Bureaucratic Revolving Doors and Interest Group Participation in Policymaking*

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Abstract

There is growing concern about the movement of individuals from private sectors to bureaucracies, yet little attention is paid to how this affects interest groups' activities. Interest groups with connections to bureaucrats may exert less effort to provide information to policymakers (the "substitution effect") or exert more effort (the "complement effect"). We address this question by constructing a novel dataset on career trajectories of bureaucrats in the Office of the US Trade Representative (USTR) and firms that served on USTR advisory committees during the period 1997-2017. Empirical results support the substitution effect: firms with connections to USTR bureaucrats decrease their lobbying spending and participation on advisory committees. We present suggestive evidence that the substitution effect occurs when connected bureaucrats' ideologies are closer to the median ideal point of the agency, which makes the connected bureaucrats pivotal players. Our findings suggest that an apparent decrease in interest groups' political activities might not imply that their influence on policymaking diminished.

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1 Introduction

Bureaucrats have significant discretion in the policymaking process and their policy choices affect various stakeholders in society. Thus, interest groups actively engage in contacting bureaucrats and providing policy-relevant information. They can directly lobby bureaucrats (Yackee and Yackee 2006; You 2017; Gordon and Rashin 2020) or lobby legislators who wield oversight authority on bureaucrats (McCubbins and Schwartz 1984; Epstein and O'Halloran 1995; Hall and Miler 2008).[1] Interest groups also participate in public forums offered by federal agencies such as federal advisory committees (Petracca 1986; Moffitt 2014; Balla and Wright 2001) and notice-and-comment rulemaking (Yackee and Yackee 2006; Libgober, Forthcoming).

Extant work on bureaucrat-interest group interactions focuses primarily on the policymaking environment where interest groups provide information to bureaucrats and two actors are treated separately. However, the recent movement between private sectors and bureaucracies, referred to as the revolving door, makes this assumption questionable. Public commentators raised a concern that government officials who have a connection with an industry - as a previous employee or lobbyist - may respond more favorably to the information provided by the industry. For instance, public watchdogs commented that Michael Froman, who was the head of the US Trade Representative and previously worked at Citibank, is "a man who, by background and mindset, responds to Wall Street rather than ordinary people" (Fulton 2015). There were also criticisms when the Environmental Protection Agency (EPA) appointed acting chief Andrew Wheeler following his previously work as a lobbyist who helped coal companies fight against EPA regulations (Friedman 2018).

Frequent movement from private sectors to bureaucracies raises the question of how the bureaucratic revolving door affects firms' willingness to participate in policymaking processes to influence bureaucratic decisions. One scenario is the substitution effect: firms are less willing to provide information to policymakers when individuals connected to the firm enter the agency.

1. For theoretical discussions on the choice of interest groups to lobby legislators or bureaucrats, see, Sloof (2000), Bennedsen and Feldmann (2006) Boehmke, Gailmard, and Patty (2005).

Interest groups may expect that those connected individuals make favorable policies toward their former employers without much of their inputs. These bureaucrats do so because of their preference alignment with their previously connected firms (Gormley 1979; Kwak 2014), or to be more responsive to the contacts made by their connected firms (Acemoglu et al. 2016). Another scenario is the complement effect: the revolving door in bureaucracies leads to an increase in firms' political activities. Interest groups may be willing to take advantage of their connections in the bureaucracy by doubling down on their political participation and existing studies document that firms often use multiple political strategies at the same time to influence the policymaking process (Ansolabehere, Figueiredo, and Snyder 2003; Akey 2015). Identifying which effect is present and why is crucial for understanding the implications of the revolving-door phenomenon in bureaucracy. If firms strategically adjust their political behavior in the expectation that their connected bureaucrats will enact preferable policy outcomes, the degree of interest group influence may not be fully captured by a measure of explicit interest group activities such as lobbying spending and participation on advisory committees.

This paper examines how firms change their information provision activities when their previously connected individuals enter federal agencies. To empirically test our argument, we focus on the Office of the United States Trade Representative (USTR), a federal agency responsible for developing US trade policies. The USTR is a good case for our study for several reasons. First, the USTR is ranked first in having the highest number of revolving-door bureaucrats considering the size of the agency. Second, the USTR consists of a small number of specialized and senior personnel. These individual bureaucrats wield significant power to develop trade policies, which makes firms' connections to these revolving-door officials valuable. Lastly, the power of developing trade policies is disproportionately accrued to USTR bureaucrats due to the expertise they possess and the fast-track authority given to the executive regarding trade negotiation. This leads interest groups to lobby the USTR directly and participate actively on USTR advisory committees to provide policy-relevant information.

We collect the list of all USTR officials who served in the agency during the period 1997-2017.

For each official, we gather the information on their career trajectories using various online sources. This data on career paths enables us to examine which officials are revolving-door bureaucrats and have previous connections with firms. We also collect the list of all firms that participated in USTR advisory committees during the period 1997-2017. Combining these two datasets, we identify two types of connections between USTR officials and firms. First, a USTR official has a *direct* connection with a firm if she worked in the firm in the past. Second, a USTR official has an *indirect* connection if she worked as a lobbyist of the firm in the past. Based on these measures of connetions, we identify bureaucrats who have revolving-door history in the full list of the USTR employees and include revolving-door bureaucrats in our analysis.

Our unit of observation is the USTR bureaucrat $\times$ firm $\times$ year pairs spanning the period 1997-2017. For every revolving-door bureaucrat and the connected firm pair, we create 21 rows for each year between 1997 and 2017. We identify the year when the revolving-door bureaucrats enter the USTR and the year the pair's connection is created based on the bureaucrat's employment history. Using this dataset, we first examine whether there is a decrease in firms' participation in policymaking process when individuals with previous connections work in the USTR. We focus on two main activities in which firms engage to provide information to bureaucrats: (1) participation on USTR advisory committees and (2) lobbying activities. While both measures reflect the level of firms' efforts to provide information to policymakers, firms' participation on advisory committees not only depends on firms' willingness to participate but also on bureaucrats' willingness to grant participation. It may be the case that firms cannot participate on committees even if they want to. Despite such differences, we argue that bureaucratic-led constraints are less of a concern if the observed effects do not differ across both measures of interest group activities.

To estimate the effect of a revolving-door bureaucrat's entry into the USTR, we use bureaucrat $\times$ firm fixed effects to account for all time-invariant individual and firm characteristics. Moreover, our identification strategy rests on the exogeneous timing of individuals joining the USTR. We argue that firms can rarely make their previous employees or lobbyists enter the USTR at the time they prefer. These individuals are primarily concerned about their future career paths, which do

not coincide with the interests of their previous employers or clients. Moreover, the competitive hiring process of career bureaucrats and the political appointment process of senior officials make it difficult for previous employees and lobbyists to join the USTR at the times firms prefer. Lastly, even if there are instances when firms enable their previous employees (lobbyists) to enter the USTR at the time when they prefer, such confounders generate upward bias that is against our argument. For instance, at the times firms need connections to the USTR, they not only try to facilitate their previous employees' or lobbyists' employment with the USTR but also increase their lobbying and advisory committee activities. Such upward bias will make our argument stronger if we still observe the negative substitution effect in our analyses.

Our empirical results support the substitution effect. When an individual with a connection to a firm enters the USTR, there is a decrease in the connected firm's participation on USTR advisory committees. The effect is driven by advisory committees that are under the direct jurisdiction of the USTR, not by the advisory committees that are jointly administered by multiple agencies. We also find that having a connected individual in the USTR also leads to a decrease in the connected firm's lobbying activities and lobbying to the USTR in particular.

To understand why the substitution effect occurs, we additionally examine which bureaucrat $\times$ firm pairs drive the substitution effect. Previous literature suggests that connected bureaucrats and firms share similar policy preferences (Gormley 1979; Kwak 2014), and this may be why the substitution occurs. We test this mechanism by measuring one-dimensional ideology scores of USTR bureaucrats and firms using the campaign finance score (CF score) data by Bonica (2016). We find that the substitution effect does not occur due to preference alignment between connected bureaucrats and firms. Instead, the substitution effect occurs when connected bureaucrats' ideologies are closer to the ideal point of the USTR. Since the USTR is an liberal agency on average, firms benefit from having a connection with liberal bureaucrats whose opinions are more likely to be heard by their peers and thus have more influence on USTR policymaking. On the other hand, the political ideology of firms does not affect whether the substitution effect occurs. Our findings suggests that the key underlying factor of the substitution effect is whether a revolving-door bureaucrat's

ideology matches with the median ideology of the agency.

The findings of this paper contribute to the existing literature by providing systematic evidence on how the revolving doors to bureaucracy change firms' incentives to provide information to policymakers. Gormley (1979) finds that when an individual with a connection to an interest group enters the bureaucracy, the connected individual is more likely to cast votes on regulation in the way that favors interest groups. Hubert and Rezaee (2019) find that the connected interest groups exert more effort in delivering policy proposals to policymakers to compensate for their loss of policy-motivated individuals to government employment. Building on these studies, we are the first to address this research question using the novel dataset on USTR bureaucrats and firms participating on USTR advisory committees and lobbying process.

Moreover, our findings suggest that inequalities in political representation does not necessarily decrease as the level of interest group activities decline. Measures such as lobbying spending and participation in rulemaking processes are frequently cited to discuss the degree of inequality in political participation and influence in bureaucracy (Yackee and Yackee 2006; Ban and You 2019). On the surface, a decrease in firms' lobbying activities and participation on federal advisory committees may appear to mean that these firms' influence over the decision-making process is waning. However, in the presence of the bureaucratic revolving door, we find that connected firms decrease their political activities because they have connected bureaucrats who may produce policy outcomes favorable towards the firms. Thus, our paper raise a caution against equating a decrease in interest groups' political activity with a decrease in interest groups' influence in the policymaking process.

2 Interest Groups and Supply of Information

Information is a crucial component in the policymaking process. Information acquisition is the core principle of how legislative organizations are structured (Krehbiel 1991) and is the primary driver of why Congress delegates policymaking authority to bureaucrats with informational advantages

and policy expertise (McCubbins, Noll, and Weingast 1987; Epstein and O'Halloran 1994).

Interest groups play an important role in providing information to both Congress and bureaucracies. One prominent strategy employed by interest groups is to lobby legislators and provide private information (Hansen 1991; Austen-Smith 1995; Lohmann 1995). Such legislative lobbying by interest groups can affect bureaucratic decision-making by reducing informational asymmetries between Congress and the bureaucracy (Epstein and O'Halloran 1995). In addition, interest groups can help with congressional oversight of the bureaucracy by alerting legislators to bureaucratic transgressions (McCubbins and Schwartz 1984), or subsidizing legislators to intervene in agency rulemaking as a form of *ex post* oversight (Hall and Miler 2008).

Empirical works on lobbying show that interest groups also directly lobby bureaucrats (Carpenter 2002; Yackee and Yackee 2006; You 2017; Gordon and Rashin 2020). Interest groups may do so only if bureaucrats, not legislators, possess the expertise to understand technical and policy-relevant information (Sloof 2000). The fact that interest groups also lobby the bureaucracy raises an interesting theoretical question about which venues interest groups choose to influence policies (Boehmke, Gailmard, and Patty 2005, 2013). Moreover, the interaction between interest groups and the bureaucracy inevitably affects the degree to which Congress delegates to the bureaucracy (Bennedsen and Feldmann 2006).

Lobbying and participating in notice-and-comment rulemaking are not the only ways that interest groups provide information to bureaucrats. Interest groups can also participate on federal advisory committees in the executive branch. In 1972 , Congress passed the Federal Advisory Committee Act (FACA) to gain expertise from groups and individuals who are outside the federal government (Bybee 1994). FACA was a part of efforts to increase public participation in the bureaucatic decision-making process (Moffitt 2014), and opened an additional opportunity for interest groups to provide information to agencies (Petracca 1986). In recent years, there have been about 1,000 federal advisory committees and approximately 7,000 members who were active in committee activities (Ginsberg and Burgat 2019).

Existing works demonstrate that political actors use advisory committees in a strategic fashion.

Moffitt (2010) shows that the Food and Drug Administration (FDA) uses federal advisory committees to protect the agency's reputation. When there is high risk and uncertainty, the FDA is more likely to rely on public participation by activating recommendations from advisory committees. Balla and Wright (2001) argue that Congress controls the composition of advisory committee membership and, consequently, bureaucratic decisions. Using the data on the Environmental Protection Agency (EPA), they show that applicants are more likely to serve on the advisory committee if they are endorsed by interest groups that are active in lobbying members of Congress.

3 What Happens if Interest Groups Become Bureaucrats?

Extant work on interactions between legislators, bureaucrats, and interest groups sheds light on how each player strategically makes their moves to provide information and affect policy outcomes. However, most of the works assume that bureaucrats and interest groups are separate actors with a fixed preference (or ideology). However, increasingly frequent movement between the bureaucracy and interest groups makes this assumption questionable.

Prior studies document how revolving doors from the executive branch to the private sector can influence bureaucrats' incentives while they are still working in government (deHaan et al. 2015; Tabakovic and Wollmann 2018). On the other hand, the public is increasingly concerned about movement from private sectors into the bureaucracy. Center for Responsive Politics issued a report in July of 2018 that shows at least 164 lobbyists who had a lobbyist career were serving the Trump administration (West 2018). One of them is Dan Elwell who joined the Federal Aviation Administration in 2017 is a former lobbyist for Aerospace Industries Association of American and American Airlines.

Despite the frequent discussion and public concerns about revolving doors into the federal government, there is a limited body of work that examines these dynamics, with two exceptions. One is Hubert and Rezaee (2019) who study how revolving doors into government affects the influence of special interests. They show that the influence of special interests can be weakened when

individuals from special interest groups move to government. The underlying logic is simple: when a policy-motivated individual moves from the private to the public sector, it increases the government's policy development capacity and, therefore, changes the bargaining environment in favor of the government. The other exception is Gormley (1979) whose work examines the Federal Communications Commission (FCC) and shows that FCC regulatory commissioners who formerly worked in a regulated industry are likely to cast votes that favors the industry. Building on this study, we additionally examine how the movement from firms to the bureaucracy affects firms' incentives to provide information to Congress and the bureaucracy.

The lack of empirical studies on this question is surprising given that movement from private sectors to government through revolving doors can fundamentally change the key elements of policymaking such as the median preference of the bureaucracy and the alignment between bureaucrats and interest groups. How do the revolving-door bureaucrats change the incentives of interest groups engaged in providing information provision to policymakers? First, there may be a decrease in the interest group's willingness to provide policy-relevant information when an individual with connections to an interest group moves into government (the "substitution effect"). Second, interest groups can increase their information provision activities in response to their previous employers or lobbyists becoming a bureaucrat (the "complement effect").

As argued by Gormley (1979), bureaucrats who formerly worked for an interest group may have preferences similar to those of the interest group where they had worked via selection or socialization. The latter mechanism has been suggested by scholars of the organizational socialization who claim that professional norms and rules in workplaces leave a cultural imprint on individuals (Kwak 2014). These connected bureaucrats may also be more responsive to contacts made by previously connected firms since they know these firms well (Acemoglu et al. 2016).

Given such preferences of revolving-door bureaucrats, additional conditions must be specified for either the substitution or complement effect to occur. Specifically, the role interest groups play in the policymaking process is an important factor in determining which effects prevail. Interest groups can participate in the policymaking process to provide information and set their pre-

ferred agenda at the beginning of the policymaking process (Hall and Wayman 1990; Austen-Smith 1993). If agenda-setting is an important objective of interest group activities, the complement effect can occur. By increasing their level of participation in the policymaking process, especially at the agenda-setting stage, firms expect that they can pull policy even closer to their preferred outcomes since they have connected bureaucrats who later develop favorable policies on the given agenda.

However, a close examination of the policymaking process suggests that individual firms may not play a decisive role in setting the agenda. Rather, interest groups can work as a large coalition to pressure Congress to adopt their preferred agenda (Hula 1999; Mahoney 2007; Lorenz 2020), which makes the impact of additional participation by one firm marginal. These studies suggest that the primary motivation of individual interest groups' participation in the policymaking process is to provide information. Thus, we expect the substitution effect of the bureaucratic revolving door. Having connected bureaucrats in the agency reduces the connected firms' incentive to continue participating in the political process since these bureaucrats will implement firms' preferred policies without firms' input into the policymaking process.

4 Data and Stylized Facts

4.1 Revolving Doors in Bureaucracy

To understand the revolving door phenomenon in the executive branch, we extract the career trajectories of revolving-door lobbyists from the Center for Responsive Politics (CRP)'s webpage.[2] The data include the career trajectories of people who were employed to federal government or appointed to a federal government entities such as advisory boards for the top 18 federal agencies that produced the most lobbyists.[3] We were able to retrieve the information of 5,752 unique indi-

2. https://www.opensecrets.org/revolving/top.php?display=G

3. The names of the included agencies are: Army, Commerce, Defense, Agriculture, Energy, Justice, EPA, Executive Office of the President, FCC, Health & Human Services, Justice, OMB, SEC, State, Transportation, Treasury, US Diplomatic Missions, and USTR.

Table 1: Summary Statistics for Revolving Doors in Bureaucracy

Variable	Mean (%)	N
Panel A. Career Trajectory		
Started in Government	45	5,752
Started in Lobbying or Private Sector	55	5,752
Government → Private Sector → Government	30	5,752
Private Sector → Government → Private Sector	41	5,752
Panel B. Career Experience		
Executive Branch	100	5,752
Congress	30.4	5,752
State/Local Government	7.8	5,752
Lobbying Firm	72.4	5,752
Private Sector	63.5	5,752

viduals. For each individual, the data records the name of each employer, the start and end years for a given employer, and the job title.

Using the data on 5,752 revolving-door lobbyists, we calculate the proportion of executive branch revolvers who started their careers in government or in the lobbying or private sector. Here, *Government* means having worked for the federal government.[4] *Lobbying* or *Private Sector* means having worked in the private sector or for a lobbying firm. We also calculate the proportion of lobbyists who started their career in government, joined the lobbying or private sectors after leaving the government, and then returned to government. Lastly, we calculate the proportion of lobbyists who served as a lobbyist or having worked in the private sector, and joined the federal government, then went back to the private sector. These final two categories, especially the former, are more consistent with common notions of a revolving-door career.

Table 1 presents these patterns. Overall, we see that roughly 45% of executive branch revolvers began their careers working in the government, while 55% began their careers in the lobbying or private sector. Roughly 30% of executive branch revolvers began their careers in government, left for jobs in the private sector or lobbying firms, and came back for the government.

What is immediately obvious from this data is that executive branch revolvers enter and exit

4. In some cases, individuals not only worked for the federal government but also worked in Congress, or for state or local governments.

government at highly variable points of their careers. The congressional revolving door, which is mostly a one-way street of young staffers leaving the government or members moving to the lobbying industry after retirement. On the other hand, the executive branch revolving door features people who enter government after years in the private sector, individuals who come in and out of government multiple times over their careers, and people who exit the government after a period of time and never return.

Table 2 presents the top ten federal agencies that produced revolving-door lobbyists in terms of an absolute number of lobbyists (A) and the relative number of lobbyists compared to the total federal employees in each agency (B) based on data from the Lobbying Disclosure Act (LDA) for the period between 1998 and 2016.[5] The White House, and the Departments of Defense, State, and Justice have the highest number of revolving-door lobbyists. The Departments of Health & Human Services, Commerce, Treasury, Energy, Transportation, and Agriculture also produce significant numbers of lobbyists.

When we consider the ratio of revolving-door lobbyists in each agency by taking into account the agency's staffing size, the State and the USTR, agencies that deal with issues of foreign policy, is ranked at the top. This could be related to the fact that foreign policy is the area where the president and the executive branch have more influence than the Congress (Canes-Wrone, Howell, and Lewis 2008). Compared to issues like taxes and health care, where revolving-door lobbyists from Congress could also possess relevant expertise, the relative advantages of expertise that lobbyists from the executive branch have about foreign policy issues may explain this pattern. Federal agencies that directly address corporate-related issues such as the Commodity Futures Trading Commission (CFTC), Federal Communications Commission (FCC) and the Security and Exchange Commission (SEC), are also included in the top 10 list.

Among the federal agencies in Table 2, the USTR is the appropriate target to examine the effect of the buraucratic revolving door. The USTR has many features that make firms more likely

5. To calculate the relative number, we obtain the total number of federal employees as of 2016 from the Office of Personnel Management website. https://www.fedscope.opm.gov

Table 2: Top 10 Federal Agencies Producing Lobbyists, 1998 - 2016

(A) Absolute Term			(B) Relative Term		
Rank	Agency	Number of Lobbyist	Rank	Agency	Ratio[b]
1	White House[a]	958	1	USTR	0.64
2	Defense	603	2	CFTC	0.08
3	State	373	3	FCC	0.07
4	Justice	337	4	FMC	0.03
5	HHS	276	5	SEC	0.02
6	Commerce	272	6	State	0.013
7	Treasury	271	7	Energy	0.012
8	Energy	190	8	EPA	0.007
9	Agriculture	169	9	Commerce	0.0057
10	Transportation	169	10	NTSB	0.0047

Notes: a. Most lobbyists who had prior experience in the White House worked in the Executive Office of the President. b. Ratio means the total number of lobbyists over the period between 1998 and 2016 compared to the total number of employees in each agency as of 2016. When we calculated the relative term, we did not include the White House. HHS = Health & Human Services, USTR = Office of the US Trade Representative, CFTC = Commodity Futures Trading Commission, FCC = Federal Communications Commission, FMC = Federal Maritime Commission, SEC = Security and Exchange Commission, NTSB = National Transportation Safety Board

to communicate with the USTR directly (rather than indirect lobbying via Congress) and value connections to USTR bureaucrats. First, the USTR consists of a small number of specialized and senior personnel and these individual bureaucrats wield significant power to develop trade policies. Moreover, the power of developing trade policies is disproportionately accrued to USTR bureaucrats due to the expertise they possess and the fast-track authority given to the executive regarding trade negotiation. Since firms value expertise and connections that USTR bureaucrats have, this explains why the USTR has the highest number of revolving-door bureaucrats relative to the size of the agency.

4.2 Bureaucrats in the USTR: Career Trajectories and Connections to Firms

Our main dataset is the USTR bureaucrat×firm×year data. To construct the dataset, we first created the list of individuals who worked in the USTR during the period 1997-2017. Our primary

data source comes from the federal Office of Personnel Management (OPM). The data covers the period 1997-2014, and contains detailed information on employees' names, duration of employment, age group, education level, pay grade, and pay plan. We also found the list of USTR employees from the opensecrets (www.opensecrets.org), federalpay (www.federalpay.org), and FedsDataCenter (www.fedsdatacenter.com) websites. We were able to track down a total of 825 USTR officials who served in the agency during the period 1997-2017. There is significant variation regarding the length of time USTR officials worked in the office. On average, they worked there for seven years; the mininum term of work was one year and the maximum was 37 years.

We collected information on their career trajectories of our list of USTR officials mainly from their LinkedIn webpages (www.linkedin.com). We used other web sources when the LinkedIn did not provide the biographical information on USTR employees. We tracked the names of firms where USTR officials worked before and after they served in the USTR, their positions in the firms, and the start and end years of their employment. We also collected information on the officials' education if it was available. Among 825 USTR officials, we were able to track down the career paths of 459 officials.

When we compare USTR officials with and without career information, there are systemic differences between the two groups. First, those with online career information spent fewer years in the USTR, workings there for 6 years on average. On the other hand, those without online career information worked for the USTR for 8 years, on average. The OPM data further shows that those with online career information were, on average, younger, received a higher salary in the USTR, and have higher education levels. Despite such systemic differences, the missing data would not pose a serious threat to our empirical findings. Given that USTR officials without online career information are more likely to be career bureaucrats, they are less likely to be included in our bureaucrat$\times$firm$\times$year data where only USTR officials with prior/post connections with private sector firms are included.

To examine the connection between 439 USTR bureaucrats and firms that served on USTR

advisory committees, we obtain the list of firms who served on USTR advisory committees from the period 1997-2017. The data comes from the FACA website (www.facadatabase.gov) and contains detailed information on the names of committee members, the names of committees in which they were members, their term limits, their employers (firms), their positions in the firms, the industry categories that their firm represents, etc. The data shows that during the years between 1997 and 2017, 3175 firms participated as members on USTR advisory committees. Using the career trajectories of the USTR bureaucrats and advisory committees, we identify the revolving door bureaucrats who have connections - whether worked at the firm or had the firm as a lobbying client - to any firms served on the USTR advisory committees.

We construct the USTR bureaucrat$\times$ firm$\times$year data. To better illustrate how our dataset looks like, we use an example of the former USTR bureaucrat James B. Green and Albright Group. The example is shown in Table 3. For the pair James B. Green and Albright Group, there are 21 rows where each row denotes each year during the period 1997-2017. The column 'Work USTR' is our independent variable which is coded as 1 if an individual works in the USTR in a given year, otherwise 0. 'Work USTR' shows that Jame B. Green worked in the USTR in 2012 ans 2013. The column 'Direct' denotes the type of connections, which is 1 for all years if the bureaucrat worked in the firms. If 'Direct'=0 for the period 1997-2017, the bureaucrat has worked as a lobbyist for the firm and has an indirect connection. Table 3 shows that Green B. James has a direct connections with Albright Group. 'Start Year' denotes the year in which the connected bureaucrat started working for the connected firm, and 'End Year' denotes the last year that the connected bureaucrat worked for the connected firm.

Lastly, 'Connected' denotes the timing when the connection was created between the bureaucrat and the firm. James B. Green began working for the Albright Group in 2010, so we can say that the connection was created after that year. Therefore, 'Connected' equals 1 starting from 2011 to 2017. This variable allows us to examine the effect of individuals' entry to the USTR on firms' political activities conditional on having connections.

Our dataset includes dependent variables that measure the intensity of firms' political activities.

Table 3: An Example of USTR Bureaucrat× Firm×Year Data

Bureaucrat	Firm	Year	Work USTR	Direct	Connected	Start Year	End Year	...
Green, James B	Albright Group	1997	0	1	0	2010	2012	...
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	...
Green, James B	Albright Group	2009	0	1	0	2010	2012	...
Green, James B	Albright Group	2010	0	1	0	2010	2012	...
Green, James B	Albright Group	2011	0	1	1	2010	2012	...
Green, James B	Albright Group	2012	1	1	1	2010	2012	...
Green, James B	Albright Group	2013	1	1	1	2010	2012	...
Green, James B	Albright Group	2014	0	1	1	2010	2012	...
Green, James B	Albright Group	2015	0	1	1	2010	2012	...
Green, James B	Albright Group	2016	0	1	1	2010	2012	...
Green, James B	Albright Group	2017	0	1	1	2010	2012	...

First, we create a binary indicator that is coded as 1 if the firm served on any USTR advisory committee in a given year, otherwise 0. We also count the total number of advisory committees on which firms served in a given year. Second, the degree of firms' lobbying, we create an outcome variable that measures (1) the number of firms' reports on lobbying activities in a given year, (2) the level of firms' spending on lobbying activities, and (3) number of reports specifically mentioned the USTR as a contacted agency. The lobbying data is from the Center for Responsive Politics (www.opensecrets.org). Table A1 in the Appendix shows the summary statistics of our main variables.

5 Revolving Doors in Bureaucracy Reduce Connected Firms' Political Participation

The unit of observation in our main dataset is bureaucrat × firm × year for the period between 1997 - 2017. To be included in the sample, a bureaucrat must have a revolving-door history (entry to or/and exit from the USTR) and connected firms must have served at least once on an advisory committee under the USTR during the period. We run the following regression:

$$
\begin{aligned}
Y_{ijt} = & \alpha_{ij} + \delta_t + \beta_1 * WorkUSTR_{it-1} + \beta_2 * Connected_{ijt} \\
& + \beta_3 * WorkUSTR_{it-1} * Connected_{ijt} + \varepsilon_{ijt}
\end{aligned} \tag{1}
$$

where i, j, t indicate a bureaucrat, firm, and year. We include bureaucrat-firm fixed effects (α_{ij}) so that our results are robust to individual-level and firm-level time-invariant confounders. We also include year fixed effects (δ_t) to account for annual political and economic shocks. $WorkUSTR_{it-1}$ is a dummy variable that indicates if a bureaucrat i works in the USTR in year $t-1$. $Connected_{ijt}$ is the binary indicator of whether a USTR bureaucrat i has a (in)direct connection with a firm j in a given year t. $WorkUSTR_{it} * Connected_{ijt}$ is an interaction term between a bureaucrat's employment in the USTR and the existing connection between the bureaucrat and the firm. Y_{ijt} is an outcome variable that measures the firm's participation on an advisory committees under the jurisdiction of the USTR. $\beta_1 + \beta_3$ is the main interest of a parameter: given connections between an individual and a firm, whether an entry of the individual into the USTR affects the firm's spending on lobbying or its probability of serving on a USTR advisory committees. Since we argue for the substitution effect, we expect $\beta_1 + \beta_3$ to be negative. Moreover, we expect β_1 to be close to 0 since firms are less likely to adjust their political activities in response to bureaucrats who did not form a connections with them.

Our model specification examines whether previous employees serving in the USTR in period t affects firms' participation on USTR committees in period $t+1$. To further demonstrate that firms adjust their political activities in response to the career choices of their previous employees, rather than vice versa, we run regressions with both lag and lead independent variables. We find that the effect of entry/exit only comes from lag variables $Entry_{it-1}$ and not from lead variables $Entry_{it+1}$. The results are presented in the Table B1, B2, B3, B4, B5, and B6 in the Appendix.

For causal identification, we exploit the within-bureaucrat$\times$firm variation by including fixed effects and additionally control for firm-level time-varying variables. However, this does not eliminate a concern for unobservable time-varying confounders. We address this problem in two ways.

First, we argue that the timing of firms' previous employees entering or exiting the USTR is likely to occur at random. Individuals who choose to work in the USTR do so primarily based on their future careers, rather than on the political and economic considerations of their previously employment in connected firms. Since individuals with prior work experience in firms rarely return to the same firm after they work in the USTR, it is unlikely for firms to persuade individuals to enter and work in the USTR during the periods firms prefer. Moreover, due to the competitive process of hiring federal government officials, individuals may not be able to enter the USTR at the exact time period that the firms prefer. Even when firms' previous employees enter or exit the USTR via political appointment, other factors - such as an appointee's education, the vacancy of the position, or the interests of political principals - may play a large role than firm's temporal situations at the time of appointment.

Second, we claim that unobservable confounders in our case are likely to generate upward bias, which works against our argument. If we observe significant and negative β_3 despite potential upward bias, this makes our argument stronger and more robust. For instance, firms may suddenly encounter trade-related disputes where they feel more need to increase their lobbying activites to the USTR. At the same time, they also may be also willing to incentivize previous employees to enter the USTR and work there to serve their firms' interests. The number of firms' trade-related disputes is thus a confounder that generates upward bias, and strengthens our results even if we fail to control for them.

Our results explain the behavior of the subset of firms that participated on USTR committees at least once. This does not limit the implications of our study since these firms are the most appropriate population for testing firms' strategic responses to the bureaucratic revolving door. They are more likely to have a high stake in the USTR policymaking process and continuously provide information to the USTR via lobbying. On the other hand, firms that have never participated on USTR committees are more likely to have less interest in the USTR and are less likely to engage in lobbying activities. They would not strategically adjust their political activities even when their previous employees enter or exit the USTR. To check whether this is the case, we examine the

list of all private sector firms where USTR officials previously worked. We divide them into two groups, those that has never participated on USTR advisory committees and those that have participated on committees at least once. We find significant discrepancies between the two groups. The former group that served on USTR advisory committees is three times more likely to engage in lobbying the USTR than the latter group.[6]

Table 4 presents the results on firms' participation on USTR advisory committees. To check whether the observed effect is driven by direct or indirect connections, we also run additional analyses on bureaucrat $\times$ firm pairs with direct connections only. Column (1) and (4) uses the binary indicator as the dependent variable, whereas (2) and (5) uses the total number of advisory committees on which firms participated. Our main interest is the effect of entry when connection equals 1, which is the linear combination of `Entry` (β_1) + `Entry` $\times$ `Connection` (β_3) in each column table.[7] We find that when the connected individual enters the USTR as a bureaucrat, a firm's likelihood of serving on the advisory committee decreases. The effect is stronger when confining the sample to direct connections only. To check which USTR advisory committees are driving the effect, we divide USTR committees into three categories based on whether they are under the main jurisdiction of USTR, DOC, and USDA.[8] Using the number of advisory committees that firms participate as the dependent variable, column (3) and (6) show that the substitution effect comes mainly from advisory committees led by the USTR.[9] Again, the effect is stronger when

6. During the period 1997-2017, the median number of years that the former group lobbied the USTR is 13, whereas it is five for the latter group. The median amount of annual lobbying spendings is \$976,930 for the former group and \$352,275 for the latter group.

7. In STATA, we use the command `lincom` to calculate the estimates and standard errors of the effect.

8. There are three types of USTR committees with respect to their jurisdictions. First, there are advisory committees that represent the interests of industry sectors such as textiles, steel, and intellectual property (*e.g.*. Industry Trade Advisory Committees, ITACs). They are co-administered by the Department of Commerce (DOC) and USTR and member appointments for these committees are jointly decided by the US Trade Representative and the DOC Secretary. The second type of advisory committee represents agricultural sectors (*e.g.* Agricultural Technical Advisory Committees, ATACs), and is under the jurisdiction of the US Department of Agriculture (USDA) and USTR. Lastly, there are four committees that consult on overall trade policies and are directly led by the USTR. These committees are the President's Advisory Committee for Trade Policy and Negotiations (TPN), the Trade Advisory Committee on Africa (TACA), the Intergovernmental Policy Advisory Committee (IGPAC), and the Trade and Environment Policy Advisory Committee (EPAC).

9. On the other hand, we observe no significant effect on firms' participation in advisory committees under the main jurisdiction of the DOC and USDA.

Table 4: The Effect of Revolving-Door Bureaucrats on Serving on USTR Advisory Committees

	All Connections			Direct Connections Only		
	(1) Any Comm	(2) No. Comm	(3) USTR	(4) Any Comm	(5) No. Comm	(6) USTR
Entry	0.01	0.03	0.03	0.00	-0.00	0.4*
	(0.02)	(0.04)	(0.02)	(0.03)	(0.04)	(0.02)
Connection	0.06	0.11*	0.01	0.04	0.07	-0.01
	(0.04)	(0.06)	(0.02)	(0.04)	(0.08)	(0.03)
Entry × Connection	-0.11**	-0.12	-0.10**	-0.14**	-0.16*	-0.12***
	(0.05)	(0.08)	(0.05)	(0.08)	(0.02)	(0.04)
Effect of Entry When Connection=1	-0.09**	-0.08	-0.07*	-0.13***	-0.16**	-0.08**
	(0.04)	(0.07)	(0.03)	(0.04)	(0.07)	(0.04)
Year FE	✓	✓	✓	✓	✓	✓
Bureaucrat-Firm FE	✓	✓	✓	✓	✓	✓
Observations	6,846	6,846	6,846	4,515	4,515	4,515
adj. R-sq	0.305	0.351	0.353	0.301	0.346	0.370

Notes: Cell entries are regression coefficients with firm-clustered standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

bureaucrats and firms are directly connected.

To further check which USTR-led advisory committees drive the results, we examine four advisory committees that exist under the USTR's sole jurisdiction: (1) Advisory Committee for Trade Policy and Negotiations (TPN), (2) Intergovernmental Policy Advisory Committee on Trade (IPAC), (3) Trade Advisory Committee on Africa (TACA)[10] and (4) Trade and Environment Policy Advisory Committee (EPAC).[11] Table C1 and C2 in the Appendix shows that the substitution effect is the strongest among firms that served on the TPN.[12] TPN is considered the most important USTR advisory committee. It is the tier 1 committee in the three-tiered trade advisory committee

10. This committee existed under a different name ("Trade Advisory Committee for Africa") for the years in 1997 and 1998. Then the committee appeared again in 2000 with the current name.

11. There are two other short-lived advisory committees: the Investment and Services Policy Advisory Committee existed in years of 1998 and 1999, and the Commission on United States-Pacific Trade and Investment Policy existed in 1997.

12. Firms that served on the IPAC employed no individual who was connected with them and entered into the USTR during the period; therefore, our data excludes the IPAC.

system and its members are appointed by the President of the United States (GAO 2009). Thus, bureauratic connections are most valuable to firms that serve on the most important advisory committee within the USTR.

In addition to firm's participation in advisory committees, we examine whether having a connected individual in the USTR as a bureaucrat also leads to a decrease in the connected firm's lobbying spending. Although both measures tap into the extent of the firm's willingness to provide information, one difference is that bureacurats select which firms get to participate in USTR committees. If USTR bureaucrats prevent firms from serving as advisory committee members, firms' non-participation on USTR advisory committees can happen even when firms are willing to participate. If this is the primary reason why we observe the substitution effect in Table 4, we are less likely to observe the substitution effect on firms' lobbying activities: firms who were unable to participate on USTR advisory committees would exert more efforts to lobby policymakers and the complement effect may emerge. On the other hand, if the substitution effect is driven mainly by firms' unwillingness to participate on USTR advisory committees, we would also observe the substitution effect on firms' lobbying activities.[13].

Table 5 presents the results. All the dependent variables are log transformed. Columns (1), (2), (4) and (5) examine the effect of the revolving door on the total number of lobbying reports and total spending by connected firms. There is a statistically significant, negative relationship between having a connected person in the USTR and the connected firms' lobbying spending.[14] We also calculate the number of unique lobbying reports that mentioned the USTR in the contacted federal agencies (Section 17 in the LDA report). Columns (3) and (6) show that a decrease in firms' lobbying activities is noticeable regarding lobbying the USTR. In contrast to firms' participation

13. We submitted a Freedom of Information Act (FOIA) request to the USTR to obtain the list of applicants who applied for the membership of all the USTR advisory committees that were active during the period 1997-2018, and their affiliated firm/organization and their position with the firm/organization to disentangle whether the substitution effect is driven by the firms' voluntary actions or the USTR's discretion. The FOIA officer corresponded that such records do not exist and the federal government has no obligation to create, compile, or obtain a record to satisfy a request (DOC-ITA-2020-000050)

14. When we divide lobbying spending into in-house vs. contract, both types of lobbying spending decrease with similar magnitudes.

Table 5: The Effect of Revolving-Door Bureaucrats on Connected Firms' Lobbying Spending

	All Connections			Direct Connections Only		
	(1) No. Report	(2) Spending	(3) USTR	(4) No. Report	(5) Spending	(6) USTR
Entry	0.00	0.11	0.04	-0.00	0.17	0.03
	(0.04)	(0.19)	(0.02)	(0.06)	(0.24)	(0.03)
Connection	0.08	0.20	0.02	0.02	0.03	-0.04
	(0.05)	(0.23)	(0.04)	(0.07)	(0.31)	(0.04)
Entry × Connection	-0.21***	-0.71**	-0.15***	-0.16**	-0.64*	-0.14***
	(0.06)	(0.32)	(0.05)	(0.07)	(0.37)	(0.05)
Effect of Entry When Connection=1	-0.20***	-0.59**	-0.10**	-0.17**	-0.46	-0.11**
	(0.06)	(0.28)	(0.04)	(0.07)	(0.32)	(0.04)
Year FE	✓	✓	✓	✓	✓	✓
Bureaucrat-Firm FE	✓	✓	✓	✓	✓	✓
Observations	6,846	6,846	6,846	4,515	4,515	4,515
adj. R-sq	0.831	0.810	0.693	0.811	0.786	0.682

Notes: Cell entries are regression coefficients with firm-clustered standard errors in parentheses. All dependent variables are log transformed. * p<0.10, ** p<0.05, *** p<0.01.

in USTR advisory committees, the substitution effect observed here is not driven by direct connections. Given that indirect connection is formed from a lobbyist-client relationship, due to the nature of such connections, firms with indirect connections with USTR bureaucrats may be more active in lobbying activities and may be more sensitive to changes in their lobbying activities.

The results of the lobbying analysis suggest that the substitution effect on the USTR advisory committees is not mainly driven by government regulations or by the USTR's prevention of connected firms serving on its advisory committees when individuals connected to those firms begin work at the USTR. If that is the case, connected firms may *increase* their lobbying spending since their other channels of influence on government-policy through providing information is blocked. The fact that the connected firms' lobbying activities also decrease, even though no formal constraints are imposed even after a connected individual enters the government service, implies that having a connected individual in the bureaucracy reduces the connected firm's incentives to participate in the policymaking process.

6 Mechanism: Ideological Matching between Revolving-Door Bureaucrats and the USTR

To understand why the substitution effect occurs, we examine which bureaucrat $\times$ firm pairs drive the substitution effect. Based on the existing literature, we test whether the substitution effect occurs among connected firms and bureaucrats who share similar political preferences. If these bureaucrat $\times$ firm pairs drive the substitution effect, this serves as evidence that firms are less incentivized to engage in information provision activities because they have connected bureaucrats who reflect their preferences in the policymaking process. Having bureaucratic connections thus benefits firms.

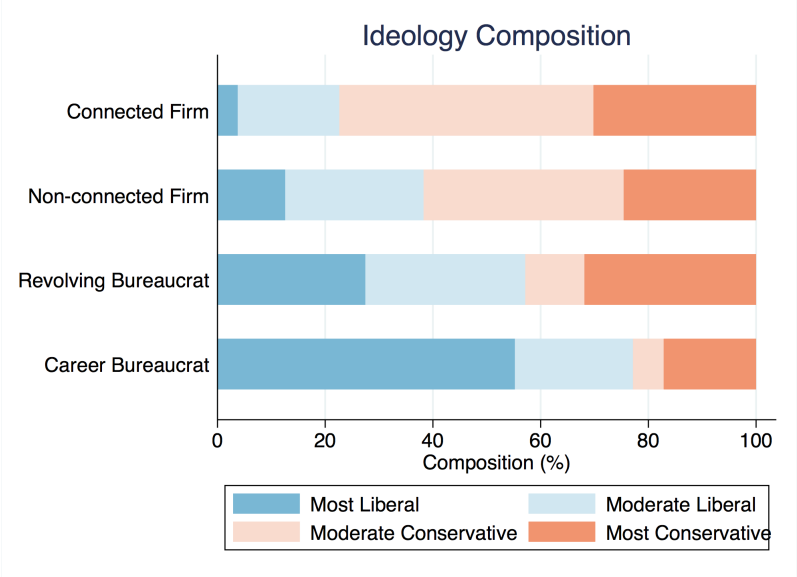
For the first step of our analyses, we tracked the one-dimensional ideological scores of all USTR bureaucrats and firms that served on any of three USTR-lead advisory committees: the TPN, TACA, and EPAC. We used the campaign finance (CF) scores by Bonica (2016) that estimate donors' ideology from campaign contribution data.[15] Out of 837 bureaucrats who worked in the USTR between 1997 and 2017, we found the contribution record of 196 bureaucrats. Among them, 105 are career bureaucrats who are not included in our bureaucrat $\times$ firm $\times$ year dataset and 91 are revolving-door bureaucrats who are included. Among 325 firms or organizations that served on the USTR-led advisory committees, we identified 228 firms with records of campaign contributions.

Figure 1 illustrates the distribution of CF scores for four different groups of bureaucrats and firms: career bureaucrat, revolving-door bureaucrat, non-connected firm, and connected firm.[16] Table A2 in the Appendix presents the summary statistics of the CF scores. The median CF score of each group shows that career bureaucrats are clearly the most liberal. Revolving-door bureaucrats

15. We argue that different policy preferences on trade policies can be capture by the general liberal-conservative ideological dimension. Feigenbaum and Hall (2015) construct the legislator ideology of trade and non-trade issues and show that they are moderately correlated.

16. For 424 bureaucrats and firms with the CF scores, we calculate the cutoff points of the CF scores based on the quartile. The cutoffs are following: $Q1 \leq -1.202, -1.202 < Q2 \leq -0.5785, -0.5785 < Q3 \leq 0.549,$ and $0.549 < Q4$. These quartile cutoff points divide samples into four groups: most liberal, moderate liberal, moderate conservative, and most conservative.

Figure 1: Composition of Ideology Within Each Type

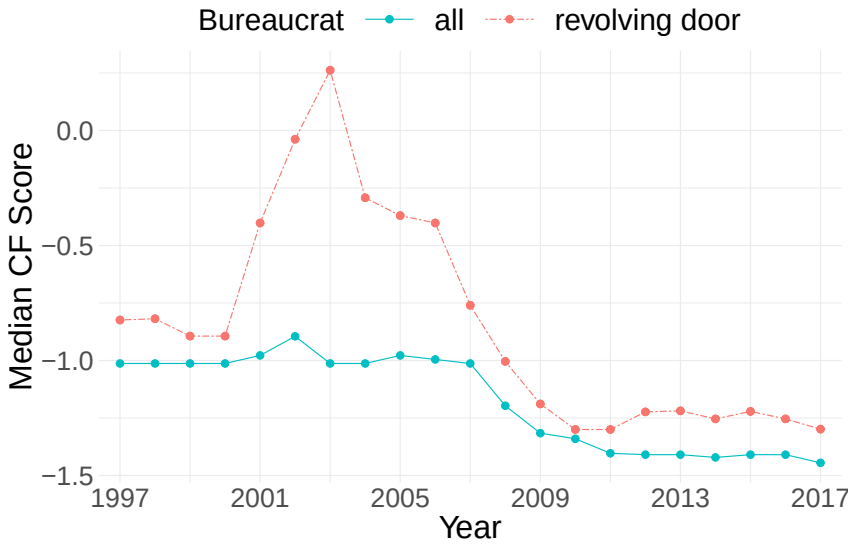


are less liberal than career bureaucrats but they are still more liberal than the median ideology of firms on USTR advisory committees. Firms that have connections to USTR bureaucrats are more conservative than firms with no such connections.

The CF scores of career and revolving-door bureaucrats suggest that the USTR agency is ideologically liberal. Figure 2 shows the ideal point of the USTR - measured by the median CF score of USTR bureaucrats - during the period 1997-2017. The solid line ("all") represents the median CF score of all bureaucrats, both career and revolving door, who worked in the USTR agency in a given year. The dashed line ("revolving door") represents the median CF score of revolving-door bureaucrats who are included in our bureaucrat $\times$ firm $\times$ year dataset. The results show that across all years, the USTR is dominated by liberal USTR bureaucrats. During the George W. Bush administration period, there was an inflow of conservative revolving-door bureaucrats, but this was not enough to pull the USTR's ideal point to the right side of the ideological scale.

Based on the CF score of USTR bureaucrats and firms, we construct an ideological gap score for bureaucrat $\times$ firm pairs by subtracting the connected bureaucrat's CF score from the connected firm's CF score. Out of the unique 326 bureaucrat $\times$ firm pairs, we identified the ideological gap

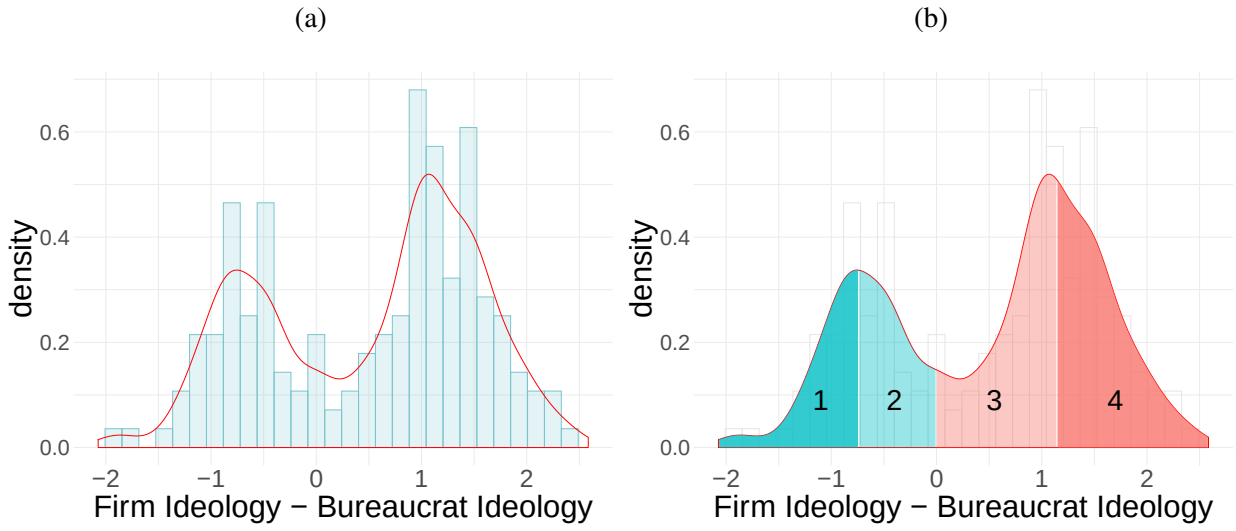
Figure 2: USTR Ideal Point During 1997-2017



score of 174 pairs. Figure 3 shows the distribution of the ideological gap score. A score greater than 0 means that the connected firm is more conservative than the connected bureaucrats. A score less than 0 means that the connected firm is more liberal than the connected bureaucrat. One notable pattern observed in Figure 3 is that there are more numbers of bureaucrat $\times$ firm pairs with the ideological gap scores greater than 0. This is because a substantial number of connected firms are conservative.

Based on the distribution of the ideological gap scores, we divide bureaucrat $\times$ firm pairs into four groups as shown in Figure 3 (b). First, we divide pairs into two groups based on 0. Next, we separate each group into two based on the median point of each group. Group 1 consists of bureaucrat $\times$ firm pairs where connected firms are more liberal than connected bureaucrats. Group 4 comprises bureaucrat $\times$ firm pairs where connected firms are more conservative than connected bureaucrats. The connected firms in group 2 (group 3) are relatively more liberal (conservative) than their connected bureaucrats, but to a lesser degree than connected firms in group 1 (group 4). We expect that group 2 and 3 drive the substitution effect if the substitution effect occurs due to close preference alignment.

Figure 3: Ideological Gap between Connected Bureaucrat × Firm Pairs



We run regression on each four group and estimate the effect of a bureaucrat's entry into the USTR when there is a prior connection between the bureaucrat and the firm. Our results are shown in Table 6. We find that the substitution effect is not driven not by groups that show smaller ideological gaps between firms and their connected bureaucrats (groups 2 and 3), but by groups 3 and 4. With respect to the level of lobbying activities, the substitution effect is more strongly observed in group 3. In terms of firms' participation on USTR advisory committees, the substitution effect is stronger among bureaucrat × firm pairs in group 4. These results suggest that the preference alignment between connected bureaucrats and firms may not be the main driver of the substitution effect as suggested by the existing literature.

To seek alternative explanations based on groups 3 and 4, we examined the distribution of bureaucrat/firm ideology in each group. Table A3 in the Appendix presents the median CF scores of bureaucrats and firms in each group. We find that firms across all four groups have similar political preferences. The median CF score of firms in all groups is around 0.1, although firms in group 4 are slightly more conservative. The firm's ideology does not seem to be a decisive factor for the substitution effect. On the other hand, what distinguishes groups 3 and 4 from groups 1 and 2 is the ideological predispositions of connected bureaucrats. As shown by the median CF score, bureaucrats in groups 3 and 4 are strongly liberal, wherease those in groups 1 and 2 are

Table 6: The Effect of Revolving-Door Bureaucrats Given Connections=1

	(1) Group 1	(2) Group 2	(3) Group 3	(4) Group 4
Participation in Advisory Committees:				
USTR Committee	-0.01	-0.03	-0.06**	-0.17**
	(0.06)	(0.04)	(0.02)	(0.08)
Lobbying Activities:				
No. Report	0.09	0.03	-0.55**	-0.34***
	(0.20)	(0.13)	(0.27)	(0.10)
(ln) Spending	0.07	1.28*	-1.87*	-1.08**
	(0.66)	(0.69)	(1.03)	(0.50)
USTR Lobbbying	0.04	-0.05	-0.38**	-0.08
	(0.14)	(0.10)	(0.17)	(0.08)
Observations	630	630	1,197	1,197

Notes: Cell entries are regression coefficients with firm-clustered standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

strongly conservative. Therefore, our evidence suggests that the substitution effect occurs only when connected USTR bureaucrats are liberal. As a robustness check, we run additional analyses on two groups that are divided based on containing liberal or conservative USTR bureaucrats. We find that the substitution effect is driven by bureaucrat $\times$ firm pairs where connected bureaucrats are liberal. The results are shown in Table D1 in the Appendix.

Combined with the description on the USTR's ideal point, our findings suggest that the substitution effect occurs when connected bureaucrats have political preferences closer to the agency's ideal point. Existing literature emphasizes that the bureaucratic preference is an important factor in determining the policy outcomes (Ting 2002; Gailmard and Patty 2007; Lewis 2008; Bils 2020) and considerable scholarship has focused on estimating the ideological positions of the executive agencies (Clinton and Lewis 2008; Bertelli and Grose 2011; Clinton et al. 2012; Richardson 2019). First, recall that the majority of USTR bureaucrats are liberal. If connected bureaucrats share similar ideological ,preferences with other bureaucrats working in the USTR, the opinions of connected bureaucrats are more likely to be at the median ideal point of the bureaucracy and,

thus, they can have more influence on the USTR policymaking process. Thus, connected firms do not always reduce their political participation when they acquire bureaucratic connections; such behaviors are conditional on the agency's ideal point. Our argument also suggests that, in the case of other agencies where the majority of bureaucrats are conservative, firms can take advantage of the bureaucratic revolving door only if their connected bureaucrats are conservative. For instance, if a conservative individual who worked for a fossil fuel firm moved to the Environmental Protection Agency (EPA) - which is one of the most liberal agencies (Clinton et al. 2012) - we do not expect that the connected firm to reduce its participation in the political process since the revolving door bureaucrat's ideology still would be far from the EPA's median ideal point. The key factor underlying the substitution effect is whether a revolving-door bureaucrat's ideology matches with the median ideology of the agency where she moves.

7 Conclusion

Bureaucrats are actively targeted by various interest groups due to their crucial roles in policy-making. Canonical models of bureaucrat-interest group interactions focus primarily on incentives of interest groups in providing policy-relevant information to bureaucrats who share their policy preferences. The underlying assumption in the models is that a bureaucrat and an interest group are separate agents with distinctive preferences. Frequent movements of individuals from the private sector to federal agencies raises a question about this key assumption. What happens to interest groups when individuals connected to those groups become bureaucrats? How do bureaucratic revolving doors affect interest groups' political activities of providing information to bureaucrats?

In this paper, we tackle this question using a novel dataset constructed from career trajectories of USTR bureaucrats and the firms that served on the federal advisory committees under the USTR for the period 1997-2017. We show that there is a strong substitution effect: when a connected person moves to the USTR as a bureaucrat, the connected firm is less likely to participate on USTR advisory committees and reduces its overall lobbying spending, particularly on activities targeting

the USTR. We provide suggestive evidence that the substitution effect is more pronounced among firms whose connected individuals have similar ideological leanings as the median ideal point of the agency they join. Our result suggests that the decreased levels of political activities by firms does not necessarily mean their influence has also declined when the revolving-door phenomenon exists. *Less inequality* in political participation among interest groups may imply *more inequality* in political influence if a selected set of interest groups can form a connection with revolving-door bureaucrats.

Our results present some conditions to observe a substitution effect between bureaucratic revolving doors and interest groups' political participation. The case we examine in this paper - revolving doors in the USTR - satisfies those conditions, but there is a significant variation across agencies regarding their ideologies (Clinton and Lewis 2008; Richardson, Clinton, and Lewis 2017) and the types of individuals who move from the private sector to those agencies. Federal advisory committees could also play different roles depending on the jurisdiction of the agency. Therefore, it is possible that bureaucratic revolving doors could lead to more active interest group participation, which suggests the complement effect. Extending our analysis to other agencies and identifying the conditions conducive to the substition or complement effect will enhance our understanding of how bureaucracy and interest groups interact in a complex policymaking environment.

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Supporting Information for
Bureaucratic Revolving Doors and Interest Group Participation in Policymaking

Contents

A Summary Statistics

Table A1: Summary Statistics of Main Variables, 1997-2017

	Mean	Median	SD	Min	Max	N
Any Committee	0.50	1	0.50	0	1	6846
Number of Committee	0.71	1	0.85	0	6	6846
Number of USTR Committee	0.13	0	0.40	0	2	6846
Number of DOC Committee	0.50	0	0.73	0	4	6846
Number of USDA Committee	0.07	0	0.23	0	1	6846
Number of Connection	0.42	0	0.32	0	5	6846
(ln) Lobbying Spending	10.16	13.99	7.12	0	18.64	6846
(ln) Number of Lobbying Report	1.99	2.19	1.59	0	5.14	6846
(ln) Number of Lobbying Report Mentioning USTR	0.73	0	0.84	0	2.89	6846
(ln) Number of Lobbying Report Mentioning DOC	0.73	0	0.82	0	2.63	6846
(ln) Number of Lobbying Report Mentioning USDA	0.30	0	0.64	0	3.09	6846

Table A2: Summary Statistics for Bureaucrat CF Scores

Type	N	Median	SD	Min	Max
Career Bureaucrat	105	-1.24	0.96	-1.89	1.27
Revolving-Door Bureaucrat	91	-0.78	0.98	-1.64	1.27
Non-connected Firm	175	0.02	0.84	-1.56	1.28
Connected Firm	53	0.14	0.75	-1.56	1.22

Table A3: Median CF Scores for Groups in Figure 3(b)

	Group 1		Group 2		Group 3		Group 4	
	N	Median	N	Median	N	Median	N	Median
Bureaucrat	30	1.03	30	0.60	57	-0.76	56	-1.12
Firm	30	0.10	30	0.12	57	0.10	56	0.29

B Including Lead Variables to the Model Specification

Table B1: The Effect of Revolving-Door Bureaucrats on Serving on Advisory Committees

	(1) Any Committee	(2) No. Committee	(3) USTR	(4) DOC	(5) USDA
Entry_{t-1}	0.01	0.00	0.02*	0.00	0.003
	(0.02)	(0.03)	(0.01)	(0.02)	(0.01)
Entry_{t+1}	0.01	-0.00	-0.01	0.01	-0.01
	(0.02)	(0.03)	(0.01)	(0.03)	(0.01)
Connection	0.06*	0.11*	0.00	0.07	0.03
	(0.03)	(0.06)	(0.02)	(0.05)	(0.02)
$\text{Entry}_{t-1} \times$ Connection	-0.08*	-0.12*	-0.10**	0.01	-0.03*
	(0.04)	(0.07)	(0.04)	(0.05)	(0.01)
$\text{Entry}_{t+1} \times$ Connection	-0.04	0.01	0.03	-0.01	-0.01
	(0.04)	(0.06)	(0.03)	(0.05)	(0.02)
Year FE	✓	✓	✓	✓	✓
Bureaucrat-Firm FE	✓	✓	✓	✓	✓
Observations	6,674	6,674	6,674	6,674	6,674
adj. R-sq	0.312	0.357	0.367	0.447	0.512

Notes: Firm-clustered standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table B2: The Effect of Revolving-Door Bureaucrats on Serving on Advisory Committees (Direct Connections Only)

	(1) Any Committee	(2) No. Committee	(3) USTR	(4) DOC	(5) USDA
Entry_{t-1}	0.01	0.00	0.04**	-0.03	-0.00
	(0.03)	(0.04)	(0.02)	(0.03)	(0.01)
Entry_{t+1}	-0.00	-0.01	-0.01	0.01	-0.01
	(0.02)	(0.03)	(0.02)	(0.03)	(0.01)
Connection	0.05	0.08	-0.02	0.09	0.01
	(0.05)	(0.08)	(0.03)	(0.07)	(0.02)
$\text{Entry}_{t-1} \times$ Connection	-0.10**	-0.14*	-0.13***	-0.04	-0.03
	(0.05)	(0.08)	(0.04)	(0.05)	(0.02)
$\text{Entry}_{t+1} \times$ Connection	-0.06	-0.05	0.05	-0.08	-0.01
	(0.05)	(0.07)	(0.04)	(0.05)	(0.02)
Year FE	✓	✓	✓	✓	✓
Bureaucrat-Firm FE	✓	✓	✓	✓	✓
Observations	4,371	4,371	4,371	4,371	4,371
adj. R-sq	0.310	0.356	0.388	0.441	0.541

Notes: Firm-clustered standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table B3: The Effect of Revolving-Door Bureaucrats on Serving on USTR Committees

	(1) TPN	(2) TACA	(3) EPAC
Entry_{t-1}	0.01	0.00	0.00
	(0.01)	(0.00)	(0.00)
Entry_{t+1}	0.00	-0.00	-0.00
	(0.01)	(0.00)	(0.00)
Connection	-0.00	0.00	0.00
	(0.01)	(0.00)	(0.01)
$\text{Entry}_{t-1} \times$ Connection	-0.05**	-0.00	-0.02
	(0.02)	(0.01)	(0.01)
$\text{Entry}_{t+1} \times$ Connection	0.00	0.01	0.01
	(0.02)	(0.01)	(0.02)
Year FE	✓	✓	✓
Bureaucrat-Firm FE	✓	✓	✓
Observations	6,674	6,674	6,674
adj. R-sq	0.395	0.228	0.385

Notes: Firm-clustered standard errors in parentheses. The outcome is a dummy variable whether a firm serves on each advisory committee. * p<0.10, ** p<0.05, *** p<0.01.

Table B4: The Effect of Revolving-Door Bureaucrats on Serving on USTR Committees (Direct Connections Only)

	(1) TPN	(2) TACA	(3) EPAC
Entry_{t-1}	0.02	0.00	0.01
	(0.01)	(0.00)	(0.00)
Entry_{t+1}	0.00	-0.00	-0.00
	(0.01)	(0.00)	(0.01)
Connection	-0.00	-0.01	0.00
	(0.02)	(0.01)	(0.01)
$\text{Entry}_{t-1} \times$ Connection	-0.07***	-0.01	-0.02
	(0.03)	(0.01)	(0.02)
$\text{Entry}_{t+1} \times$ Connection	0.01	0.01	0.01
	(0.03)	(0.01)	(0.03)
Year FE	✓	✓	✓
Bureaucrat-Firm FE	✓	✓	✓
Observations	4,371	4,371	4,371
adj. R-sq	0.402	0.244	0.437

Notes: Firm-clustered standard errors in parentheses. The outcome is a dummy variable whether a firm serves on each advisory committee. * p<0.10, ** p<0.05, *** p<0.01.

Table B5: The Effect of Revolving-Door Bureaucrats on Connected Firms' Lobbying Spending

	(1) No. Report	(2) (ln) Spending	(3) USTR	(4) DOC	(5) USDA
Entry_{t-1}	0.02	0.17	0.06**	0.02	0.03
	(0.04)	(0.17)	(0.02)	(0.02)	(0.02)
Entry_{t+1}	−0.07**	−0.16	−0.05*	-0.02	-0.02
	(0.03)	(0.16)	(0.02)	(0.02)	(0.02)
Connection	0.08	0.21	0.02	0.03	-0.01
	(0.05)	(0.24)	(0.04)	(0.04)	(0.02)
$\text{Entry}_{t-1} \times$ Connection	-0.22***	-0.75***	-0.13***	-0.07*	-0.03
	(0.05)	(0.28)	(0.04)	(0.04)	(0.04)
$\text{Entry}_{t+1} \times$ Connection	0.02	-0.10	-0.03	-0.04	-0.00
	(0.06)	(0.33)	(0.04)	(0.04)	(0.03)
Year FE	✓	✓	✓	✓	✓
Bureaucrat-Firm FE	✓	✓	✓	✓	✓
Observations	6,674	6,674	6,674	6,674	6,674
adj. R-sq	0.831	0.811	0.701	0.671	0.676

Notes: Firm-clustered standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table B6: The Effect of Revolving-Door Bureaucrats on Connected Firms' Lobbying Spending

	(1) No. Report	(2) (ln) Spending	(3) USTR	(4) DOC	(5) USDA
Entry_{t-1}	0.01	0.02	0.06***	0.01	0.03
	(0.05)	(0.23)	(0.03)	(0.03)	(0.02)
Entry_{t+1}	−0.06	−0.10	−0.07**	-0.03	-0.05**
	(0.04)	(0.23)	(0.03)	(0.03)	(0.02)
Connection	0.01	0.03	-0.04	-0.04	-0.01
	(0.07)	(0.33)	(0.04)	(0.04)	(0.03)
$\text{Entry}_{t-1} \times$ Connection	-0.19***	-0.68**	-0.14***	-0.05	-0.05
	(0.06)	(0.34)	(0.04)	(0.03)	(0.04)
$\text{Entry}_{t+1} \times$ Connection	0.05	-0.13	0.01	-0.00	0.03
	(0.08)	(0.44)	(0.04)	(0.05)	(0.04)
Year FE	✓	✓	✓	✓	✓
Bureaucrat-Firm FE	✓	✓	✓	✓	✓
Observations	4,371	4,371	4,371	4,371	4,371
adj. R-sq	0.810	0.787	0.694	0.667	0.632

Notes: Cell entries are regression coefficients with firm-clustered standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

C Results on USTR-Led Advisory Committees

Table C1: The Effect of Revolving-Door Bureaucrats on Serving on USTR Committees

	(1) TPN	(2) TACA	(3) EPAC
Entry	0.02	0.00	0.01
	(0.01)	(0.00)	(0.01)
Connection	-0.00	0.00	0.00
	(0.02)	(0.01)	(0.01)
Entry × Connection	-0.06**	-0.00	-0.01
	(0.03)	(0.02)	(0.02)
Effect of Entry When Connection=1	-0.04**	-0.00	-0.01
	(0.02)	(0.01)	(0.01)
Year FE	✓	✓	✓
Bureaucrat-Firm FE	✓	✓	✓
Observations	6,846	6,846	6,846
adj. R-sq	0.382	0.222	0.373

Notes: Cell entries are regression coefficients with firm-clustered standard errors in parentheses. The outcome is a dummy variable whether a firm serves on each advisory committee. * p<0.10, ** p<0.05, *** p<0.01.

Table C2: The Effect of Revolving-Door Bureaucrats on Serving on USTR Committees (Direct Connections Only)

	(1) TPN	(2) TACA	(3) EPAC
Entry	0.02	0.00	0.00
	(0.01)	(0.00)	(0.01)
Connection	-0.01	-0.01	0.01
	(0.02)	(0.01)	(0.01)
Entry × Connection	-0.07**	-0.00	-0.03**
	(0.02)	(0.01)	(0.01)
Effect of Entry When Connection=1	-0.04**	-0.00	-0.02*
	(0.02)	(0.01)	(0.01)
Year FE	✓	✓	✓
Bureaucrat-Firm FE	✓	✓	✓
Observations	4,515	4,515	4,515
adj. R-sq	0.388	0.235	0.421

Notes: Cell entries are regression coefficients with firm-clustered standard errors in parentheses. The outcome is a dummy variable whether a firm serves on each advisory committee. * p<0.10, ** p<0.05, *** p<0.01.

D Heterogeneous Effects of the Bureaucratic Revolving Door

Table D1: The Effect of Revolving Door Bureaucrats Given Connections=1

	(1) Liberal Bureaucrats	(2) Conservative Bureaucrats
Participation in Advisory Committees:		
Any Committee	-0.07	-0.03
	(0.05)	(0.07)
No. Committee	-0.04	-0.06
	(0.09)	(0.12)
USTR Committee	-0.10**	-0.04
	(0.04)	(0.04)
DOC Committee	0.09	-0.00
	(0.07)	(0.10)
USDA Committee	-0.03	-0.02
	(0.02)	(0.02)
TPN	-0.06**	-0.03
	(0.02)	(0.03)
TACA	-0.01	0.01
	(0.01)	(0.01)
EPAC	-0.01	-0.01
	(0.01)	(0.02)
Lobbying Activities:		
No. Report	-0.35***	0.10
	(0.09)	(0.15)
(ln) Spending	-1.28***	0.59
	(0.46)	(0.47)
USTR Lobbbying	-0.19***	0.03
	(0.06)	(0.10)
DOC Lobbying	-0.13**	0.01
	(0.06)	(0.10)
USDA Lobbying	-0.06*	0.03
	(0.03)	(0.08)
Observations	2,814	1,407

Notes: Cell entries are regression coefficients with firm-clustered standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

E USTR Advisory Committees Data

The number of advisory committees in every fiscal year is 27 on average . The minimum is 26 and the maximum is 31. After 2006, 16 committees (*e.g.* Industry Trade Advisory Committees, ITACs) are under the jurisdiction of the Department of Commerce (DOC), 7 committees (*e.g.* Agricultural Technical Advisory Committees, ATACs) are under the USDA, and 4 committees are under the USTR (Table E1).

Table E2 shows the list of USTR advisory committees during the period 1997-2017. There is 54 unique number of advisory committees. Table 5 shows that ATACs under the USDA have not undergone any systemic changes during 1997-2017. On the other hand, ITACs under the DOC changed their structures in the year 2004.

The number of members varies by advisory committees. Some committees have members as many as 30-40, and some committee members have as few as 5-10. The number of committee members changes slightly every year, suggesting that some members do not serve for fixed terms and enter and leave advisory committees without any constraint. It would be interesting to examine which committees have the most members and why. For instance, in the fiscal year 2017, two advisory committees with the most members were ITAC on Small and Minority Business (37 members) and ITAC on Chemicals, Pharmaceuticals, Health Science Products and Services (30 members). On the other hand, in the fiscal year 2005, two advisory committees with the most members were ITAC on Textiles and Clothing (49 members) and Intergovernmental Policy Advisory Committee on Trade (46 members).

Table E1: Jurisdiction of USTR Advisory Committees

	DOC	USDA	USTR	Total
1998	20	6	5	31
1999	20	6	3	29
2000	21	6	4	31
2001	21	6	4	31
2002	21	6	4	31
2003	21	7	4	31
2004	17	7	4	28
2005	17	7	3	27
2006	16	7	4	27
2007	16	7	4	27
2008	16	7	4	27
2009	16	7	4	27
2010	16	7	4	27
2011	16	7	4	27
2012	16	7	4	27
2013	16	7	4	27
2014	16	7	4	27
2015	16	7	4	27
2016	16	7	4	27
2017	16	7	4	27

Table E2: List of USTR Advisory Committees, 1997-2017

No.	Agency	CommitteeName	Start	End
1	USDA	Agricultural Policy Advisory Committee for Trade	1997	2017
2	USDA	Agricultural Technical Advisory Committee for Trade in Animal and Animal Products	1997	2017
3	USDA	Agricultural Technical Advisory Committee for Trade in Fruits and Vegetables	1997	2017
4	USDA	Agricultural Technical Advisory Committee for Trade in Grain, Feed, and Oilseeds	1997	2010
5	USDA	Agricultural Technical Advisory Committee for Trade in Grains, Feed, Oilseeds and Planting Seeds	2011	2017
6	USDA	Agricultural Technical Advisory Committee for Trade in Processed Foods	2003	2017
7	USDA	Agricultural Technical Advisory Committee for Trade in Sweeteners	1997	2017
8	USDA	Agricultural Technical Advisory Committee for Trade in Tobacco, Cotton, and Peanuts	1997	2017
9	DOC	Industry Functional Advisory Committee on Customs Matters for Trade Policy Matters	1997	2003
10	DOC	Industry Functional Advisory Committee on Intellectual Property Rights for Trade Policy Matters	1997	2003
11	DOC	Industry Functional Advisory Committee on Standards for Trade Policy Matters	1997	2003
12	DOC	Industry Functional Advisory Commttee on Electronic Commerce for Trade Policy Matters	2000	2003
13	DOC	Industry Sector Advisory Committee on Aerospace Equipment for Trade Policy Matters (ISAC 1)	1997	2003
14	DOC	Industry Sector Advisory Committee on Building Products and Other Materials for Trade Policy Matters (ISAC 9)	1997	2003
15	DOC	Industry Sector Advisory Committee on Capital Goods for Trade Policy Matters (ISAC 2)	1997	2003
16	DOC	Industry Sector Advisory Committee on Chemicals and Allied Products for Trade Policy Matters (ISAC 3)	1997	2003
17	DOC	Industry Sector Advisory Committee on Consumer Goods for Trade Policy Matters (ISAC 4)	1997	2003

18	DOC	Industry Sector Advisory Committee on Electronics and Instrumentation for Trade Policy Matters (ISAC 5)	1997	2003
19	DOC	Industry Sector Advisory Committee on Energy for Trade Policy Matters (ISAC 6)	1997	2003
20	DOC	Industry Sector Advisory Committee on Ferrous Ores and Metals for Trade Policy Matters (ISAC 7)	1997	2003
21	DOC	Industry Sector Advisory Committee on Footwear Leather and Leather Products for Trade Policy Matters (ISAC 8)	1997	2003
22	DOC	Industry Sector Advisory Committee on Lumber and Wood Products for Trade Policy Matters (ISAC 10)	1997	2003
23	DOC	Industry Sector Advisory Committee on Nonferrous Ores and Metal for Trade Policy Matters (ISAC 11)	1997	2003
24	DOC	Industry Sector Advisory Committee on Paper and Paper Products for Trade Policy Matters (ISAC 12)	1997	2003
25	DOC	Industry Sector Advisory Committee on Services for Trade Policy Matters (ISAC 13)	1997	2003
26	DOC	Industry Sector Advisory Committee on Small and Minority Business for Trade Policy Matters (ISAC 14)	1997	2003
27	DOC	Industry Sector Advisory Committee on Textiles and Apparel for Trade Policy Matters (ISAC 15)	1997	2003
28	DOC	Industry Sector Advisory Committee on Transportation Construction and Agricultural Equipment for Trade Policy Matters (ISAC 16)	1997	2003
29	DOC	Industry Sector Advisory Committee on Wholesaling and Retailing for Trade Policy Matters (ISAC 17)	1997	2003
30	DOC	ITAC, Committee of Chairs of the Industry Trade Advisory Committees for Trade Policy Matters	2004	2005
31	DOC	Industry Trade Advisory Committee on Aerospace Equipment	2004	2017
32	DOC	Industry Trade Advisory Committee on Automotive Equipment and Capital Goods	2004	2017
33	DOC	Industry Trade Advisory Committee on Building Materials, Construction, and Nonferrous Metals	2014	2017
34	DOC	Industry Trade Advisory Committee on Chemicals, Pharmaceuticals, Health Science Products and Services	2004	2017
35	DOC	Industry Trade Advisory Committee on Consumer Goods	2004	2017

36	DOC	Industry Trade Advisory Committee on Customs Matters and Trade Facilitation	2004	2017
37	DOC	Industry Trade Advisory Committee on Distribution Services	2004	2017
38	DOC	Industry Trade Advisory Committee on Energy and Energy Services	2004	2017
39	DOC	Industry Trade Advisory Committee on Forest Products	2004	2017
40	DOC	Industry Trade Advisory Committee on Information and Communications Technologies, Services, and Electronic Commerce	2004	2017
41	DOC	Industry Trade Advisory Committee on Intellectual Property Rights	2004	2017
42	DOC	Industry Trade Advisory Committee on Nonferrous Metals and Building Materials	2004	2013
43	DOC	Industry Trade Advisory Committee on Services and Finance	2004	2017
44	DOC	Industry Trade Advisory Committee on Small and Minority Business	2004	2017
45	DOC	Industry Trade Advisory Committee on Standards and Technical Trade Barriers	2004	2017
46	DOC	Industry Trade Advisory Committee on Steel	2004	2017
47	DOC	Industry Trade Advisory Committee on Textiles and Clothing	2004	2017
48	USTR	Intergovernmental Policy Advisory Committee on Trade	1997	2017
49	USTR	Advisory Committee for Trade Policy and Negotiations	1997	2017
50	USTR	Investment and Services Policy Advisory Committee	1997	1998
51	USTR	Trade Advisory Committee for Africa	1997	1998
52	USTR	Trade Advisory Committee on Africa	2000	2017
53	USTR	Trade and Environment Policy Advisory Committee	1997	2017
54	USTR	Commission on United States-Pacific Trade and Investment Policy	1997	1997

Table E3 shows the types of committee members' designation. There are three types of committee members: Representative, Special Government Employee (SGE), and Regular Government Employee (RGE). Representative is a person who usually comes from the private or non-profit sector. RGE and SGE are individuals who represent the state or local government. This information is not reported until the fiscal year 2005. On average, Representatives constitute the majority of committee members. Very few members are RGE or SGE.

Table E3: Advisory Committee Member's Designation

	Ex Officio	Not required	RGE	Representative	SGE	sum (%)
1997	0	100	0	0	0	100
1998	0	100	0	0	0	100
1999	0	100	0	0	0	100
2000	0	100	0	0	0	100
2001	0	100	0	0	0	100
2002	0	100	0	0	0	100
2003	0	100	0	0	0	100
2004	0	100	0	0	0	100
2005	0	0	0.13	95.05	4.81	100
2006	0.14	0	0.14	94.97	4.76	100
2007	0	0	0.14	96.97	2.90	100
2008	0	0	0	96.13	3.87	100
2009	0	0	0	100	0	100
2010	0	0	0	98.87	1.13	100
2011	0	0	0.48	98.56	0.96	100
2012	0	0	0.50	98.33	1.17	100
2013	0	0	0.52	98.62	0.86	100
2014	0	0	0	98.18	1.82	100
2015	0	0	0	98.50	1.50	100
2016	0	0	0	98.48	1.52	100
2017	0	0	0	98.69	1.31	100

Table E4 shows types of committee members' term limit. This information is not reported until the year 2001. At the beginning of the year 2001, most members serve 2 years in advisory committees, but by the year 2017, most members serve 4 years in advisory committees. 75% of RGE and SGE members have no fixed term. 7% of SGE members haved terms coded as 'other.'

Table E4 also shows that there is a systemic shift in committee member's term limit in the year 2005. Before 2005, about 90 % of member's term limit was 2 years, but after 2005, there is a sudden increases in the percentage of committee members whose term limit is 4 years. This shift coincides with the period during which the Congress and the government worked to restructure the trade advisory system.[1]

Thre are unique 1920 categories of represented groups (`RepresentedGroup`). The top 10 most represented groups are textiles, financial services, chemicals, information technology, automotive,

1. `https://www.finance.senate.gov/chairmans-news/grassley-praises-restructuring-of-trade-advisory-system`

pharmaceuticals, footwear and retail sector.

Table E4: Types of Committee Member's Term Limit

	1 yr	2 yrs	3 yrs	4 yrs	5 yrs	$<$ 1 yr	no fixed	no report	other	sum (%)
1997	0	0	0	0	0	0	0	100	0	100
1998	0	0	0	0	0	0	0	100	0	100
1999	0	0	0	0	0	0	0	100	0	100
2000	0	0	0	0	0	0	0	100	0	100
2001	0.13	51.19	0.13	0	0	0	48.54	0	0	100
2002	0.31	97.98	0.16	0.16	0	0	1.40	0	0	100
2003	0.29	97.57	0.14	0.14	0	0	1.86	0	0	100
2004	0	94.00	0	0.00	0	0	5.87	0	0	100
2005	0	89.97	0	0.13	0	0	9.89	0	0	100
2006	0	34.56	0	55.92	0	0.14	9.39	0	0	100
2007	0	30.90	0.55	55.86	0	0	12.69	0	0	100
2008	0	0.97	0	86.05	0	0	12.98	0	0	100
2009	0	0.88	0	87.17	0	0	11.95	0	0	100
2010	0	0.14	0	84.89	0.14	0.14	14.69	0	0	100
2011	0	0	0	83.17	0.32	0	16.51	0	0	100
2012	0	0	0	82.94	0.17	0	16.89	0	0	100
2013	0	0	0	86.06	0.17	0	13.77	0	0	100
2014	4.98	0	0	91.04	0.17	0	0	0.	3.81	100
2015	0.90	0	8.25	87.11	0.15	0.15	0	0	3.45	100
2016	0	0.34	9.14	85.45	0.17	0	0	0	4.91	100
2017	0	0.37	8.22	89.16	0.19	0	0	0	2.06	100

F Federal Office of Personnel Management (OPM) Data

There are 825 numbers of USTR officials who served in the USTR during the period 1997-2017. On average, these officials worked for seven years in the USTR, and they worked from a minimum of 1 year to a maximum of 37 years.

Table F1 and Figure F1 show the number of USTR officials who worked in the agency each year. The number of USTR officials increase during the second term of the Bush administration (2005-2008) and the Obama administration(2009-2012).

Figure F2 shows the number of USTR officials who enter and exit in each year. We exclude the year 2017 since the exit year of all USTR officials staying in the USTR in 2017 is censored in 2017. The figure suggests that in some years, people are more likely to come in and leave the USTR.

Among 835 USTR officials, 459 have information about their career path. This means that we have 45% missing data on career trajectories of USTR officials. There are some systemic differences in work years between USTR officials with and without career data. Those with career information spend fewer years in the USTR. On average, they work in the USTR for six years, and 75% percentile is eight years. On the other hand, those without career information on average work in the USTR for eight years and 75% percentile is 13 years.

We can also compare characteristics of USTR officials with and without career information. Among 658 USTR officials who have their information in OPM data, 333 of them have information on their career trajectories. OPM data contains information on federal employees' age group, education level, basic pay. There are 12 age groups. (1) 15-19, (2) 20-24, (3) 25-29, (4) 30-34, (5) 35-39, (6) 40-44, (7) 45-49, (8) 50-54, (9) 55-59, (10) 60-64, (11) 65-69, (12) 70-74. Education level consists of 22 levels, ranging from no formal education (code 01) to Post-Doctorate (code 22). Table F2 shows the comparison of USTR officials in OPM data with and without information. On average, those with career information are younger, received a higher salary in the USTR, and have a higher education level. Specifically, USTR officials with no career information have a college degree on average (code 12). On the other hand, USTR officials with career information have professional degrees such as J.D. or M.D.

We collected the information on career trajectories of individuals who worked in the USTR during the period 1997-2017. Each row contains the information on the name of the employer, the job title, and the start/end year of employment.

We categorized employers into 18 types. Table F3 shows the types of employers. The frequency denotes the number of unique employers that fall under each category. The most frequent employer types are USTR, other federal government agencies, and private firms. Employers are labeled as 'other' if they are the ones founded by individuals themselves. Employers are labeled as 'political

Table F1: Number of USTR Officials by Year, 1997-2017

Year	# of Employees	Year	# of Employees
1997	188	2008	281
1998	202	2009	282
1999	214	2010	285
2000	212	2011	277
2001	226	2012	292
2002	226	2013	277
2003	228	2014	257
2004	265	2015	230
2005	280	2016	230
2006	289	2017	233
2007	292		

Figure F1: Number of USTR Officials by Year, 1997-2017

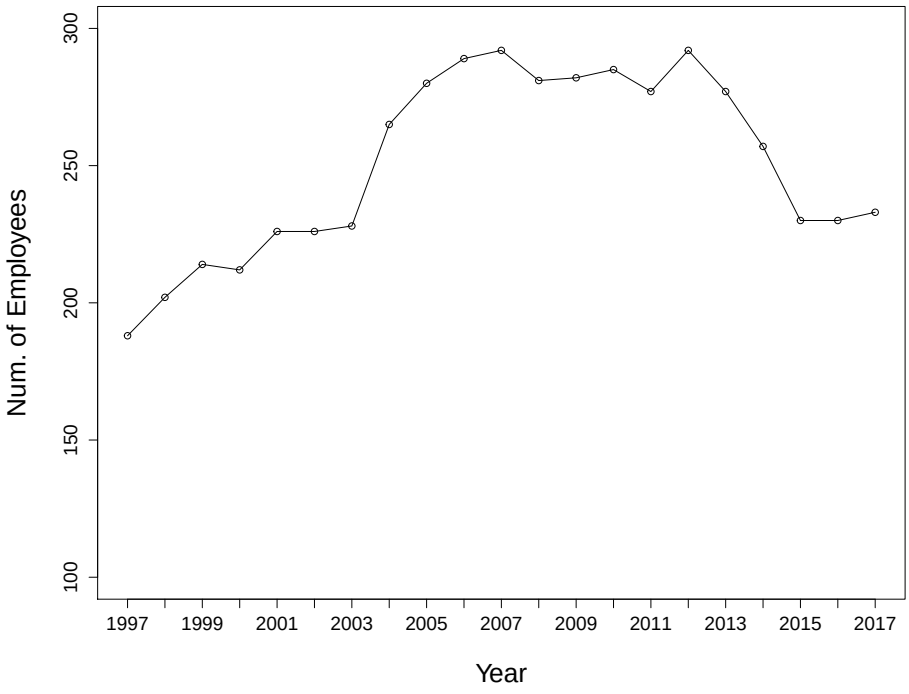
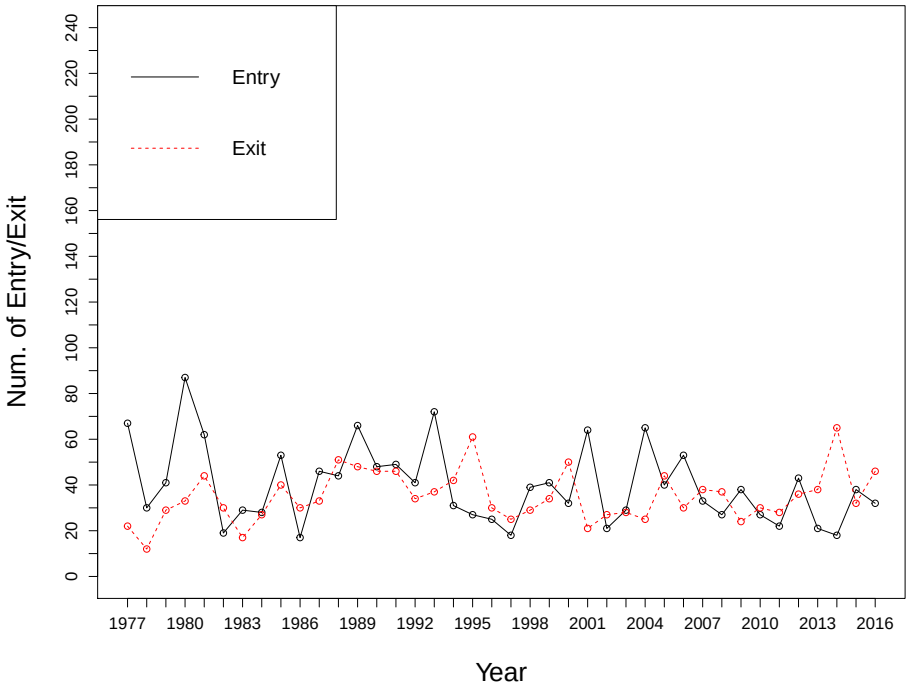


Table F2: Descriptive Statistics on the OPM Data

	Without Information		With Information		Two Sample T-tests	
	Mean	SD	Mean	SD	t	p-value
Age Group	6.04	2.17	5.43	1.79	14.61	0.000
Education Level	12.53	5.43	15.98	2.35	-40.77	0.000
Basic Pay	76741	39538	101490	36352	-30.72	0.000

Figure F2: Entry and Exit of USTR Officials by Year, 1997-2016



organization' if they are organized interest group with political agenda and lobbying power (e.g., Emily's List). The difference between 'political organization' and'trade association' is that the latter refers to business interests, whereas the former refers to advocacy groups with other political agenda. Employers are coded as 'misc' if they had jobs that are hard to categorize, such as writers.

Here, we define USTR officials as revolving-door if they worked for 'private sector' employers labeled as 'consulting firm,' 'lobbying/law firm,' 'private firm,' or 'trade association' either before or after working in the USTR. This leads us to limit our focus on cases where individuals move between the USTR and private profit sectors. Among individuals who worked in the USTR between 1997 and 2017, 314 individuals out of 438 with the career information are revolving door. Among 314 revolving-door officials, 183 of them worked in the private sector before coming to the USTR.

228 of them worked in the private sector after leaving the USTR and 97 of them worked in the private sector before and after working in the USTR.

For 183 individuals who worked in the private sector before entering the USTR, their average employment years are 5 years. The median is 4 years, minimum is 0 year (e.gl, working less than a year) and maximum is 26 years. These individuals worked in two private sector firms on average and 6 firms at maximum. Moreover, around 17 % of them worked in consulting firms, 55% of them worked in lobbying/law firms, 57% of them in private firms and 24% of them worked in trade organizations.

Table F3: Types of Employers

Type	Freq.
ustr	813
federal government	644
private firm	603
lobbying/law firm	335
congress	228
education	226
trade association	160
campaign	137
consulting firm	118
nonprofit	114
intern/clark	112
other	104
international organization	71
think tank	63
state/local government	62
political organization	43
military	29
misc	26