Environmental Enforcement during Legislative Vacancies: Insights from Clean Air Act Inspections*

Jongeun Park Abdoul G. Sam

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Abstract

Members of Congress often seek to influence the enforcement of environmental regulations to satisfy voters and improve their chances of reelection. When these members resign or pass away, their positions remain vacant until the next election. These vacancies, which are assumed to be exogenous to environmental enforcement activities, provide regulators with a temporary period of independence from congressional influence. We investigate the impact of congressional vacancies in the U.S. House of Representatives on Clean Air Act inspections. We find that vacancies of Democratic congressional members lead to a 26.1% reduction in the probability of an inspection and a 28.6% decrease in the number of inspections compared to when Democratic members are in office. This finding suggests that regulators may increase inspections to align with the preferences of Democratic incumbents, then revert to usual inspection levels once these members leave Congress. However, the effects of Democratic vacancies become insignificant when regulatory discretion is limited by additional guidelines and enforcement measures, such as Clean Air Act High Priority Violation and Non-attainment designations. We do not find significant evidence that Republican vacancies influence overall inspections. Our study sheds light on how regulatory actions are shaped by congressional influence and provides insights into improving the effectiveness of environmental regulation.

Keywords: Clean Air Act, regulatory enforcement, congressional vacancy, and bureaucracy
JEL Codes: D73, H70, K42, Q53, Q58

*The authors are respectively Ph.D. candidate and professor in the Department of Agricultural, Environmental, and Development Economics at The Ohio State University. Correspondence: Jongeun Park (park.3070@osu.edu). The authors thank Brent Sohngen, Alex Hollingsworth, Sathya Gopalakrishnan, Santiago Saavedra, Clark Lundberg, Ryan Abman, Melinda Ritchie, Alex Acs, Seungki Lee, Ryan Scott, Leah Bevis, Anne Fitzpatrick, Saeed Moshiri for valuable feedback. We also thank workshop and conference participants at Western Economic Association International, Midwest Economics Association, Midwest Political Science Association, Agricultural & Applied Economics Association, and Canadian Resource and Environmental Economics Association for helpful discussions and comments. The authors are responsible for all errors.

1 Introduction

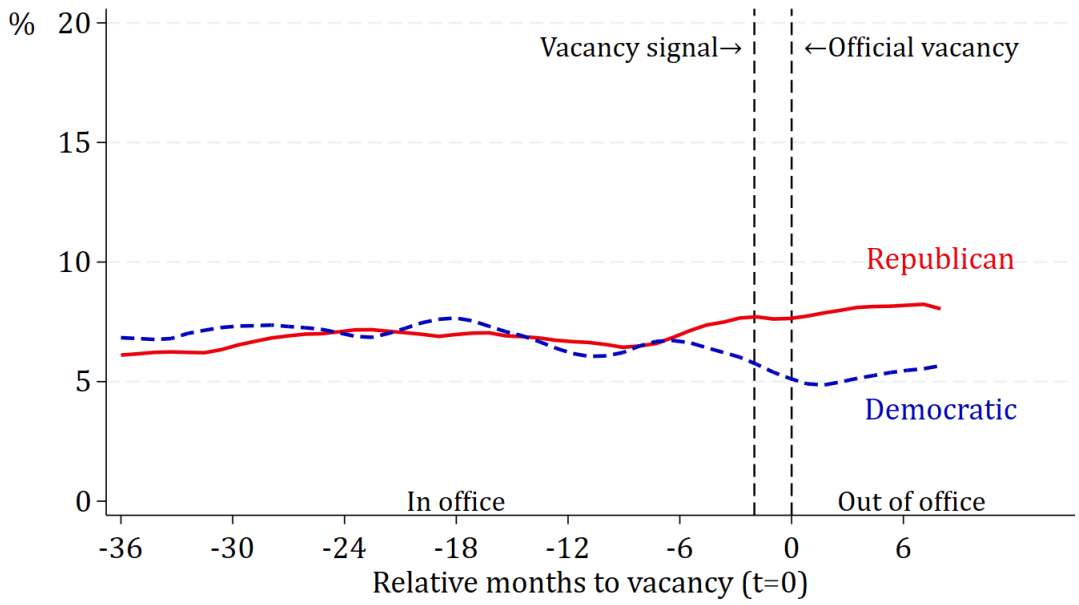
The enforcement of environmental regulations often sparks political debates about balancing environmental protection with economic growth. Politicians may seek to influence enforcement to reflect their constituents' preferences and improve their chances of reelection. However, enforcement is conducted by bureaucratic regulators who possess specialized knowledge and experience, and they may pursue objectives that differ from those of politicians. This disparity in information and objectives creates political tension between the two: while politicians aim to shape enforcement to align with their agendas, regulators may prioritize their own objectives (Moe, 2012).

We answer the question: Do state regulators align their actions with local congressional representatives? Specifically, we examine how state regulators adjust their Clean Air Act inspections in response to vacancies of Republican and Democratic members in the U.S. House of Representatives. These vacancies create a temporary absence of congressional representatives until the seats are filled through general or special elections. This provides a unique opportunity to observe regulatory behavior without congressional influence and allows us to gain insights into the impact of political influence on regulatory actions. Following the conventional view that Republicans generally support more lenient environmental regulations, while Democrats tend to advocate for more stringent ones (Innes and Mitra, 2015; McCright et al., 2014; Raff et al., 2022), we investigate how the departure of congressional members and their party affiliations shape the regulatory actions during vacancy periods.

We construct a monthly facility-level panel dataset in the United States between 2013 and 2022.[1] We compile lists of Clean Air Act stationary sources and their state-level inspection records from the Environmental Protection Agency's Enforcement and Compliance History Online database. Additionally, we incorporate data from the Risk-Screening Environmental Indicators, which assess facility-level environmental performance based on toxic pollutant releases reported to the Toxics Release Inventory Program. Consequently, the final dataset includes facilities regulated under both the Clean Air Act and the Toxics Release Inventory Program. We also collect information on congressional vacancies, including member names, political affiliations, and effective vacancy dates, from the House of Representatives History, Art & Archives. To supplement this, we manually collect public news articles to identify the dates of public announcements for congressional resignations and deaths, as well as their potential reasons. By matching vacancy information with each facility's geographic coordinates, we identify periods during which facilities experience vacancies in their congressional districts.

[1]The period is selected to avoid potential changes from the decennial congressional redistricting process. Redistricting can alter the demographic and political composition of districts, which may influence the behavior of both regulators and congressional members. Further details are discussed in the section 4 Data.

Figure 1: The average probability of inspections before and after a congressional vacancy



Notes: This figure illustrates the average probability of Clean Air Act inspections before and after congressional vacancies in congressional districts that experience the vacancies. The two vertical dotted lines denote the times of the public announcement signaling the upcoming vacancy ($t = -2$) and the official vacancy ($t = 0$), respectively.

Figure 1 illustrates the average probability of Clean Air Act inspections before and after congressional vacancies in congressional districts that experience such vacancies. Initially, facilities in both Republican and Democratic districts exhibit relatively similar inspection probabilities. However, once a vacancy signal—the public announcement of a resignation or death—occurs, a noticeable divergence emerges. This difference in inspection probabilities between districts represented by the two parties persists throughout the vacancy period, which suggests that regulators may adjust their inspection behavior when congressional representatives leave Congress prematurely.

Our identification strategy relies on the assumption that congressional vacancies are exogenous to environmental inspections, conditional on observable time-control variables and facility, year, and month-fixed effects. Vacant seats in the U.S. House of Representatives primarily arise from voluntary resignations (78%) and deaths (19%). Resignations are typically driven by factors such as pursuing other government positions, moving to the private sector, or involvement in scandals or crimes, which are unlikely to be related to environmental inspections. These events create quasi-random shocks that temporarily reduce congressional influence over regulators, allowing us to isolate the effect of congressional influence from other political and economic characteristics that may affect inspections. Additionally, congressional members often

announce their intention to resign—commonly to run for or be nominated to other government positions—about two months before their official departure. These early announcements may lead regulators to anticipate upcoming vacancies, potentially biasing estimates of vacancy effects. To address this anticipation effect, we use the public announcement date of an upcoming vacancy as the start date of the vacancy period, rather than the official vacancy date.

We find that Democratic vacancies reduce the probability of inspections by 26.1% and the number of inspections by 28.6% compared to periods with Democratic incumbents. This suggests that regulators may increase inspections to align with the preferences of incumbent Democrats and revert to lower inspection levels once these members leave Congress. In contrast, we do not find statistically significant evidence that regulators adjust their behavior in response to Republican vacancies compared to Republican incumbency periods. The limited effect of Republican vacancies could be due to either minimal political influence from Republicans or constraints on regulators' budgetary and human resources, which may limit their capacity to increase inspections during these vacancies.

We also examine how powerful politicians, the governor's party affiliation, and limited regulatory discretion affect the impact of vacancies on inspections. First, powerful politicians, proxied by House committee membership related to budget, rules, or the environment, do not appear to influence the effects of vacancies on regulatory behavior. These committee members typically focus on national issues, and their influence on state regulatory actions may not be significantly stronger than that of other congressional members. Similarly, we do not observe a significant impact of the governor's party affiliation on the vacancy effects, indicating that governors may not specifically respond to congressional vacancies. Furthermore, significant violators of the Clean Air Act are designated as High Priority Violations, while counties that fail to meet air quality standards are designated as Non-attainment areas. Both designations require state regulators to address violations and air quality issues promptly, imposing additional guidelines and procedures that may limit regulatory discretion, particularly in reducing inspections. We find that in areas with limited regulatory discretion, proxied by High Priority Violation and Non-attainment designations, the effects of Democratic vacancies are insignificant.

We contribute to the understanding of congressional control over bureaucracy by investigating how state regulators respond when one of their multiple political principals is absent. Our findings also suggest that differences in regulatory outcomes between Republican and Democratic members may be shaped by the actions of both parties, rather than by a single party. State regulators are influenced by multiple political principals from the executive, legislative, and judicial branches (Palus and Yackee, 2022; Yackee and Yackee, 2021). While many studies examine the relationship between incumbent congressional members and regulators (Downey,

2023; Heitz et al., 2023; Innes and Mitra, 2015; Lowande, 2018; Short, 2021), the impact of congressional vacancies on state regulatory behavior remains underexplored. Moreover, although significant differences in environmental enforcement between Republican and Democratic politicians have been documented (Beland and Boucher, 2015; Fowler and Kettler, 2021; Gulen and Myers, 2024; He et al., 2020; Innes and Mitra, 2015; Liu, 2020; Raff et al., 2022), little attention has been paid to whether these differences are driven by one party or both.

We also contribute to the literature on environmental regulatory enforcement by proposing congressional vacancies as a determinant of enforcement. The enforcement of environmental regulations is shaped by administrative and regulatory information about regulated facilities (Blundell, 2020; Blundell et al., 2020; Evans and Stafford, 2019), as well as environmental budgets (Blundell et al., 2021) and regulatory expertise (Duflo et al., 2018; Kang and Silveira, 2021). Beyond internal information and regulatory resources, enforcement is also influenced by external political factors and public participation, including political influence (Elrod et al., 2019; Fredriksson and Wang, 2020; Gulen and Myers, 2024; Heitz et al., 2023; Innes and Mitra, 2015; Kahn et al., 2015; List and Sturm, 2006; Raff, 2023), decentralization (Burgess et al., 2012; Lipscomb and Mobarak, 2017; Sjöberg and Xu, 2018), citizen complaints (Buntaine et al., 2024; Colmer et al., 2024; Grant and Grooms, 2017; Maniloff and Kaffine, 2021), and media coverage (Cecato, 2022). The closest studies are Innes and Mitra (2015) and Heitz et al. (2023), both of which examine congressional influence on Clean Air Act inspections and enforcement actions, using a regression discontinuity design based on election outcomes. In contrast, our approach focuses on congressional vacancies. We specifically examine inspections rather than enforcement actions because inspections are more frequent and flexible, making them more adjustable during short periods of congressional vacancies, whereas enforcement actions occur only after detected violations and are rarely observed during these vacancy periods.

Lastly, we propose congressional vacancies as an exogenous source of identification to estimate the effects of congressional influence. A common strategy to isolate the impact of politicians from other unobserved factors is a regression discontinuity design based on a narrow margin of victory in elections (Marshall, 2024). Our approach, which takes advantage of the absence of politicians, identifies which politician contributes to the observed differences between two winners without relying on a specific candidate as the baseline group. This provides a viable alternative when a regression discontinuity design is not feasible or appropriate. Existing studies that exploit the absence of political figures typically focus on the absence of municipal leaders and its impact on the business sector, such as firm investment (Cheng et al., 2024a), air quality (Cheng et al., 2024b), and economic growth (Cheng et al., 2024c). In contrast, we focus on the absence of congressional members and examine how their party affiliation shapes regulatory behavior, particularly in the context of environmental regulation.

The remainder of the paper is organized as follows: Section 2 provides an overview of bureaucratic discretion, political influence, and Clean Air Act inspections. Section 3 presents the conceptual framework and hypotheses. Section 4 explains how the data are obtained and processed. Section 5 introduces the econometric strategy used to estimate the causal impact of congressional vacancies and political party affiliations on Clean Air Act inspections. In Section 6, the regression results are presented and discussed. Section 7 concludes the paper.

2 Background

2.1 Congressional influence on bureaucratic decision-making

Congressional members often lack the specialized knowledge and time necessary for effective regulatory enforcement. In contrast, bureaucratic regulators, through their professional careers, develop the technical expertise and practical experience required to perform these tasks more effectively (Shipan, 2004). This gap in expertise creates an information asymmetry between Congress and regulators, which leads Congress to delegate regulatory enforcement authority with a high degree of discretion to more knowledgeable regulators (Daley et al., 2014; Miller, 2005; Moe, 2012). As a result, regulators can make their judgment in enforcement actions, considering not only their expertise but also their personal values, as well as political and economic contexts (Boland and Godsell, 2021; Downey, 2023; Moe, 2012; Palus and Yackee, 2022). This flexibility often results in different regulatory decisions on similar issues when implementing regulations (Burgess et al., 2012; Duflo et al., 2018; Shimshack, 2014).

Since constituents often make their voting decisions based on how regulatory outcomes affect their daily lives (Hazlett and Mildenberger, 2020; Liao and Ruiz Junco, 2022; Mehic, 2023; Yao et al., 2022), bureaucratic enforcement actions that shape these outcomes draw significant attention from congressional members, who are primarily motivated by reelection prospects (Holland, 2015, 2016; Hu et al., 2021). Repeated interactions between legislators and regulators strengthen their cooperation, with both sides aiming to maximize their respective benefits (Carpenter and Krause, 2015). This cooperation often leads to an alignment of regulatory actions with political preferences across various sectors, such as environmental enforcement (Innes and Mitra, 2015), public procurement (Boland and Godsell, 2021; Szucs, 2024), prosecutions (Downey, 2023), Securities and Exchange Commission actions (Correia, 2014), and workplace safety enforcement (Fisman and Wang, 2015). Additionally, congressional influence over regulators affects the personal attitudes of agency staff, including their job satisfaction, commitment to staying with the agency, and their efforts to build expertise (Marvel and McGrath, 2016; Richardson, 2019).

Congressional members have several tools to exert control over regulators. First, they can pass laws that limit the discretion of regulators (McCubbins et al., 1987; West and Raso, 2013).[2] Second, they can adjust agency budgets to favor regulators whose actions align with their political views (Innes and Mitra, 2015; Weingast and Moran, 1983). Lastly, they can hold oversight hearings to support regulators whose actions match their preferences or to pressure those who deviate to change their behavior (MacDonald and McGrath, 2016; Marvel and McGrath, 2016; McGrath, 2013). These hearings also help mitigate the information asymmetry between Congress and regulators by allowing congressional representatives to gather more information on agency activities (MacDonald and McGrath, 2016). In addition, informal inquiries and direct contact from congressional members are also considered as a part of oversight (Downey, 2023; Lowande, 2018; Ritchie and You, 2019).

Some regulations are enforced by state regulators, who are granted authority by federal regulatory agencies. Congressional members may also influence these state regulators, either by pressuring federal agencies to oversee them or by directly reaching out to state regulators. For example, the Environmental Protection Agency (EPA) delegates most environmental regulations to state and local authorities (Shimshack, 2014). Congressional members frequently urge the EPA to address specific local environmental and public health concerns, which often requires collaboration with state regulators.[3] State regulators, who rely heavily on federal grants for their environmental budgets, may align their actions with EPA preferences to maintain good relationships and secure continued funding (Blundell et al., 2021; Clark and Whitford, 2011; Fowler and Kettler, 2021).[4] The EPA uses informal tools, such as the Clean Air Act Watch List, to monitor state regulators' enforcement actions (Evans and Stafford, 2019). State regulators also strengthen their bargaining power with firms by leveraging the potential for stricter federal enforcement measures (Anders and Campbell, 2024).[5] Additionally, congressional members often reach out directly to state regulators (Waterman et al., 2004), and state regulators perceive Congress as one of their key political principals (Helland, 1998b; Waterman et al., 1998).[6]

[2]The Administrative Procedure Act, for instance, requires regulators to publicly announce proposed rules and collect feedback from the public, including regulated interest groups, for a certain period (McCubbins et al., 1987; Shapiro and Moran, 2016; Yackee, 2019). This process allows interest groups to inform congressional representatives of their concerns regarding bureaucratic actions (McCubbins et al., 1987; Wagner et al., 2011).

[3]For instance, in 2024, U.S. Representative Debbie Dingell (MI-6) sent a letter to an EPA regional office requesting attention to an oil spill in Northville, Michigan (Powers, 2024). Congressional members also reveal their political preferences on environmental protection through social media and conduct oversight hearings to scrutinize state-level regulatory actions (Rodd, 2021).

[4]Federal grants account for, on average, 48.8% of state environmental health expenditures (see Figure A.1).

[5]Evans and Stafford (2019) suggest that releasing of the EPA's Clean Air Act Watch List, which tracks unresolved enforcement issues for significant Clean Air Act violators, influences the behavior of state and local regulators. Similarly, Anders and Campbell (2024) examine the effects of EPA budget cuts, showing that state regulators use the threat of stronger EPA enforcement as a bargaining tool with firms.

[6]Following a freight train derailment in East Palestine, Ohio, on February 3, 2023, which caused significant

2.2 Clean Air Act Inspections

The Clean Air Act, established in 1970, is a landmark environmental law aimed at improving air quality and protecting public health in the United States. The EPA is responsible for developing and enforcing specific regulations to ensure that the law is effectively implemented in practice (Aldy et al., 2022; Currie and Walker, 2019). While the EPA oversees the overall enforcement process, it delegates most primary enforcement responsibilities to state and local authorities, with 10 regional EPA offices collaborating to support them (Woods, 2022). As a result, state and local governments are primarily responsible for inspecting regulated facilities and taking enforcement actions when violations are detected. These actions can range from verbal warnings to administrative orders and fines (EPA, 2010; Evans et al., 2018; Shimshack and Ward, 2022).

Inspection is a primary method for verifying the compliance information reported by regulated facilities and for identifying potential regulatory violations (Blundell et al., 2020; Shimshack, 2014). Under the Clean Air Act, inspection activities include but are not limited to visible emission monitoring, interviews, document reviews, stack tests, and performance testing (EPA, 2016). These inspections fall into three main categories: Full Compliance Evaluation, which involves a comprehensive assessment of all pollutants at all regulated sites; Partial Compliance Evaluation, which focuses on specific pollutants or individual sites; and Investigation, an in-depth monitoring process targeting specific issues (EPA, 2016; Hanna and Oliva, 2010; Lim, 2016).

While the EPA provides guidelines to help state regulators meet federal minimum inspection requirements, the technical complexity of regulations and their vagueness grant state regulators considerable discretion and flexibility in making inspection decisions (Shimshack, 2014). For example, state regulators can negotiate their inspection plans with EPA regional offices or may choose to implement flexible enforcement strategies (EPA, 2016). Consequently, the number and scope of inspections can vary significantly across states and regulatory programs, often shaped by compliance history (Blundell et al., 2020), citizen complaints (Colmer et al., 2024), as well as socioeconomic and political factors (González, 2024; Heitz et al., 2023; Innes and Mitra, 2015). This regulatory discretion is also prevalent in other federal environmental regulatory enforcement, such as Clean Water Act (Grooms, 2015; Raff, 2023; Raff and Earnhart, 2018; Woods, 2022) and Safe Drinking Water Act (Daley et al., 2014), as well as in state-level environmental programs (Blundell, 2020; Maniloff and Kaffine, 2021; Zirogiannis et al., 2018).

environmental and health concerns, the House Energy and Commerce Committee sent letters not only to the EPA but also to the Ohio EPA and the Pennsylvania Department of Environmental Protection, requesting detailed information and plans from state regulators on how they intended to address the accident.

3 Conceptual framework and hypothesis

We adopt the public choice theory of regulation, which suggests that regulators maximize net political support (Earnhart, 2004; Helland and Whitford, 2003; Peltzman, 1976; Raff, 2023). Specifically, we extend Helland and Whitford (2003) model, which posits that regulators aim to maximize political support within their regional jurisdictions, by incorporating the political preferences of congressional representatives.

Consider a congressional district with n residents and m firms. Regulators seek to maximize net political support, which is defined as the political support from residents minus the political opposition from firms within the district. Environmental damage $v(s)$ satisfies $v'(s) > 0$ and $v''(s) > 0$, where a higher regulatory enforcement level s indicates more lenient enforcement. Political support from citizens f is characterized by the proportion α of $v(s)$ that affect local residents, where $f'(\alpha v(s)) < 0$ and $f''(\alpha v(s)) < 0$. Political opposition from firms h, with $h(t)' > 0$ and $h''(t) > 0$, is determined by compliance costs t, where $t'(\frac{s}{m}) < 0$ and $t''(\frac{s}{m}) > 0$. The relative political influence of firms compared to citizens is captured by e, which reflects factors such as firm size and political connections, with e greater than zero.

We incorporate the political preferences of congressional representatives regarding environmental protection, denoted by θ, into the Helland and Whitford (2003) model. If congressional representatives are pro-environmental, then $\theta > 1$, and if they are pro-business, then $\theta < 1$. For members who are indifferent between business and the environment or do not influence regulators, $\theta = 1$. A higher θ imposes more weight on citizen support relative to firm opposition, and regulators have a keen perception of these preferences (Palus and Yackee, 2022; Potter, 2017). The regulators maximize:

$$M = n\theta f(\alpha v(s)) - meh(t(\frac{s}{m})) \tag{1}$$

The corresponding first-order condition with respect to s is

$$K = \frac{dM}{ds} = n\alpha\theta \, \mathrm{v}'(s) \, \mathrm{f}'(\alpha \, \mathrm{v}(s)) - \mathrm{e} \, \mathrm{t}'\left(\frac{s}{m}\right) \mathrm{h}'\left(\mathrm{t}\left(\frac{s}{m}\right)\right) = 0 \tag{2}$$

When we differentiate the first-order condition in Equation 2 with respect to θ and s, respectively, we obtain

$$\frac{\partial K}{\partial \theta} = n \, \mathrm{v}'(s) \, \alpha \, \mathrm{f}'(\mathrm{v}(s) \, \alpha) < 0 \tag{3}$$

and

$$\frac{\partial K}{\partial s} = -\frac{e\left(t'\left(\frac{s}{m}\right)\right)^2 h''\left(t\left(\frac{s}{m}\right)\right)}{m} - \frac{e\,t''\left(\frac{s}{m}\right)h'\left(t\left(\frac{s}{m}\right)\right)}{m} + n\alpha^2\theta\left(v'(s)\right)^2 f''(\alpha\, v(s)) + n\alpha\theta\, v''(s) f'(\alpha\, v(s)) < 0 \tag{4}$$

Given that K represents the marginal benefit of having a higher s, Equation 3 implies that pro-environmental members reduce the marginal benefit of lenient enforcement, incentivizing regulators to adopt stricter enforcement. Equation 4 suggests as enforcement becomes more lenient, it becomes optimal to tighten enforcement because the marginal benefit of maintaining leniency declines.

By implicit function theorem, the relationship between s and θ is

$$\frac{ds}{d\theta} = -\frac{\frac{\partial K}{\partial \theta}}{\frac{\partial K}{\partial s}} < 0 \tag{5}$$

Therefore, the more congressional representatives prioritize environmental protection over business (higher θ), the less lenient enforcement is (lower s). In other words, pro-environmental members lead to stricter enforcement, while pro-business members lead to more lenient enforcement. We adopt the conventional perspective that Republicans are more likely to be business-friendly and support relaxed environmental regulation and enforcement compared to Democrats, indicated as higher s (Beland and Boucher, 2015; Fowler and Kettler, 2021; Innes and Mitra, 2015; McCright et al., 2014; Raff et al., 2022).[7]

Congressional vacancy implies the absence of political influence from a congressional representative, making θ become 1. $\theta = 1$ results in a corresponding change in s in the opposite direction. For instance, suppose a Democratic member has a positive θ. A vacancy decreases θ towards 1, increasing s according to the negative relationship between θ and s described in Equation 5. The hypothetical relationship on how vacancy changes s is summarized in Table 1.

Table 1: The hypothetical relationship between congressional vacancy and enforcement by political party affiliation

	Incumbent	Vacant	$\Delta\theta$	Δs
Democratic Party	$\theta > 1$	$\theta = 1$	$-$	$+$
Republican Party	$\theta < 1$	$\theta = 1$	$+$	$-$

Notes: This table presents the hypothetical relationship between congressional vacancies and enforcement s by political party affiliation. $\Delta\theta$ represents the difference in θ when a congressional seat changes from incumbency to vacancy. Δs indicates the corresponding change in s based on $\Delta\theta$ and Equation 5.

[7] As a robustness check, we also use interest group ratings, including those from the League of Conservation Voters and the American Conservative Union, as alternative measures of environmental preference.

Therefore, we anticipate that a congressional vacancy from a Republican representative will lead to a higher probability and/or count of inspections during the vacancy period. Conversely, if the vacancy is from a Democratic representative, a lower probability and/or count of inspections is expected. This suggests that when the representatives are in office, they influence regulators, who adjust their inspection behaviors in the opposite direction during congressional vacancies. This leads to the following hypothesis:

□ Hypothesis 1: Republican vacancies increase the probability of and the number of the Clean Air Act inspections while Democratic vacancies decrease them.

State regulators may be particularly susceptible to the influence of powerful politicians. Congressional committees serve as a key channel through which congressional members control regulators through their budgetary and oversight authority (Heitz et al., 2023; Helland, 1998a; Kleit et al., 1998; Shipan, 2004). Congressional members who serve on committees that oversee budget, regulatory rules, and environmental issues may have a more influential impact on inspection decisions. Therefore, the influence of members on these committees is expected to be greater than that of members not serving on such committees, which potentially leads to more significant effects of congressional vacancies on inspections.

□ Hypothesis 2A: The effects of congressional vacancies on inspections are more significant for members who serve on any influential committee.

Governors hold significant authority in shaping and enforcing regulations within their states, and their political preferences, often reflected by their political party affiliation, heavily influence regulatory actions and outcomes (Raff et al., 2022). For instance, when it comes to environmental regulations, Republican governorship, compared to Democratic ones, tends to result in lower adoption of facility-level air pollution abatement technology (Raff et al., 2022), higher levels of toxic pollutants (Fowler and Kettler, 2021), and poorer ambient air quality (Beland and Boucher, 2015). When governors and congressional members belong to different political parties, their opposing influences can help regulatory agencies maintain independence (Palus and Yackee, 2022; Voorn et al., 2019). However, when a congressional member leaves office, regulators may lose this balance and tend to follow the governor's preferences, potentially acting against the absent congressional member's preference. In contrast, when the governor and congressional members are from the same party, the governor is likely to keep regulators aligned with their shared goals, even during congressional vacancies, which may prevent regulators from deviating from the preferences of the absent congressional members.

□ Hypothesis 2B: Regulators do not adjust their inspections during congressional vacancies

when the governor and congressional members are from the same political party. However, they do respond to vacancies when the governor and congressional members are from opposing parties.

When regulations require additional enforcement actions for specific target facilities, regulators have less discretion in their actions (Carril, 2022; Montagnes and Wolton, 2017). For instance, if a facility is identified as a significant violator of the Clean Air Act during inspection, it is designated as a High Priority Violation. This designation requires state regulators and the EPA to coordinate efforts to address the violation, which results in increased scrutiny (Blundell et al., 2020). Similarly, counties that fail to meet the National Ambient Air Quality Standards are designated as Non-attainment areas. In these cases, the state governor must submit State Implementation Plans to the EPA and enforce them to improve air quality (Curtis, 2020; Raff and Walter, 2020). Both High Priority Violation and Non-attainment designations may impose additional regulatory requirements, which limit the discretion of regulators to reduce inspections.

□ Hypothesis 2C: Regulators do not adjust their behavior in response to Democratic vacancies when stringent regulations, such as High Priority Violation or Non-attainment area designations, are in place.

4 Data

We use the EPA's Integrated Compliance Information System for Air (ICIS-AIR), which maintains a historical record of inspections and enforcement actions conducted by federal, state, and local regulators on stationary sources of air pollution under the Clean Air Act.[8] The database includes Full and Partial Compliance Evaluations, formal and informal enforcement actions, and High Priority Violation status, all recorded daily. We aggregate the data at the monthly level to track which facilities are subject to these actions or statuses each month. Additionally, we obtain facility-level longitude and latitude information from the EPA's Facility Registry Service dataset and match these locations with the records from the ICIS-AIR database.

We also obtain Risk-Screening Environmental Indicators (RSEI) score data from the EPA to measure yearly facility-level environmental performance.[9] The RSEI score is a health risk metric that assesses the potential impact of toxic pollutants based on their toxicity, quantities released, and the affected population (EPA, 2024). Since the RSEI score is calculated based on

[8]The ICIS-AIR database is accessible at https://echo.epa.gov/tools/data-downloads.
[9]The RSEI database is accessible at https://www.epa.gov/rsei/ways-get-rsei-results.

toxic pollutant releases under the Toxics Release Inventory Program, facilities that do not meet the program's reporting threshold are not included in the RSEI data.

We match each facility to its corresponding congressional district based on the year and geographical coordinates, using Cartographic Boundary Files provided by the U.S. Census Bureau. We obtain data on individual congressional members from the Center for Effective Lawmaking.[10] This dataset provides comprehensive information on House and Senate members, including political party affiliation, congressional district, age, majority party membership, number of terms served, state legislature experience, and Legislative Effectiveness Scores.[11]

We also obtain House committee assignment data for the 107th to 115th Congresses from Stewart and Woon (2017) and for the 116th and 117th Congresses from the Clerk of the House of Representatives.[12] We identify influential committee members based on their membership in committees that oversee budgeting, rules, and environmental issues. A congressional member is considered influential if they serve on any of the following committees during their term: Appropriations, Budget, House Oversight, Rules, Government Reform and Oversight, Transportation, Energy and Commerce, or Science and Technology.

We collect information on congressional vacancies from the US House of Representatives: History, Art & Archives, including the effective date of the vacancy, party affiliation, reason for the vacancy (e.g., death or resignation), and the date of any special election held, along with the subsequent successor.[13] We manually collect public news articles discussing the reasons a congressional member might resign or their positions after leaving Congress (see Table A.12). From these articles, we also gather information on when departing members first publicly announce their intention to leave Congress, which we consider the start of the vacancy signaling period, rather than the official departure date. For legislators pursuing federal, state, or local office, we use the earliest date among their nominations, candidacy announcement, or resignation announcement. For others, we use the date of their resignation announcement (see Table A.2).

For socio-economic control variables, we obtain county-level per capita personal income and population data from the Bureau of Economic Analysis.[14] County unemployment rates

[10] The individual congressional member dataset is accessible at https://thelawmakers.org/data-download.

[11] Legislative Effectiveness Scores, developed by the Center for Effective Lawmaking, assess a legislator's lawmaking effectiveness based on 15 indicators, including whether a member's bill is introduced, receives committee actions and is passed in Congress. For more details, see https://thelawmakers.org/methodology.

[12] Stewart and Woon (2017) House committee assignment data is accessible at http://web.mit.edu/17.251/www/data_page.html.

[13] Congressional vacancy information is accessible at https://history.house.gov/Elections/.

[14] We use per capita personal income as an alternative to GDP per capita. In 2023, the Bureau of Economic Analysis updated its methodology and classification of national economic accounts, shifting the reference year for GDP measures from 2012 to 2017 (Guci and Wetzler, 2023). As of June 2024, the updated GDP data is only available from 2017 onward, and the older version does not include data for 2022.

are collected from the Department of Agriculture Economic Research Service. We obtain data on governors' political party affiliation from the National Governors Association website. Non-attainment area status data is collected from the EPA; a facility is classified as being in a Non-attainment area if it is located in a county where any of the following criteria pollutants exceeds the thresholds: ozone, carbon monoxide, lead, nitrogen dioxide, particulate matter, and sulfur dioxide.

We obtain data on state expenditures from the Annual Survey of State and Local Government Finances by the Census Bureau.[15] To measure federal grants and state expenditures for environmental health, We use the item B43 "Intergovernmental Revenue from Federal – Environmental Health" and item E27 "Current Operations – Environmental Health", respectively. Since the survey uses a fiscal year ending on June 30th, we match the data with facility records based on the corresponding year and month.

For robustness checks, we use environmental interest group ratings as proxies for political preferences: the League of Conservation Voters and the American Conservative Union. The League of Conservation Voters assesses pro-environmental votes, while the American Conservative Union evaluates conservative voting patterns. We collect League of Conservation Voters rating data for the years 2013-2022 from their website, and ratings from the American Conservative Union for the years 2013-2021 are obtained from the CQ Press Voting and Elections Collection database.

We combine the ICIS-AIR and RSEI databases to construct a comprehensive monthly panel dataset covering the period from 2013 to 2022.[16] After eliminating observations with missing variables, our final dataset consists of 1,330,716 observations with 13,939 observations (1%) recorded as vacant. Table 2 represents the descriptive statistics segmented by vacancy status. Congressional members who leave office tend to have lower legislative effectiveness scores, serve more terms, and are less likely to belong to the majority party compared to those who remain. When examining the descriptive statistics by political party affiliation (Table A.1), there are distinct differences between Republican and Democratic members. For instance, Republican members, on average, have a higher number and probability of inspections, lower RSEI scores, serve fewer terms, and are less likely to be majority party members compared to Democratic

[15]The Annual Survey of State and Local Government Finances dataset is accessible at https://www.census.gov/data/datasets/2022/econ/state/historical-datasets.html.

[16]We begin in 2013 as it marks the first year for the winners of the 2012 election, following congressional redistricting based on the 2010 Census. Starting in this period helps mitigate potential unobserved confounding factors related to redistricting that could influence both vacancy decisions and inspections. Congressional districts are redrawn every 10 years, typically by state legislatures, with each party aiming to maximize its representation. Unobserved factors, such as local political preferences, may affect new district maps, leading some incumbents to face reduced re-election prospects and opt to resign (Skelley, 2023). These unobserved local characteristics could also affect the probability and count of inspections.

members.

Table 2: Descriptive statistics by congressional vacancy

	(1) Vacant	(2) Incumbent	(3) Difference (1)-(2)
Republican	0.66	0.64	-0.02***
	(0.47)	(0.48)	(0.00)
High Priority Violation	0.04	0.04	0.00
	(0.20)	(0.20)	(0.00)
Lagged RSEI score	23,153.43	25,675.29	2,521.86
	(228220.22)	(341222.90)	(2,897.00)
Age	61.21	57.46	-3.75***
	(11.41)	(10.74)	(0.09)
Legislative Effectiveness Scores	0.44	0.92	0.49***
	(0.61)	(0.98)	(0.01)
Number of terms served	7.45	5.01	-2.44***
	(5.59)	(4.14)	(0.04)
Majority party member	0.49	0.55	0.06***
	(0.50)	(0.50)	(0.00)
Influential Committee	0.37	0.60	0.23***
	(0.48)	(0.49)	(0.00)
Served in state legislature	0.46	0.47	0.01*
	(0.50)	(0.50)	(0.00)
Unemployment rate	5.43	5.27	-0.16***
	(1.95)	(1.99)	(0.02)
Per capita personal income (US$)	49,740.28	48,611.90	-1,128.38***
	(12,363.92)	(13,023.08)	(110.83)
Republican Governor	0.60	0.64	0.03***
	(0.49)	(0.48)	(0.00)
Republican Senate ratio	0.56	0.55	-0.01***
	(0.39)	(0.41)	(0.00)
Non-attainment areas	0.33	0.31	-0.01***
	(0.47)	(0.46)	(0.00)
N	13,939	1,316,777	1,330,716

Notes: This table represents the descriptive statistics by congressional vacancy. * p<0.10, ** p<0.05, *** p<0.01.

5 Econometrics strategy

We examine whether and how state regulators respond to congressional members when conducting Clean Air Act inspections. Specifically, we focus on the causal impact of congressional members' political party affiliation on both the probability and number of inspections, as party affiliations often reflect different policy priorities regarding environmental protection. However, simply comparing Clean Air Act inspections based on the political party of congressional members may result in biased estimates due to potential sample selection and omitted variable bias. Since congressional members generally represent the preferences of their constituents, it is challenging to disentangle the influence of the members from that of their constituents. These unobserved constituent preferences may be associated with both firm behavior and inspection decisions, as well as election outcomes.

To identify the causal impact of congressional influence on Clean Air Act inspections, we exploit congressional vacancies in the House of Representatives.[17] When a congressional member resigns or dies, it creates a vacant seat in the House, which typically remains vacant until it is filled through either a general or special election. On average, House seats remain vacant for approximately 147.4 days (see Figure A.2 for the distribution of vacancy periods).[18] By examining the behavior of regulators during these vacancy periods, we can obtain insights into the potential influence of congressional members on regulatory actions. We estimate the following regression equation[19]:

$$\begin{aligned} Y_{iym} = \beta_0 + \beta_1 VACANT_{iym} + \beta_2 REP_{iym} + \beta_3 VACANT_{iym} \times REP_{iym} \\ + \beta_4 X_{iym} + \rho_i + \eta_y + \tau_m + \epsilon_{iym} \end{aligned} \tag{6}$$

where Y_{iym} represents the outcome variables, including a dummy variable for whether an inspection occurred and the count of inspections at facility i in year y and month m. $VACANT_{iym}$ is a dummy variable indicating whether a facility is located in a congressional district with a

[17] Unlike the House of Representatives, the procedure for filling a vacant Senate seat is determined by each state's legislature. In most states, governors appoint interim senators to serve until a general or special election is held. However, some states leave the seat vacant until the next election, without a gubernatorial appointment (Neale, 2018).

[18] The average vacancy durations for Republican and Democratic members are 148.5 and 148.2 days, respectively.

[19] The two-way fixed effects model may generate biased estimates when multiple treatment periods and heterogeneous treatment effects are present, as it uses already treated groups as control groups (Goodman-Bacon, 2021). Nonetheless, we prefer the model in Equation 6 due to the limited number of vacancy and inspection observations. Although the de Chaisemartin and D'Haultfoeuille (2024) difference-in-differences estimator addresses potential bias from multiple treatment periods and treatments that can switch on and off, the estimates may lack statistical precision in our setting primarily due to the limited variation in the outcome variables across relative treatment periods. For example, for Democratic vacancies, the 1-month and 2-month post-treatment effects are based on 513 and 473 vacancy observations, respectively. Of these, only 26 observations in the 1-month period and 16 in the 2-month period were recorded as inspected, which contributes to the imprecision of the estimates. The results are shown in Figure A.4.

vacant House seat. REP_{iym} equals 1 if the district's representative is a Republican, 0 otherwise. X_{iym} denotes a set of control variables. ρ_i, η_y, and τ_m represent facility, year, and month fixed effects, respectively. The error term ϵ_{iym} is clustered by congressional district to account for potential error correlation within each congressional district.

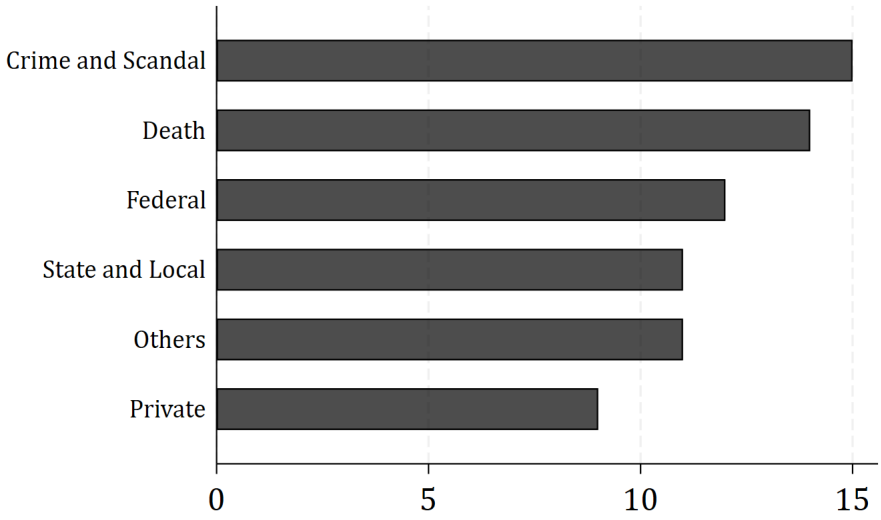
All estimations include facility and year-by-month fixed effects to account for time-invariant facility characteristics and common shocks within specific years and months, such as election cycles and weather. In addition to these fixed effects, we include several control variables related to facility, politician, and regional characteristics to reduce omitted variable bias. First, we control for firm-level environmental behavior that could influence inspection decisions. This includes environmental performance and compliance behavior, as indicated by the 1-year lagged RSEI score and High Priority Violation status (Blundell et al., 2020; Earnhart, 2004; Eckert and Eckert, 2010; Kleit et al., 1998; Woods, 2022).

Additionally, we control for the political characteristics of individual congressional members, including age and legislative efficacy indicators, such as influential committee assignments, Legislative Effectiveness Scores, number of terms served, state legislature experience, and majority party status. Congressional members with low re-election prospects and low efficacy are more likely to retire, which also probably determines their political influence (Wolak, 2007). Furthermore, regional characteristics can influence the level of enforcement (Earnhart, 2004). To capture regional economic features, we include county-level unemployment rates and per capita personal income. We also control for the political party affiliation of governors and the Senate ratio in each state to account for checks and balances from other political branches beyond congressional members (Palus and Yackee, 2022). Lastly, we include Non-attainment areas as a control variable to account for current regulatory conditions that may affect inspection decisions (Gray and Deily, 1996). Non-attainment areas, which fail to comply with National Ambient Air Quality Standards, typically face more regulatory inspections (Gray and Deily, 1996) and draw more attention from politicians compared to attainment areas.

Furthermore, regulators may anticipate congressional vacancies and adjust their behavior before congressional members officially leave office (see Figure 1). Resigning members typically announce their intention to step down before their official departure, which serves as a signal of an upcoming vacancy. This signaling may lead to anticipation effects, providing incentives for regulators to deviate from their political preferences even before the official vacancy occurs.[20] On average, the vacancy signal is sent 65 days before the official departure. We use this vacancy signaling as our main vacancy indicator, rather than the official vacancy date to mitigate

[20]The anticipation effects could also stem from changes in legislators' behavior. Exiting congressional members tend to reduce their efforts in legislative activities (Rothenberg and Sanders, 2000) or exhibit cognitive inconsistency in public speeches (Romano, 2018).

Figure 2: Reasons for congressional resignation



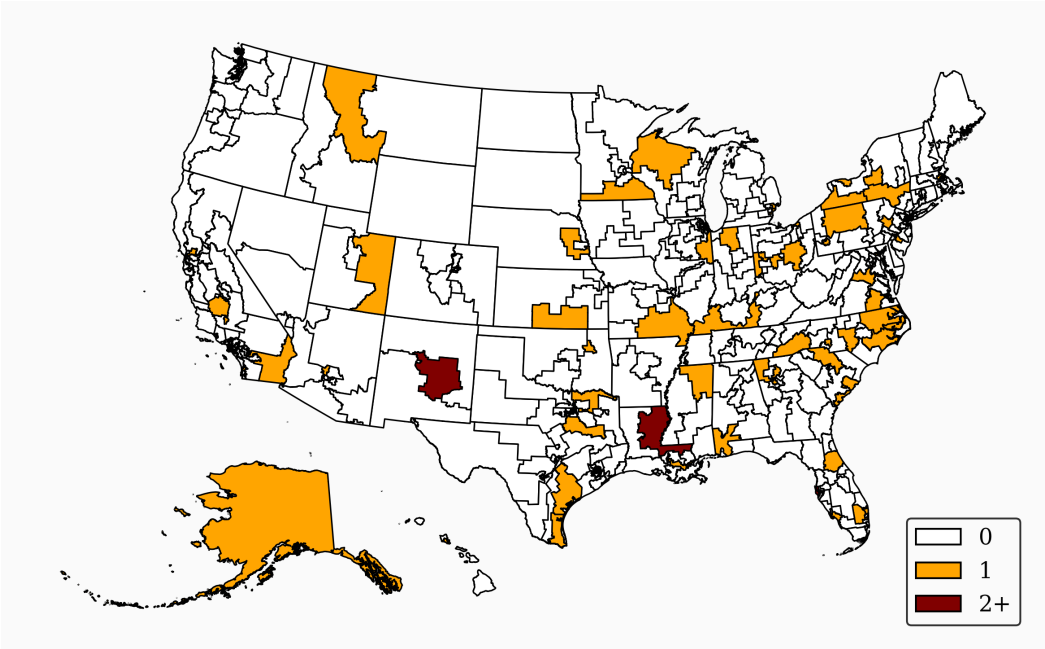
Notes: This figure illustrates the count of congressional vacancies by reason of resignation. It only shows voluntary resignation. The "Federal" includes appointment to or running for federal executive, judiciary, and legislative positions. The "Crime and Scandal" includes any crimes and scandals in which a representative is involved, who are not necessarily to be found guilty. The "State and Local" includes appointment to or running for state and local executive, judiciary, and legislative positions. The "Private" includes any private organizations, including investment banks, lobbying firms, and non-profit organizations. The "Others" includes unknown and personal family and health issues.

anticipation effects.

Our identification strategy assumes that congressional vacancies are exogenous to factors shaping inspection decisions, after controlling for time-varying variables as well as facility, year, and month fixed effects. Other than political influence, we do not identify any other channels that link congressional vacancies with Clean Air Act inspections, which would provide exogenous shocks to regulators. Between 2013 and 2022, a total of 72 vacancies occurred, including 56 resignations (77.8%) and 14 deaths (19.4%) (see Figure A.3).[21] Previous studies suggest that the congressional members leave office due to electoral insecurity (Choi, 2017; Wolak, 2007), career ceilings (Lawless and Theriault, 2005), alternative opportunities in the private sector (Egerod, 2022), and scandals (Gulati and Brown, 2021). Figure 2 shows that congressional members indeed leave Congress for various reasons, including appointments to or candidacies for federal and state positions, opportunities in private organizations, and involvement in crimes or scandals. These patterns are consistent with the literature on the motivations behind resignations. In addition, Figure 3 shows the geographical distribution of congressional districts that experience congressional vacancies between 2013 and 2022.

[21]The other two cases are due to unsettled election results in North Carolina's 9th district during the 116th Congress and New York's 22nd district during the 117th Congress.

Figure 3: Geographical distribution of congressional vacancy



Notes: This figure shows the geographical distribution of congressional districts that experience congressional vacancies at any point between 2013 and 2022. The numbers in the legend represent the total number of vacancy events that occur during this period.

We do not observe any systematic regional pattern of vacancy events, which indicates that congressional vacancies occur independently of specific regional characteristics.
For heterogeneous treatment effect analysis, we use the following equation:

$$\begin{aligned} Y_{iym} &= \alpha_0 + \alpha_1 VACANT_{iym} + \alpha_2 REP_{iym} + \alpha_3 GROUP_{iym} + \alpha_4 VACANT_{iym} \times REP_{iym} + \\ &\alpha_5 VACANT_{iym} \times GROUP_{iym} + \alpha_6 REP_{iym} \times GROUP_{iym} + \\ &\alpha_7 VACANT_{iym} \times REP_{iym} \times GROUP_{iym} + \alpha_8 X_{iym} + \lambda_i + \sigma_y + \nu_m + \upsilon_{iym} \end{aligned} \tag{7}$$

where $GROUP_{iym}$ is an indicator for a specific group, such as influential committee members, Republican governorship, High Priority Violation facilities, or Non-attainment areas. υ_{iym} denotes the error term.

As robustness checks, we implement Poisson pseudo-maximum likelihood regressions by Correia et al. (2020) to address the rare occurrence of inspections. Additionally, instead of using political party affiliation as a proxy for environmental policy preferences, we incorporate ratings from interest groups, such as League of Conservation Voters and American Conservative Union, as alternative measures. We also examine the effects of actual official vacancies and examine potential spillover effects on other districts. We conduct placebo simulations to rule out the possibility that the estimates are driven by other unobserved factors.

6 Empirical results

6.1 The effects of congressional vacancy on Clean Air Act inspection

Table 3 shows the effects of congressional vacancies on the probability and the count of Clean Air Act inspections (Hypothesis 1). The dependent variables are a binary indicator of inspections (columns 1 and 2) and the count of inspections (columns 3 and 4). Columns 1 and 3 display the regression results without the interaction term for political party affiliation, while columns 2 and 4 include the interaction term. The reported coefficients in the linear probability models with the binary inspection variable (columns 1 and 2) are multiplied by 100. We do not observe any significant effects of vacancy on inspection probability (column 1) or inspection count (column 3). However, this lack of significant evidence could be because different political parties influence inspections in opposite directions—some pushing for more inspections, others pushing for fewer—which may cancel each other out.

When we include the interaction term between Republican membership and congressional vacancy to detect the role of political party affiliation (column 2), we find that regulators reduce the probability of inspection by 1.29 percentage points when Democratic congressional seats are vacant. This effect is equivalent to a 26.1% reduction in the probability of inspections for facilities located in districts with Democratic incumbents. In contrast, the effects of Republican vacancies are not statistically significant although the coefficient remains positive at 0.51. The coefficient of the interaction term indicates that the effects of Democratic and Republican vacancies are significantly different by 1.81 percentage points. For the count of inspections (column 4), the overall effects align with those observed in the inspection probability in column 2. Vacancies in Democratic seats lead to a 28.6% reduction in the number of inspections, whereas there is no significant evidence to suggest that Republican vacancies have a positive effect.

The negative effects of Democratic vacancies on both inspection probability and count suggest that regulators adjust their inspection behavior in response to these vacancies. This implies that Democratic members may advocate for more inspections while in office, and regulators revert to usual inspection levels once these members leave Congress. The limited evidence of Republican vacancy effects may stem from less interference by Republican members, a lack of regulatory response due to resource constraints or low incentives, or a combination of these factors. The positive difference between the effects of Republican and Democratic vacancies suggests that inspections are less frequent under Republican incumbents compared to Democratic ones, which aligns with previous findings in the literature (Innes and Mitra, 2015). We further propose that this observed difference is driven by both parties, as Democratic incumbents, which serve as the baseline group, may lead to more inspections.

Table 3: The effects of congressional vacancy on inspection occurrence and count

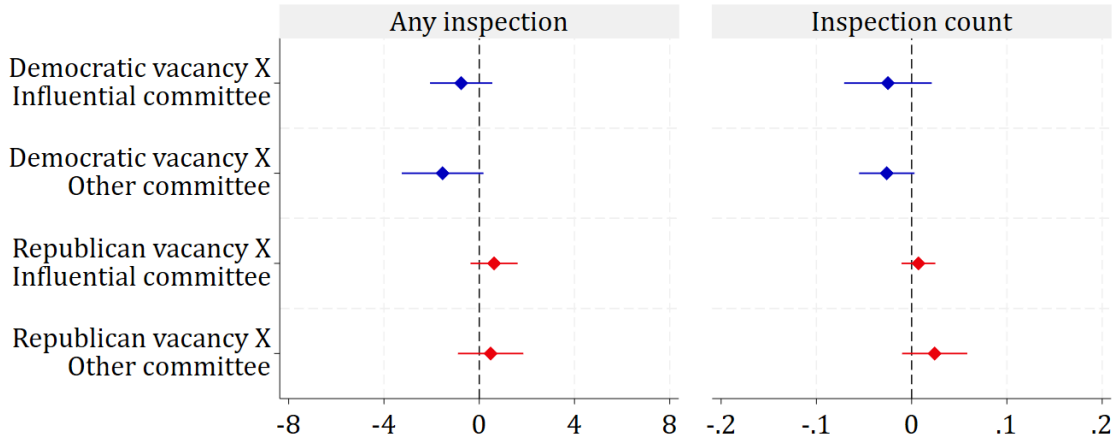
	Any inspection		Inspection count	
	(1)	(2)	(3)	(4)
Vacant	-0.06	-1.29*	0.00	-0.02*
	(0.42)	(0.67)	(0.01)	(0.01)
Republican		0.51		0.01
		(0.39)		(0.01)
Vacant × Republican		1.81**		0.04***
		(0.79)		(0.02)
Republican vacancy vs. incumbency				
Vacant + Vacant × Republican		0.53		0.02
		(0.45)		(0.01)
Democratic vacancy vs. incumbency				
Vacant		-1.29*		-0.02*
		(0.67)		(0.01)
Observations	1,330,716	1,330,716	1,330,716	1,330,716
Mean of dep. var. in Rep. incumbents	6.54%	6.54%	0.09	0.09
Mean of dep. var. in Dem. incumbents	4.95%		0.07	0.07
Mean of dep. var. in incumbents	5.97%		0.07	5.96%
Facility, year, and month fixed-effects	YES		YES	YES
Controls	YES		YES	YES
R^2	0.16		0.17	0.17

Notes: This table shows the results of OLS regressions of Clean Air Act inspections on the interaction between congressional vacancy and political party affiliation. In columns 1 and 2, the reported mean value of the dependent variable and coefficients are multiplied by 100. Control variables include lagged RSEI score, High Priority Violation, age, Legislative Effectiveness Scores, number of terms served, majority party, influential committee, state legislature experience, county-level unemployment rate, county-level per capita personal income, Governor's political party affiliation, the proportion of Republican Senators, and Non-attainment areas. Inspection counts Standard errors are clustered at the congressional district level. * p<0.10, ** p<0.05, *** p<0.01.

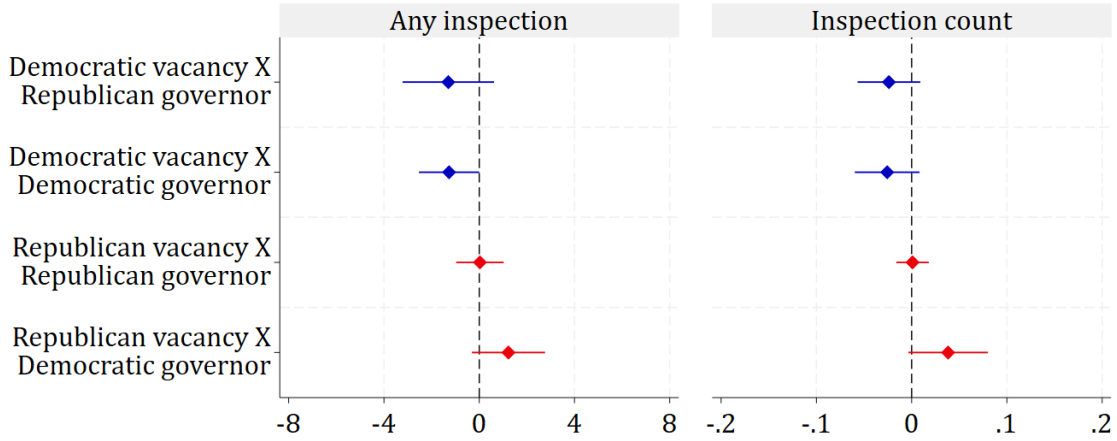
We examine heterogeneous treatment effects across political and regulatory contexts, including influential committee membership, the political party affiliation of the governor, High Priority Violation status, and Non-attainment areas. Figure 4 (a) shows that congressional vacancies do not have heterogeneous effects on the occurrence or number of inspections based on the membership of influential committees (hypothesis 2A). Although Democratic vacancies among other committees reduce the probability of inspections and the count of inspections by 29.6% and 42.9%, this reduction is not significantly different from the effect of Democratic vacancies among influential committee members. Additionally, we do not find sufficient evidence to support that Republican vacancies increase inspection probability or count, regardless of

Figure 4: The effects of congressional vacancy on inspection occurrence and count by political background

(a) Influential committee



(b) Governor's political party



Notes: These figures show the results of OLS regressions of Clean Air Act inspections on the interaction among congressional vacancies, political party affiliation, and either (a) House committee membership, or (b) governor's political party affiliation. The reported coefficients are multiplied by 100 for the left graph (Any inspection). The baseline groups for Democratic and Republican members are the incumbent Democratic and Republican members, respectively. Control variables include lagged RSEI score, High Priority Violation, age, Legislative Effectiveness Scores, number of terms served, majority party, influential committee, state legislature experience, county-level unemployment rate, county-level per capita personal income, Governor's political party affiliation, the proportion of Republican Senators, and Non-attainment areas. Standard errors are clustered at the congressional district level. The detailed results corresponding to figures (a) and (b) are presented in Table A.3 and Table A.4, respectively.

committee membership.

Our findings indicate that state regulators do not respond more strongly to vacancies of members serving on influential committees compared to those on other committees. One

possible explanation is that congressional committees tend to focus on national and critical issues, rather than regional concerns, which may limit the influence of congressional committee membership on state regulators' behavior. Influential committee members, who control federal budgets and legislations, are likely more focused on influencing federal regulators (e.g., the EPA) than state-level authorities. Similarly, committee members overseeing environmental issues may prioritize major national environmental concerns. These significant issues, which are important enough to attract the attention of influential committee members, may also draw interest from other members. As a result, the differences in effects between members of influential committees and those of other committees diminish.

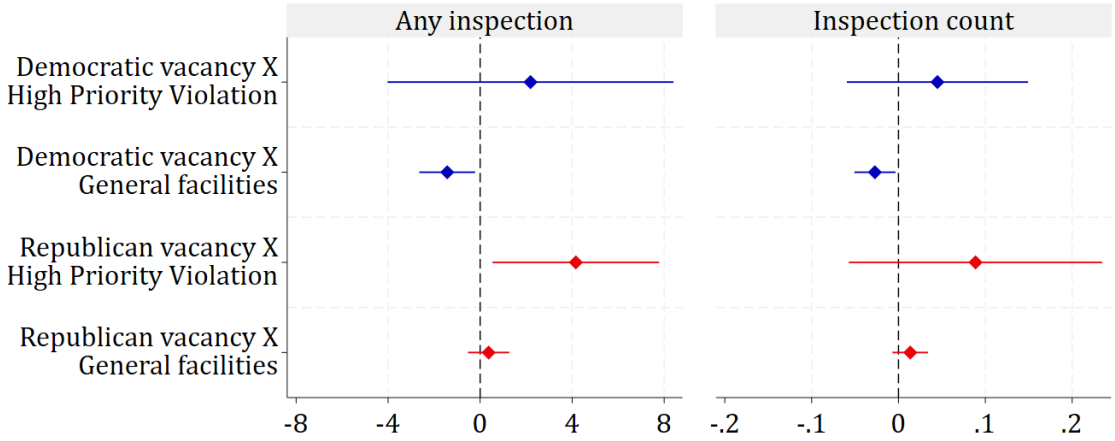
Figure 4 (b) shows that the political party affiliation of the governor does not significantly change the effects of congressional vacancies on inspections (Hypothesis 2B). Under a Democratic governor, Democratic congressional vacancies reduce the probability of inspections by 26.9%, compared to Democratic incumbency. These effects are not significantly different from those observed under a Republican governor. We also do not observe any significant effects of Republican vacancies, regardless of the governor's political party affiliation. The insignificant role of governorship suggests that governors may not adjust their behavior in response to congressional vacancies. They do not specifically push regulators to conduct more or fewer inspections simply because a congressional seat is vacant. In other words, governors probably maintain a consistent level of influence on state regulators, regardless of the presence of specific congressional members.

We test Hypothesis 2C, which posits that additional regulatory procedures restrict inspection behavior. As shown in Figure 5 (a), Democratic vacancies lead to a 30.3% decrease in the probability of inspections for general facilities compared to Democratic incumbency, while there is no significant effect of Democratic vacancies on inspections for High Priority Violation facilities. In contrast, under Republican vacancies, inspections for High Priority Violation facilities increase by 34.3% compared to Republican incumbency, and there are no significant effects observed for general facilities. In Figure 5 (b), Democratic vacancies result in a 49.7% reduction in the probability of inspections for facilities in attainment areas compared to Democratic incumbency, whereas no significant reduction is observed in Non-attainment areas. For Republican vacancies, we do not find strong evidence of heterogeneous effects between attainment and Non-attainment areas.

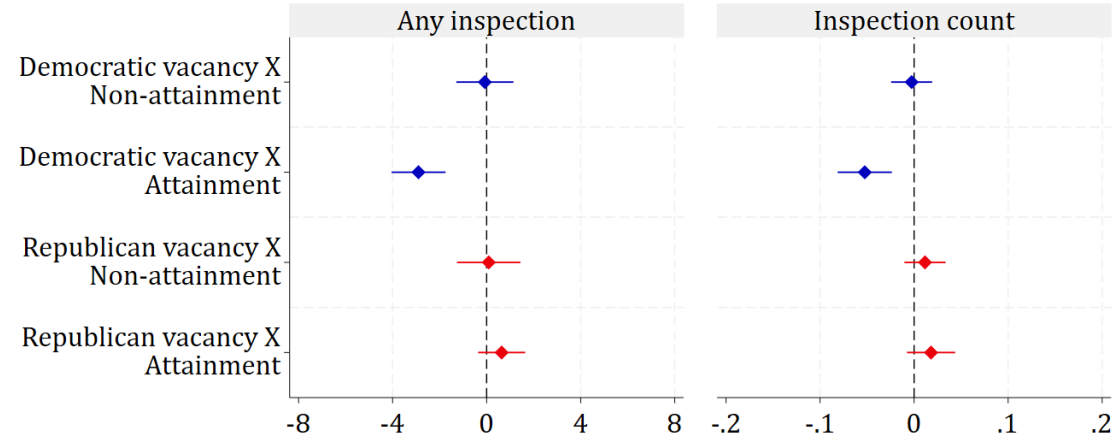
In response to Democratic vacancies, where regulators may be inclined to reduce inspections, we lose significance for facilities subject to additional regulatory procedures that limit regulators' discretion. However, we observe significant results for general facilities. Interestingly, significant effects are observed for Republican vacancies in the case of High Priority Violation facilities. One possible explanation for this is that Republicans may be more likely to pressure regulators to

Figure 5: The effects of congressional vacancy on inspection occurrence by regulatory background

(a) High Priority Violation



(b) Non-attainment



Notes: These figures show the results of OLS regressions of Clean Air Act inspections on the interaction among congressional vacancies, political party affiliation, and either (a) High Priority Violation, or (b) Non-attainment. The reported coefficients are multiplied by 100. The baseline groups for Democratic and Republican members are incumbent Democratic and Republican members, respectively. Control variables include lagged RSEI score, High Priority Violation, age, Legislative Effectiveness Scores, number of terms served, majority party, influential committee, state legislature experience, county-level unemployment rate, county-level per capita personal income, Governor's political party affiliation, the proportion of Republican Senators, and Non-attainment areas. Standard errors are clustered at the congressional district level. The corresponding detailed results for figures (a) and (b) are presented in Table A.5 and Table A.6, respectively.

reduce inspections, particularly for these types of facilities. Then, regulators may leverage their regulatory bargaining power and resources to increase inspections for High Priority Violation facilities during Republican vacancies.

6.2 Robustness checks

Poisson pseudo-maximum likelihood regressions:
Instead of using OLS regression in Equation 6, we apply Poisson pseudo-maximum likelihood regressions, suggested by Correia et al. (2020), to account for the rare occurrence of inspections and their count-based nature:

$$Y_{iym} = exp(\mu_0 + \mu_1 VACANT_{iym} + \mu_2 REP_{iym} + \mu_3 VACANT_{iym} * REP_{iym} + \mu_4 X_{iym} + \omega_i + \chi_y + \sigma_m) \quad (8)$$

This method also relaxes the assumption that the dependent variable must strictly follow a Poisson distribution. With Poisson pseudo-maximum likelihood regressions, facilities that are never inspected and show no variation in inspections over time are captured by facility-fixed effects and dropped from the estimation. The dropped observations represent 27.9% of the original dataset, with a similar percentage of incumbency (27.9%) and vacancy (29.8%) observations being excluded. Overall estimations with Poisson pseudo-maximum likelihood regressions are consistent with the main results (see Table A.7). We also observe consistent heterogeneous effects by committee membership (Table A.8), governor's political party affiliation (Table A.9), High Priority Violation (Table A.10), and Non-attainment areas (Table A.11).

Interest group ratings:
Political stances on environmental issues and conservative voting tend to be sharply divided along party lines, as illustrated in Figure A.5. Instead of using political party affiliation as a proxy for environmental preferences, we use interest group ratings from two organizations: 1) League of Conservation Voters and 2) American Conservative Union. Both organizations evaluate congressional members based on legislative behavior, with the League of Conservation Voters focusing on environmental issues and the American Conservative Union on conservative values. Each rating ranges from 0 to 100. A higher score from the League of Conservation Voters indicates stronger pro-environmental behavior, while a higher score from the American Conservative Union reflects stronger conservative behavior. We define a congressional member as pro-environmental if their League of Conservation Voters rating exceeds 50 and as conservative if their American Conservative Union rating exceeds 50.

The regression results based on these interest group ratings are consistent with the main findings. For instance, as shown in Table A.13, vacancies of pro-environmental members, indicated by higher ratings from the League of Conservation Voters, reduce the probability of inspections by 1.26 percentage points, equivalent to 25.7% of the average inspection probability for pro-environmental incumbents, and reduce the inspection count by 28.6%. In contrast, we do not find statistically significant evidence that vacancies of pro-business members affect

inspections. However, vacancies of liberal members, as identified by lower ratings from the American Conservative Union, decrease both the probability of inspections and the number of inspections by 26% and 28.6%, respectively, compared to liberal incumbents (see Table A.14).

Official vacancy:
Table A.15 presents the estimation results using the official date of vacancy rather than the vacancy signal periods. While these results lack strong statistical significance, the directions and magnitudes of the effects align with the main findings. Specifically, we observe a positive difference in the vacancy effects between Republicans and Democrats, as reflected in the interaction term. This difference is driven by a reduction in inspections associated with Democratic vacancies.

Spillover effects to other congressional districts:
State regulators may adjust their resource allocation in response to congressional vacancies by changing inspection activities in other districts with no congressional vacancies. For instance, regulators might reduce inspections in a district with a Democratic vacancy while increasing inspections in a district without a vacancy. We test whether Republican and Democratic vacancies in one district lead to changes in inspection activities in districts without vacancies within the same state. We limit the sample to facilities in districts without direct congressional vacancies but located in states where another district experiences a vacancy. We do not observe any significant spillover effects (see Table A.16).

Placebo simulation:
We examine whether the estimated effects are determined by unobserved factors correlated with congressional vacancies, rather than the vacancies themselves. Following Agarwal et al. (2015), Kuka et al. (2020), and Vu (2024), we randomly assign congressional vacancies to congressional districts and run 1,000 simulations of Equation 6. In Figure A.6, we do not observe significant congressional vacancy effects, and the placebo coefficients are centered around zero. The actual estimates from our main analysis are not located within the 95% confidence intervals of the simulated regressions. These results indicate that our main findings are unlikely to be driven by other unobserved factors.

7 Conclusions

We find that state regulators respond to congressional vacancies, indicating that congressional influence plays a significant role in shaping local Clean Air Act inspections. Vacancies of

Democratic members reduce the probability and count of inspections by 26.1% and 28.6%, respectively, compared to when Democratic incumbents are in office, suggesting that more inspections occur during Democratic incumbency. There is weak evidence of increased inspections during Republican vacancies. Additionally, we provide a heterogeneous effects analysis based on political and regulatory contexts. We do not observe significant effects related to committee membership or the governor's political party affiliation. However, we find that limited bureaucratic discretion, due to additional regulatory requirements such as High Priority Violations and Non-attainment designations, restricts the ability to reduce inspections during periods of Democratic vacancies. In contrast, we also find that regulators increase inspections during Republican vacancies at facilities with High Priority Violations.

Along with the findings of Innes and Mitra (2015), our results suggest that individual congressional members have significant influence over state regulatory authorities and that state regulators are capable of adjusting their behavior in response to short-term legislative vacancies. This indicates that regulatory decisions are shaped not only by the collective actions of Congress through formal legislation and oversight but also by the personal policy preferences of individual members. Moreover, given the widespread political polarization across various sectors—not just in environmental regulation, but also in areas such as health and education–local enforcement actions may similarly reflect partisan divides. These findings contribute to ongoing debates on how to balance independent regulatory decisions based on expertise with democratic accountability through responsiveness to elected representatives.

A number of studies use narrow margins of victory in elections to estimate the causal effects of politicians and find significant differences in outcomes of interest between Republican and Democratic winners (Marshall, 2024). However, focusing solely on election outcomes does not allow researchers to identify which party specifically drives these differences. Our findings not only confirm a significant distinction between Republican and Democratic politicians but also suggest that these differences may stem from divergent responses by each party. In this paper, we observe that most of the observed differences in vacancy effects between Republicans and Democrats are primarily driven by Democratic vacancies. However, Republican vacancies also contribute to this difference in specific cases, such as inspections at facilities with High Priority Violation.

Interpreting the absence of significant findings is challenging. It remains unclear whether this reflects a genuine lack of political influence, limited motivation among regulators, or resource constraints that prevent regulatory action despite political influence and regulators' willingness. Nonetheless, our approach, which focuses on congressional vacancies, offers an alternative to regression discontinuity designs based on election outcomes where regression discontinuity designs are not feasible.

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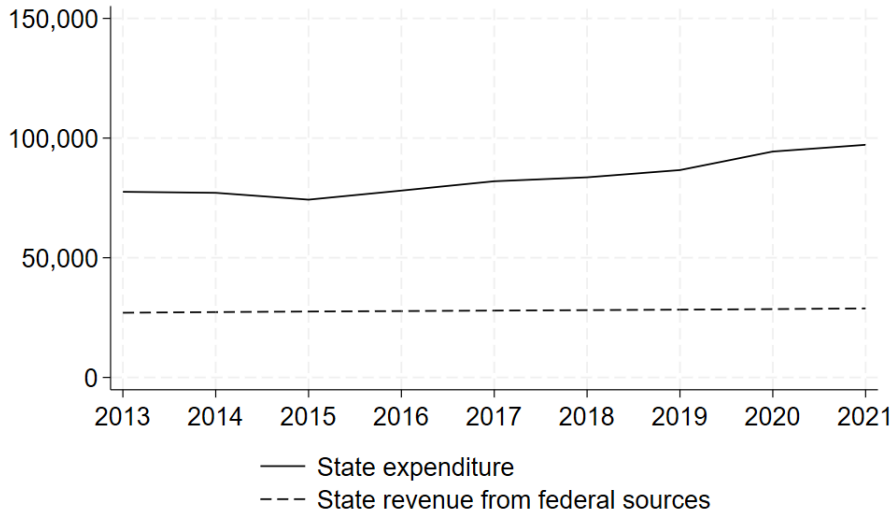
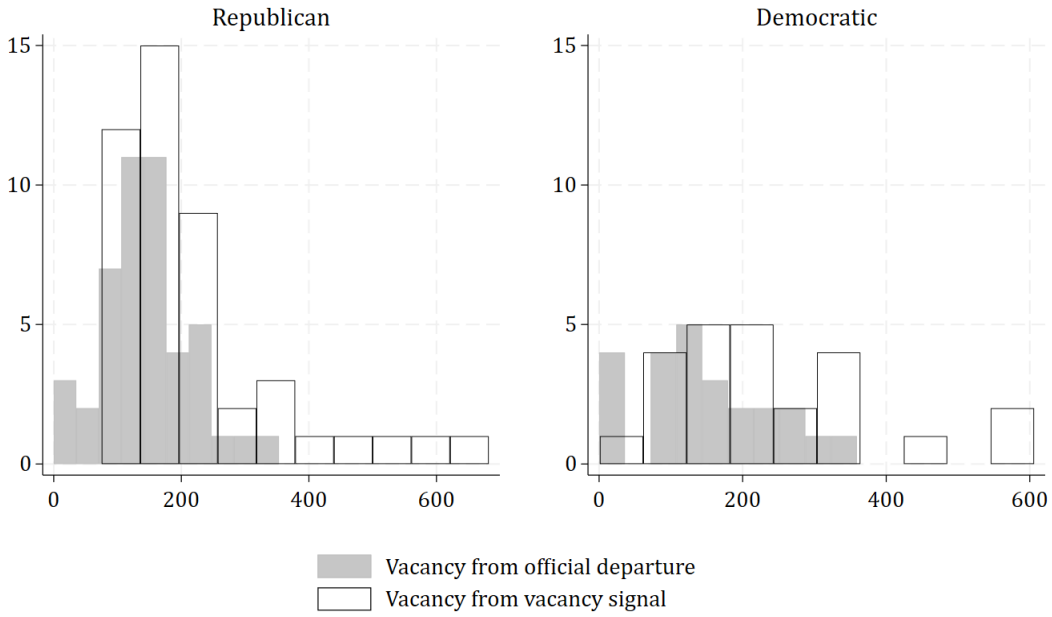
Appendix

Figure A.1: The trend of state expenditure and revenue from federal sources for environmental health



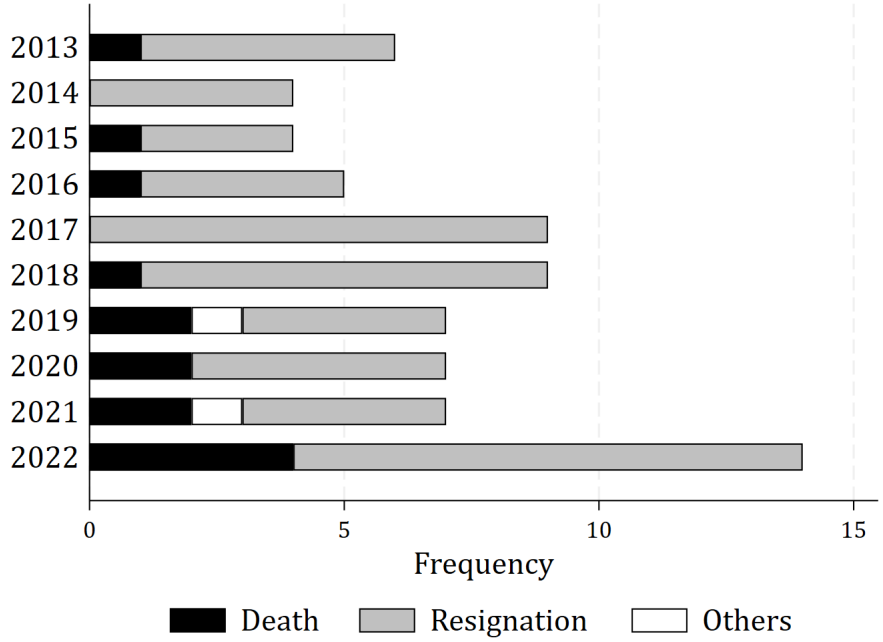
Notes: This figure illustrates the average amounts of state government expenditure and federal grants allocated for environmental health. State expenditure refers to spending on "Current Operations – Environmental Health," while state revenue from federal sources pertains to "Intergovernmental Revenue from Federal – Environmental Health," as classified by the Annual Survey of State and Local Government Finances. The values are reported in units of thousands of U.S. current dollars for each year.

Figure A.2: Distribution of congressional vacancy periods by political party affiliation



Notes: This figure illustrates the number of days vacancies last by political party affiliation between 2013 and 2022.

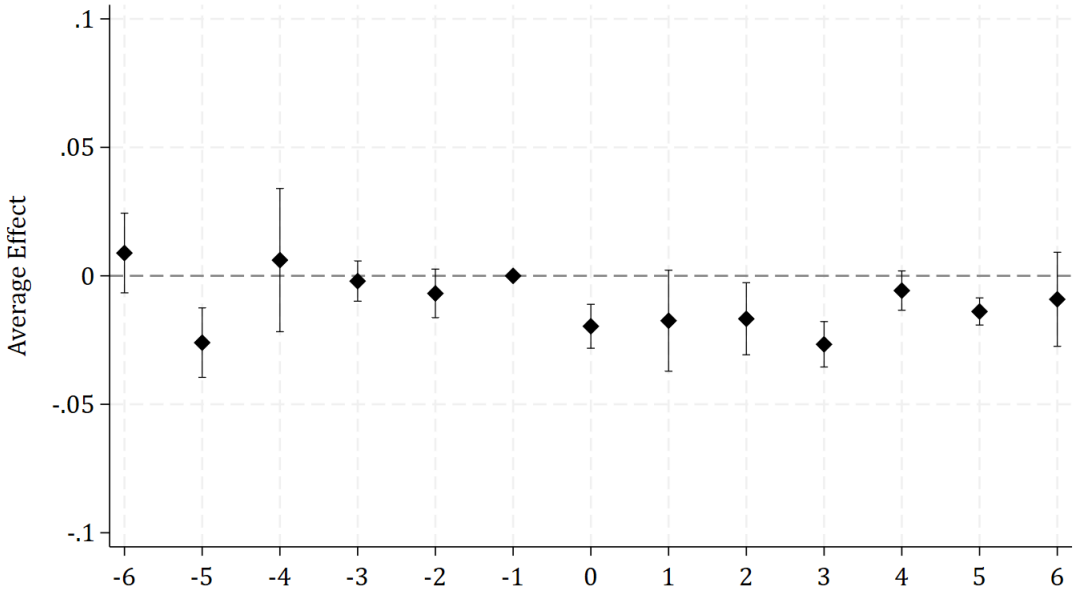
Figure A.3: Frequency and distribution of congressional vacancies by reason



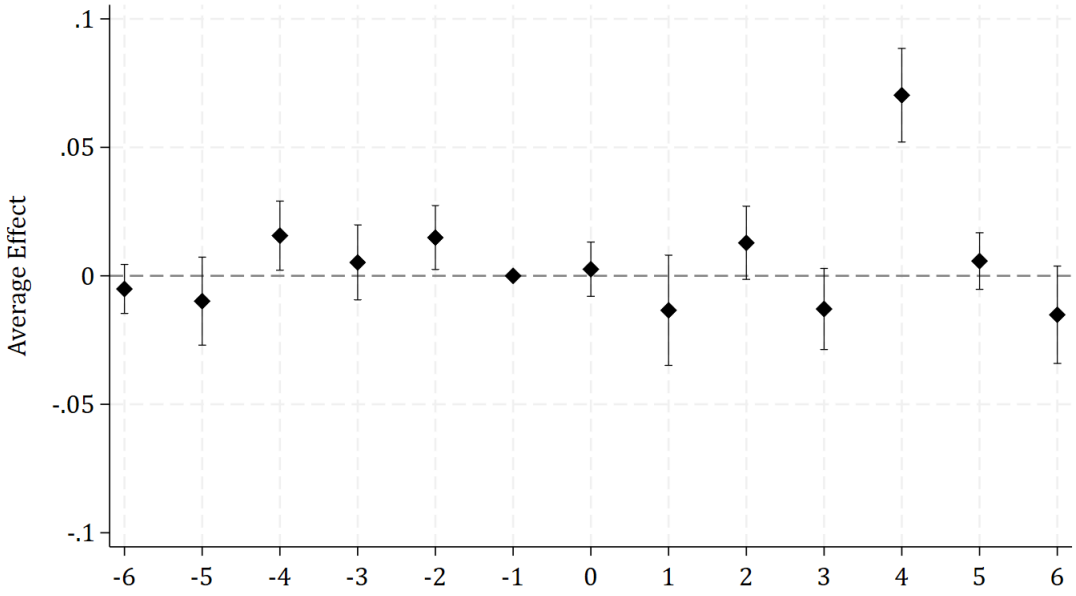
Notes: This figure shows the frequency and distribution of congressional vacancies by the reasons behind them between 2013 and 2022.

Figure A.4: The effects of congressional vacancies on inspection probability using de Chaisemartin and D'Haultfoeuille (2024) estimator

(a) Democratic vacancy



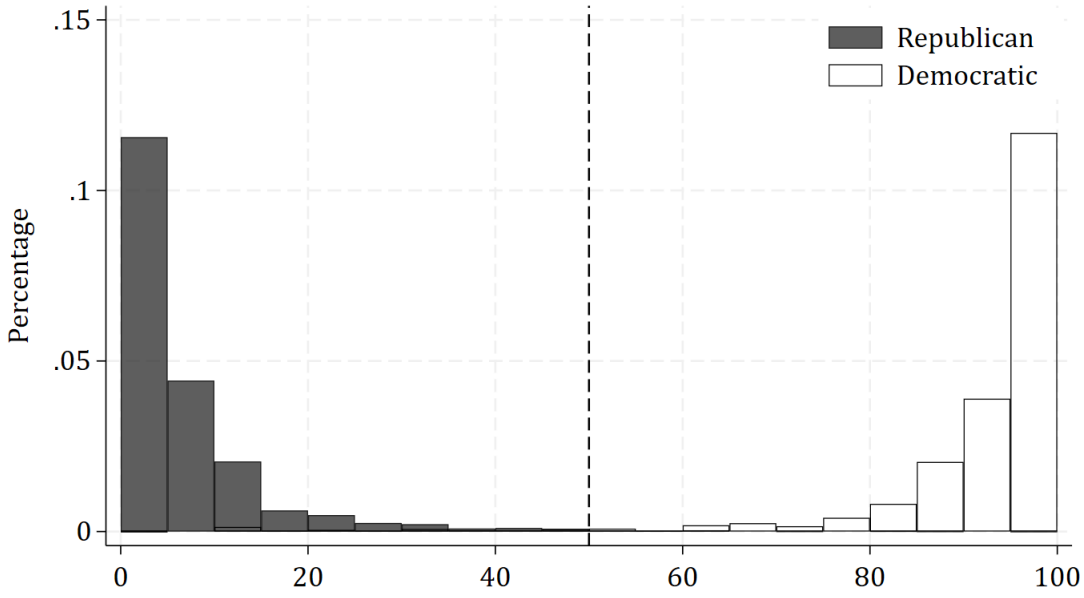
(b) Republican vacancy



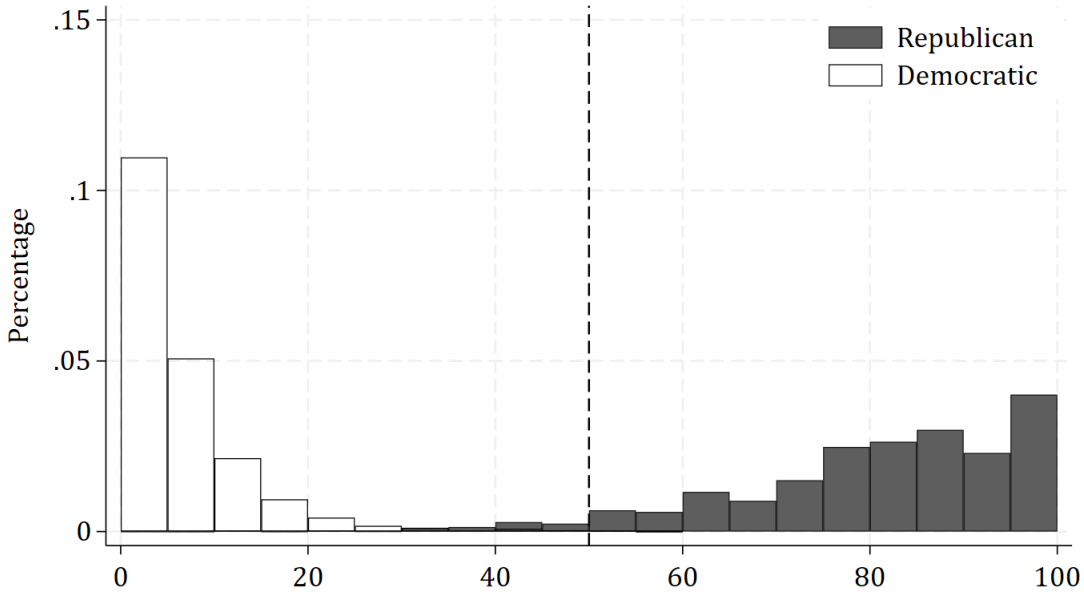
Notes: These figures illustrate the estimated effects of Democratic (a) and Republican (b) vacancies on inspection probability, using de Chaisemartin and D'Haultfoeuille (2024) difference-in-differences estimator. The horizontal axis represents the month relative to the congressional vacancy, while the vertical axis displays the estimated coefficients along with their 95% confidence intervals. The error terms are clustered at the state level.

Figure A.5: Distribution of interest group ratings by political party affiliation

(a) League of Conservation Voters



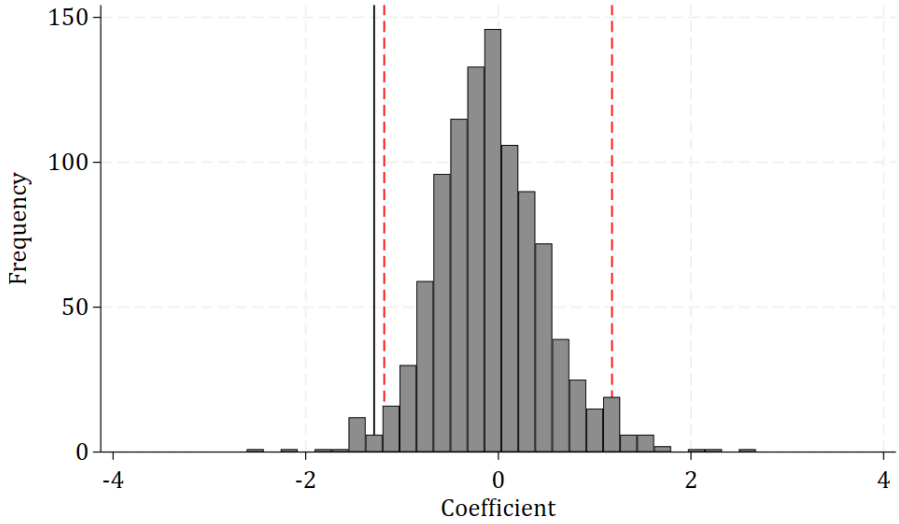
(b) American Conservative Union



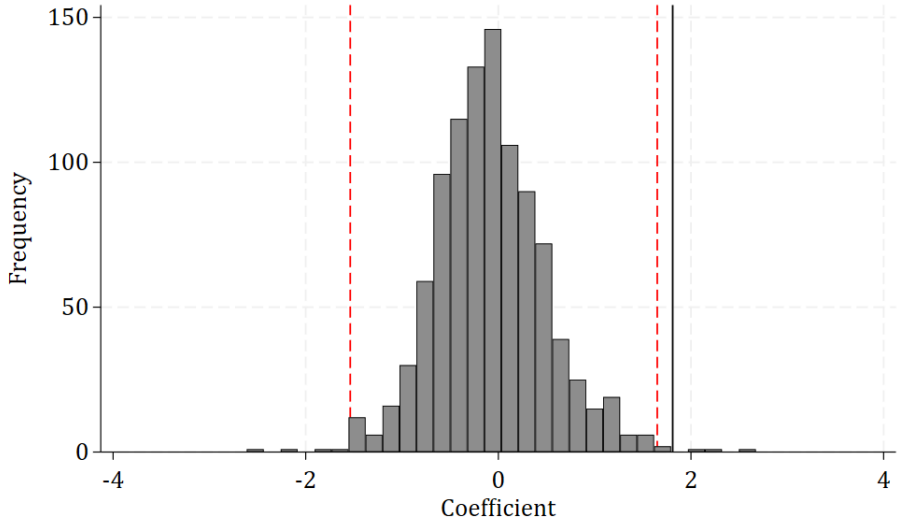
Notes: These figures illustrate the distributions of ratings from (a) League of Conservation Voters and (b) American Conservative Union, by political party affiliation of congressional members.

Figure A.6: Placebo effects of congressional vacancies

(a) Democratic vacancy v. Democratic incumbency
(The coefficient of "Vacant")



(b) Democratic vacancy effect v. Republican vacancy effect
(The coefficient of "Vacant × Republican")



Notes: These figures illustrate the histograms of placebo coefficients of (a) Vacant and (b) Vacant × Republican based on the results of placebo regressions of Clean Air Act inspections on the interaction of congressional vacancy and political party affiliation. A total of 1,000 simulations were performed. The vertical red dotted lines indicate the 95% confidence interval, while the black solid line represents the actual estimated coefficient from the main analysis.

Table A.1: Descriptive statistics by political party affiliation

	(1) Republican	(2) Democratic	(3) Difference (1)-(2)
Vacant	0.01	0.01	-0.00***
	(0.10)	(0.10)	(0.00)
High Priority Violation	0.04	0.04	-0.01***
	(0.21)	(0.19)	(0.00)
Lagged RSEI score	25,351.69	26,167.88	816.19
	(377216.74)	(263478.69)	(612.95)
Age	55.80	60.48	4.68***
	(9.88)	(11.53)	(0.02)
Legislative Effectiveness Scores	0.93	0.89	-0.04***
	(0.97)	(0.99)	(0.00)
Number of terms served	4.22	6.45	2.22***
	(3.39)	(4.94)	(0.01)
Majority party member	0.63	0.40	-0.22***
	(0.48)	(0.49)	(0.00)
Influential Committee	0.60	0.60	0.01***
	(0.49)	(0.49)	(0.00)
Served in state legislature	0.49	0.42	-0.07***
	(0.50)	(0.49)	(0.00)
Unemployment rate	5.12	5.56	0.44***
	(1.87)	(2.16)	(0.00)
Per capita personal income (US$)	45,352.62	54,336.36	8,983.74***
	(10,295.91)	(15,129.33)	(22.12)
Republican Governor	0.72	0.49	-0.23***
	(0.45)	(0.50)	(0.00)
Republican Senate ratio	0.67	0.34	-0.33***
	(0.37)	(0.40)	(0.00)
Non-attainment areas	0.20	0.52	0.32***
	(0.40)	(0.50)	(0.00)
N	846,184	484,532	1,330,716

Notes: This table represents the descriptive statistics by political party affiliation. * p<0.10, ** p<0.05, *** p<0.01.

Table A.2: Criteria for vacancy signal

Category	First vacancy signal
Federal	The earliest date among: (1) nomination by President, (2) announcement of running for a federal position, or (3) announcement of resignation
State and Local	The earliest date of either: (1) announcement of running for state and local position, or (2) announcement of resignation
Crime and Scandal	Announcement of resignation
Private	Announcement of resignation
Others	Announcement of resignation

Notes: This table shows the criteria to determine the first-time vacancy signal based on public news articles.

Table A.3: The congressional vacancy effects on inspections by influential committee membership

	(1) Any inspection	(2) Inspection count
Vacant × Republican × Influential Committee	-0.63	-0.02
	(1.44)	(0.03)
Vacant × Republican	2.02*	0.05**
	(1.11)	(0.02)
Vacant × Influential Committee	0.78	0.00
	(1.10)	(0.03)
Republican × Influential Committee	0.31	0.01
	(0.57)	(0.01)
Vacant	-1.54*	-0.03*
	(0.87)	(0.01)
Republican	0.35	0.00
	(0.51)	(0.01)
Influential Committee	-0.34	-0.01
	(0.51)	(0.01)
Republican vacancy vs. incumbency (influential committee)		
Vacant + (Vacant × Republican) + (Vacant × Influential Committee)		
+ (Vacant × Republican × Influential Committee)	0.62	0.01
	(0.50)	(0.01)
Republican vacancy vs. incumbency (other committee)		
Vacant + Vacant × Republican	0.48	0.02
	(0.70)	(0.02)
Democratic vacancy vs. incumbency (influential committee)		
Vacant + Vacant × Influential Committee	-0.76	-0.02
	(0.67)	(0.02)
Democratic vacancy vs. incumbency (other committee)		
Vacant	-1.54*	-0.03*
	(0.87)	(0.01)
Observations	1,330,716	1,330,716
Mean of dep. var. with Rep. incumbents on influential committee	6.17%	0.09
Mean of dep. var. with Rep. incumbents on other committee	7.09%	0.1
Mean of dep. var. with Dem. incumbents on influential committee	4.78%	0.07
Mean of dep. var. with Dem. incumbents on other committee	5.21%	0.07
Facility, year, and month fixed-effects	YES	YES
Controls	YES	YES
R^2	0.16	0.17

Notes: This table shows the results of OLS regressions of Clean Air Act inspections on the interactions among congressional vacancies, political party affiliation, and influential committee membership. In column 1, the reported mean value of the dependent variable and coefficients are multiplied by 100. Control variables include lagged RSEI score, High Priority Violation, age, Legislative Effectiveness Scores, number of terms served, majority party, state legislature experience, county-level unemployment rate, county-level per capita personal income, Governor's political party affiliation, the proportion of Republican Senators, and Non-attainment areas. Standard errors are clustered at the congressional district level. * p<0.10, ** p<0.05, *** p<0.01.

Table A.4: The congressional vacancy effects on inspections by governorship

	(1) Any inspection	(2) Inspection count
Vacant × Republican × Republican Governor	-1.17	-0.04
	(1.51)	(0.03)
Vacant × Republican	2.49**	0.06**
	(1.03)	(0.03)
Vacant × Republican Governor	-0.03	0.00
	(1.15)	(0.02)
Republican × Republican Governor	0.09	-0.01
	(0.38)	(0.01)
Vacant	-1.27**	-0.03
	(0.64)	(0.02)
Republican	0.46	0.01
	(0.42)	(0.01)
Republican Governor	-0.90**	-0.02***
	(0.35)	(0.01)
Republican vacancy vs. incumbency (Republican Governor)		
Vacant + (Vacant × Republican) + (Vacant × Republican Governor)		
+ (Vacant × Republican × Republican Governor)	0.03	0.00
	(0.51)	(0.01)
Republican vacancy vs. incumbency (Democratic Governor)		
Vacant + Vacant × Republican	1.23	0.04*
	(0.78)	(0.02)
Democratic vacancy vs. incumbency (Republican Governor)		
Vacant + Vacant × Republican Governor	-1.30	-0.02
	(0.98)	(0.02)
Democratic vacancy vs. incumbency (Democratic Governor)		
Vacant	-1.27**	-0.03
	(0.64)	(0.02)
Observations	1,330,716	1,330,716
Mean of dep. var. with Rep. incumbents and Rep. Governor	5.97%	0.08
Mean of dep. var. with Rep. incumbents and Dem. Governor	8.03%	0.12
Mean of dep. var. with Dem. incumbents and Rep. Governor	5.18%	0.07
Mean of dep. var. with Dem. incumbents and Dem. Governor	4.73%	0.07
Facility, year, and month fixed-effects	YES	YES
Controls	YES	YES
R^2	0.16	0.17

Notes: This table shows the results of OLS regressions of Clean Air Act inspections on the interactions on the interaction among congressional vacancies, political party affiliation, and the governor's political party affiliation. In column 1, the reported mean value of the dependent variable and coefficients are multiplied by 100. Control variables include lagged RSEI score, High Priority Violation, age, Legislative Effectiveness Scores, number of terms served, majority party, influential committee, state legislature experience, county-level unemployment rate, county-level per capita personal income, the proportion of Republican Senators, and Non-attainment areas. Standard errors are clustered at the congressional district level. * p<0.10, ** p<0.05, *** p<0.01.

Table A.5: The congressional vacancy effects on inspections by High Priority Violation

	(1) Any inspection	(2) Inspection count
Vacant × Republican × High Priority Violation	0.17	0.00
	(3.48)	(0.09)
Vacant × Republican	1.80**	0.04***
	(0.76)	(0.02)
Vacant × High Priority Violation	3.62	0.07
	(3.00)	(0.05)
Republican × High Priority Violation	0.05	0.02
	(0.52)	(0.02)
Vacant	-1.43**	-0.03**
	(0.62)	(0.01)
Republican	0.51	0.01
	(0.38)	(0.01)
High Priority Violation	1.22***	0.01
	(0.41)	(0.01)
Republican vacancy vs. incumbency (High Priority Violation)		
Vacant + (Vacant × Republican) + (Vacant × High Priority Violation)		
+ (Vacant × Republican × High Priority Violation)	4.16**	0.09
	(1.84)	(0.07)
Republican vacancy vs. incumbency (general facilities)		
Vacant + Vacant × Republican	0.37	0.01
	(0.46)	(0.01)
Democratic vacancy vs. incumbency (High Priority Violation)		
Vacant + Vacant × High Priority Violation	2.19	0.04
	(3.16)	(0.05)
Democratic vacancy vs. incumbency (general facilities)		
Vacant	-1.43**	-0.03**
	(0.62)	(0.01)
Observations	1,330,716	1,330,716
Mean of dep. var. with Rep. incumbents and High Priority Violation	12.13%	0.23
Mean of dep. var. with Rep. incumbents and general facilities	6.28%	0.09
Mean of dep. var. with Dem. incumbents and High Priority Violation	10.74%	0.17
Mean of dep. var. with Dem. incumbents and general facilities	4.72%	0.07
Facility, year, and month fixed-effects	YES	YES
Controls	YES	YES
R^2	0.16	0.17

Notes: This table shows the results of OLS regressions of Clean Air Act inspections on the interaction among congressional vacancies, political party affiliation, and High Priority Violation. In column 1, the reported mean value of the dependent variable and coefficients are multiplied by 100. Control variables include lagged RSEI score, High Priority Violation, age, Legislative Effectiveness Scores, number of terms served, majority party, influential committee, state legislature experience, county-level unemployment rate, county-level per capita personal income, Governor's political party affiliation, the proportion of Republican Senators, and Non-attainment areas. Standard errors are clustered at the congressional district level. * p<0.10, ** p<0.05, *** p<0.01.

Table A.6: The congressional vacancy effects on inspections by Non-attainment

	(1) Any inspection	(2) Inspection count
Vacant × Republican × Non-attainment	-3.38***	-0.06**
	(1.13)	(0.02)
Vacant × Republican	3.54***	0.07***
	(0.77)	(0.02)
Vacant × Non-attainment	2.82***	0.05***
	(0.74)	(0.02)
Republican × Non-attainment	0.14	0.01
	(0.43)	(0.01)
Vacant	-2.90***	-0.05***
	(0.58)	(0.01)
Republican	0.45	0.01
	(0.46)	(0.01)
Non-attainment	0.08	-0.01
	(0.38)	(0.01)
Republican vacancy vs. incumbency (Non-attainment)		
Vacant + (Vacant × Republican) + (Vacant × Non-attainment)		
+ (Vacant × Republican × Non-attainment)	0.09	0.01
	(0.69)	(0.01)
Republican vacancy vs. incumbency (attainment areas)		
Vacant + Vacant × Republican	0.64	0.02
	(0.51)	(0.01)
Democratic vacancy vs. incumbency (Non-attainment)		
Vacant + Vacant × Non-attainment	-0.08	-0.00
	(0.62)	(0.01)
Democratic vacancy vs. incumbency (attainment)		
Vacant	-2.90***	-0.05***
	(0.58)	(0.01)
Observations	1,330,716	1,330,716
Mean of dep. var. with Rep. incumbents and Non-attainment	6%	0.08
Mean of dep. var. with Rep. incumbents and attainment	6.68%	0.09
Mean of dep. var. with Dem. incumbents and Non-attainment	4.12%	0.06
Mean of dep. var. with Dem. incumbents and attainment	5.84%	0.08
Facility, year, and month fixed-effects	YES	YES
Controls	YES	YES
R^2	0.16	0.17

Notes: This table shows the results of OLS regressions of Clean Air Act inspections on the interaction among congressional vacancies, political party affiliation, and Non-attainment areas. In column 1, the reported mean value of the dependent variable and coefficients are multiplied by 100. Control variables include lagged RSEI score, High Priority Violation, age, Legislative Effectiveness Scores, number of terms served, majority party, influential committee, state legislature experience, county-level unemployment rate, county-level per capita personal income, Governor's political party affiliation, the proportion of Republican Senators, and Non-attainment areas. Standard errors are clustered at the congressional district level. * p<0.10, ** p<0.05, *** p<0.01.

Table A.7: The congressional vacancy effects on inspections with Poisson pseudo-maximum likelihood regressions

	Any inspection		Inspection count	
	(1)	(2)	(3)	(4)
Vacant	-0.64	-21.06*	5.13	-26.52*
	(6.60)	(10.99)	(10.15)	(14.35)
Republican		5.32		7.18
		(5.35)		(8.05)
Vacant × Republican		34.61*		56.59*
		(20.43)		(32.05)
Republican vacancy vs. incumbency				
Vacant + Vacant × Republican		6.26		15.05
		(6.73)		(9.94)
Democratic vacancy vs. incumbency				
Vacant		-21.06*		-26.52*
		(10.99)		(14.35)
Observations	958,925	958,925	958,925	958,925
Mean of dep. var. in Rep. incumbents	8.39%	8.39%	0.12	0.12
Mean of dep. var. in Dem. incumbents	8.01%	8.01%	0.11	0.11
Mean of dep. var. in incumbents	8.27%	8.27%	0.12	0.12
Facility, year, and month fixed-effects	YES	YES	YES	YES
Controls	YES	YES	YES	YES

Notes: This table shows the results of Poisson pseudo-maximum likelihood regressions of Clean Air Act inspections on the interaction between congressional vacancy and political party affiliation. Coefficients are modified based on the following formula: $100 \times (exp(\beta) - 1)$. Control variables include lagged RSEI score, High Priority Violation, age, Legislative Effectiveness Scores, number of terms served, majority party, influential committee, state legislature experience, county-level unemployment rate, county-level per capita personal income, Governor's political party affiliation, the proportion of Republican Senators, and Non-attainment areas. Standard errors are estimated using the delta method and are clustered at the congressional district level. * p<0.10, ** p<0.05, *** p<0.01.

Table A.8: The congressional vacancy effects on inspections by influential committee membership with Poisson pseudo-maximum likelihood regressions

	(1) Any inspection	(2) Inspection count
Vacant × Republican × Influential Committee	2.54	14.73
	(26.07)	(48.49)
Vacant × Republican	34.76	63.06
	(25.80)	(40.10)
Vacant × Influential Committee	1.47	-19.66
	(22.40)	(31.45)
Republican × Influential Committee	5.97	15.19
	(10.60)	(14.55)
Vacant	-22.49*	-26.73
	(12.73)	(16.26)
Republican	2.20	-0.37
	(7.96)	(10.30)
Influential Committee	-5.56	-9.69
	(8.74)	(10.15)
Republican vacancy vs. incumbency (influential committee)		
Vacant + (Vacant × Republican) + (Vacant × Influential Committee)		
+ (Vacant × Republican × Influential Committee)	8.68	10.12
	(8.78)	(12.16)
Republican vacancy vs. incumbency (other committee)		
Vacant + Vacant × Republican	4.46	19.47
	(10.46)	(15.03)
Democratic vacancy vs. incumbency (influential committee)		
Vacant + Vacant × Influential Committee	-21.35*	-41.14**
	(11.90)	(19.39)
Democratic vacancy vs. incumbency (other committee)		
Vacant	-22.49*	-26.73
	(12.73)	(16.26)
Observations	958,925	958,925
Mean of dep. var. with Rep. incumbents on influential committee	8.06%	0.11
Mean of dep. var. with Rep. incumbents on other committee	8.87%	0.12
Mean of dep. var. with Dem. incumbents on influential committee	7.89%	0.11
Mean of dep. var. with Dem. incumbents on other committee	8.17%	0.11
Facility, year, and month fixed-effects	YES	YES
Controls	YES	YES

Notes: This table shows the results of Poisson pseudo-maximum likelihood regressions of Clean Air Act inspections on the interactions among congressional vacancy, political party affiliation, and committee membership. In column 1, the reported mean value of the dependent variable and coefficients are multiplied by 100. Coefficients are modified based on the following formula: $100 \times (exp(\beta) - 1)$. Control variables include lagged RSEI score, High Priority Violation, age, Legislative Effectiveness Scores, number of terms served, majority party, influential committee, state legislature experience, county-level unemployment rate, county-level per capita personal income, Governor's political party affiliation, the proportion of Republican Senators, and Non-attainment areas. Standard errors are estimated using the delta method and are clustered at the congressional district level. * p<0.10, ** p<0.05, *** p<0.01.

Table A.9: The congressional vacancy effects on inspections by governorship with Poisson pseudo-maximum likelihood regressions

	(1) Any inspection	(2) Inspection count
Vacant × Republican × Republican Governor	-24.50	-34.51
	(20.51)	(25.42)
Vacant × Republican	61.59*	103.17*
	(31.92)	(58.93)
Vacant × Republican Governor	19.66	26.24
	(28.43)	(44.05)
Republican × Republican Governor	2.46	-5.30
	(6.29)	(8.59)
Vacant	-31.06**	-38.73**
	(12.22)	(16.72)
Republican	4.35	9.10
	(5.55)	(8.79)
Republican Governor	-18.23***	-26.74***
	(4.60)	(5.83)
Republican vacancy vs. incumbency (Republican Governor)		
Vacant + (Vacant × Republican) + (Vacant × Republican Governor)		
+ (Vacant × Republican × Republican Governor)	0.64	2.91
	(9.42)	(13.43)
Republican vacancy vs. incumbency (Democratic Governor)		
Vacant + Vacant × Republican	11.41	24.47*
	(9.51)	(13.66)
Democratic vacancy vs. incumbency (Republican Governor)		
Vacant + Vacant × Republican Governor	-17.50	-22.66
	(14.16)	(18.21)
Democratic vacancy vs. incumbency (Democratic Governor)		
Vacant	-31.06**	-38.73**
	(12.22)	(16.72)
Observations	958,925	958,925
Mean of dep. var. with Rep. incumbents and Rep. Governor	7.63%	0.10
Mean of dep. var. with Rep. incumbents and Dem. Governor	10.39%	0.16
Mean of dep. var. with Dem. incumbents and Rep. Governor	7.48%	0.10
Mean of dep. var. with Dem. incumbents and Dem. Governor	8.63%	0.13
Facility, year, and month fixed-effects	YES	YES
Controls	YES	YES

Notes: This table shows the results of Poisson pseudo-maximum likelihood regressions of Clean Air Act inspections on the interactions among congressional vacancy, political party affiliation, and governor's political party affiliation. Coefficients are modified based on the following formula: $100 \times (exp(\beta) - 1)$. Control variables include lagged RSEI score, High Priority Violation, age, Legislative Effectiveness Scores, number of terms served, majority party, influential committee, state legislature experience, county-level unemployment rate, county-level per capita personal income, Governor's political party affiliation, the proportion of Republican Senators, and Non-attainment areas. Standard errors are estimated using the delta method and are clustered at the congressional district level. * p<0.10, ** p<0.05, *** p<0.01.

Table A.10: The congressional vacancy effects on inspections by High Priority Violation with Poisson pseudo-maximum likelihood regressions

	(1) Any inspection	(2) Inspection count
Vacant × Republican × High Priority Violation	-36.84**	-52.69***
	(16.99)	(13.93)
Vacant × Republican	38.28**	65.02**
	(18.98)	(31.88)
Vacant × High Priority Violation	78.91*	128.54**
	(45.78)	(61.46)
Republican × High Priority Violation	-3.15	2.71
	(4.61)	(8.97)
Vacant	-24.35***	-31.48***
	(9.05)	(11.90)
Republican	5.41	6.81
	(5.40)	(8.17)
High Priority Violation	13.65***	9.70
	(4.53)	(7.17)
Republican vacancy vs. incumbency (High Priority Violation)		
Vacant + (Vacant × Republican) + (Vacant × High Priority Violation)		
+ (Vacant × Republican × High Priority Violation)	18.21**	22.25*
	(8.51)	(12.38)
Republican vacancy vs. incumbency (general facilities)		
Vacant + Vacant × Republican	4.61	13.07
	(7.31)	(11.50)
Democratic vacancy vs. incumbency (High Priority Violation)		
Vacant + Vacant × High Priority Violation	35.34	56.60
	(40.25)	(46.42)
Democratic vacancy vs. incumbency (general facilities)		
Vacant	-24.35***	-31.48***
	(9.05)	(11.90)
Observations	958,925	958,925
Mean of dep. var. with Rep. incumbents and High Priority Violation	12.88%	0.24
Mean of dep. var. with Rep. incumbents and general facilities	8.14%	0.11
Mean of dep. var. with Dem. incumbents and High Priority Violation	14.57%	0.24
Mean of dep. var. with Dem. incumbents and general facilities	7.69%	0.11
Facility, year, and month fixed-effects	YES	YES
Controls	YES	YES

Notes: This table shows the results of Poisson pseudo-maximum likelihood regressions of Clean Air Act inspections on the interactions among congressional vacancy, political party affiliation, and High Priority Violation. Coefficients are modified based on the following formula: $100\times(exp(\beta)-1)$. Control variables include lagged RSEI score, High Priority Violation, age, Legislative Effectiveness Scores, number of terms served, majority party, influential committee, state legislature experience, county-level unemployment rate, county-level per capita personal income, Governor's political party affiliation, the proportion of Republican Senators, and Non-attainment areas. Standard errors are estimated using the delta method and are clustered at the congressional district level. * p<0.10, ** p<0.05, *** p<0.01.

Table A.11: The congressional vacancy effects on inspections by Non-attainment with Poisson pseudo-maximum likelihood regressions

	(1) Any inspection	(2) Inspection count
Vacant × Republican × Non-attainment	-43.36***	-51.98***
	(11.89)	(12.56)
Vacant × Republican	67.78***	113.75***
	(19.62)	(33.89)
Vacant × Non-attainment	61.09**	90.76**
	(29.08)	(43.87)
Republican × Non-attainment	3.17	8.79
	(7.10)	(10.59)
Vacant	-35.37***	-45.20***
	(5.97)	(7.51)
Republican	4.17	4.31
	(6.59)	(9.85)
Non-attainment	-0.60	-9.31
	(6.77)	(8.20)
Republican vacancy vs. incumbency (Non-attainment)		
Vacant + (Vacant × Republican) + (Vacant × Non-attainment)		
+ (Vacant × Republican × Non-attainment)	-1.06	7.28
	(8.44)	(9.19)
Republican vacancy vs. incumbency (attainment areas)		
Vacant + Vacant × Republican	8.44	17.13
	(7.84)	(11.89)
Democratic vacancy vs. incumbency (Non-attainment)		
Vacant + Vacant × Non-attainment	4.12	4.53
	(17.82)	(22.45)
Democratic vacancy vs. incumbency (attainment)		
Vacant	-35.37***	-45.20***
	(5.97)	(7.51)
Observations	958,925	958,925
Mean of dep. var. with Rep. incumbents and Non-attainment	8.44%	0.12
Mean of dep. var. with Rep. incumbents and attainment	8.38%	0.12
Mean of dep. var. with Dem. incumbents and Non-attainment	7.45%	0.11
Mean of dep. var. with Dem. incumbents and attainment	8.49%	0.12
Facility, year, and month fixed-effects	YES	YES
Controls	YES	YES
R^2		

Notes: This table shows the results of Poisson pseudo-maximum likelihood regressions of Clean Air Act inspections on the interactions among congressional vacancy, political party affiliation, and Non-attainment areas. Coefficients are modified based on the following formula: $100 \times (exp(\beta) - 1)$. Control variables include lagged RSEI score, High Priority Violation, age, Legislative Effectiveness Scores, number of terms served, majority party, influential committee, state legislature experience, county-level unemployment rate, county-level per capita personal income, Governor's political party affiliation, the proportion of Republican Senators, and Non-attainment areas. Standard errors are estimated using the delta method and are clustered at the congressional district level. * p<0.10, ** p<0.05, *** p<0.01.

Table A.12: Sources of news articles about resignation of congressional members

Congress number	State	Congressional district	News article
117	PA	18	Potter, C. (2022, October 13). Democrats seek to address confusion over 'Mike Doyle' in 12th Congressional District race. WHYY. Retrieved from https://whyy.org/articles/pennsylvania-12th-congressional-district-mike-doyle-summer-lee/
117	NC	1	Travis, F. (2022, December 30). Butterfield leaving Congress a few days early for DC law firm. WRAL News. Retrieved from https://www.wral.com/story/butterfield-leaving-congress-a-few-days-early-for-dc-law-firm/20649319/
117	CA	37	The Associated Press (2021, September 27). Rep. Karen Bass running for Los Angeles mayor. NBC News. Retrieved from https://www.nbcnews.com/politics/elections/rep-karen-bass-running-los-angeles-mayor-n1280209
117	FL	22	Rogers, A. (2022, February 28). Ted Deutch to resign from Congress to lead American Jewish Committee. CNN. Retrieved fromhttps://www.cnn.com/2022/02/28/politics/ted-deutch-retiring-congressman-florida/index.html
117	FL	13	Anderson, C. (2021, May 4).Once GOP governor of Florida, Crist now runs as Democrat. AP News. Retrieved from https://apnews.com/article/florida-government-and-politics-d497d057a9fb15657084ed38d82e76ff
117	NY	19	Nahmias, L., & Sapienza, B. (2022, May 3). Rep. Delgado to resign Wednesday, become NY lieutenant governor. Bloomberg. Retrieved from https://www.bloomberg.com/news/articles/2022-05-03/hochul-appoints-antonio-delgado-as-lieutenant-governor-for-n-y
117	NY	23	Ackley, K., & Metz, J. (2022, May 10).NY Rep. Tom Reed resigns, cites 'extremism' in House. Roll Call. Retrieved from https://rollcall.com/2022/05/10/ny-rep-tom-reed-resigns-cites-extremism-in-house/
117	TX	34	Livingston, A. (2022, March 24). U.S. Rep. Filemon Vela will resign early from Congress. The Texas Tribune. Retrieved from https://www.texastribune.org/2022/03/24/filemon-vela-resign/
117	NE	1	The Associated Press. (2022, March 26). Nebraska Rep. Fortenberry says he will resign following conviction for lying to FBI. NPR. Retrieved from https://www.npr.org/2022/03/26/1089034831/nebraska-fortenberry-resigns
117	CA	22	White, J. (2021, December 6). Nunes quits Congress for Trump Media job. Politico. Retrieved fromhttps://www.politico.com/news/2021/12/06/devin-nunes-will-leave-congress-523826

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Table A.12, continued

Congress number	State	Congressional district	News article
117	OH	15	White, C. (2021, April 19). Steve Stivers resigning from Congress to lead Ohio Chamber of Commerce. ABC6. Retrieved from https://abc6onyourside.com/news/local/steve-stivers-resigns-congress-4-19-21
117	NM	1	Cabral, S. (2020, December 17). Deb Haaland: Historic Native American 'pick for Biden cabinet.' BBC. Retrieved from https://www.bbc.com/news/world-us-canada-55356373
117	OH	11	Thomas, K., & Restuccia, A. (2020, December 8). Biden Expected to Nominate Marcia Fudge to Lead HUD, Tom Vilsack to Head Agriculture Again. The Wall Street Journal. Retrieved from https://www.wsj.com/articles/president-elect-joe-biden-to-nominate-marcia-fudge-to-lead-department-of-housing-and-urban-development-11607468752
117	LA	2	Mcgill, K. (2020, November 17). Richmond ready for move from Congress to West Wing. AP News. Retrieved from https://apnews.com/article/joe-biden-cedric-richmond-louisiana-new-orleans-8b790419b26b47dda7d617f8430e0b25
116	CA	8	Mai-Duc, C. (2019, September 17). California Republican Rep. Paul Cook to retire from Congress, run for county supervisor seat. Los Angeles Times. Retrieved from https://www.latimes.com/california/story/2019-09-17/republican-paul-cook-retire-congress
116	GA	14	McPherson, L. (2020, September 11). Georgia Rep. Tom Graves to resign, effective October. Roll Call.. Retrieved from https://rollcall.com/2020/09/11/georgia-rep-tom-graves-to-resign-effective-october/
116	TX	4	Nichols, H., & Smith, A. (2019, July 28). Trump to nominate Texas congressman to replace intelligence chief Dan Coats. NBC News. Retrieved from https://www.nbcnews.com/politics/donald-trump/dan-coats-out-intelligence-chief-soon-reports-n1035506
116	NC	11	Croucher, S. (2019. December 19). Trump Ally Mark Meadows Is Quitting the House, Eyes New Role With President: 'My Work...Is Only Beginning.' Newsweek. Retrieved from https://www.newsweek.com/mark-meadows-congress-trump-impeachment-2020-campaign-republican-1478203
116	CA	50	Watson, J. (2020, January 7). GOP Rep. Duncan Hunter resigns after corruption conviction. AP News. Retrieved from https://apnews.com/article/21f9320c1ab116538a9244941c11192b

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Congress number	State	Congressional district	News article
116	CA	25	Caygle, H., Bresnahan, J., & Cheney, K. (2019, October 27). Rep. Katie Hill to resign amid allegations of inappropriate relationships with staffers. Politico. Retrieved from https://www.politico.com/news/2019/10/27/rep-katie-hill-to-resign-amid-allegations-of-inappropriate-relationships-with-staffers-000301
116	NY	27	Walsh, D. (2019, September 30). GOP Rep. Chris Collins Resigns Ahead Of Reported Guilty Plea On Insider Trading. NPR. Retrieved from https://www.npr.org/2019/09/30/765762967/gop-rep-chris-collins-resigns-ahead-of-reported-guilty-plea-on-insider-trading
116	WI	7	Byrd, H. (2019, August 26). GOP Rep. Sean Duffy to resign from Congress. CNN. Retrieved from https://www.cnn.com/2019/08/26/politics/sean-duffy-resign/index.html
116	PA	12	Oprysko, C., & Montellaro, Z. (2019, January 17). Pennsylvania GOP Rep. Tom Marino to retire this month. Politico. Retrieved from https://www.politico.com/story/2019/01/17/tom-marino-retire-1109470
115	NM	1	Barrow, B. (2018, June 6). Lujan Grisham wins Democratic nomination for governor of New Mexico. PBS. Retrieved from https://www.pbs.org/newshour/politics/lujan-grisham-wins-democratic-nomination-for-governor-of-new-mexico
115	WV	3	Killough, A. (2017, May 8). Rep. Evan Jenkins to challenge Sen. Joe Manchin. CNN. Retrieved from https://www.cnn.com/2017/05/08/politics/west-virginia-senate-race/index.html
115	FL	6	Killough, A. (2018, September 10). Ron DeSantis resigns from Congress to focus on governor's race. CNN. Retrieved from https://www.cnn.com/2018/09/10/politics/desantis-resigns-from-congress/index.html
115	PA	15	Cheney, K., & Schneider, E. (2018, April 17). Dent resigns, to leave Congress next month. Politico. Retrieved from https://www.politico.com/story/2018/04/17/charlie-dent-resigns-528605
115	PA	7	Mccaskill, N., & Shepard, S. (2018, April 27). Meehan resigns, vows to repay $39K harassment settlement. Politico. Retrieved from https://www.politico.com/story/2018/04/27/patrick-meehan-resigns-557511
115	OK	1	Caputo, M. (2017, September 1). Rubio, Nelson blast Trump's NASA pick. Politico. Retrieved from https://www.politico.com/story/2017/09/01/marco-rubio-bill-nelson-trump-nasa-jim-bridenstine-242269

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Table A.12, continued

Congress number	State	Congressional district	News article
115	TX	27	Bowman, B. (2018, April 6). Farenthold Resigns After Sexual Harassment Scandal. Roll Call. Retrieved from https://rollcall.com/2018/04/06/farenthold-resigns-after-sexual-harassment-scandal/
115	OH	12	Schneider, E. (2017, October 19). Ohio's Tiberi to leave Congress. Politico. Retrieved from https://www.politico.com/story/2017/10/19/pat-tiberi-to-leave-congress-243940
115	AZ	8	Fandos, N. (2017, December 7). House Republican Trent Franks Resigns Amid Harassment Investigation. The New York Times. Retrieved from https://www.nytimes.com/2017/12/07/us/politics/trent-franks-house-member-resigns.html
115	MI	13	Naylor, B., & Montanaro, D. (2017, December 5). Conyers Resigns Amid Sexual Harassment Allegations. NPR. Retrieved from https://www.npr.org/2017/12/05/567160325/conyers-resigning-amid-sexual-harassment-allegations
115	PA	18	Bade, R., & Sherman, J. (2017, October 5). Tim Murphy resigns from Congres. Politico. Retrieved from https://www.politico.com/story/2017/10/05/tim-murphy-resigns-from-congress-243510
115	UT	3	Huetteman, E., & Flegenheimer, M. (2017, April 19). Jason Chaffetz, Powerful House Republican, Won't Run in 2018. The New York Times. Retrieved from https://www.nytimes.com/2017/04/19/us/politics/jason-chaffetz-congress-utah-house-oversight.html
115	MT	1	Welker, K. (2016, December 13). Trump Taps Montana Republican Rep. Ryan Zinke as Interior Secretary. NPR News. Retrieved from https://www.nbcnews.com/news/us-news/trump-taps-montana-republican-rep-ryan-zinke-interior-secretary-n695631
115	SC	5	Ortiz, E. (2016, December 17). Mick Mulvaney of South Carolina Picked as White House Budget Chief. NBC News. Retrieved from https://www.nbcnews.com/politics/2016-election/mick-mulvaney-south-carolina-picked-white-house-budget-chief-n697311
115	GA	6	Jacobs, B. (2016, November 29). Donald Trump selects Tom Price as secretary of health and human services. The Guardian. Retrieved from https://www.theguardian.com/us-news/2016/nov/28/tom-price-health-human-services-secretary-trump-administration
115	CA	34	Kopan, T. (2016, December 1).Xavier Becerra to leave Congress for California attorney general post. CNN. Retrieved from https://www.cnn.com/2016/12/01/politics/xavier-becerra-california-attorney-general/index.html

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Table A.12, continued

Congress number	State	Congressional district	News article
115	KS	4	Mazzetti, M. (2016, November 18). Mike Pompeo, Sharp Critic of Hillary Clinton, Is Trump's Pick to Lead C.I.A. The New York Times. Retrieved from https://www.nytimes.com/2016/11/19/us/politics/donald-trump-mike-pompeo-cia.html
114	MI	10	Selweski, C. (2016, May 5). Why on earth is Candice Miller running for county drain commissioner?. Bridge Michigan. Retrieved from https://www.bridgemi.com/michigan-government/why-earth-candice-miller-running-county-drain-commissioner
114	CA	44	Cahn, E. (2015, February 18). Janice Hahn Endorses Successor in Congress. Roll Call. Retrieved from https://rollcall.com/2015/02/18/janice-hahn-endorses-successor-in-congress/
114	KY	1	Caygle, H. (2016, August 31). Rep. Whitfield will resign following ethics probe. Politico. Retrieved from https://www.politico.com/story/2016/08/ed-whitfield-ethics-resigning-227610
114	PA	2	Bresnahan, J. (2016, June 23). Democratic Rep. Chaka Fattah resigns effective immediately. Politico. Retrieved from https://www.politico.com/story/2016/06/fattah-resigns-effective-immediately-224731
114	OH	8	Raju, M., & Walsh, D. (2015, September 26). Why John Boehner quit. CNN. Retrieved from https://www.cnn.com/2015/09/25/politics/why-john-boehner-quit/index.html
114	IL	18	Bash, D., Zeleny, J., & Jaffe, A. (2015, March 18). Aaron Schock resigns amid scandal. CNN. Retrieved from https://www.cnn.com/2015/03/17/politics/aaron-schock-resigns/index.html
114	NY	11	Horowitz, J. (2014, December 30). Michael Grimm, in a Reversal, Will Resign From Congress. The New York Times. Retrieved from https://www.nytimes.com/2014/12/30/nyregion/michael-grimm-in-a-reversal-will-resign-from-congress.html
113	VA	7	Parker, R. (2014, July 31). Eric Cantor set to resign from Congress in August, he says. Los Angeles Times. Retrieved from https://www.latimes.com/nation/politics/politicsnow/la-na-pn-eric-cantor-resign-for-congress-20140731-story.html
113	NJ	1	Horowitz, J. (2014, February 4). Amid Ethics Inquiry, South Jersey Democrat Is Giving Up House Seat for a New Job. The New York Times. Retrieved from https://www.nytimes.com/2014/02/05/us/politics/rob-andrews-to-resign-from-congress.html

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Table A.12, continued

Congress number	State	Congressional district	News article
113	FL	19	Sherman, J., & Isenstadt, A.. (2014, January 27). Radel resigns from House seat. Politico. Retrieved from https://www.politico.com/story/2014/01/trey-radel-resignation-102642
113	NC	12	Lowrey, A. (2013, May 1). Obama Nominates Congressman to Lead Mortgage Agency. The New York Times. Retrieved from https://www.nytimes.com/2013/05/02/business/obama-to-name-melvin-watt-to-oversee-fannie-and-freddie.html
113	LA	5	Isenstadt, A. (2013, August 6). GOP Rep. Alexander retiring. Politico. Retrieved from https://www.politico.com/story/2013/08/rodney-alexander-retiring-095254
113	AL	1	Neuman, S. (2013, May 23). Alabama Republican Jo Bonner Says He's Leaving Congress.NPR. Retrieved from https://www.npr.org/sections/thetwo-way/2013/05/23/186323352/alabama-republican-jo-bonner-says-hes-leaving-congress
113	MA	5	Trygstad, K. (2012, December 27). Markey Running for Senate in Massachusetts. Roll Call. Retrieved from https://rollcall.com/2012/12/27/markey-running-for-senate-in-massachusetts/
113	MO	8	Kim, S. (2012, December 3). Jo Ann Emerson to retire in Feb. Politico. Retrieved from https://www.politico.com/story/2012/12/jo-ann-emerson-retiring-084508
113	SC	1	Wong, S. (2012, December 17). Scott to succeed DeMint in Senate. Politico. Retrieved from https://www.politico.com/story/2012/12/tim-scott-to-succeed-demint-in-senate-085169
113	IL	2	Davey, M. (2012, November 21). Jesse Jackson Jr. Resigns, Facing Illness and Inquiry. The New York Times. Retrieved from https://www.nytimes.com/2012/11/22/us/jackson-jr-to-resign-house-seat.html

Note: All the news articles were retrieved on July 22, 2024.

Table A.13: The effects of congressional vacancy on inspections by League of Conservation Voters scores

	Any inspection	
	(1)	(2)
Vacant × Pro-environment	-1.94**	-0.04**
	(0.91)	(0.02)
Vacant	0.68	0.02
	(0.62)	(0.02)
Pro-environment	-0.21	-0.00
	(0.33)	(0.01)
Pro-environment vacancy v. incumbency		
Vacant + Vacant × Pro-environment	-1.26*	-0.02*
	(0.67)	(0.01)
Pro-business vacancy vs. incumbency		
Vacant	0.68	0.02
	(0.62)	(0.02)
Observations	1,310,031	1,310,031
Mean of dep. var. in Pro-environmental incumbents	4.9%	0.07
Mean of dep. var. in Pro-business incumbents	6.58%	0.09
Facility, year, and month fixed-effects	YES	YES
Controls	YES	YES
R^2	0.16	0.17

Notes: This table shows the results of linear probability model regressions of Clean Air Act inspections on the interaction between congressional vacancy and rating from the League of Conservation Voters. The term “Pro-environment" equals 1 if a congressional member’s rating from the League of Conservation Voters is higher than 50; otherwise, it equals 0. In column 1, the reported mean value of the dependent variable and coefficients are multiplied by 100. Control variables include lagged RSEI score, High Priority Violation, age, Legislative Effectiveness Scores, number of terms served, majority party, influential committee, state legislature experience, county-level unemployment rate, county-level per capita personal income, Governor’s political party affiliation, the proportion of Republican Senators, and Non-attainment areas. Standard errors are clustered at the congressional district level. * p<0.10, ** p<0.05, *** p<0.01.

Table A.14: The effects of congressional vacancy on inspections by American Conservative Union rating

	Any inspection	
	(1)	(2)
Vacant × Conservative	2.25**	0.05**
	(0.98)	(0.02)
Vacant	-1.36*	-0.02*
	(0.73)	(0.01)
Conservative	0.20	0.00
	(0.25)	(0.01)
Conservative vacancy vs. incumbency		
Vacant + Vacant × Conservative	0.89	0.03
	(0.68)	(0.02)
Liberal vacancy vs. incumbency		
Vacant	-1.36*	-0.02*
	(0.73)	(0.01)
Observations	1,181,480	1,181,480
Mean of dep. var. in Conservative incumbents	6.5%	0.09
Mean of dep. var. in Liberal incumbents	5.24%	0.07
Facility, year, and month fixed-effects	YES	YES
Controls	YES	YES
R^2	0.16	0.17

Notes: This table shows the results of linear probability model regressions of Clean Air Act inspections on the interaction between congressional vacancy and rating from the American Conservative Union. The term “Conservative" equals 1 if a congressional member’s rating from the American Conservative Union is higher than 50; otherwise, it equals 0. In column 1, the reported mean value of the dependent variable and coefficients are multiplied by 100. Control variables include lagged RSEI score, High Priority Violation, age, Legislative Effectiveness Scores, number of terms served, majority party, influential committee, state legislature experience, county-level unemployment rate, county-level per capita personal income, Governor’s political party affiliation, the proportion of Republican Senators, and Non-attainment areas. Standard errors are clustered at the congressional district level. * p<0.10, ** p<0.05, *** p<0.01.

Table A.15: The effects of congressional vacancy on inspections using official vacancy

	(1) Any inspection	(2) Inspection count
Vacant × Republican	1.54*	0.04**
	(0.83)	(0.02)
Vacant	-1.11	-0.02
	(0.71)	(0.01)
Republican	0.53	0.01
	(0.39)	(0.01)
Republican vacancy vs. incumbency		
Vacant + Vacant × Republican	0.43	0.01
	(0.45)	(0.01)
Democratic vacancy vs. incumbency		
Vacant	-1.11	-0.02
	(0.71)	(0.01)
Observations	1,330,716	1,330,716
Mean of dep. var. in Rep. incumbents	6.54%	0.09
Mean of dep. var. in Dem. incumbents	4.94%	0.07
Facility, year, and month fixed-effects	YES	YES
Controls	YES	YES
R^2	0.16	0.17

Notes: This table shows the results of OLS regressions of Clean Air Act inspections on the interaction between official congressional vacancy and political party affiliation. In column 1, the reported mean value of the dependent variable and coefficients are multiplied by 100. Control variables include lagged RSEI score, High Priority Violation, age, Legislative Effectiveness Scores, number of terms served, majority party, influential committee, state legislature experience, county-level unemployment rate, county-level per capita personal income, Governor's political party affiliation, the proportion of Republican Senators, and Non-attainment areas. inspection counts Standard errors are clustered at the congressional district level.

Table A.16: The effects of congressional vacancy on inspections in other districts in the state

	(1) Any inspection	(2) Inspection count
Republican vacancy in a state	0.71	0.02
	(0.51)	(0.01)
Democratic vacancy in a state	-1.08	-0.03
	(0.72)	(0.02)
Observations	1,327,828	1,327,828
Mean of dep. var. with no Rep. vacancy within a state	5.88%	0.08
Mean of dep. var. with no Dem. vacancy within a state	5.90%	0.08
Facility, year, and month fixed-effects	YES	YES
Controls	YES	YES
R^2	0.16	0.17

Notes: This table shows the results of OLS regressions of Clean Air Act inspections on the interaction between congressional vacancy and political party affiliation among facilities that do not experience congressional vacancies in a congressional district. In columns 1 and 2, the reported mean value of the dependent variable and coefficients are multiplied by 100. Control variables include lagged RSEI score, High Priority Violation, age, Legislative Effectiveness Scores, number of terms served, majority party, influential committee, state legislature experience, county-level unemployment rate, county-level per capita personal income, Governor's political party affiliation, the proportion of Republican Senators, and Non-attainment areas. Inspection counts Standard errors are clustered at the congressional district level.