w_g} \cdot c\big(\tau_g^*(\underline{\psi}^*)\big) < 1$.*

To clarify the role of endogenous connections, Corollary 1 characterizes the effects of w_g in the fixed-connections benchmark.[24]

Corollary 1. *In the fixed-connections counterfactual, increasing w_g will decrease $\underline{\psi}^*$ and increase $\tau_g^*(\psi)$ for all $\psi \geq \underline{\psi}^*$.*

[23] Since equilibria are not necessarily unique, Propositions 5 and 6 are local comparative statics (see Lemma A.3).

[24] Throughout, $\overline{q}$ is held fixed at its baseline value to isolate the direct effects of w_g and λ.

Without endogenous connections, higher wages always attract more workers and uniformly extend entrants' tenures ($\frac{\partial \overline{\psi}^*}{\partial w_g} = -1 < 0$). With endogenous connections, however, high-tenure workers may revolve sooner while low-tenure workers stay longer. Moreover, the wage effects on the exit margin change as government tenure increases. The indirect effect that encourages revolving grows, while the direct effect that discourages it remains constant. Formally, for ρ sufficiently large,

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

Now we consider how cooling-off periods affect workers' behavior. The duration of the cooling-off period changes the value of lobbying careers, thereby affecting incentives for both entering government service and subsequently transitioning into lobbying. Cooling-off periods directly decrease Q^* by causing lobbyists to lose connections during the waiting period. This discourages entry by reducing connections further but also discourages exit by making connections more durable, so the indirect effect is ambiguous. The overall effect of λ on Q^* is:

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

If workers are sufficiently impatient (high ρ), then the direct effect dominates and Q^* decreases. In turn, fewer workers enter government but they stay longer. Proposition 6 formally states these effects.

Proposition 6. *If ρ is sufficiently large then, at any equilibrium, a marginal increase in λ: (i) increases $\underline{\psi}^*$, (ii) decreases Q^*, and (iii) increases $\tau_g^*(\psi)$ for all $\psi \geq \underline{\psi}^*$.*

With sufficient impatience, the directional effects are the same for endogenous and fixed connections, but the indirect effect via connections alters the magnitude of change. Corollary 2 characterizes the fixed-connections setting.

Corollary 2. *In the fixed-connections counterfactual, increasing λ will: (i) increase $\underline{\psi}^*$, (ii) decrease $\overline{Q}(\lambda) \equiv \int_{\lambda}^{\infty} e^{-(\delta+\rho)\tau_\ell} \, \overline{q} \, d\tau_\ell$, and (iii) for ρ sufficiently large, increase $\tau_g^*(\psi)$ for all $\psi \geq \underline{\psi}^*$.*

6.2 Aggregate Effects

We consider two aggregate objectives that broadly capture in reduced-form many central concerns related to government capacity and revolving-door lobbying.

First, the revolving door affects the government's ability to attract and retain workers. Consistent with the literature on public service motivation (James, 1989; Perry and Wise, 1990), workers with higher ψ may be more productive.[25] In addition, high government capacity depends on retaining experienced workers. We therefore model aggregate government output as:

$$Y_g = \int_0^\infty e^{-\delta\tau_g} \int_{\max\{\overline{\psi}(\tau_g),\underline{\psi}\}}^\infty y_g(\psi,\tau_g)\, dG(\psi)\, d\tau_g,$$

where $y_g(\psi,\tau_g)$, the output of an individual worker, is increasing in both ψ and τ_g. We assume the simple functional form $y_g(\psi,\tau_g) = v(\tau_g)\cdot\max\{\psi,0\}$. This specification makes transparent how the forces in the model affect Y_g because additional workers do not increase government output once $\underline{\psi}$ is negative. To ensure Y_g is well defined, assume $\mathbb{E}[\max\{\psi,0\}] < \infty$, which holds for the Gumbel specifications in our numerical analyses. However, the qualitative mechanisms we emphasize do not depend on this exact functional form; what matters is that as $\underline{\psi}$ decreases, additional workers are less productive due to lower public service motivation and/or shorter tenures. We return below to how our results change if government tenure and ψ are instead substitutes in government production.

Second, after exiting, revolving-door lobbyists can leverage their connections to influence policy on behalf of their clients. We assume that a lobbyist's value for her client is captured by the output (or revenue) she generates, and interpret greater output as more socially costly.[26] Thus, the cost from lobbying by revolvers is proportional to total lobbying output:

$$Y_\ell = \int_0^\infty e^{-\delta a} \int_{\underline{\psi}}^{\max\{\overline{\psi}(a),\underline{\psi}\}} \mathbf{1}\big\{a - \tau_g^*(\psi) \geq \lambda\big\} \cdot\; y_\ell\big(q\big(a-\tau_g^*(\psi)\big),\tau_g^*(\psi)\big)\, dG(\psi)\, da, \quad (20)$$

where the indicator reflects that revolvers generate no output during the cooling-off period.

Increasing the government wage or cooling-off period affects both the entry and exit decisions of workers, and can therefore have several effects on Y_g and Y_ℓ. First, consider entry. Lowering $\underline{\psi}$ increases the mass of government workers, which increases Y_g. However, these marginal entrants have relatively lower ψ and in equilibrium have shorter government tenures. Thus, the marginal contribution to Y_g through entry is increasingly muted as $\underline{\psi}$ decreases. In terms of Y_ℓ, if more workers enter government then more eventually become revolvers. Additionally, revolvers will have more connections in government. Consequently, the entry effect also increases Y_ℓ.

[25] Models of the bureaucracy also emphasize intrinsic motivation for productive effort (e.g., Gailmard and Patty, 2007; Prendergast, 2007), and evidence suggests public service motivation improves performance (see Ritz et al., 2016, for a review).

[26] If lobbying is instead socially beneficial, e.g., due to information transmission, then the opposite interpretation should be used for evaluating welfare implications.

Second, consider increasing a worker's government tenure. Straightforwardly, if a worker stays longer this increases Y_g, as there are more workers in government and they obtain more experience. The effect of tenure on Y_ℓ is more subtle. On one hand, a longer government tenure raises a worker's lobbying productivity through $v(\tau_g)$. On the other, it also lowers the probability that the worker survives to become a revolver. Because v is concave in τ_g, while survival decreases exponentially with age, the first effect typically dominates for low tenure workers and the second for high tenure workers. Thus, increasing the tenure of low-ψ workers is a force for increasing Y_ℓ, whereas increasing the tenure of high-ψ workers is a force for decreasing it.

6.3 Numerical Analysis

Changing the public sector wage or cooling-off period affects both the entry and exit decisions of workers. This generates multiple competing effects on Y_g and Y_ℓ, making it difficult to sign comparative statics in general. As such, we conduct a numerical exercise designed to illustrate the consequences of changing regulations on Y_g and Y_ℓ.

Parameter values & functional forms. Our goal is not a full quantitative analysis but instead to clarify how key forces in the model qualitatively affect outcomes and show that endogenous connections shape regulatory consequences. We discipline parameters using moments from data on revenues and careers so that workers in the model face empirically plausible tradeoffs. In doing so, we highlight that endogenizing connections improves the model's fit to key features of the revenue distribution.

We set $\delta = .025$, implying an expected working life of 40 years, and the discount rate to $\rho = .05$ (both values are standard in the literature). We base w_g on the average wages for government workers with advanced degrees and choose w_p to be consistent with the estimated public-sector wage gap for such workers.[27] This yields values $w_p = 1.26$ and $w_g = .97$ (in units of \$100,000, inflation adjusted to 2008).[28] To keep lobbying compensation comparable to incomes in the government and private sector, we now assume that revolvers only keep a fraction s_ℓ of the revenue they generate. Absent direct evidence on this share, we take law-firm partners as a reasonable comparison group and set $s_\ell = .5$, as estimates for their compensation relative to originations (Major, Lindsey & Africa, 2024) and for average law-firm profits (Srinivasan, 2023) are often above 40%. Formally, s_ℓ scales the worker's payoff from lobbying—her dynamic payoff from revolving after tenure τ_g becomes $s_\ell\, v(\tau_g)\, Q$—while

[27] We focus on workers with advanced degrees since potential revolvers likely have high outside options.

[28] We convert the 2010 average hourly wages in Falk (2012) into annual income (40 hours/week × 52 weeks) and then deflate to 2008 dollars.

Y_ℓ continues to measure gross lobbying output.[29] Finally, we set the cooling-off period to be one year, $\lambda = 1$, which is a common duration (see footnote 21).

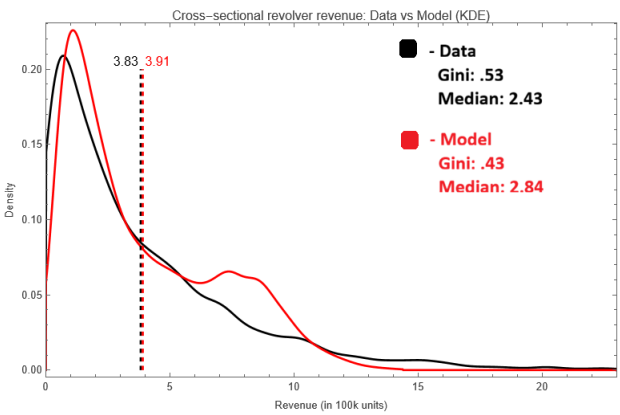
We assume $v(\tau_g) = r \cdot \log\big(1 + \tau_g\big)$, and that ψ is drawn from a Gumbel distribution with location parameter μ and scale parameter fixed to 1. Lacking estimates for the parameters r and μ, we calibrate them to target two moments: average revolver lobbying revenue in 2008 and average government tenure for federal workers in 2008.[30] This yields $\mu \approx -3.244$ and $r = 5.6$. Given our stylized environment, μ and r account for a number of unmodeled factors in fitting the data, and thus should not be taken directly as estimates for the empirical distribution of public service motivation.

Under this specification, the model generates an average annual revolver revenue of $\$391,000$ (data: $\$384,000$) and average government tenure of 9.3 years (data: 9.9 years, U.S. Bureau of Labor Statistics, 2008). Figure 3A compares the model distribution of revenue to the empirical distribution of revolver revenue for 2008. Despite only targeting the mean, the model reasonably approximates the overall shape of the distribution, with a median revenue of $\$284,000$ (data: $\$243,000$) and Gini coefficient .43 (data: .53). Moreover, the endogeneity of connections is important for generating this inequality. Figure 3B plots the empirical distribution of revenue against the fixed-connections model (holding Q fixed at the baseline Q^*). The fixed-connections alternative still matches the mean reasonably well ($\$418,000$ per year), but the median is too high ($\$404,000$ per year), and overall the distribution does not exhibit enough inequality (Gini = .06).

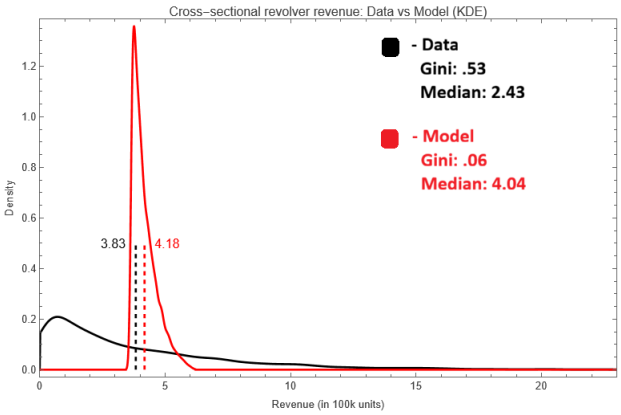
Effects of revolving door regulations. Having established face validity for the importance of connections under a reasonable parameter specification, we now analyze how Y_ℓ and Y_g vary with revolving door regulations via w_g and λ. First, Figure 4A plots how Y_g and Y_ℓ change as w_g increases from .97 to 1.29. The effect of w_g on Y_g is minimal: over this range, which ends slightly above $w_p = 1.26$, Y_g changes by less than 3% and Y_g is *decreasing* throughout. The muted response of Y_g reflects the countervailing effects of entry and tenure. Increasing w_g increases Y_g through the entry effect because it lowers $\underline{\psi}^*$. In terms of tenure, although some workers stay longer in government, recall from part (iii) of Proposition 5 that high ψ workers can exit sooner when Q^* increases. As a result, retention decreases for the most motivated and experienced workers. These contrasting forces are illustrated by Figure 4B, which plots the tenure response for a low-ψ worker and a high-ψ worker, as well as the

[29] Since s_ℓ is a fixed positive scalar, worker career choices coincide with those characterized in Sections 5 and 6, but now with v adjusted to $s_\ell v$.

[30] Specifically, for each pair (r, μ) on a grid, we solve for an equilibrium Q^* and $\underline{\psi}^*$ and simulate the distributions of government tenure and revolver revenue. We then choose (r, μ) to minimize the sum of squared relative moments, $\big(\frac{AvgTenure_{model} - AvgTenure_{data}}{AvgTenure_{data}}\big)^2 + \big(\frac{AvgRev_{model} - AvgRev_{data}}{AvgRev_{data}}\big)^2$.



(A) Empirical distribution in 2008 (black) compared to the model distribution (red).



(B) Empirical distribution in 2008 (black) compared to the fixed-connections model distribution (red).

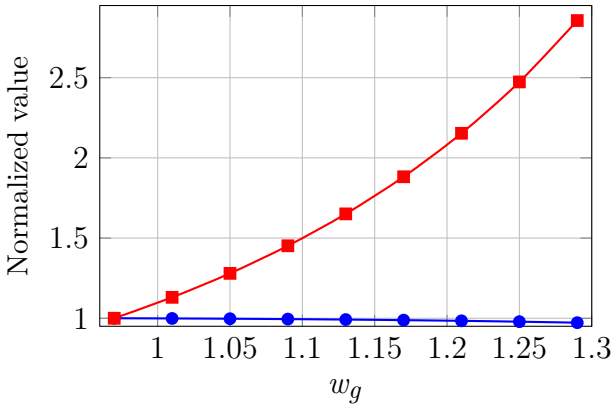
Figure 3. Kernel density estimates of revolver revenue distributions.

entry rate. Note that if connections are instead exogenous then all entrants would stay longer following an increase in w_g (Corollary 1). Thus, the possibility that increasing public sector wages may depress government output is a direct consequence of the equilibrium feedback effects through endogenous connections.[31]

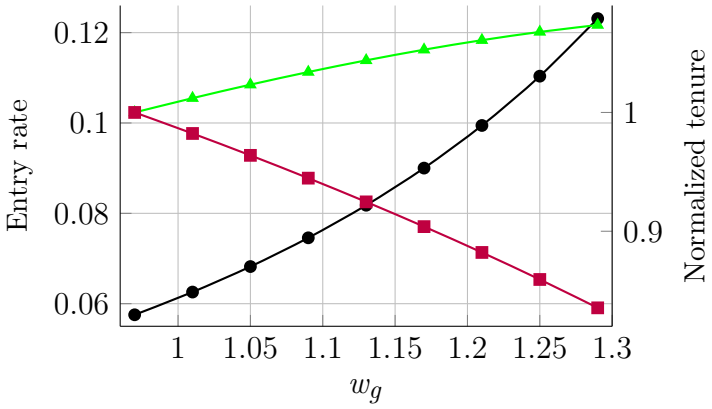
Instead, for total lobbying output the entry and tenure effects work in the same direction. Higher w_g draws more workers into government, which increases the number of revolvers and their equilibrium connection stock. In addition, low-ψ workers stay longer in government and become more valuable as lobbyists through higher $v(\tau_g)$, while high-ψ workers exit sooner and thus are more likely to survive to become revolvers. Therefore, the tenure effect is also a force for increasing Y_ℓ. Consequently, in contrast to Y_g, we observe that Y_ℓ is highly responsive to changes in w_g.

Second, we vary the cooling-off period, λ. Figure 5A plots the (normalized) values of Y_g and Y_ℓ as λ increases from 1 to 3 years. Although fewer workers enter government as λ increases, those who do enter stay longer in government and have higher ψ than those who are deterred. In turn, under this parameterization, the tenure effect dominates the entry effect and Y_g increases. For Y_ℓ, as previously discussed, a longer tenure pushes towards increasing lobbying output for low-ψ workers and decreasing it for high-ψ workers. As increasing λ increases τ_g^* for all workers who still enter government, the tenure effect on Y_ℓ is ambiguous in general. However, due to their long tenures, and thus much higher lobbying value, high-ψ workers are much more responsive to λ (see Figure 5B). At the same time, higher λ lowers entry, which decreases the total number of revolvers. Consequently, the overall indirect effects

[31] Under alternative parameter values Y_g may increase in w_g, however, the response remains highly inelastic. See Appendix B.



(A) Y_g (blue, circle) and Y_ℓ (red, square) as a function of w_g. Note that Y_g and Y_ℓ are normalized by their initial values.



(B) Government tenure for a worker with $\psi = 0$ (green, triangle), for a worker with $\psi = 2$ (purple, square), and the entry rate (black, circle) as a function of w_g. Note that tenures are normalized by their initial values.

Figure 4. Counterfactuals over w_g.

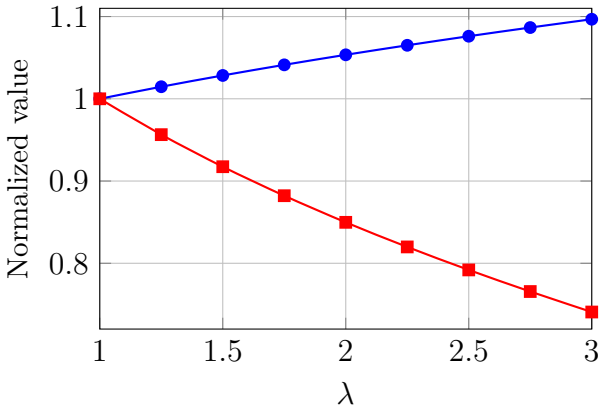
of λ push towards lowering Y_ℓ. Moreover, increasing λ has the direct effect of preventing revolvers from lobbying for some time and diminishes their connections. Consequently, the dampening forces dominate and Y_ℓ decreases in this numerical example.

Robustness. In Appendix B, we show that the main qualitative results hold under alternative parameter choices.[32] If the parameters are not constrained by empirical moments—e.g., for extreme parameter values where entry rates are near one—raising wages is not so clearly dominated. However, under empirically plausible configurations, the forces in the model favor cooling-off periods over wage increases.

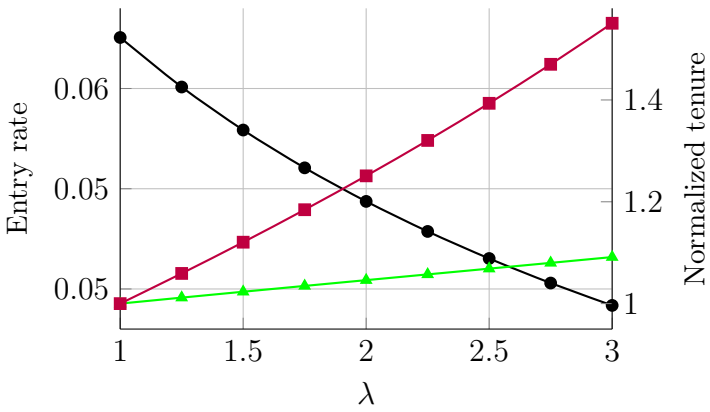
To vary the form of government output, we conduct the same numerical exercise under an alternative specification where government tenure and ψ are substitutes ($y_g = v(\tau_g) + \max\{0, \psi\}$). We find that, due to the endogeneity of connections, the response of Y_g is again inelastic compared to Y_ℓ. Thus, raising government wages is again a relatively ineffective tool for addressing the revolving door.

Taking stock. Comparing the two regulatory instruments, cooling-off periods both improve government output and reduce lobbying output, whereas higher wages increase lobbying output while having a limited—and potentially negative—effect on government output. Furthermore, these advantages of cooling-off periods hold even without also accounting for

[32] In our numerical analysis we truncate ages and ψ to speed computation. We show that the baseline qualitative findings also hold if we increase the truncation values.



(A) Y_g (blue, circle) and Y_ℓ (red, square) as a function of λ. Note that Y_g and Y_ℓ are normalized by their initial values.



(B) Government tenure for a worker with $\psi = 0$ (green, triangle), for a worker with $\psi = 2$ (purple, square), and the entry rate (black, circle) as a function of λ. Note that tenures are normalized by their initial values.

Figure 5. Counterfactuals over λ.

the fiscal costs of higher public sector salaries.[33]

7 Concluding Discussion

7.1 Extensions

Fixed size of government. In our model, government size is endogenous, to starkly show how the supply of workers into government affects incentives through connections. To incorporate a size constraint, assume there is a cap on government size with hires selected randomly if there are excess applications. The key forces that lead to superstars and revenue inequality remain: high-ψ workers stay much longer in government and connections diminish after revolving.

When considering an increase in w_g or λ, fixing the size eliminates entry effects that are driven by changes in the mass of government workers. This alters the magnitude of the indirect effect of connections on behavior (and thus on Y_g and Y_ℓ). However, compositional effects remain: making government more attractive draws in low-ψ workers and encourages longer government tenures, while a more durable connection stock makes lobbying relatively more attractive for high-ψ workers. Constraining government size dampens connection effects, but should not fundamentally alter our main qualitative insights about revolving-door policies.

Actions in government. Suppose workers can take a costly action before revolving that increases their lobbying payoff, capturing various behaviors from productive effort that build human capital (deHaan et al., 2015; Kempf, 2020; Shepherd and You, 2020) to policy favors (Cornaggia et al., 2016; Tabakovic and Wollmann, 2018; Tenekedjieva, 2021). The incentives evolve with government tenure due to the increasing value of their connections, and a key factor is whether the action complements or substitutes for connections in lobbying output.[34] If the action complements the revolver's connections, then costlier actions become more appealing as the value of i's connections grows. In contrast, if it is a substitute, then costlier actions become relatively less appealing. Thus, if the action is a complement, workers with longer tenures distort more; if a substitute, they distort less.

These factors also determine the impact of regulations. Suppose lifetime discounted connection stock Q^* increases, either because w_g increases (as in Proposition 5) or because λ decreases (as in Proposition 6). If connections and the in-government action are substitutes,

[33] Of course, with an infinite budget the tradeoffs for w_g disappear.

[34] For example, building expertise enables more effective lobbying arguments, complementing connections. Conversely, granting policy favors as a quid-pro-quo substitutes for developing connections.

then the policy change dampens a worker's incentive to take action before revolving; and vice versa if they are complements.

Endogenous price for lobbying services. We have fixed the price of lobbying output as exogenous in order to isolate the impact of endogenous connections. Suppose the price of lobbying services is denoted p_ℓ, so that the lobbying flow payoff to a revolver who supplies output y_ℓ is $p_\ell \cdot y_\ell(\tau_g, \tau_\ell)$. To endogenize p_ℓ, we assume lobbying output is aggregated by a perfectly competitive sector with a strictly increasing, differentiable, and strictly concave production function $F(Y_\ell)$. Then, the equilibrium price per unit of output is pinned down by

$$p_\ell = F'(Y_\ell). \tag{21}$$

Workers still take prices as given when making career choices, so behavior is still summarized by entry and exit thresholds. Our qualitative insights about career paths and revenue inequality are unchanged. For instance, our within-equilibrium comparisons of revolver outcomes are unchanged because they hold p_ℓ^* fixed. Endogenous connections continue to generate declining revenues over lobbying tenure; in contrast, shutting down connections ($q_{it} = \overline{q}$) leaves revenues flat even with endogenous prices.

Endogenizing p_ℓ creates additional equilibrium effects for comparative statics on w_g or λ that are distinct from those through connections. Consider a policy that increases the aggregate supply of government workers and, in turn, aggregate lobbying output. Through the endogenous price channel, strict concavity of F then lowers p_ℓ^*, which discourages revolving. Through the endogenous connections, the connection stock increases, which encourages revolving and further incentivizes more workers to join government.

7.2 Conclusion

We developed a model of the labor market for revolving-door lobbyists in which government connections are endogenous and dynamic, eroding as former colleagues exit. Our model explicitly accounts for how the value of each worker's connections depends on others' career decisions, generating feedback between individual choices and aggregate market outcomes. When workers extend their government careers, they slow connection decay for all revolvers, creating general equilibrium effects. This feedback produces distinctive patterns: connection dynamics amplify revenue inequality, revenues decline with lobbying tenure as networks erode, and there are temporary superstars whose elite status fades as contacts exit.

The connections dynamics we highlight can shape the impact of policy instruments aimed at curbing the revolving door. We shed new light on why cooling-off periods may be particularly

appealing: under empirically plausible conditions, they not only reduce lobbying output but also improve the composition of government workers and reduce government turnover. Conversely, raising public sector wages appears ineffective, and potentially detrimental, in an environment where connections to others are important.

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Appendix

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A Proofs

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 $\psi_i \leq \overline{\psi}^*(\tau_g)$.*

PROOF. Fix an equilibrium σ^* and let Q^* denote the associated value of (5). Differentiating $V_g(\tau_g, \psi; Q^*)$ yields

$$\frac{\partial V_g}{\partial \tau_g} = e^{-(\delta+\rho)\tau_g}\Big(\psi + w_g - Q^* \cdot c(\tau_g)\Big),$$

where $c(\tau_g) \equiv (\delta+\rho)v(\tau_g) - v'(\tau_g)$ is strictly increasing, with $\lim_{\tau_g \to \infty} c(\tau_g) = \infty$. Thus, $\frac{\partial V_g}{\partial \tau_g}$ has the sign of $\psi + w_g - Q^* \cdot c(\tau_g)$, which is nonincreasing in τ_g, so exiting at tenure τ_g is optimal if and only if $\psi \leq Q^* \cdot c(\tau_g) - w_g$. Setting $\overline{\psi}^*(\tau_g) \equiv Q^* \cdot c(\tau_g) - w_g$ completes the proof. □

Lemma 2. *In every equilibrium, there exists a $\underline{\psi}^* \in \mathbb{R}$ such that each worker i enters government if $\psi_i \geq \underline{\psi}^*$ 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, by the envelope theorem $V_g^*(\psi, \sigma^*)$ is nondecreasing in ψ and strictly increasing wherever $\tau_g^*(\psi) > 0$. Types with $\tau_g^*(\psi) = 0$ have $V_g^* = v(0) \cdot Q^* \leq \frac{v(0)}{\delta(2\delta+\rho)} < \frac{w_p}{\delta+\rho} = V_p$, using $\frac{v(0)}{\delta} < w_p$. Thus, $\tau_g^*(\underline{\psi}^*) > 0$, which implies V_g^* must be strictly increasing at $\underline{\psi}^*$, so it is unique. □

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

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

$$\overline{\psi}(\tau_g) = Q \cdot \Big((\delta+\rho) \cdot v(\tau_g) - v'(\tau_g)\Big) - w_g, \tag{A.2}$$

$$Q = \int_0^\infty e^{-(\delta+\rho)\tau_\ell} \int_{\tau_\ell}^\infty e^{-\delta a}\Big[1 - G\Big(\max\{\underline{\psi}, \overline{\psi}(a)\}\Big)\Big]\, da\, d\tau_\ell. \tag{A.3}$$

PROOF. By construction, any solution to the above system of equations that satisfies $Q > 0$ and $\underline{\psi} > \overline{\psi}(0)$ is an equilibrium. We show that the solution constructed below satisfies both conditions (Step 4). Subsequently, in Proposition 2(i), we show that both are satisfied in every equilibrium.

By Lemma 2, in any equilibrium there exists $\underline{\psi}$ such that i enters government if and only if $\psi_i \geq \underline{\psi}$. Furthermore, by Lemma 1, there exists $\overline{\psi}(\tau_g)$ such that each worker i is in government at government tenure τ_g, i.e., age $a = \tau_g$, if and only if $\psi_i > \max\{\overline{\psi}(\tau_g), \underline{\psi}\}$. Thus, we have:

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

We establish existence of equilibrium by a fixed-point argument. Let $\mathcal{Q} \equiv \big[0, \frac{1}{\delta(2\delta+\rho)}\big]$. There are four steps.

Step 1. Given Q, each newly born worker i will optimally revolve after a tenure that solves

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

Each worker's stopping problem is over $\tau_g \in [0, \infty]$, where $\tau_g = \infty$ denotes never revolving. Since $v' \leq v'(0)$ implies $v(\tau_g) \leq v(0) + v'(0) \cdot \tau_g$, we have $e^{-(\delta+\rho)\tau_g} \cdot v(\tau_g) \cdot Q \to 0$ as $\tau_g \to \infty$, so the objective extends continuously to the compact domain $[0, \infty]$ and takes the value $\frac{\psi+w_g}{\delta+\rho}$ at $\tau_g = \infty$. By the theorem of the maximum, V_g^* is continuous on $\mathbb{R} \times \mathcal{Q}$. For $Q > 0$, the derivative of the objective in τ_g has the sign of $\psi + w_g - Q \cdot c(\tau_g)$, which is strictly decreasing in τ_g since c is strictly increasing to ∞. Thus, the objective is strictly quasiconcave with a unique and finite maximizer $\tau^*(\psi; Q)$. If $\psi_i + w_g \leq Q \cdot c(0)$, then i's optimal stopping time is $\tau_g^*(\psi_i) = 0$. Otherwise, it is the unique solution to:

$$e^{-(\delta+\rho)\tau_g}(\psi_i + w_g) + e^{-(\delta+\rho)\tau_g} v'(\tau_g) \cdot Q - (\delta+\rho) e^{-(\delta+\rho)\tau_g} v(\tau_g) \cdot Q = 0. \tag{A.4}$$

At $Q = 0$, the maximizer may be $\tau_g = \infty$ and $V_g^*(\psi; 0) = \frac{\max\{\psi+w_g, 0\}}{\delta+\rho}$. Only V_g^* is used below. Step 4 verifies that any fixed point has $Q^* > 0$.

Step 2. By the envelope theorem $\frac{\partial V_g^*}{\partial \psi} = \frac{1-e^{-(\delta+\rho)\tau^*}}{\delta+\rho} \geq 0$, so $V_g^*(\cdot; Q)$ is nondecreasing and strictly increasing over $\tau^* > 0$. Corner types, for whom $\tau^* = 0$, have $V_g^* = v(0) \cdot Q \leq \frac{v(0)}{\delta(2\delta+\rho)} < \frac{w_p}{\delta+\rho} = V_p$, using $\frac{v(0)}{\delta} < w_p$ and $\frac{\delta+\rho}{2\delta+\rho} < 1$. Since $V_g^* \to \infty$ as $\psi \to \infty$, there is a unique $\hat{\psi}(Q)$ with $V_g^*(\hat{\psi}(Q); Q) = V_p$. Furthermore, V_g^* is strictly increasing at $\hat{\psi}(Q)$ and, since V_g^* is jointly continuous, is continuous in Q. Let $\Psi \equiv \big[\min_{Q \in \mathcal{Q}} \hat{\psi}(Q), \max_{Q \in \mathcal{Q}} \hat{\psi}(Q)\big]$, which is a compact interval.

Step 3. For $(Q, \underline{\psi}) \in \mathcal{Q} \times \Psi$ define

$$\Gamma(Q, \underline{\psi}) \equiv \int_0^\infty e^{-(\delta+\rho)\tau_\ell} \int_{\tau_\ell}^\infty e^{-\delta a} \Big[1 - G\big(\max\{\underline{\psi},\ Q \cdot c(a) - w_g\}\big)\Big]\, da\, d\tau_\ell.$$

The integrand is in $[0, e^{-\delta a}]$ and $G(\max\{\cdot\})$ is continuous in $(Q, \underline{\psi})$. Consequently, by dominated convergence Γ is continuous, with $\Gamma(\mathcal{Q} \times \Psi) \subseteq \mathcal{Q}$.

Step 4. The mapping $T : \mathcal{Q} \times \Psi \to \mathcal{Q} \times \Psi$ defined by $T(Q, \underline{\psi}) = \big(\Gamma(Q, \underline{\psi}),\ \hat{\psi}(Q)\big)$ is a continuous function from a nonempty, compact, and convex set into itself. Brouwer's theorem yields a fixed point $(Q^*, \underline{\psi}^*)$. We first verify $Q^* > 0$. If $Q^* = 0$, then $\max\{\underline{\psi}^*,\ Q^* \cdot c(a) - w_g\}$ is constant in a, so $Q^* = \Gamma(0, \underline{\psi}^*) = \Big(1 - G\big(\max\{\underline{\psi}^*, -w_g\}\big)\Big) \cdot \frac{1}{\delta(2\delta+\rho)} > 0$ by full support of G, a contradiction. Therefore $Q^* > 0$, so every worker's optimal tenure is finite and unique by Step 1. Furthermore, the exit cutoff $\overline{\psi}^*(\tau_g) \equiv Q^* \cdot c(\tau_g) - w_g$ is strictly increasing and unbounded. Moreover, $\underline{\psi}^* = \hat{\psi}(Q^*)$ is in the region where $\tau^* > 0$. That is, $\underline{\psi}^* > Q^* \cdot c(0) - w_g = \overline{\psi}^*(0)$, so the marginal entrant's tenure $\tau_g^*(\underline{\psi}^*) = \overline{\psi}^{*-1}(\underline{\psi}^*)$ is positive and finite. Equations (12) and (13) hold by construction of $\overline{\psi}^*$ and Γ. Then, substituting $\tau_g^*(\underline{\psi}^*)$ into the marginal entrant's indifference condition $V_g^*(\underline{\psi}^*; Q^*) = V_p$ and rearranging yields (11). Thus, the fixed point is a solution of (11)–(13) that satisfies the two conditions above, and therefore an equilibrium. □

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.*

PROOF. To begin, we prove (i). We show 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, $\psi_i + w_g \geq w_p$ implies $V_g^* > V_p = \frac{w_p}{\delta+\rho}$, so i would enter in equilibrium. Consequently, $\underline{\psi}^* < w_p - w_g$. For the first inequality, we show a contradiction. Suppose $\overline{\psi}^*(0) \geq \underline{\psi}^*$. Then, workers with $\psi_i \in [\underline{\psi}^*, \overline{\psi}^*(0)]$ will revolve immediately after joining government. Thus, for these workers we have $V_g^* = Q^* \cdot v(0) \leq \frac{v(0)}{\delta(2\delta+\rho)} < \frac{w_p}{\delta+\rho} = V_p$, where the first inequality uses $Q^* \leq \frac{1}{\delta(2\delta+\rho)}$ and the second uses $\frac{v(0)}{\delta} = y_\ell\big(\frac{1}{\delta}, 0\big) < w_p$ together with $\frac{\delta+\rho}{2\delta+\rho} < 1$. These workers therefore strictly prefer the private sector, contradicting $\psi_i \geq \underline{\psi}^*$.

We now prove (ii). First, $\overline{\psi}^*$ is strictly increasing in τ_g since $\frac{\partial \overline{\psi}^*}{\partial \tau_g} = Q^* \cdot \big((\delta+\rho) \cdot v'(\tau_g) - v''(\tau_g)\big) > 0$ follows from $v' \geq 0$ and $v'' \leq 0$. Second, $\overline{\psi}^*$ is concave in τ_g since $\frac{\partial^2 \overline{\psi}^*}{\partial \tau_g^2} = Q^* \cdot \big((\delta+\rho) \cdot v''(\tau_g) - v'''(\tau_g)\big) \leq 0$ follows from $v'' \leq 0$ and $v''' \geq 0$. □

Lemma 3. *For all sufficiently large a, revenue $y_\ell(\tau_g, a - \tau_g)$ is strictly convex in τ_g for τ_g sufficiently close to a.*

PROOF. Revenue is $y_\ell(\tau_g, a-\tau_g) = v(\tau_g)q(a-\tau_g)$. The second derivative with respect to τ_g is:

$$\frac{d^2\, y_\ell}{d\tau_g^2} = \Big(v''(\tau_g)q(a-\tau_g) - 2v'(\tau_g)q'(a-\tau_g) + v(\tau_g)q''(a-\tau_g)\Big). \tag{A.5}$$

We analyze each term as $a \to \infty$ with $\tau_\ell = a - \tau_g$ small. First, we claim $\lim_{\tau_g\to\infty} v''(\tau_g) = 0$. Since $v'' \leq 0$ and $v''' \geq 0$, the function v'' is increasing and bounded above by zero, so the limit exists. If $\lim_{\tau_g\to\infty} v''(\tau_g) = L < 0$, then $v'(\tau_g) \to -\infty$ as $\tau_g \to \infty$, contradicting $\lim_{\tau_g\to\infty} v'(\tau_g) < \infty$. Thus, $v''(\tau_g) \to 0$.

For the first term in (A.5), since $v''(\tau_g) \to 0$ and q is bounded on $\mathbb{R}_+$, we have $v''(\tau_g)q(a-\tau_g) \to 0$ as $a \to \infty$ with τ_g close to a.

For the second term, $v' > 0$ and $q' < 0$ imply $-2v'(\tau_g)q'(a-\tau_g) > 0$.

For the third term, note that for small τ_ℓ, equation (10) implies $q'(\tau_\ell) = -e^{-\delta\tau_\ell}(1-G(\underline{\psi}^*))$ and therefore $q''(\tau_\ell) = \delta e^{-\delta\tau_\ell}(1-G(\underline{\psi}^*))$, which is bounded away from zero. Since $v(\tau_g) \to \infty$ as $\tau_g \to \infty$, the third term $v(\tau_g)q''(a-\tau_g) \to \infty$.

Combining these observations, for a sufficiently large and τ_g sufficiently close to a, the third term dominates the potentially negative first term in (A.5) and the second term is positive, so $\frac{d^2\, y_\ell}{d\tau_g^2} > 0$. □

Lemma 4. *In equilibrium, government tenure τ_g and lobbying tenure τ_ℓ are independent in the cross-section of revolvers.*

PROOF. We show that the joint distribution of (τ_g, τ_ℓ) among revolvers in steady state decomposes into a product of marginals.

Consider a revolver observed at date t with government tenure τ_g and lobbying tenure τ_ℓ. This worker has age $a = \tau_g + \tau_\ell$, entered government at date $t - a$, and revolved at date $t - \tau_\ell$. In equilibrium, since $\overline{\psi}^*$ is strictly increasing by Proposition 2, a worker who revolves after tenure τ_g must have $\psi = \overline{\psi}^*(\tau_g)$. Accordingly, among revolvers τ_g has support $[\tau_g^{\min}, \infty)$, where $\tau_g^{\min} \equiv \overline{\psi}^{*-1}(\underline{\psi}^*)$.

At any date, the flow of newborn workers who will choose to revolve after government tenure in $[\tau_g, \tau_g + d\tau_g]$ equals $g(\overline{\psi}^*(\tau_g))\frac{d\overline{\psi}^*}{d\tau_g}d\tau_g$. This expression follows from the change of variables $\psi = \overline{\psi}^*(\tau_g)$, since the density of ψ is $g(\psi)$ and, since $\overline{\psi}^*$ is strictly increasing, $\frac{d\overline{\psi}^*}{d\tau_g} > 0$ is positive. The probability that such a worker survives to age $a = \tau_g + \tau_\ell$ without exogenous attrition is $e^{-\delta a} = e^{-\delta(\tau_g+\tau_\ell)}$.

Therefore, the joint measure of revolvers with tenures in $[\tau_g, \tau_g + d\tau_g] \times [\tau_\ell, \tau_\ell + d\tau_\ell]$ is:

$$\begin{aligned} d\mu^r(\tau_g, \tau_\ell) &= g(\overline{\psi}^*(\tau_g)) \frac{d\overline{\psi}^*}{d\tau_g} \cdot e^{-\delta(\tau_g+\tau_\ell)}\, d\tau_g\, d\tau_\ell \\ &= \underbrace{g(\overline{\psi}^*(\tau_g)) \frac{d\overline{\psi}^*}{d\tau_g} \cdot e^{-\delta\tau_g}\, d\tau_g}_{\equiv\, d\mu^r_{\tau_g}(\tau_g)} \cdot \underbrace{e^{-\delta\tau_\ell}\, d\tau_\ell}_{\equiv\, d\mu^r_{\tau_\ell}(\tau_\ell)}, \end{aligned}$$

where the factorization uses $e^{-\delta(\tau_g+\tau_\ell)} = e^{-\delta\tau_g} \cdot e^{-\delta\tau_\ell}$.

Integrating each factor separately, the total measure of revolvers is $\mu^r_{\tau_g}([\tau_g^{\min}, \infty)) \cdot \mu^r_{\tau_\ell}(\mathbb{R}_+)$, where $\mu^r_{\tau_\ell}(\mathbb{R}_+) = \int_0^\infty e^{-\delta\tau_\ell} d\tau_\ell = \frac{1}{\delta}$. Dividing each factor by its integral yields the joint density $f(\tau_g, \tau_\ell) = f_{\tau_g}(\tau_g) \cdot f_{\tau_\ell}(\tau_\ell)$, where $f_{\tau_\ell}(\tau_\ell) = \delta e^{-\delta\tau_\ell}$ and $f_{\tau_g}(\tau_g) = \frac{g(\overline{\psi}^*(\tau_g)) \frac{d\overline{\psi}^*}{d\tau_g} e^{-\delta\tau_g}}{\mu^r_{\tau_g}([\tau_g^{\min}, \infty))}$. This product form establishes independence. □

Proposition 3. *For the top α fraction of earners, we have: (i) $\text{TopShare}_\alpha > \alpha$, and $\frac{\text{TopShare}_\alpha}{\alpha}$ is strictly decreasing in α; (ii) $\mathbb{E}[\tau_g | \, y_\ell > y_\alpha] > \mathbb{E}[\tau_g]$ and $\mathbb{E}[\tau_\ell] > \mathbb{E}[\tau_\ell | \, y_\ell > y_\alpha]$; and (iii) for every revolver with $y_\ell(\tau_g, 0) > y_\alpha$, there exists finite $\tau_\ell^\dagger > 0$ such that $y_\ell(\tau_g, \tau_\ell) < y_\alpha$ for all $\tau_\ell > \tau_\ell^\dagger$.*

PROOF. To begin, we note three useful properties. First, the revenue distribution is atomless, since (τ_g, τ_ℓ) has an absolutely continuous distribution by Lemma 4 and, since $v' > 0$, each level set $\{(\tau_g, \tau_\ell) : v(\tau_g) q(\tau_\ell) = y\}$ has measure zero. Therefore the survival function $S(y) \equiv P(y_\ell > y)$ is continuous, and for each $\alpha \in (0, 1)$ there exists y_α with $S(y_\alpha) = \alpha$.

Second, $\mathbb{E}[y_\ell] \in (0, \infty)$, which we will prove in Step 1 of the proof of Proposition 4.

Third, $\mathbb{E}[\tau_g] < \infty$ and $\mathbb{E}[\tau_\ell] = \frac{1}{\delta} < \infty$. For τ_g, by Lemma 4, the marginal density of τ_g in the cross-section of revolvers is proportional to $g(\overline{\psi}^*(\tau_g)) \frac{d\overline{\psi}^*}{d\tau_g} e^{-\delta\tau_g}$, with a strictly positive normalizing constant from the total revolver mass. Since $\tau_g e^{-\delta\tau_g} \leq \frac{1}{\delta e}$ for all $\tau_g \geq 0$, and using $u = \overline{\psi}^*(\tau_g)$ we have $\int_{\tau_g^{\min}}^\infty g(\overline{\psi}^*(\tau_g)) \frac{d\overline{\psi}^*}{d\tau_g} d\tau_g \leq \int_{\mathbb{R}} g(u)\, du = 1$, it follows that $\mathbb{E}[\tau_g]$ is finite. For τ_ℓ, lobbyists only exit due to attrition, so it is exponentially distributed with rate δ and therefore $\mathbb{E}[\tau_\ell] = \frac{1}{\delta}$.

Part (i): The top α fraction is

$$\text{TopShare}_\alpha = \frac{\mathbb{E}[y_\ell \cdot \mathbf{1}_{y_\ell > y_\alpha}]}{\mathbb{E}[y_\ell]} = \alpha \cdot \frac{\mathbb{E}[y_\ell | \, y_\ell > y_\alpha]}{\mathbb{E}[y_\ell]}.$$

Since the revenue distribution is atomless, $\mathbb{E}[y_\ell | \, y_\ell > y_\alpha] > y_\alpha > \mathbb{E}[y_\ell | \, y_\ell \leq y_\alpha]$. By the

law of total expectation,

$$\mathbb{E}[\, y_\ell] = \alpha\, \mathbb{E}[\, y_\ell |\, y_\ell >\ y_\alpha] + (1-\alpha)\, \mathbb{E}[\, y_\ell |\, y_\ell \leq\ y_\alpha] < \mathbb{E}[\, y_\ell |\, y_\ell >\ y_\alpha],$$

so $\text{TopShare}_\alpha > \alpha$.

To complete Part (i), note $\frac{\text{TopShare}_\alpha}{\alpha} = \frac{\mathbb{E}[\, y_\ell |\, y_\ell > y_\alpha]}{\mathbb{E}[\, y_\ell]}$, so it suffices to show that $\mathbb{E}[\, y_\ell |\, y_\ell > y_\alpha]$ strictly decreases in α. Fix $0 < \alpha_1 < \alpha_2 < 1$, so $y_{\alpha_1} \geq y_{\alpha_2}$ and $P(\, y_{\alpha_2} < y_\ell \leq y_{\alpha_1}) = \alpha_2 - \alpha_1 > 0$. Decomposing the top α_2 group,

$$\mathbb{E}[\, y_\ell \mid\ y_\ell >\ y_{\alpha_2}] = \frac{\alpha_1}{\alpha_2}\, \mathbb{E}[\, y_\ell \mid\ y_\ell >\ y_{\alpha_1}] + \frac{\alpha_2 - \alpha_1}{\alpha_2}\, \mathbb{E}[\, y_\ell \mid\ y_{\alpha_1} \geq\ y_\ell >\ y_{\alpha_2}].$$

Then, since $\mathbb{E}[\, y_\ell \mid\ y_\ell >\ y_{\alpha_1}] >\ y_{\alpha_1} \geq \mathbb{E}[\, y_\ell \mid\ y_{\alpha_1} \geq\ y_\ell >\ y_{\alpha_2}]$, we have $\mathbb{E}[\, y_\ell \mid\ y_\ell >\ y_{\alpha_1}] > \mathbb{E}[\, y_\ell \mid\ y_\ell >\ y_{\alpha_2}]$, so $\frac{\text{TopShare}_\alpha}{\alpha}$ is strictly decreasing in α.

Part (ii): By Lemma 4, $\tau_g \perp \tau_\ell$ in the cross-section of revolvers. Define

$$h(\tau_g) \equiv P(\, y_\ell >\ y_\alpha \mid \tau_g) = P\left(q(\tau_\ell) > \frac{y_\alpha}{v(\tau_g)}\right).$$

Since v is strictly increasing in τ_g, h is nondecreasing. By the law of iterated expectations, we have $\mathbb{E}[h(\tau_g)] = P(\, y_\ell >\ y_\alpha) = \alpha$. Moreover, $h(\tau_g)$ is nondegenerate, which follows because $v(\tau_g) \to \infty$ and $q(\tau_\ell) > 0$ for all finite τ_ℓ, so we have $h(\tau_g) \to 1$ as $\tau_g \to \infty$, while $\mathbb{E}[h(\tau_g)] = \alpha < 1$. Then, using $\mathbb{E}[\tau_g \cdot \mathbf{1}\{\, y_\ell >\ y_\alpha\}] = \mathbb{E}[\tau_g \cdot h(\tau_g)]$, we have $\mathbb{E}[\tau_g \mid\ y_\ell >\ y_\alpha] - \mathbb{E}[\tau_g] = \frac{\text{Cov}\left(\tau_g, h(\tau_g)\right)}{\alpha} > 0$, where $\text{Cov}(\tau_g,\, h(\tau_g)) > 0$ since h is nondecreasing and $h(\tau_g)$ is nondegenerate.

For τ_ℓ, define $\tilde{h}(\tau_\ell) \equiv P(\, y_\ell >\ y_\alpha \mid\ \tau_\ell)$. Since q is strictly decreasing in τ_ℓ, $\tilde{h}$ is nonincreasing in τ_ℓ, and it is nondegenerate since $\mathbb{E}[\tilde{h}(\tau_\ell)] = \alpha > 0$ and $q(\tau_\ell) \to 0$ implies $\tilde{h}(\tau_\ell) \to 0$ as $\tau_\ell \to \infty$. Analogous to the argument above, we obtain $\mathbb{E}[\tau_\ell \mid\ y_\ell >\ y_\alpha] - \mathbb{E}[\tau_\ell] = \frac{\text{Cov}\left(\tau_\ell, \tilde{h}(\tau_\ell)\right)}{\alpha} < 0$.

Part (iii): Fix τ_g such that $y_\ell(\tau_g, 0) >\ y_\alpha$. Revenue $y_\ell(\tau_g, \tau_\ell) = v(\tau_g)q(\tau_\ell)$ is strictly decreasing in τ_ℓ since q is strictly decreasing in τ_ℓ. By equation (10), $\lim_{\tau_\ell \to \infty} q(\tau_\ell) = 0$, so $\lim_{\tau_\ell \to \infty}\, y_\ell(\tau_g, \tau_\ell) = 0 <\ y_\alpha$. By continuity and strict monotonicity, there exists a unique $\tau_\ell^\dagger > 0$ with $\, y_\ell(\tau_g, \tau_\ell^\dagger) =\ y_\alpha$ and $\, y_\ell(\tau_g, \tau_\ell) <\ y_\alpha$ for all $\tau_\ell > \tau_\ell^\dagger$. □

Proposition 4. *The revenue distribution in the fixed-connections counterfactual, R_0, strictly Lorenz dominates the revenue distribution with endogenous connections, R_ℓ. Thus,* $\text{Gini}(R_\ell) > \text{Gini}(R_0)$ *and* $\text{TopShare}_\alpha(R_\ell) > \text{TopShare}_\alpha(R_0)$ *for all* $\alpha \in (0, 1)$.

PROOF. The proof proceeds in three steps. First, we use the independence of τ_g and τ_ℓ from

Lemma 4 to decompose endogenous-connection revenues as the product of fixed-connection revenues and an independent multiplicative factor, $M(\tau_\ell)$, that captures connection decay. Second, we show that this multiplicative structure yields strict convex order between the normalized revenue distributions. For strictness, we verify that the multiplicative factor is nondegenerate with support on both sides of its mean and that fixed-connections revenues have unbounded support. Third, we translate strict convex order into strict Lorenz dominance, which implies the Gini and top-share orderings.

Step 1. Define $M(\tau_\ell) \equiv \frac{q(\tau_\ell)}{\bar{q}}$, where $\bar{q} \equiv (\delta+\rho)Q^*$ is chosen so that $\int_0^\infty e^{-(\delta+\rho)\tau_\ell}\bar{q}\, d\tau_\ell = Q^*$. Since $y_\ell = v(\tau_g)q(\tau_\ell)$ and $y_0 = v(\tau_g)\bar{q}$, we have $y_\ell = y_0 \cdot M(\tau_\ell)$. Throughout, expectations over τ_ℓ, and in turn over M, are taken with respect to the steady-state cross-sectional distribution of revolvers from Lemma 4. The discounted measure defining $\overline{q}$ is used only to equate career incentives across the two settings. Note that M is strictly decreasing in τ_ℓ with $\lim_{\tau_\ell\to\infty} M(\tau_\ell) = 0$. Additionally, since $\tau_g \perp \tau_\ell$ by Lemma 4, we have $y_0 \perp M$.

Next, we verify that $\mathbb{E}[\,y_0]$ and $\mathbb{E}[\,y_\ell]$ are finite. Since $\mathbb{E}[\,y_0] = \bar{q}\cdot\mathbb{E}[v(\tau_g)]$ and the marginal density of τ_g is proportional to $g(\overline{\psi}^*(\tau_g))\frac{d\overline{\psi}^*}{d\tau_g}e^{-\delta\tau_g}$ by Lemma 4, finiteness requires $\int_{\tau_g^{\min}}^\infty v(\tau_g)\, e^{-\delta\tau_g}\, g(\overline{\psi}^*(\tau_g))\frac{d\overline{\psi}^*}{d\tau_g}\, d\tau_g < \infty$. Then, $v'' \le 0$ implies $v'(\tau_g) \le v'(0) < \infty$ for all τ_g, so $v(\tau_g) \le v(0) + v'(0)\,\tau_g$. Since $\big(v(0) + v'(0)\,\tau_g\big)e^{-\delta\tau_g}$ is bounded on $\mathbb{R}_+$ and $\int_{\tau_g^{\min}}^\infty g(\overline{\psi}^*(\tau_g))\frac{d\overline{\psi}^*}{d\tau_g}\, d\tau_g \le 1$, the integral converges and $\mathbb{E}[\,y_0] < \infty$. Similarly, $\mathbb{E}[M] < \infty$ since $q(\tau_\ell) \le q(0) < \infty$ for all τ_ℓ, and $\mathbb{E}[M] > 0$ since $q(\tau_\ell) > 0$ for all finite τ_ℓ because G has full support on $\mathbb{R}$. Thus, $\mathbb{E}[\,y_\ell] = \mathbb{E}[\,y_0]\cdot\mathbb{E}[M] \in (0,\infty)$.

Step 2. Define the normalized variables $\tilde{y}_0 \equiv \frac{y_0}{\mathbb{E}[\,y_0]}$ and $\tilde{M} \equiv \frac{M}{\mathbb{E}[M]}$, so that $\mathbb{E}[\,\tilde{y}_0] = \mathbb{E}[\tilde{M}] = 1$, $\tilde{y}_0 \perp \tilde{M}$, and $\frac{y_\ell}{\mathbb{E}[\,y_\ell]} = \tilde{y}_0 \cdot \tilde{M}$. We consider scale-invariant inequality measures, so it suffices to compare the distributions of $\tilde{y}_0$ and $\tilde{y}_0 \cdot \tilde{M}$. We show that $\tilde{y}_0 <_{cx} \tilde{y}_0 \cdot \tilde{M}$, by using the notational convention $(\,y-d)_+ = \max\{0,\, y-d\}$ and verifying that $\mathbb{E}[(\,\tilde{y}_0\cdot\tilde{M} - d)_+] > \mathbb{E}[(\,\tilde{y}_0 - d)_+]$ for all $d > 0$. Since both $\tilde{y}_0$ and $\tilde{M}$ are nonnegative with common mean 1, these coincide for $d \le 0$, so it suffices to check the case with $d > 0$.

Let $\overline{m}$ denote the supremum of the support of $\tilde{M}$. Since $\mathbb{E}[\tilde{M}] = 1$ and M is strictly decreasing, $M(\tau_\ell) < M(0)$ for all $\tau_\ell > 0$, so $\mathbb{E}[M] < M(0)$. Thus, $\overline{m} = \frac{M(0)}{\mathbb{E}[M]} > 1$.

Fix $d > 0$. For any $\tilde{y}_0 > \frac{d}{\overline{m}}$, the function $(\,\tilde{y}_0\cdot\tilde{M} - d)_+$ is convex and has a kink at $\tilde{M}^* = \frac{d}{\tilde{y}_0} \in (0,\overline{m})$. The support of $\tilde{M}$ therefore places positive probability on both $\{\tilde{M} < \tilde{M}^*\}$ and $\{\tilde{M} > \tilde{M}^*\}$. Thus, Jensen's inequality is strict, with $\mathbb{E}\Big[(\,\tilde{y}_0\cdot\tilde{M} - d)_+ \;\Big|\; \tilde{y}_0\Big] > \Big(\tilde{y}_0\cdot\mathbb{E}[\tilde{M}] - d\Big)_+ = (\,\tilde{y}_0 - d)_+$. Since $v(\tau_g)\to\infty$ as $\tau_g\to\infty$ and τ_g has unbounded support, $\tilde{y}_0$ is unbounded, so $P(\,\tilde{y}_0 > \frac{d}{\overline{m}}) > 0$. Then, taking expectations over $\tilde{y}_0$ yields $\mathbb{E}\Big[(\,\tilde{y}_0\cdot\tilde{M} - d)_+\Big] > \mathbb{E}[(\,\tilde{y}_0 - d)_+]$. Both expectations are finite since $(x-d)_+ \le x$ and

$\mathbb{E}[\,\tilde{y}_0] = \mathbb{E}[\,\tilde{y}_0\tilde{M}] = 1$. Since $d > 0$ is arbitrary and the random variables have equal finite means, it follows that $\tilde{y}_0 <_{cx} \tilde{y}_0 \cdot \tilde{M}$ (see Theorem 3.A.1 in Shaked and Shanthikumar, 2007).

We now strengthen this to strict Lorenz dominance at every interior quantile.[35] Since both normalized variables have mean 1 and $(d - z)_+ = (z - d)_+ + d - z$, the strict inequalities above are equivalent to $\mathbb{E}[(d - \tilde{y}_0\tilde{M})_+] > \mathbb{E}[(d - \tilde{y}_0)_+]$ for every $d > 0$. We combine these with the standard conjugate representation of the cumulative quantile function: for a nonnegative random variable Z with continuous distribution function F_Z, the quantity $\int_0^p F_Z^{-1}(u)\,du = \sup_{d\geq 0}\Big\{\, p\,d - \mathbb{E}\big[(d - Z)_+\big]\Big\}$ is attained at $d = F_Z^{-1}(\,p)$, since $\mathbb{E}[(d - Z)_+] = \int_0^d F_Z(z)\,dz$ is convex in d with derivative $F_Z(d)$. Both $\tilde{y}_0$ and $\tilde{y}_0 \cdot \tilde{M}$ are strictly positive and atomless, since τ_g is continuously distributed, v is strictly increasing, and $\tilde{M}$ is an independent factor. Thus, fixing $p \in (0, 1)$ and evaluating the representation for $\tilde{y}_0 \cdot \tilde{M}$ at its p-quantile $d_p > 0$, we have

$$\int_0^p F^{-1}_{\tilde{y}_0\tilde{M}}(u)\,du \;=\; p\,d_p - \mathbb{E}\big[(d_p - \tilde{y}_0\tilde{M})_+\big] \;<\; p\,d_p - \mathbb{E}\big[(d_p - \tilde{y}_0)_+\big] \;\leq\; \int_0^p F^{-1}_{\tilde{y}_0}(u)\,du.$$

Since $\mathbb{E}[\,\tilde{y}_0] = \mathbb{E}[\,\tilde{y}_0 \cdot \tilde{M}] = 1$ and Lorenz curves are scale invariant, this implies $L_{R_\ell}(\,p) < L_{R_0}(\,p)$ for every $p \in (0, 1)$. Thus, $R_0 <_{\text{Lorenz}} R_\ell$.

Step 3. We have shown that the Lorenz curve of R_ℓ lies strictly below that of R_0. Note that, for any nonnegative random variable Z, the Gini coefficient satisfies $\text{Gini}(Z) = 1 - 2\int_0^1 L_Z(\,p)\,d\,p$ and the top α fraction satisfies $\text{TopShare}_\alpha(Z) = 1 - L_Z(1 - \alpha)$. Both expressions are strictly decreasing in the Lorenz curve, so $L_{R_\ell} < L_{R_0}$ implies $\text{Gini}(R_\ell) > \text{Gini}(R_0)$ and $\text{TopShare}_\alpha(R_\ell) > \text{TopShare}_\alpha(R_0)$ for all $\alpha \in (0, 1)$. □

Next, we prove the comparative statics results in Section 6. To do so, we introduce two functions. Additionally, we now incorporate the cooling-off period λ into the expressions.[36]

Specifically, we define:

$$\phi_1(Q, \underline{\psi}) = \int_{\min\{\lambda,\overline{a}\}}^{\overline{a}} e^{-(\delta+\rho)\tau_\ell}\Big\{\int_{\tau_\ell}^{\overline{a}} e^{-\delta a}\Big(1 - G(\underline{\psi})\Big)\,da + \int_{\overline{a}}^{\infty} e^{-\delta a}\Big(1 - G(\overline{\psi}(a))\Big)\,da\Big\}\,d\tau_\ell \tag{A.6}$$

$$+ \int_{\max\{\lambda,\overline{a}\}}^{\infty} e^{-(\delta+\rho)\tau_\ell}\int_{\tau_\ell}^{\infty} e^{-\delta a}\Big(1 - G(\overline{\psi}(a))\Big)\,da\,d\tau_\ell - Q,$$

[35] As usual, $X <_{\text{Lorenz}} Y$ denotes that the Lorenz curve of X lies strictly above that of Y at every $p \in (0, 1)$, so X Lorenz dominates Y and exhibits lower inequality. See Section 3.A of Shaked and Shanthikumar (2007) for details.

[36] The proof of Proposition 2(i) applies for any $\lambda \geq 0$, since a cooling-off period only lowers the value of revolving at every tenure. Notably, the marginal entrant's optimal tenure $\overline{a}$ remains strictly positive.

and

$$\phi_2(Q,\underline{\psi}) = w_p - (\delta+\rho)e^{-(\delta+\rho)\tau_g^*(Q,\underline{\psi})}\cdot v\big(\tau_g^*(Q,\underline{\psi})\big)\cdot Q - \Big(1-e^{-(\delta+\rho)\tau_g^*(Q,\underline{\psi})}\Big)(\underline{\psi}+w_g), \tag{A.7}$$

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

$$\underline{\psi} \;=\; Q\cdot c(a) - w_g \;=\; (\delta+\rho)\,v(a)\,Q - v'(a)\,Q - w_g. \tag{A.8}$$

Equilibria are characterized by solutions $(Q^*,\underline{\psi}^*)$ to $\big(\phi_1(Q,\underline{\psi}),\phi_2(Q,\underline{\psi})\big)=(0,0)$.

Lemma A.1. *Fix any $\varepsilon\in\big(0,\, w_p-\frac{v(0)}{\delta}\big)$. There exists $\rho_0>0$ such that for all $\rho\ge\rho_0$, every equilibrium satisfies $\underline{\psi}^*+w_g \;\ge\; w_p-\frac{v(0)}{\delta}-\varepsilon \;>\; 0$. Consequently, $c(a)>0$ for every $a\ge\overline{a}$.*

PROOF. The marginal entrant is indifferent, satisfying $V_g(\overline{a},\underline{\psi}^*;Q^*)=\frac{w_p}{\delta+\rho}$. By Proposition 2(i), we have $\overline{a}>0$, since a cooling-off period only lowers the value of revolving immediately, so the property extends to all $\lambda\ge 0$. Denoting $x\equiv(\delta+\rho)\overline{a}>0$ and multiplying by $\delta+\rho$, we have

$$(1-e^{-x})(\underline{\psi}^*+w_g) = w_p-(\delta+\rho)e^{-x}v(\overline{a})\,Q^*.$$

Since $Q^*\le\frac{1}{\delta(2\delta+\rho)}$, we have $(\delta+\rho)Q^*\le\frac{1}{\delta}$. Additionally, $v(\overline{a})\le v(0)+v'(0)\overline{a}$ with $\overline{a}=\frac{x}{\delta+\rho}$ and $\sup_{x\ge0}xe^{-x}=e^{-1}$. Altogether, this implies

$$(\delta+\rho)e^{-x}v(\overline{a})\,Q^* \;\le\; \tfrac{1}{\delta}\Big(v(0)+\tfrac{v'(0)}{e(\delta+\rho)}\Big).$$

Thus, the right-hand side above is weakly greater than $w_p-\frac{v(0)}{\delta}-\frac{v'(0)}{e\delta(\delta+\rho)}$, which strictly increases in ρ and converges to $w_p-\frac{v(0)}{\delta}$ as $\rho\to\infty$. Therefore, there exists ρ_0 such that $\rho\ge\rho_0$ implies $w_p-\frac{v(0)}{\delta}-\frac{v'(0)}{e\delta(\delta+\rho)}>w_p-\frac{v(0)}{\delta}-\varepsilon>0$, where strict positivity uses the maintained assumption $y_\ell(\frac{1}{\delta},0)=\frac{v(0)}{\delta}<w_p$. Then, from $1-e^{-x}\in(0,1)$, we obtain $\underline{\psi}^*+w_g\ge w_p-\frac{v(0)}{\delta}-\varepsilon$. Finally, we have $c(\overline{a})=\frac{\underline{\psi}^*+w_g}{Q^*}>0$, and c is strictly increasing, so $c>0$ on $[\overline{a},\infty)$. Since $\tau_g^*(\psi)\ge\overline{a}$ for every entrant $\psi\ge\underline{\psi}^*$, this covers all revolving tenures. □

Lemma A.2. *Let ρ_0 be as in Lemma A.1. For all $\rho\ge\rho_0$, at every equilibrium we have $\frac{\partial\phi_1}{\partial Q}\le-1$, $\frac{\partial\phi_1}{\partial\underline{\psi}}\le0$, $\frac{\partial\phi_2}{\partial Q}<0$, and $\frac{\partial\phi_2}{\partial\underline{\psi}}<0$.*

PROOF. First,

$$\begin{aligned}\frac{\partial \phi_1}{\partial Q} &= -1 - \int_{\min\{\lambda,\overline{a}\}}^{\overline{a}} e^{-(\delta+\rho)\tau_\ell} \int_{\overline{a}}^{\infty} e^{-\delta a} \cdot \Big((\delta+\rho)v(a) - v'(a) \Big)\, g(\overline{\psi}(a))\, da\, d\tau_\ell \\ &\quad - \int_{\max\{\lambda,\overline{a}\}}^{\infty} e^{-(\delta+\rho)\tau_\ell} \int_{\tau_\ell}^{\infty} e^{-\delta a} \cdot \Big((\delta+\rho)v(a) - v'(a) \Big)\, g(\overline{\psi}(a))\, da\, d\tau_\ell \\ &< 0,\end{aligned}$$

where the inequality uses Lemma A.1, which yields $c(a) = (\delta+\rho)v(a) - v'(a) > 0$ for all $a \geq \overline{a}$. Both integral terms are therefore nonnegative and $\frac{\partial \phi_1}{\partial Q} \leq -1$. Throughout, boundary terms from differentiating the limits involving $\overline{a}(Q, \underline{\psi})$ vanish because the integrands are continuous at $a = \overline{a}$ and at $\tau_\ell = \overline{a}$, where $\overline{\psi}(\overline{a}) = \underline{\psi}$. To finish, we have $\frac{\partial \phi_1}{\partial \underline{\psi}} = -\int_{\min\{\lambda,\overline{a}\}}^{\overline{a}} e^{-(\delta+\rho)\tau_\ell} \Big(\int_{\tau_\ell}^{\overline{a}} e^{-\delta a}\, g(\underline{\psi})\, da \Big)\, d\tau_\ell \leq 0$; $\frac{\partial \phi_2}{\partial Q} = -(\delta+\rho) \cdot e^{-(\delta+\rho)\tau_g^*(\underline{\psi})} \cdot v(\tau_g^*(\underline{\psi})) < 0$; and $\frac{\partial \phi_2}{\partial \underline{\psi}} = -\Big(1 - e^{-(\delta+\rho)\tau_g^*(Q,\underline{\psi})}\Big) < 0$. □

Lemma A.3. *Let ρ_0 and ε be as in Lemma A.1. There exists $\rho_1 \geq \rho_0$ such that for all $\rho \geq \rho_1$, every $\lambda \geq 0$, and every equilibrium,*

$$\frac{\partial \phi_1}{\partial Q}\frac{\partial \phi_2}{\partial \underline{\psi}} - \frac{\partial \phi_1}{\partial \underline{\psi}}\frac{\partial \phi_2}{\partial Q} \;\geq\; \tfrac{1}{2}\big(1 - e^{-(\delta+\rho)\overline{a}}\big) \;>\; 0.$$

PROOF. Let $x \equiv (\delta+\rho)\overline{a} > 0$, and define $I \equiv \big[\, w_p - w_g - \frac{v(0)}{\delta} - \varepsilon,\;\; w_p - w_g \,\big]$, and $\overline{g} \equiv \sup_{\psi \in I} g(\psi) < \infty$.. By Lemma A.1 and Proposition 2(i), $\underline{\psi}^* \in I$, so $g(\underline{\psi}^*) \leq \overline{g}$. By Lemma A.2, $\frac{\partial \phi_1}{\partial Q} \leq -1$ and $\frac{\partial \phi_2}{\partial \underline{\psi}} = -(1 - e^{-x})$, so $\frac{\partial \phi_1}{\partial Q}\frac{\partial \phi_2}{\partial \underline{\psi}} \geq 1 - e^{-x}$. For the second term, both factors are nonpositive, and

$$\begin{aligned}\left|\frac{\partial \phi_1}{\partial \underline{\psi}}\right| &\leq \overline{g} \int_0^{\overline{a}} e^{-(\delta+\rho)\tau_\ell}(\overline{a} - \tau_\ell)\, d\tau_\ell \leq \overline{g}\, \frac{x(1-e^{-x})}{(\delta+\rho)^2}, \\ \left|\frac{\partial \phi_2}{\partial Q}\right| &= (\delta+\rho)e^{-x}v(\overline{a}) \\ &\leq (\delta+\rho)e^{-x}v(0) + v'(0)\, xe^{-x}.\end{aligned}$$

using $v(\overline{a}) \leq v(0) + v'(0)\overline{a}$ and $\overline{a} = \frac{x}{\delta+\rho}$. With $xe^{-x} \leq e^{-1}$ and $x^2 e^{-x} \leq 4e^{-2}$,

$$\left|\frac{\partial \phi_1}{\partial \underline{\psi}}\frac{\partial \phi_2}{\partial Q}\right| \leq \overline{g} \cdot (1 - e^{-x})\Big(\frac{v(0)}{e(\delta+\rho)} + \frac{4\, v'(0)}{e^2(\delta+\rho)^2}\Big).$$

Thus, the determinant is weakly greater than $(1 - e^{-x})\big[\, 1 - \overline{g} \cdot \big(\frac{v(0)}{e(\delta+\rho)} + \frac{4v'(0)}{e^2(\delta+\rho)^2}\big)\big]$, and the bracket exceeds $\frac{1}{2}$ once $\rho \geq \rho_1$. □

Proposition 5. *If ρ is sufficiently large then, at any equilibrium, a marginal increase in w_g: (i) increases Q^*, (ii) decreases $\underline{\psi}^*$, and (iii) decreases $\tau_g^*(\psi_i)$ for all ψ_i above a cutoff $\hat{\psi} \geq \underline{\psi}^*$ and increases it for $\psi_i \in (\underline{\psi}^*, \hat{\psi})$. Moreover, the interval $(\underline{\psi}^*, \hat{\psi})$ is nonempty if and only if $\frac{\partial Q^*}{\partial w_g} \cdot c\big(\tau_g^*(\underline{\psi}^*)\big) < 1$.*

PROOF. To sign the comparative statics, we apply the implicit function theorem to the system (A.6) and (A.7), 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.2, we have $\frac{\partial \phi_1}{\partial Q} < 0$, $\frac{\partial \phi_1}{\partial \underline{\psi}} \leq 0$, $\frac{\partial \phi_2}{\partial Q} \leq 0$, and $\frac{\partial \phi_2}{\partial \underline{\psi}} < 0$. Additionally,

$$\begin{aligned} \frac{\partial \phi_2}{\partial w_g} &= -\Big(1 - e^{-(\delta+\rho)\tau_g^*(\underline{\psi}, Q)}\Big) < 0, \text{ and} \\ \frac{\partial \phi_1}{\partial w_g} &= \int_{\min\{\lambda, \overline{a}\}}^{\overline{a}} e^{-(\delta+\rho)\tau_\ell} \int_{\overline{a}}^{\infty} e^{-\delta a} g(\overline{\psi}(a))\, da\, d\tau_\ell \\ &\quad + \int_{\max\{\lambda, \overline{a}\}}^{\infty} e^{-(\delta+\rho)\tau_\ell} \int_{\tau_\ell}^{\infty} e^{-\delta a} g(\overline{\psi}(a))\, da\, d\tau_\ell > 0. \end{aligned}$$

Thus, $\frac{\partial \phi_2}{\partial \underline{\psi}} \cdot \frac{\partial \phi_1}{\partial w_g} - \frac{\partial \phi_1}{\partial \underline{\psi}} \cdot \frac{\partial \phi_2}{\partial w_g} < 0$ 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

$$\frac{\partial \phi_1}{\partial Q}\frac{\partial \phi_2}{\partial \underline{\psi}} - \frac{\partial \phi_1}{\partial \underline{\psi}}\frac{\partial \phi_2}{\partial Q} > 0. \tag{A.9}$$

By Lemma A.3, there exists ρ_1 such that the determinant in (A.9) is strictly positive for all $\rho \geq \rho_1$, uniformly across equilibria, so the Jacobian is nonsingular and $\frac{\partial \underline{\psi}^*}{\partial w_g} < 0 < \frac{\partial Q^*}{\partial w_g}$, which yields (i)–(ii). For (iii), differentiate the identity $\overline{\psi}^*(\tau_g^*(\psi)) = \psi$ with respect to w_g:

$$\frac{\partial \tau_g^*(\psi)}{\partial w_g} = -\frac{\frac{\partial \overline{\psi}^*}{\partial w_g}}{\frac{\partial \overline{\psi}^*}{\partial \tau_g}} = -\frac{-1 + \frac{\partial Q^*}{\partial w_g} \cdot c(\tau_g^*(\psi))}{Q^* \cdot c'(\tau_g^*(\psi))}.$$

The denominator is positive. The numerator $N(\psi) \equiv -1 + \frac{\partial Q^*}{\partial w_g} \cdot c(\tau_g^*(\psi))$ is strictly increasing in ψ since c and τ_g^* are increasing and $\frac{\partial Q^*}{\partial w_g} > 0$, and diverges to $+\infty$ as $\psi \to \infty$ since $c(\tau_g^*(\psi)) \to \infty$. If $N(\underline{\psi}^*) \geq 0$, set $\hat{\psi} = \underline{\psi}^*$. Then, for every entrant $\psi > \hat{\psi}$, we have $N(\psi) > 0$ and therefore $\frac{\partial \tau_g^*(\psi)}{\partial w_g} < 0$, so the region $(\underline{\psi}^*, \hat{\psi})$ is empty. If $N(\underline{\psi}^*) < 0$, i.e.,

$\frac{\partial Q^*}{\partial w_g} \cdot c\big(\tau_g^*(\underline{\psi}^*)\big) < 1$, then N has a unique zero $\hat{\psi} > \underline{\psi}^*$, so $\frac{\partial \tau_g^*(\psi)}{\partial w_g} > 0$ for $\psi \in (\underline{\psi}^*, \hat{\psi})$ and $\frac{\partial \tau_g^*(\psi)}{\partial w_g} < 0$ for $\psi > \hat{\psi}$. □

Proposition 6. *If ρ is sufficiently large then, at any equilibrium, a marginal increase in λ: (i) increases $\underline{\psi}^*$, (ii) decreases Q^*, and (iii) increases $\tau_g^*(\psi)$ for all $\psi \geq \underline{\psi}^*$.*

PROOF. Applying the implicit function theorem yields

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

Note that $\frac{\partial \phi_2}{\partial \lambda} = 0$ and $\frac{\partial \phi_1}{\partial \lambda} = -e^{-(\delta+\rho)\lambda} \int_\lambda^\infty e^{-\delta a}\Big(1 - G\big(\max\{\underline{\psi}, \overline{\psi}(a)\}\big)\Big) da < 0$. Then, Lemma A.2 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

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

By Lemma A.3, this determinant is strictly positive for all $\rho \geq \rho_1$, uniformly across equilibria, so the Jacobian is nonsingular. The comparative statics on $\tau_g^*(\psi)$ follow from

$$\frac{d\tau_g^*(\psi)}{d\lambda} = -\frac{\frac{\partial Q^*}{\partial \lambda} \cdot c(\tau_g^*(\psi))}{Q^* \cdot c'(\tau_g^*(\psi))} > 0,$$

using $\frac{\partial Q^*}{\partial \lambda} < 0$ and that $\psi \geq \underline{\psi}^*$ implies $\tau_g^*(\psi) \geq \tau_g^*(\underline{\psi}^*) = \overline{a}$, so $c(\tau_g^*(\psi)) > 0$ by Lemma A.1. □

Corollary 1. *In the fixed-connections counterfactual, increasing w_g will decrease $\underline{\psi}^*$ and increase $\tau_g^*(\psi)$ for all $\psi \geq \underline{\psi}^*$.*

PROOF. With fixed connections, the dynamic payoff from revolving is $v(\tau_g) \cdot \overline{Q}$, where $\overline{Q} \equiv \int_0^\infty e^{-(\delta+\rho)\tau_\ell}\, \overline{q}\, d\tau_\ell = \frac{\overline{q}}{\delta+\rho}$ is exogenous. The exit cutoff is therefore $\overline{\psi}^*(\tau_g) = \overline{Q} \cdot c(\tau_g) - w_g$, so $\frac{\partial \overline{\psi}^*}{\partial w_g} = -1$ pointwise and every entrant's tenure satisfies $\frac{\partial \tau_g^*(\psi)}{\partial w_g} = \frac{1}{\overline{Q} \cdot c'(\tau_g^*(\psi))} > 0$. For entry, the envelope theorem yields $\frac{\partial V_g^*}{\partial w_g} = \frac{1 - e^{-(\delta+\rho)\tau_g^*(\psi)}}{\delta+\rho}$, which is strictly positive at all $\psi \geq \underline{\psi}^*$ since entrants' tenures are positive, while V_p is unchanged. Thus, $\underline{\psi}^*$ decreases. □

Corollary 2. *In the fixed-connections counterfactual, increasing λ will: (i) increase $\underline{\psi}^*$, (ii) decrease $\overline{Q}(\lambda) \equiv \int_\lambda^\infty e^{-(\delta+\rho)\tau_\ell}\,\overline{q}\,d\tau_\ell$, and (iii) for ρ sufficiently large, increase $\tau_g^*(\psi)$ for all $\psi \geq \underline{\psi}^*$.*

PROOF. With fixed connections and a cooling-off period,

$$\overline{Q}(\lambda) = \frac{\overline{q}}{\delta+\rho}\,e^{-(\delta+\rho)\lambda}, \qquad\qquad \frac{\partial \overline{Q}}{\partial \lambda} = -(\delta+\rho)\,\overline{Q}(\lambda) < 0,$$

giving (ii). For (i), the envelope theorem yields

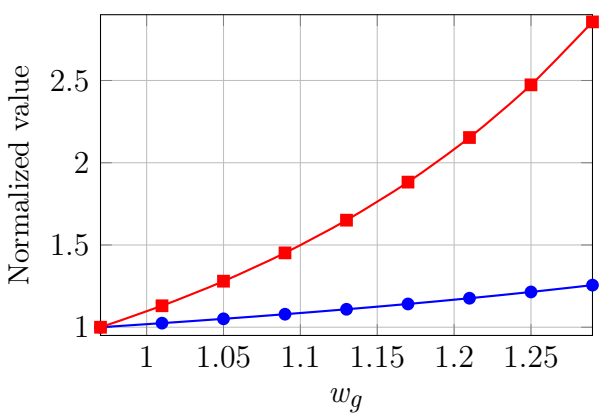
$$\frac{\partial V_g^*}{\partial \lambda} = e^{-(\delta+\rho)\tau_g^*(\psi)}\,v\big(\tau_g^*(\psi)\big)\frac{\partial \overline{Q}}{\partial \lambda} \leq 0,$$

which holds strictly at $\psi = \underline{\psi}^*$ since the marginal entrant does not revolve immediately. This follows since the argument of Proposition 2(i) applies under the normalization $\overline{q} = (\delta+\rho)Q^*$, while V_p is unchanged. Thus, $\underline{\psi}^*$ increases. For (iii), the exit cutoff is $\overline{\psi}^*(\tau_g) = \overline{Q}(\lambda)\cdot c(\tau_g) - w_g$, so

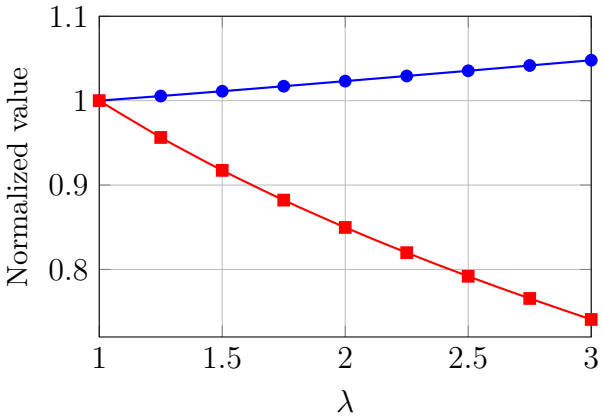
$$\frac{d\tau_g^*(\psi)}{d\lambda} = -\frac{\frac{\partial \overline{Q}}{\partial \lambda}\cdot c\big(\tau_g^*(\psi)\big)}{\overline{Q}(\lambda)\cdot c'\big(\tau_g^*(\psi)\big)},$$

which is positive whenever $c\big(\tau_g^*(\psi)\big) > 0$. Since $(\delta+\rho)\,\overline{Q}(\lambda) \leq \overline{q} = (\delta+\rho)Q^* \leq \frac{1}{\delta}$, the argument of Lemma A.1 applies verbatim, so for ρ sufficiently large we have $c(\tau_g) > 0$ at every tenure at which a worker revolves. □

B Additional Numerical Examples

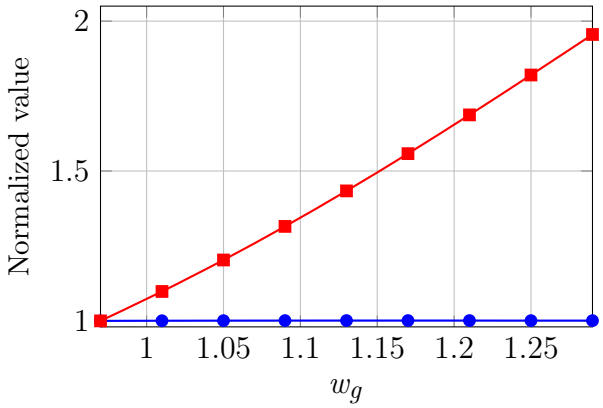


(A) Y_g (blue, circle) and Y_ℓ (red, square) as functions of w_g, normalized by initial values.

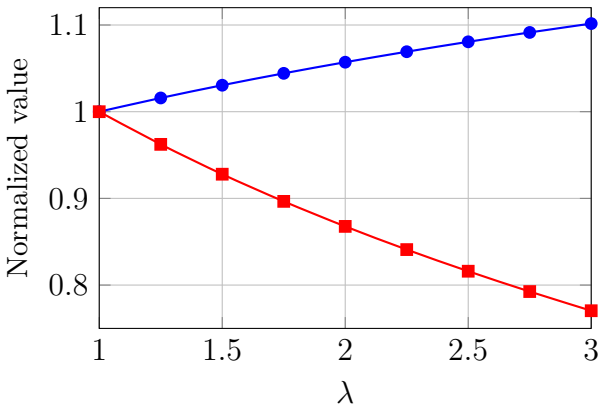


(B) Y_g (blue, circle) and Y_ℓ (red, square) as functions of λ, normalized by initial values.

Figure B.1. Policy counterfactuals with alternative functional form for government output, $y_g(\tau_g, \psi) = v(\tau_g) + \max\{\psi, 0\}$. All parameter values are the same as in the baseline specification.

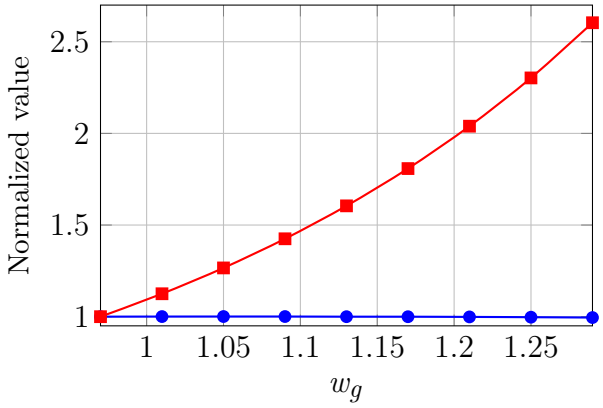


(A) Y_g (blue, circle) and Y_ℓ (red, square) as functions of w_g, normalized by initial values.

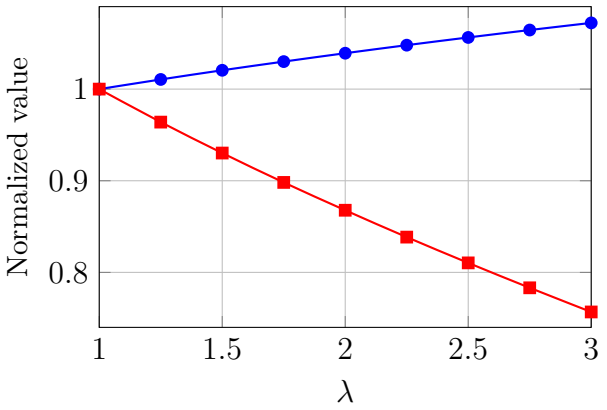


(B) Y_g (blue, circle) and Y_ℓ (red, square) as functions of λ, normalized by initial values.

Figure B.2. Policy counterfactuals with parameter values not chosen to match the data: $\delta = .025$, $\rho = .05$, $s_\ell = 1$, $w_p = 1$, $w_g = 1$, $\lambda = 1$, $r = .5$, $\mu = -\gamma_E - 1$, where $\gamma_E \approx 0.577$, and scale $= 1$.

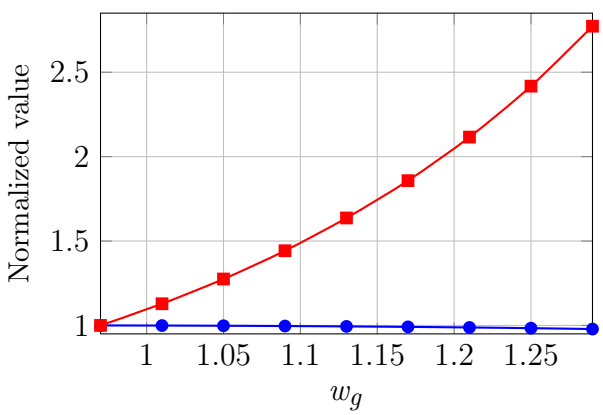


(A) Y_g (blue, circle) and Y_ℓ (red, square) as functions of w_g, normalized by initial values.

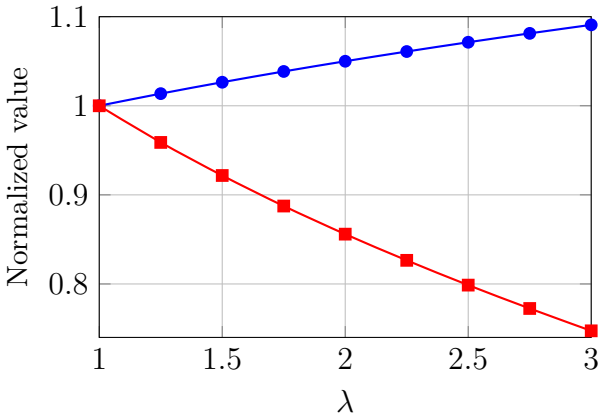


(B) Y_g (blue, circle) and Y_ℓ (red, square) as functions of λ, normalized by initial values.

Figure B.3. Policy counterfactuals with $s_\ell = .35$, $r = 6.346$, $\mu \approx -3.244$. Remaining parameter values are the same as in the baseline specification.

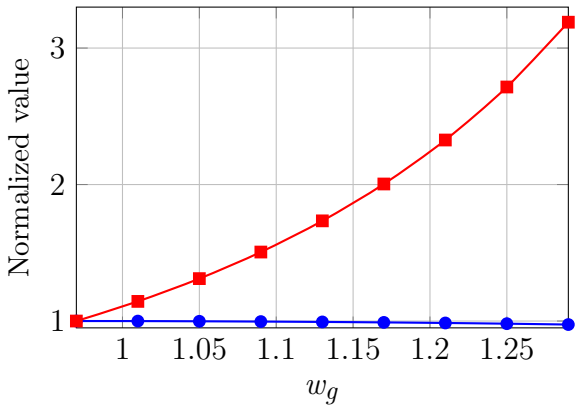


(A) Y_g (blue, circle) and Y_ℓ (red, square) as functions of w_g, normalized by initial values.

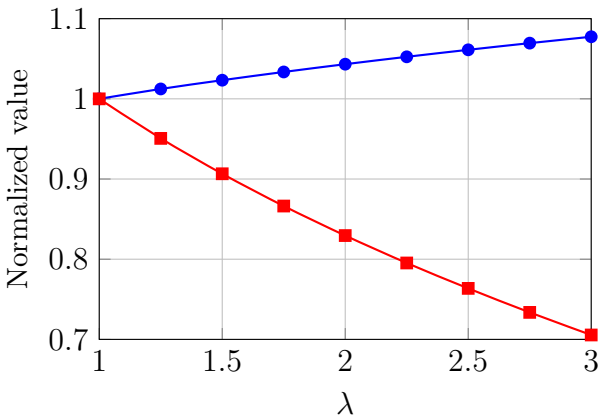


(B) Y_g (blue, circle) and Y_ℓ (red, square) as functions of λ, normalized by initial values.

Figure B.4. Policy counterfactuals with $s_\ell = .65$, $r \approx 4.107$, $\mu \approx -3.244$. Remaining parameter values are the same as in the baseline specification.

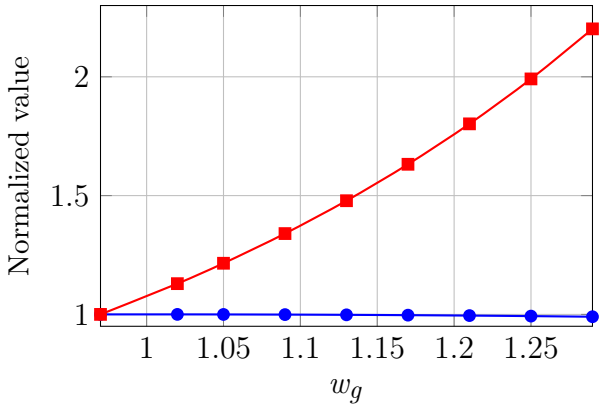


(A) Y_g (blue, circle) and Y_ℓ (red, square) as functions of w_g, normalized by initial values.

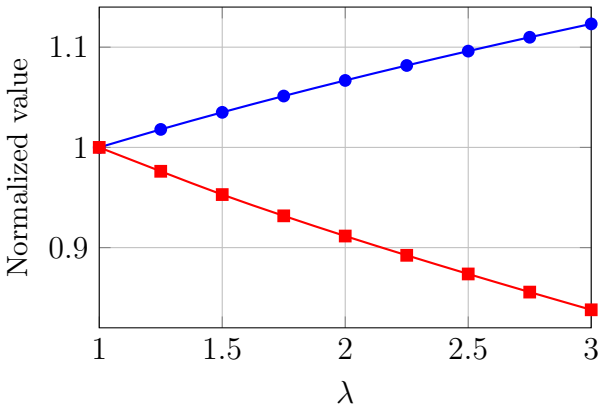


(B) Y_g (blue, circle) and Y_ℓ (red, square) as functions of λ, normalized by initial values.

Figure B.5. Policy counterfactuals with $\rho = .04$, $\mu \approx -3.244$, $r = 4.8533$. Remaining parameter values are the same as in the baseline specification.

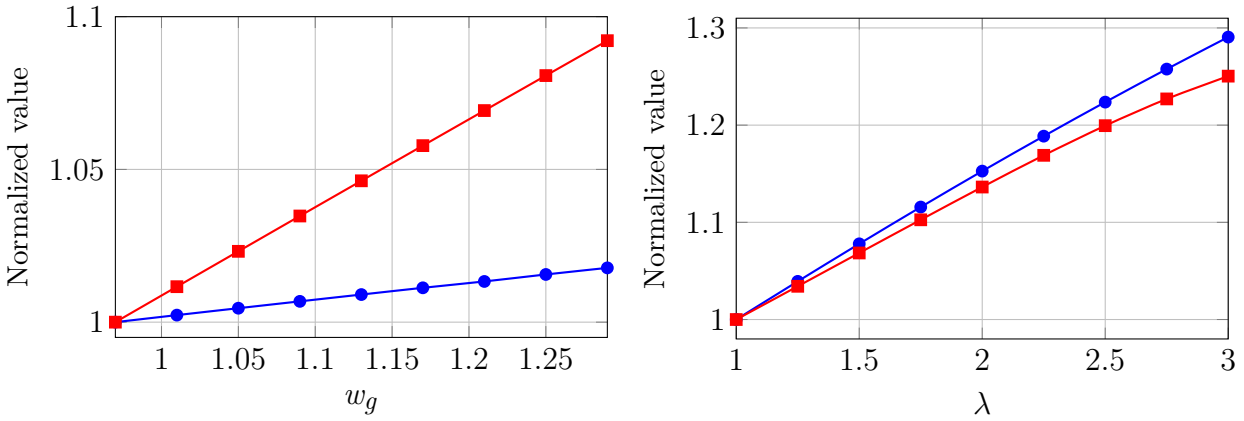


(A) Y_g (blue, circle) and Y_ℓ (red, square) as functions of w_g, normalized by initial values.



(B) Y_g (blue, circle) and Y_ℓ (red, square) as functions of λ, normalized by initial values.

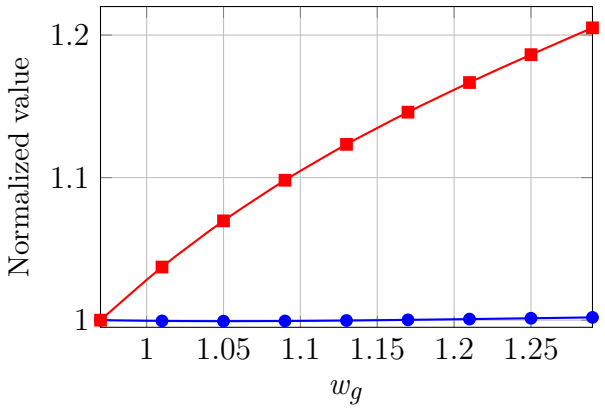
Figure B.6. Policy counterfactuals with $\rho = .075$, $\mu \approx -2.577$, and $r = 3.36$. Remaining parameter values are the same as in the baseline specification.



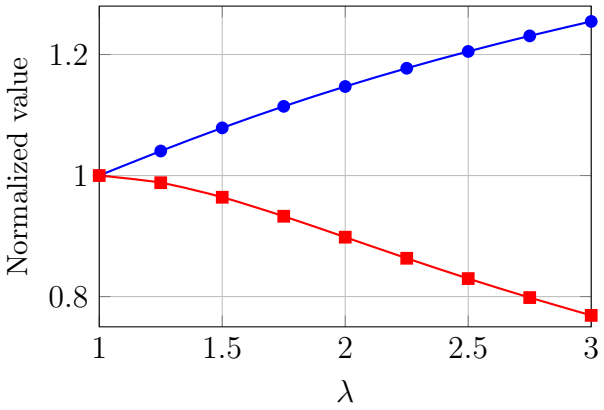
(A) Y_g (blue, circle) and Y_ℓ (red, square) as functions of w_g, normalized by initial values.

(B) Y_g (blue, circle) and Y_ℓ (red, square) as functions of λ, normalized by initial values.

Figure B.7. Normalized output counterfactuals for Y_g and Y_ℓ over w_g and λ in a case with high entry, with parameter values not chosen to match the data: $r = 2$, $\mu = -\gamma_E$. Remaining parameter values are the same as in the baseline specification.

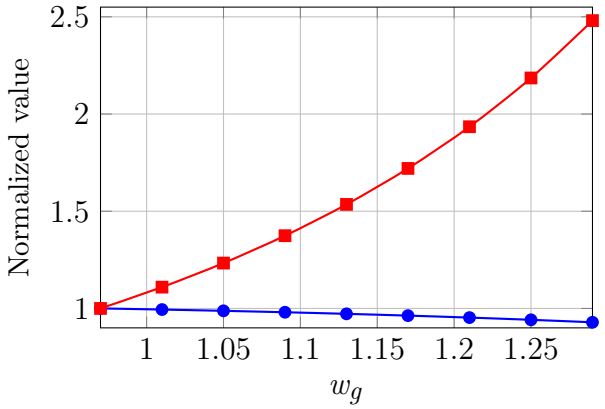


(A) Y_g (blue, circle) and Y_ℓ (red, square) as functions of w_g, normalized by initial values.

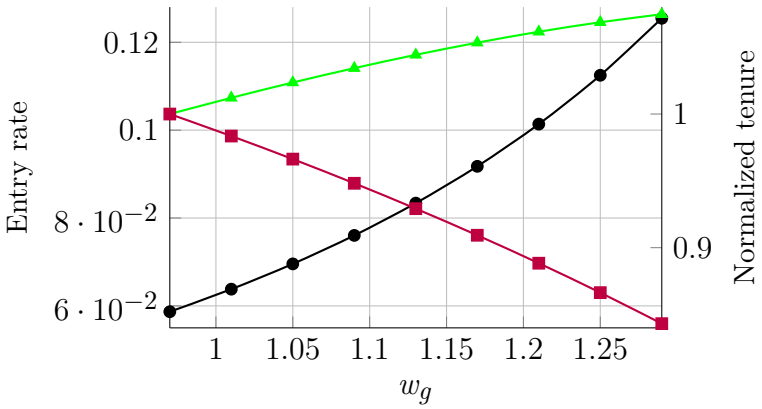


(B) Y_g (blue, circle) and Y_ℓ (red, square) as functions of λ, normalized by initial values.

Figure B.8. Normalized output counterfactuals for Y_g and Y_ℓ over w_g and λ in a case with high entry, parameter values not chosen to match the data: $\delta = .025$, $\rho = .05$, $s_\ell = 1$, $w_p = 1$, $w_g = 1$, $\lambda = 1$, $r = 1$, $\mu = -\gamma_E - 1$, scale $= 1$.

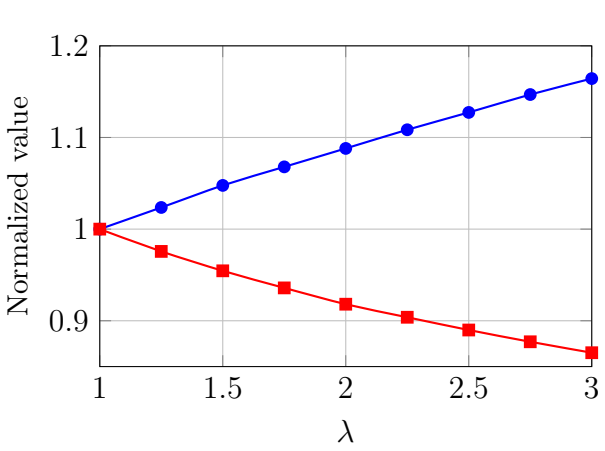


(A) Y_g (blue, circle) and Y_ℓ (red, square) as a function of w_g. Note that Y_g and Y_ℓ are normalized by their initial values.

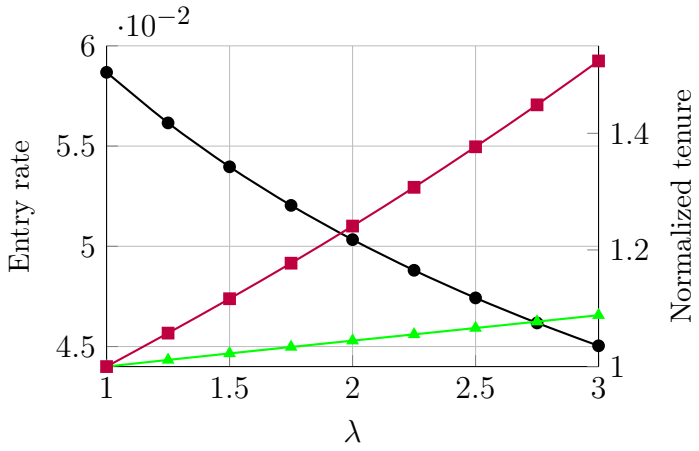


(B) Government tenure for a worker with $\psi = 0$ (green, triangle), for a worker with $\psi = 2$ (purple, square), and the entry rate (black, circle) as a function of w_g. Note that tenures are normalized by their initial values.

Figure B.9. Counterfactuals over w_g with alternative truncations for ages and ψ, $nmax = 200$, $amax = 200$, $smax = 200$, $psiMin = -25$, $psiMax = 25$.



(A) Y_g (blue, circle) and Y_ℓ (red, square) as a function of λ. Note that Y_g and Y_ℓ are normalized by their initial values.



(B) Government tenure for a worker with $\psi = 0$ (green, triangle), for a worker with $\psi = 2$ (purple, square), and the entry rate (black, circle) as a function of λ. Note that tenures are normalized by their initial values.

Figure B.10. Counterfactuals over λ with alternative truncations for ages and ψ, $nmax = 200$, $amax = 200$, $smax = 200$, $psiMin = -25$, $psiMax = 25$.

C Empirical Analysis of Lobbyist Revenue Dynamics

This appendix supplements the revenue-tenure analysis in Section 5.1. Unless otherwise noted, all tables report estimates of β from equation (14) with standard errors clustered by individual. Across these specifications and samples, we do not find robust evidence of positive returns to lobbying tenure. The exception is the individual-fixed-effects specification in column (1) of Table C.6, which omits period controls and thus conflates within-career tenure with secular industry growth. Once aggregate lobbying expenditures are controlled for—displayed in column 2—the estimate is again small and non-positive.

We organize the robustness analysis into four categories. First, we vary the estimation sample (Tables C.1 and C.2). Second, we vary the revenue measure and normalization (Tables C.3 and C.4). Third, we consider alternative specifications (Tables C.5 and C.6). Finally, Table C.7 estimates the revenue-tenure relationship for non-revolving-door lobbyists as a comparison group.

Table C.1. Revenue-Tenure Relationship: Relaxing the Contiguous-Career Restriction

	By Career Length				Pooled
	3 yrs	4 yrs	5 yrs	6 yrs	3–6 yrs
Panel A: At most 1 zero-revenue period					
$\hat{\beta}$	-0.080^{*}	-0.041	-0.020	-0.014	-0.025
	(0.031)	(0.030)	(0.029)	(0.046)	(0.013)
Lobbyists	243	159	97	70	569
Observations	813	858	710	645	3,026
Panel B: At most 2 consecutive zero-revenue periods					
$\hat{\beta}$	-0.081^{*}	-0.045	-0.006	0.005	-0.013
	(0.029)	(0.028)	(0.028)	(0.039)	(0.012)
Lobbyists	272	179	117	91	659
Observations	873	926	808	789	3,396

Notes: * $p < 0.05$. The baseline sample requires contiguous positive-revenue periods. Panels allow lobbyists whose longest gap between positive-revenue periods is at most 1 (Panel A) or 2 (Panel B) reporting periods. All specifications include period fixed effects. The pooled specification includes career-length fixed effects.

Table C.2. Revenue-Tenure Relationship: Progressively Relaxing Sample Restrictions

	Career $\geq$ 3 yrs		Career 3–6 yrs	
Sample	$\hat{\beta}$	N	$\hat{\beta}$	N
Baseline	-0.027	155	-0.039	135
	(0.026)		(0.028)	
Include 1998 starts	-0.076^{*}	270	-0.076^{*}	190
	(0.013)		(0.018)	
Include 2008 careers	0.002	861	-0.028	603
	(0.014)		(0.015)	
Include both	-0.043^{*}	1,394	-0.044^{*}	658
	(0.007)		(0.012)	
Both + allow 1 zero-period	-0.035^{*}	3,479	-0.046^{*}	1,745
	(0.004)		(0.007)	
Both + allow $\leq$ 2 zero-periods	-0.033^{*}	3,938	-0.041^{*}	1,927
	(0.004)		(0.007)	

Notes: * $p < 0.05$. Each row progressively relaxes restrictions from the baseline sample, which excludes lobbyists entering in 1998, those still active in 2008, and those with any gap in positive-revenue periods. *Include 1998 starts* adds lobbyists whose first positive-revenue period decreases in 1998. *Include 2008 careers* adds those still active in 2008. Subsequent rows additionally allow gaps of at most 1 or 2 consecutive zero-revenue periods. Both specifications pool across career lengths and include period and career-length fixed effects. N denotes the number of individual lobbyists.

Table C.3. Revenue-Tenure Relationship: Alternative Revenue Measurements

	By Career Length		Pooled
	3 yrs	4 yrs	3–6 yrs
Panel A: Annual revenue			
$\hat{\beta}$	−0.075	−0.203	−0.112
	(0.145)	(0.208)	(0.065)
Lobbyists	62	37	135
Observations	124	110	396
Panel B: Alternative revenue variable			
$\hat{\beta}$	−0.135*	−0.091	−0.071*
	(0.062)	(0.084)	(0.033)
Lobbyists	62	37	135
Observations	241	214	780

Notes: * $p < 0.05$. Both panels use the baseline sample. Panel A aggregates revenues to the calendar-year level. The dependent variable is the log ratio of annual revenue to first-year revenue, and period fixed effects are replaced by year fixed effects. Panel B uses the alternative revenue variable `rev_worper` from Blanes i Vidal et al. (2012) rather than `revw_worper`. The pooled specification includes career-length fixed effects.

Table C.4. Revenue-Tenure Relationship: Normalizing by Second-Period Revenue

	By Career Length				Pooled
Sample	3 yrs	4 yrs	5 yrs	6 yrs	3–6 yrs
Panel A: Baseline (contiguous careers)					
$\hat{\beta}$	−0.037	−0.107	0.023	−0.046	−0.027
	(0.070)	(0.083)	(0.072)	(0.106)	(0.032)
Lobbyists	62	37	18	18	135
Observations	241	214	144	181	780
Panel B: At most 1 zero-revenue period					
$\hat{\beta}$	−0.087*	−0.046	−0.027	−0.011	−0.028
	(0.034)	(0.031)	(0.034)	(0.064)	(0.015)
Lobbyists	243	159	97	70	569
Observations	813	858	710	645	3,026
Panel C: At most 2 consecutive zero-revenue periods					
$\hat{\beta}$	−0.083*	−0.052	−0.006	0.000	−0.016
	(0.032)	(0.029)	(0.032)	(0.053)	(0.014)
Lobbyists	272	179	117	91	659
Observations	873	926	808	789	3,396

Notes: * $p < 0.05$. The dependent variable is $\log\left(\frac{y_{it}}{y_{i,2}}\right)$, where $y_{i,2}$ is lobbyist i's revenue in her second positive-revenue period, rather than the average of the first two periods used in the main specification. The estimation sample is otherwise identical: observations from the first two periods are excluded in both specifications, so estimates reflect only the change in the baseline denominator. Sample definitions in Panels B and C correspond to those in Table C.1. All specifications include period fixed effects. Pooled specifications include career-length fixed effects.

Table C.5. Revenue-Tenure Relationship: Quadratic Specification and Excluding Period Fixed Effects

	By Career Length		Pooled
	3 yrs	4 yrs	3–6 yrs
Panel A: Quadratic specification			
Linear	−0.508	−0.158	0.018
	(0.305)	(0.238)	(0.061)
Quadratic	0.064	0.008	−0.005
	(0.041)	(0.023)	(0.005)
Panel B: Excluding period fixed effects			
$\hat{\beta}$	−0.047	−0.025	−0.022
	(0.031)	(0.029)	(0.016)
Lobbyists	62	37	135
Observations	241	214	780

Notes: * $p < 0.05$. Both panels use the baseline sample. Panel A augments equation (14) with a quadratic term in lobbying tenure. Panel B omits period fixed effects from the linear specification. The pooled specification includes career-length fixed effects.

Table C.6. Revenue-Tenure Relationship: Individual Fixed Effects on Full Sample

	(1)	(2)
$\hat{\beta}$	0.011*	−0.004
	(0.001)	(0.003)
ln(agg. revenue)		0.476*
		(0.103)
Individual FE	Yes	Yes
Lobbyists	6,279	6,279
Observations	64,115	64,115

Notes: * $p < 0.05$. Dependent variable is log of individual revenue in reporting period. Sample includes all revolving-door lobbyists with at least two positive-revenue periods, without restrictions on entry year, exit year, or career gaps. Specifications include individual fixed effects. Column (2) controls for aggregate industry conditions using the log of total real lobbying expenditures in the calendar year. Standard errors clustered by individual.

Table C.7. Revenue-Tenure Relationship: Non-Revolving-Door Lobbyists

	By Career Length				Pooled
	3 yrs	4 yrs	5 yrs	6 yrs	3–6 yrs
$\hat{\beta}$	−0.052*	−0.025	0.004	0.002	−0.022
	(0.024)	(0.024)	(0.031)	(0.034)	(0.012)
Lobbyists	280	150	77	45	552
Observations	1,081	878	601	445	3,005

Notes: * $p < 0.05$. Sample restricted to lobbyists without prior federal government employment. These lobbyists may also experience connection-related dynamics if their professional networks include government officials whose turnover affects lobbying effectiveness. All specifications include period fixed effects. The pooled specification includes career-length fixed effects.

D Empirical Distribution of Revolver Revenues

Table D.1. Descriptive Statistics by Year of Revolver Revenue (in 2008 dollars)

Year	*N*	Mean	Median	Mean/Med.	P10	P90	Gini
1999	2302	281,726	172,320	1.635	23,940	668,485	0.547
2000	2381	294,897	179,039	1.647	25,092	711,325	0.550
2001	2642	315,040	185,970	1.694	26,122	784,926	0.554
2002	2795	324,975	207,080	1.569	26,720	799,056	0.541
2003	3158	348,202	208,134	1.673	26,240	857,595	0.547
2004	3381	351,026	214,595	1.636	25,700	826,255	0.544
2005	3784	370,105	225,360	1.642	25,040	865,789	0.548
2006	3962	373,766	227,491	1.643	26,663	915,143	0.544
2007	4174	388,935	251,905	1.544	31,733	940,626	0.531
2008	4170	383,130	242,603	1.579	31,762	899,160	0.532

Notes: Annual revenue distribution statistics for active revolving-door lobbyists (in 2008 dollars). P10 and P90 are the 10th and 90th percentiles.

Table D.2. Tests of Power Law and Log-Normal Distributions for Annual Lobbying Revenue

Year	Power Law (p-value)	Log-Normal (p-value)
1998	0.017	0.201
1999	0.001	0.014
2000	0.286	0.455
2001	0.079	0.059
2002	0.535	0.002
2003	0.060	0.001
2004	0.009	0.050
2005	0.103	0.076
2006	0.657	0.420
2007	0.157	0.043
2008	0.007	0.116

Note: Tests of whether annual lobbying revenues (in 2008 dollars) follow power law or log-normal distributions. For each year 1998–2008, we conduct bootstrap goodness-of-fit tests following Clauset et al. (2009) with the null hypothesis that revenues follow each distribution.

Figure D.1. Density of Annual Revenues for Revolving-door Lobbyists (in 2008 dollars)

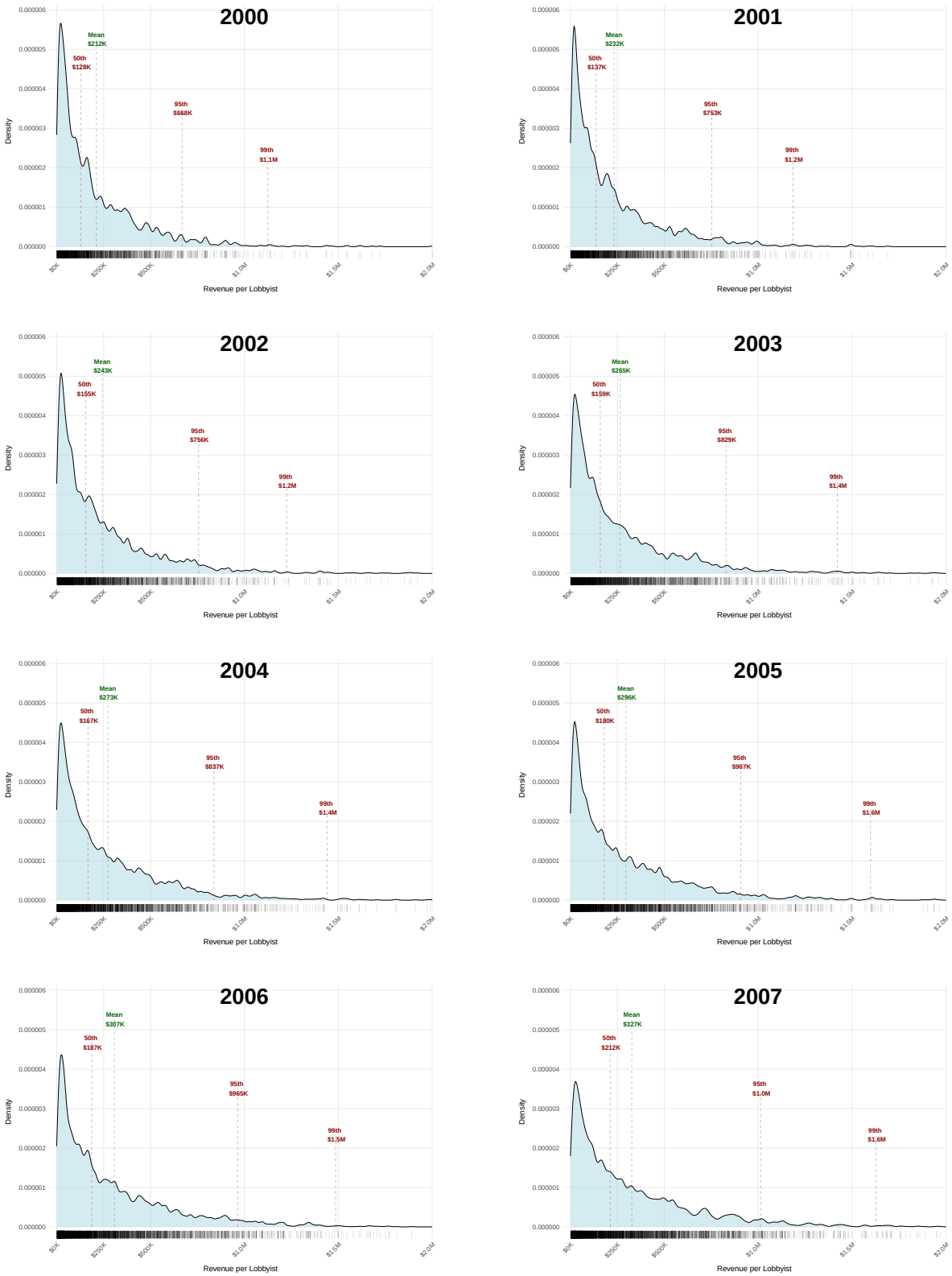


Figure D.2. Distributions of Annual Revenue in 2001–2008 (in 2008 dollars)

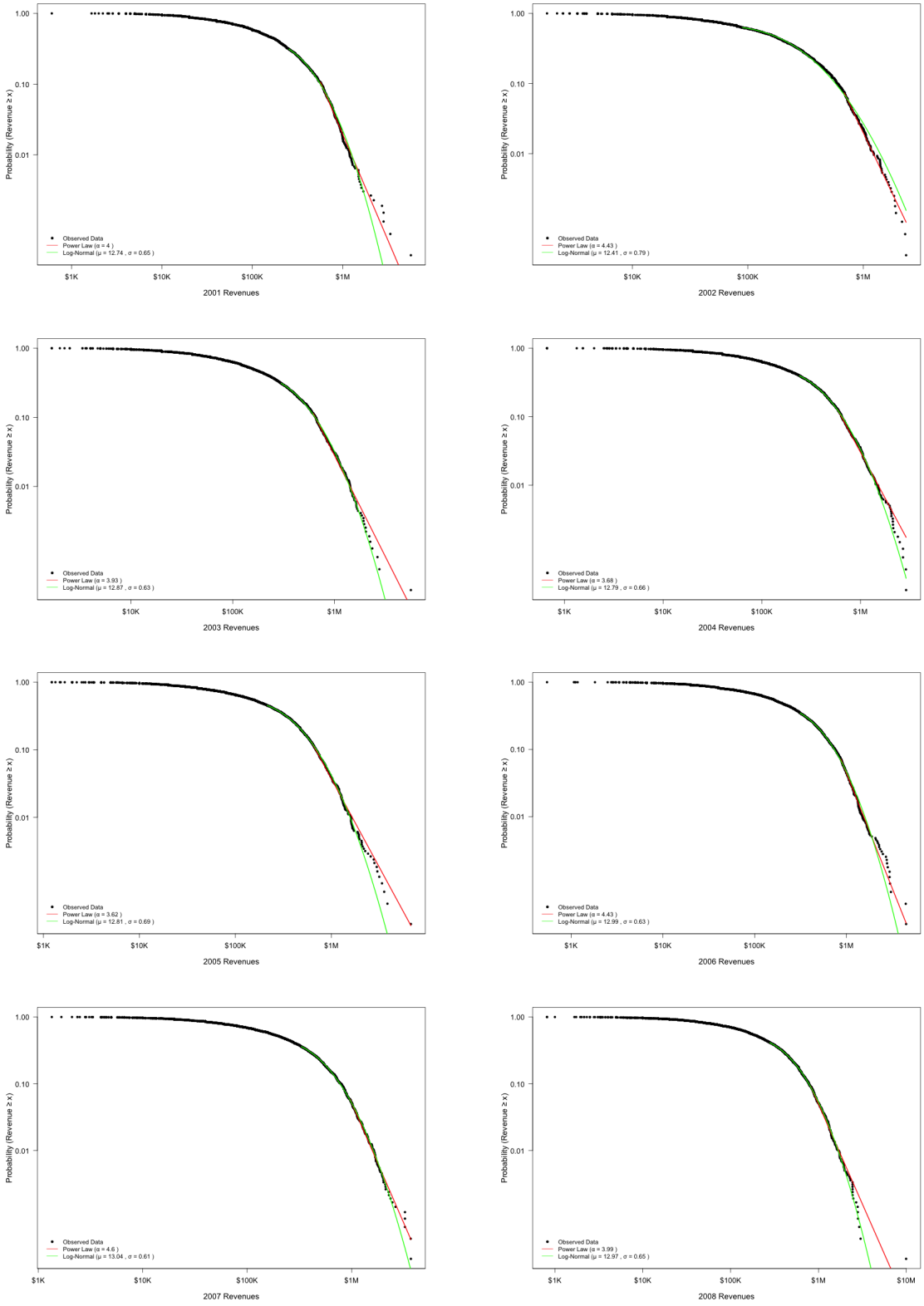


Figure D.2 plots the complementary cumulative distribution of annual lobbying revenues on log-log scales for each year from 2001–2008. For each year, we show the observed data (points) and fitted power law (red line) and log-normal (green line) distributions. The plots are created using the `poweRlaw` 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.

The key takeaway is the heavy-tailed property that persists across all years. The Gini coefficient is between 0.53 and 0.55 throughout the panel (Table D.1), and the density plots consistently show pronounced right skew with a small number of superstar lobbyists generating revenues several times the median.