Understanding Vacancy Time: A Theoretical Framework Informed by Cross-Sector Comparison

Amanda Rutherford
School of Public and Environmental Affairs
Indiana University
aruther@indiana.edu

Jeryl L. Mumpower
Bush School of Government and Public Service
Texas A&M University
jmumpower@tamu.edu

Ricardo A. Bello-Gomez
School of Public and Environmental Affairs
Indiana University
rabellog@umail.iu.edu

Marlisa Griffin
Bush School of Government and Public Service
Texas A&M University
meg6@tamu.edu

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At least since Warner et al.'s (1963) publication of *The American Federal Executive*, a body of research has focused on understanding the characteristics and experiences of bureaucrats, whether public sector employees are motivated differently than their private sector counterparts, and how employees advance through various career ladders. However, little research has considered the importance of executive vacancies for organizations. The purpose of this study is to first provide an overview of the frequency and length of vacancies in multiple sectors and to then propose a framework and set of testable hypotheses for future research evaluating the causes and consequences of such vacancies. We compare vacancies from 48 U.S. federal agencies with data from the Fortune 100 private firms, NonProfit Times Top 100, and the U.S. News and World Report top 100 public and private non-profit universities over a twenty-one year period (1993-2013). These data are used to provide a starting point to develop a framework with a number of additional hypotheses for future empirical analysis.

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Extensive literatures in public administration document the causes and effects of executive turnover and executive succession in a range of organizations (McCabe et al. 2008, Boyne et al. 2010, Bertelli and Lewis 2012). Debates continue to evolve about the optimal level of turnover in various agencies or the contexts that are best suited for internal or external executive hires (Hill 2005, Villadsen 2012, Petrovsky et al. 2015). Yet, this body of research tends to ignore the frequency and length of the interval between one executive and the next or implicitly assumes that vacancies are necessarily linked to negative consequences. More recent scholarship in political science has brought attention to the politics of the nomination and confirmation processes for executive and judicial vacancies (Fesler and Kettl 1996, O'Connell 2008, Bell 2002). Although some of this work has examined trends in the frequency and length of vacancies, the focus has been generally confined to a limited number of appointments in the U.S. federal system of governance. While certainly important, these federal appointments are typically not comparable to other positions in the public, private, or nonprofit sectors. In many organizations, there is no prescribed or mandated appointment or approval process but perhaps only a governing board with the ability to make unilateral hiring decisions. There may be reason to suspect that vacancies are both more frequent and lengthy in public agencies, particularly in comparison to private firms, but established empirical knowledge about how patterns of vacancy compare across sectors is virtually nonexistent.

Some observers have recognized the practical importance of differences between sectors in frequency and length of vacancy. For example, in an interview with the *Washington Post*, David Lewis stated, “If you told people on Wall Street that every four years or eight years, you

were going to lop off the top of a Fortune 500 company and say the company would operate normally, you'd be called crazy. There is no question that it matters. Turnover and vacancies in politically appointed positions hurts performance" (Eggen and Lee 2008). So why have we not paid more attention to vacancies in executive positions beyond the context of federal and judicial nominations? These individuals set goals and priorities, determine many budgetary and implementation processes, and are ultimately held accountable for the performance of their organizations. Perhaps scholars have been too quick to make assumptions about the causes and consequences of vacancy, or perhaps data issues have allowed little more than anecdotal evidence in the past. Either way, the success and stability of many organizations cannot be fully understood without considering the role of executive vacancies.

This study aims to provide a research agenda with testable hypotheses to encourage scholars in the field of public administration to take the phenomenon of vacancy more seriously. Beyond simply providing a theoretical starting point in the form of a research agenda, we offer a comparative assessment of the timing and length of vacancies across multiple sectors in order to gain a better understanding of the nature of executive vacancies in public, private, and non-profit organizations. More specifically, we use data from multiple sources to examine twenty-one years of vacancies in federal agencies, Fortune 100 firms, the NonProfit Times Top 100, and top-rated public and private nonprofit universities in the United States to illustrate that patterns of vacancies and presence of permanent executives vary widely across sectors. After establishing these comparative trends through descriptive analysis and ANOVA, we propose a research agenda with an associated set of testable hypotheses for future research on the causes and effects of vacancies.

What We (Don't) Know about Vacancies from Public Administration Literature

At least since Warner et al.'s (1963) publication of *The American Federal Executive*, much research in the field of public administration has focused on understanding the characteristics and experiences of bureaucrats, whether public sector employees are motivated differently from their private sector counterparts, and how employees advance through various career ladders. However, rarely has this research considered the importance of vacancies at the top of these organizations. Instead, two bodies of work, broadly categorized as work on turnover and managerial succession, often speak to this issue in indirect ways.

A wealth of research has been dedicated to understanding questions of why managers and employees either intend to leave or definitively depart from an organization (e.g., Bertelli 2007, Kellough and Osuna 1995, Lee and Whitford 2007, Seldon and Moynihan 2000). Many scholars initially perceived turnover as leading to largely negative consequences but have since concluded that some moderate level of turnover can be healthy for an organization. A large portion of this work among public administration scholars tests hypotheses on data available through the Federal Employee Viewpoint Survey (FEVS) (Pitts, Marvel, and Fernandez 2011), though others have considered local city management (McCabe et al. 2008), education (Grissom and Andersen 2012), and public servants in the United Kingdom (Boyne et al. 2010).

Among work focused on managerial and executive turnover (rather than non-managerial employee turnover), there is much discussion of how turnover may reshape organizational strategy in both positive and negative ways. For example, Bertelli and Lewis (2012) contend that turnover in public agencies influences agency performance and policy implementation via disrupting established relationships and draining expertise. Further, new strategy might help to boost the organization while at the same time creating learning costs and confusion. In flipping the link between turnover and performance, Boyne et al. (2010, 2011) argue that the extent of a

positive or negative effect from turnover of a top-level manager may depend on the organization's performance, with high-performing agencies being hurt by change while low performing agencies have more room to improve through new strategies. Petrovsky et al. (2017) also consider the length of tenure rather than only the likelihood of turnover, as shorter tenures are likely to mean that top-level managers are not able to make a meaningful contribution to the organization. Still, among these studies, there is little mention of vacancy time; instead, this is lost in the focus on the effects of managerial and organizational change as well as the transition to a new manager. As such, public administration research is often not fully situated in the real world experiences many organizations face with an executive vacancy.

When the focus of research shifts from predicting turnover or length of tenure to the transition from one executive to the next, a natural opportunity arises to discuss vacancy time. Much of this research is centered on the trade-offs inherent in hiring a new executive from inside or outside of the organization. Recent empirical work in public administration has been fueled by Boyne and Dayha (2002) who argue that the effect of succession on organizational performance is shaped by the motives, means, and opportunities of the executive. More specifically, they hypothesize that the time in office of the previous executive and the appointment of an outsider will enhance the effects on succession while the frequency of turnover will suppress the link between succession and performance. Hill (2005) extends on these hypotheses by empirically testing the effects of insider and outsider superintendent succession on student standardized tests in the case of Texas schools; findings suggest external hires have an immediate negative short-term effect on performance.

Work in the context of both public agencies and private firms has debated whether inside or outside hires are more advantageous, as inside hires may be less likely to adopt new strategies

but have greater knowledge of the organization while outside hires possess the opposite traits (less knowledge of the organization but experience with various other strategies that may help the organization) (DiMaggio and Powell 1983, Kesner and Sebora 1994). More recent work by Villadsen (2012) shifts this discussion slightly by finding that insiders are more likely to conduct comprehensive change when new or different practices are viewed as legitimate in the organization. Petrovsky, James, and Boyne (2015) further suggest that the trade-off between inside and outside executive hires may be contingent on the current level of performance in the organization. Despite rich theorizing and empirical testing, the frame of these studies focuses on the fact that new executives define organizational values and objectives but overlooks what happens to these values and objectives when no permanent executive or CEO is in office. In other words, this work tends to assume that a new executive is ready to fill the shoes of an outgoing executive without any gaps.

It is worth noting that, within studies of private firms, research has recently begun to consider interim CEOs. Using agency theory, Liang et al. (2012) offer a framework to understand why boards appoint interim CEOs. Likewise, Mooney, Semadeni, and Kesner (2012, 2013) provide a typology of interim CEOs according to six possible roles a board may want these individuals to have in the organization. Additional work by Mooney et al. (2017) suggests that the appointment of interim CEOs to be more likely in cases of former CEO removal and short tenure or lack of a groomed successor. Whether these typologies and reasons for hiring an interim CEO extend to non-profit or public agencies is unclear. Moreover, this literature has not yet focused on the effect of the interim length on organizational process and outputs.

The Politics of Federal Vacancies and the Problem of Limited Generalizability

For public sector agencies, research by political scientists has more directly addressed the need to consider vacancies given the time now required to nominate and receive approval for many appointed positions in the U.S. federal government (e.g., Carter 1995, McCarty and Razaghian 1999, Bertelli and Feldmann 2006). In the American context, a new presidential administration must fill approximately 4,000 positions, of which about 1,000 require Senate confirmation (Committee on Oversight and Government Reform 2012). Between the Jimmy Carter and George W. Bush administrations, these types of positions were either empty or filled by acting officials on an interim basis one-quarter of the time (O'Connell 2008). As work noting patterns of longer confirmation periods, politics in confirmation timing, and additional appointment conflicts emerged in the early 1990s, concerns were raised about disruptions to organizational performance (Gaertner, Gaertner, and Devine 1983), a lack of institutional memory (National Commission of the Public Service 1990), and the restricted ability to build constructive relationships (Ingraham 1995). Fesler and Kettl (1996) identify five costs of an early exit from an appointed position: loss of sustained themes, undermined teamwork, loss of political control, need for presidential resources to be devoted to replacements, and promotion of second rate subordinates. In one of the more comprehensive works to date on documenting federal vacancies, O'Connell (2008) notes that vacancies may carry some positive benefits—the selection of better appointees and longer tenures, the need for agency inaction, and competent temporary officials who are career civil servants—but hypothesizes that the costs of agency inaction, insufficient direction, and the loss in accountability and legitimacy likely outweigh such benefits. Though O'Connell does not look directly at the causes or effects of the vacancies she documents, she sums up the need to understand vacancies well in stating:

> To weigh the costs and benefits precisely, we would need to learn more. For instance, we would want to have additional information on how agency performance is affected by

> vacancies. How much do vacancies affect agency action? What kind of action is most affected? Do agencies do better with temporary officials than with appointees? How do careerists react to vacancies? Do they work as hard for acting officials? In addition, we would want to determine how agency vacancies affect regulatory compliance and perceptions of agency legitimacy. Are businesses less likely to comply with regulations if the agency is missing top leaders? Do voters prefer agencies run by political appointees or acting officials? Are agencies more or less responsive to the White House, Congress, and interest groups when important positions are vacant? (pg. 950-951)

Some scholars have proposed theories about the political causes of delay, either from the perspective of legislators (Bell 2002; Bond, Fleisher, and Krutz 2009) or the president (Hollibaugh 2015). While much work intricately describes the issue of vacancies in these appointed positions, discussion of the effects of these vacancies often remains game theoretical, anecdotal, or case study specific rather than being based on large-N empirical research. A larger limitation in this line of work is its rather narrow scope that raises questions of generalizability to other types of public agencies as well as to other sectors. The phenomenon of federal appointees that are nominated and confirmed likely does not extend far, given the multitude of organizational types, cultures, and norms in the U.S. context and around the world.

Do Vacancies Look Different across Sectors? An Examination of Observed Data

Because little theoretical work focuses specifically on the frequency and length of vacancy in organizations using a multi-sector approach, we examine data on top executives (CEOs, agency heads, etc.) in four types of organizations in order to aid in the generation of a research agenda and testable hypotheses. Information about executive start and end employment dates, whether an individual was acting as an interim executive, and the reason for executive departure was hand collected from organizational websites and media sources.

Specifically, data were tracked from January 1, 1993 to December 31, 2013 across four sectors to get an initial indication of whether and how vacancy differs across these types of organizations. The appendix presents the list of organizations included in the sample from all

four groups (Tables A1-A4); to serve as a reference, we include revenue information (or in the case of federal agencies, outlays) from 2015 for these organizations. First, we include data from private firms by focusing on the top 100 of the 2016 Fortune 500 listing. Data from all 100 firms were coded and included 329 interim or permanent executives during the twenty-one year time period. Second, a list of nonprofit agencies was generated from the 2016 Nonprofit Times Top 100 ranking. Within this sector, complete data were successfully coded for 82 organizations while only partial data were available for 16 organizations, primarily because they were not in existence for the entire study period.[1] The final nonprofit data include 364 executives across 100 agencies.

Third, the public sector is represented by data from federal agencies. Vacancies at the top of these agencies have been the focus of some political science scholars, and we can compare trends in this sector to the other settings for which information was collected in this study. Specifically, we include cabinet-level departments (e.g., Department of Justice), cabinet-rank agencies (e.g. Small Business Administration), White House agencies (e.g., OMB), independent agencies (e.g., NASA), and cabinet-dependent agencies (e.g., USAID) in our analysis. We did not include any diplomatic posts, collegial bodies, government corporations, or agencies led by a deputy or assistant secretary. Each of the positions included is nominated by the president and confirmed by the Senate, and the most common positions in our analysis are either cabinet agency heads or heads of cabinet-dependent agencies. This results in 48 total agencies and 442 executives. Importantly, when comparing various types of positions within this sample, cabinet-dependent agencies carry weight in the analyses below that should be interpreted with some caution. These positions constitute a large portion of the sample, and the extent to which they

[1] For those non-profit organizations with incomplete information, we also report the number and length of vacancy events. To calculate percent of time with vacancy, we divided by the total period with available information.

can be pooled with the cabinets under which they are positioned is a valid concern. Indeed, it is in the cabinet-dependent positions that vacancy time and vacancy length appear to be the longest among the types of agencies we identify here.[2] We maintain these posts are part of our sample to provide an adequate number of agencies in the sample when making comparisons to other sectors. Further, while removing these agencies from the sample slight decreases average vacancy time and length among federal agencies, it does not substantively alter our findings and the differences detected across sectors.

Finally, to include a sector in which both public and private organizations exist, we gathered data on presidents at the top 100 universities and colleges as ranked by the 2016 U.S. News and World Report. We use this source given its saliency among both practitioners and stakeholder groups.[3] The 2016 ranking includes 57 private institutions and 43 public institutions. Across the 100 universities coded, 398 permanent or interim executives held the office of the presidency.

A few limitations are clear from these data. First, our analysis focuses on large, resource-rich organizations situated in the United States. These organizations are salient, meaning that information on executives and vacancies is easier to track as compared to smaller organizations. Further, within the public sector, we only capture one level of the U.S. federal structure and do not consider state or local agencies within the context of this analysis (though see pages 15-16 for discussion of federal-state vacancy comparisons). Finally, we focus on sectors within one country for this initial glimpse at vacancy, though future work could potentially compare one or more sectors across multiple countries.

[2] Comparison figures among federal agency types are available upon request.
[3] We also compared this list to the largest 100 institutions, as defined by total revenue. The lists are highly correlated, with seventy institutions on both lists.

To calculate vacancy with as much detail as possible, we collected precise start and end employment dates for each executive in our sample. Although year and month details were consistently available, exact start and end days within a month were not publicly reported for a small fraction of cases. In those instances, we approximated starting dates of employment to the first day of the month and ending dates to the last day of the month. Following this adjustment, we consider vacancy as each period of time during which an organization did not have a permanent CEO or agency head, though someone may have been serving on an interim basis. From this definition, vacancy time can be captured through a count of vacancy events (number of vacancy events per organization over the twenty-one year period), vacancy length (number of days per vacancy event), or percent of vacant time over the period studied (share of total days per organization). These measures capture different characteristics of the phenomenon of vacancy. For instance, an organization might experience several vacancy events that each last a short period of time. Other organizations may only experience one vacancy event that lasts for a year or more. Of course, longer vacancy length should lead to a longer percent of vacant time in an organization.

Findings

With these measures of vacancy in mind, we conducted exploratory analyses to understand patterns of similarities and differences across sectors. First, Figure 1 summarizes the distribution of vacancy lengths for each of the four sectors. Box plots provide a good way to compare dissimilar distributions, especially in cases that include substantial skewness and the presence of outliers. The distributions for the four sectors are positively skewed, and all vacancy lengths are concentrated near zero. The public sector, as represented by US federal agencies, is the only sector for which the median vacancy length is higher than zero. This likely reflects the

nomination and confirmation structure for these positions. In other sectors, boards or CEOs themselves can perhaps smooth the transition and reduce vacancies by prioritizing career succession and grooming successors, among other options. These options are not the same for appointed federal positions given the direct effect of the political process; after nomination by the president, individuals are subject to hearings and a confirmation vote in the Senate (see Dull et al. 2012 for additional discussion of delays in these processes). In this regard, the data presented in Figure 1 provide surface-level evidence that research related to federal vacancies has limited generalization to other types of organizations.

<<<Figure 1 Here>>>

Interestingly, the higher education sector looks most similar to federal agencies in terms of the interquartile range (between zero and approximately 200 days). Still, a median of zero means that half of the leadership transitions do not present a vacancy while, in 25 percent of the cases, a vacancy is less than 200 days. For-profit and non-profit organizations show distributions that are even more concentrated around zero vacancy days except for some outliers. Indeed, the for-profit sector has an interquartile range that indicates that up to 75 percent of leadership transitions occurred in five days or less. That the trend for these for-profit organizations is so different from other sectors underlines that, with respect to vacancies, there are clear differences among sectors that we expect will have important implications for larger organizational processes and outputs. Although we are not conducting more sophisticated data analysis in this study, it is possible that such a difference might mean for-profit firms are planning well ahead for successions and that they can react quickly to vacancies. It is worth noting that there are two outliers in the for-profit sector with vacancy lengths of more than 800 days while the rest of the distribution lies below 400 days. These data points correspond to the long interim appointments

of Bruce Johnson as CEO of Sears Holding Corporation (2008-2011) and Steve Jobs as CEO of Apple (1997-2000). In the case of non-profits, there are more outliers (data points outside the 1.5 interquartile range) than in for-profit organizations. However, those outliers are more evenly distributed such that there are no particularly extreme cases.

As displayed in Table 1, a one-way ANOVA confirms that the mean vacancy length is statistically different among the sectors. We use the Bonferroni method to correct for the increasing chance of finding significant results when conducting multiple comparisons in the same dataset. We identify statistically different means between the for-profit firms and every other sector. Federal agencies have significantly different mean vacancy lengths when compared to non-profits, but neither federal agencies nor non-profits are significantly different from universities.

<<<Table 1 Here>>>

We next examine the percent of time organizations experience vacancies. Overall, the box plot in Figure 2 resembles the trends identified in Figure 1. With a median of 5 percent and an interquartile range between 3 and 12 percent, the federal sector stands out again as having a different distribution from the other sectors (median 5.72, standard deviation 7.05). Only one position—the U.S. Treasurer—falls outside the 1.5 interquartile range with a vacancy percentage that exceeds thirty percent. As with the case of vacancy lengths, institutions of higher education, non-profit agencies, and for-profit firms exhibit increasingly concentrated distributions (standard deviations of 3.65, 4.61, and 3.82 respectively). The higher education sector presents a median slightly above zero (0.91) and contains few outliers. On the other hand, non-profits and for-profits have medians of zero, indicating that at least half of the organizations in these sectors did not present top executive vacancies during the twenty-one year period. Again, the for-profit

distribution is entirely concentrated around zero with very few outliers. The data point above 35 percent corresponds to the Sears case noted above.[4]

The one-way ANOVA displayed in Table 2 shows significant differences in the mean percent of vacant time among sectors. Bonferroni pair-wise comparisons suggest that differences across each pair of sectors are statistically significant at the .01 level except for the non-profit and for-profit pairing (significant at .10) and the non-profit and university pairing (not significant). This confirms substantial differences across sectors in the amount of time without a permanent CEO in place—0.8% of the time for private firms; 2.4% for nonprofit agencies; 2.9% for leading national universities; and 7.6% for federal agencies. In other words, federal agencies were roughly 9.9 times more likely to have an interim CEO heading the organization than were private firms.

<<<Figure 2 Here>>>

<<<Table 2 Here>>>

It is possible that organizations in our data could have a low percentage of vacancy time simply because they have not had much executive turnover.[5] Therefore, we include a comparison of the number of permanent CEOs per organization in Figure 3. There are clear sectoral differences in the number of permanent CEOs over the study period, with federal agencies outpacing other sectors in the total number of CEOs, on average. Most federal agencies in the sample had between four and six executives between 1993 and 2013 (sector mean 5.46, standard deviation 1.47). The average number of permanent CEOs was virtually the same across for-profit

[4] Sears Holding Corporation was founded in 2005 and is not equivalent to the department store that is owned by the holding corporation. This leads us to account for a significantly shorter period of analysis for the firm as compared to other organizations in our sample.

[5] We also considered whether low versus high vacancy times might be influenced by presidential administration, particularly for shifts in federal agencies. While some differences were observed for agencies by administration, none stood out as being vastly different than the others. Clinton's first term has the smallest interquartile range while Clinton's second term has the largest interquartile range. See Figures A5-A8 in the appendix for more details.

firms, non-profit organizations, and universities. Non-profits commonly had two or three CEOs (mean 2.80, standard deviation 1.48) while universities had between two and four presidents during the same period of time (mean 3.10, 0.88). For-profit organizations, which exhibit low rates of vacancy per Figures 1 and 2, experience between one and five CEOs (mean 3.12, standard deviation 1.42). We take this to mean that for-profit organizations did not have significantly less turnover than other sectors during this period. Instead, this could indicate that some of the differences observed in this study are driven by the management of vacancy periods (e.g., total length of vacancy, number of interim CEOs during a vacancy). The one-way ANOVA in Table 3 also shows that only the public sector experiences significantly more turnover than other sectors.

Sectors differ in terms of distributions of CEO's in ways that go beyond what is captured by measures of central tendency. Across sectors, the distribution of frequencies over the study period differs in terms of variance, skewness, and kurtosis. As an example, the percentage of organizations with five or more permanent CEO's during the study period ranged from 50 percent for public agencies to 0 percent for universities. Likewise, the likelihood of having a small number of permanent CEO's over time differs substantially across sectors. During the study period, the percentage of organizations with only one or two permanent CEO's was 2.1% for federal agencies, 26.0% for universities, 37.0% for for-profit firms, and 50.5% for nonprofit organizations.

<<<Figure 3 Here>>>

<<<Table 3 Here>>>

In Figure 4, we present the distribution of the number of vacancy events for each sector. Here, a vacancy event corresponds to each instance in which there is at least one day without a

permanent CEO in an organization. During the 21-year study period, the average number of vacancy events was 0.72 for-profit firms, 0.80 for universities, 0.96 for nonprofit organizations, and 3.58 for federal agencies. Non-profit organizations had 33% more vacancy events while universities had 11% more vacancy events than did private firms. Federal agencies, on the other hand, had almost five times more vacancy events, on average, than private firms. This helps make clear that for three of the four sectors, the most common history is to have exclusively permanent leadership in place. This was not the case for federal agencies, however, where nomination and confirmation processes create a dynamic in which the median and modal number of interim appointments was four. For federal agencies, the distribution of vacancy events closely follows the distribution of permanent top executives.

Regarding the other sectors, distributions are positively skewed, present similar profiles, and have a peak at one vacancy event. These distributions are substantially different from those in Figure 3 which were not skewed and centered on two or three permanent CEOs. As shown in Table 4, a one-way ANOVA finds the public sector to be significantly different from the rest. The data thus suggest that for-profits, non-profits, and universities are able to manage CEO turnover events without vacancy in many cases. It also suggests that there are substantial differences across sectors in the probability of experiencing some period under interim leadership.

<<<Figure 4 Here>>>

<<<Table 4 Here>>>

It should also be noted that, although data on state and local bureaucracies are outside of the scope of the current study, it is unclear whether data on vacancies will look somewhat different by government level. In order to get an initial glimpse of such a comparison, we

collected data on ten state agencies in New York for the 1993-2013 time period. Agencies included were required to meet two criteria: 1) the agency heads are appointed by the governor and approved by the legislature and 2) no missing information impeded tracking of agency head appointment, confirmation, and departure. The resulting ten agencies—the Department of Agriculture and Markets, Department of Corrections and Community Supervision, Department of Environmental Conservation, Banking Department, Insurance Department, Department of Health, Department of State, Department of Motor Vehicles, Department of Civil Service, and Department of Taxation and Finance—included 56 permanent agency heads and 33 interim agency heads. These agencies are not necessarily representative of all state agencies such that general conclusions should be made with caution. As such, we do not include these agencies in the main analysis below but argue these agencies tend to have some equivalent across many of the U.S. states and should provide some indication of whether state agencies are experiencing vacancies at similar rates as what we observe at the federal level.

While the state agency information was not all inclusive, the resulting trends were surprisingly similar to those found for federal agencies (additional information is available Figures A1-A4 of the appendix). The state agencies also had a median vacancy length greater than zero days (e.g., Figure 1 and A1), and the interquartile range of percent vacant time was actually higher than federal agencies (e.g., Figure 2 and A2). This suggests that while federal agencies are quite different from the private and non-profit sectors, they may not be so far removed from other levels of government (of course, data from a larger number of states would be required to increase the confidence in any such conclusion). Further, both the distribution of the number of permanent CEOs/agency heads (e.g., Figure 3 and A3) and number of vacancies (e.g., Figure 4 and A4) for our sample of state agencies was similar to those for our sample of

federal agencies. Interestingly, none of the state agencies in our sample had fewer than three vacancy events, which is not the case for the federal agencies in this study. Combined, these trends emphasize the need to develop better theory and empirical analysis related to vacancy in organizations, particularly those in the public sector.

Finally, including universities in this analysis presents the opportunity to compare organizations from different sectors in the same policy area. If sector, defined here by ownership, matters for vacancy, we might expect to see similar trends in the distribution of vacancy lengths and percent of vacant time among organizations that belong to the same sector. For example, the hiring of public university presidents might incorporate some of the same characteristics as those of federal agencies given the role of governors or governor-appointed governing board members in these staffing decisions. To examine this possibility, we compare public universities with public agencies and private non-profit universities with non-profit organizations.[6]

Figure 5 presents the distribution of vacancy time as the percent of total time for public and private non-profit universities. Private non-profit universities have a more skewed distribution as well as a concentration on the first bin (zero to two percent). While both distributions reach a maximum around 15%, the public university data is more evenly distributed over the range. The differences in the shape of this distribution suggest that university groups might better resemble their corresponding sectors rather than each other. Though not shown here, private non-profit and public universities are also quite different from each another with respect to the mean number of interim presidents (1.35 for public universities, 0.53 for private universities), as well as the likelihood of having no interim presidents (18.6% of public

[6] Most private universities in the United States are actually private non-profit organizations that reinvest their surpluses. Even though there are some private for-profit institutions of higher education in the U.S., none of these institutions met the criteria to be part of our sample.

universities, 59.7% of private universities). Public universities are thus much more likely to experience interim leadership than their private non-profit peer institutions.

<<<Figure 5 Here>>>

Figure 6 compares the distribution of vacancy time as percent of total time for public universities and federal agencies. Even though both distributions are positively skewed and peak at the first bin (zero to two percent), their overall shape is not the same. The distribution for public universities looks substantially narrower and more concentrated on the first bin. Moreover, the distribution for federal agencies presents a tail that goes beyond 15% which is the maximum value observed for public universities, and up to 30%. In this case, we cannot say that public universities match public organizations. A better match may perhaps be identified if state or local data on public agencies were used.

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Comparing private non-profit universities to the non-profit sector provides a slightly different story. As shown in Figure 7, the first bin (zero to two percent) represents the highest frequency in both distributions collecting about 70% of the data. The tails that correspond to the rest of the distribution are similar to each other, except for a local peak at 4-6% for private universities. Overall, fractions of vacant time show salient similarities between private non-profit universities and non-profit organizations, suggesting that sector does indeed matter.

Establishing a Research Agenda on the Causes and Effects of Executive Vacancies

Analyses of databases on executive transitions over a 21-year period provide evidence that there are substantial levels of variance among sectors with respect to the frequency and length of executive vacancies at the top of the organization. Although not altogether surprising, this finding is noteworthy because it moves several key propositions about executive transitions

and successions from the realm of speculation and anecdote to empirical validation. Support for these propositions is strong but is still subject to certain qualifications because of the nature of the data used in the analyses. In other words, the nature of these databases limits the types of organizations to which generalizations should be made. The findings cannot be extended with a high degree of confidence to all public agencies, non-profit organizations, for-profit firms, or colleges and universities.

With this caveat in mind, we develop a conceptual model with several hypotheses that can guide additional research about the causes and effects of observed differences in the frequency and length of executive vacancies. Rather than providing an exhaustive list of all possible hypotheses, we build a conceptual model of causes and consequences of executive vacancies and highlight some of the many possible venues for future research. As noted in Figure 8, the causes and consequences of the occurrence and length of executive vacancies are expected to be linked to factors at the environmental, organizational, and individual levels. Each level will contribute to vacancy and may be weighted to different degrees.

<<< Figure 8 here>>>

Causes of Vacancy- Environmental Factors

H_1: Instances of interim leadership will last longer in organizations in which higher levels of imposed political constraints—transparency, accountability, procedural safeguards, and the involvement of multiple stakeholders—are present.

We expect politics and political processes imposed on organizations will necessarily affect what levels of autonomy organizations have in replacing positions of leadership. Indeed, the role of political constraints cannot be underemphasized, as they are strictly enforced in public agencies while similar rules or structures imposed by governing boards in the private sector may

be suspended at times given majority support by the board. The epitome of the dynamic described in the first hypothesis can be found in federal agencies where high-level appointment in permanent status requires Senate confirmation. We expect that those positions which do not require such confirmation will not experience such gaps in permanent leadership. When processes are designed to ensure that organizational leaders are selected in a manner that is clear, carried out in public, and incorporates opportunities for the input of multiple stakeholders, it becomes very difficult to avoid gaps between successive leaders with permanent appointment.

The succession process for university presidents also provides an opportunity to examine this hypothesis more closely. For public universities, search processes, among many functions that may include the use of public funds, generally place a greater emphasis on transparency, accountability, procedural safeguards, and the involvement of multiple stakeholders than do private non-profit universities (Lake 2010). For example, the Association of Public and Land-Grant Universities (APLU) and the American Association of State Colleges and Universities (AASCU) partnered in 2007 to create the Voluntary System of Accountability Program for public institutions with the goal of providing accessible and transparent information that can be compared across institutions regarding undergraduate experiences and outcomes (see more at www.voluntarysystem.org). One would thus expect that interim leadership would last longer in public universities as opposed to private universities, just as our preliminary analyses suggest. More generally, some scholars have attributed the increases in CEO salaries and turnover that have occurred in the U.S. since the 1990s to accountability and transparency via press scrutiny and investor activism (Kaplan and Minton 2006).

This hypothesis can also be extended to consider sunshine laws, or those laws requiring that specific processes of public agencies must be open to the public. This may include

meetings, records, votes, and other types of actions or deliberations by government officials. Here, we expect that instances of interim leadership last longer when search processes are governed by explicit sunshine laws which may make it more time-consuming to attract quality candidates while complying with open records laws. While many states exempt personnel matters from open meetings requirements, some aspects of these processes may still be required in open meetings (e.g., the state of Georgia, see Pupillo 1993).

Finally, it should be noted that while this hypothesis is generally focused on the length of vacancy, there is some possibility that increased transparency may increase the occurrence of vacancy. In extending and adapting Holmstron's career-concerns model to more specifically consider transparency, Hermalin and Welsbach (2007) predict that improved information may increase the rate of CEO turnover (in addition to increasing CEO salary).

In developing this hypothesis, we do not mean to frame transparency and accountability policies in a purely negative light. Many consequences of such policies may be positive; the quality of candidates may be higher, candidates who would not have been considered may receive additional consideration, and organizations may be careful not to make missteps or shortcuts in decision making. Yet, it is not always clear when and how organizations are able to maximize these benefits while minimizing the costs of greater information collection and additional time with an executive vacancy which may lead to lack of direction in the organization (see more below).

H_{2a}: The greater the availability of strong replacement candidates, either inside or outside of the organization, the lower the frequency of CEO vacancies across sectors.

H_{2b}: The greater the availability of strong replacement candidates, either inside or outside of the organization, the shorter the length of CEO vacancies across sectors.

Neoclassical economic theory presumes that markets for labor have demand and supply curves, just like markets for goods. In a similar vein, we posit that the availability of potential replacements for incumbent CEO's might affect the likelihood that CEOs will be dismissed and leadership transition processes initiated. More specifically, if there do not appear to be viable replacement candidates, various stakeholders may be less likely to seek to dismiss a CEO or agency head even if s/he has a few apparent weaknesses. It is possible that the certainty of such weaknesses outweighs the uncertainty of determining who else might be willing and able to lead the organization. Additionally, when a CEO voluntarily departs the organization, the availability of qualified candidates in the labor supply should also lessen the length of a vacancy and the related search for a new executive.

This dynamic may also be affected by whether potential replacements are internal and/or external to the organization. Parrino (1997) concluded that low-performing CEOs are easier to identify and replace in industries consisting of similar firms as opposed to diverse industries. He also found that outsiders replaced the CEO 49.6% of the time when the termination was forced and the board of directors was looking for a change in comparison to 9.9% of the time when CEOs departed voluntarily. Dalton and Kesner (1985) found that New York Stock Exchange companies in the midrange of performance hire outsiders while low and high performers selected insiders. More recently, Petrovsky, James, and Boyne (2015) hypothesize that high performing agencies should hire successors with a high level of publicness fit while low performing agencies should seek moderate levels of publicness fit, though they do not specifically address the supply of these candidates.

Causes of Vacancy- Organizational Factors

H_{3a}: The frequency of top executive vacancy and interim appointments will differ across sectors and organizations based on their approach to succession plans.

H_{3b}: The length of top executive vacancy and interim appointments will differ across sectors and organizations based on their approach to succession plans.

These hypotheses are based on the notion that differences across sectors and organizations in the practice of succession planning are likely to affect the frequency and length of interim appointments. Those sectors and organizations that routinely develop and follow succession plans are expected to have both fewer and shorter interim appointments. Sectors and organizations are likely to be found to differ substantially in this regard. At one end of the continuum, research is expected to find that private firms practice succession planning more extensively than other organizations. At the other end of the continuum, it is expected that future research will confirm that the ability to conduct succession planning is severely constrained in the context of many public agencies, in which the opportunity for such plans is dependent on continuity of political leadership and constrained by nomination and approval processes as well as by other regulations and resource constraints. It should be noted, though, that the issue has not gone unnoticed at least for federal agencies. Congress required federal agencies to establish a chief human capital officer in 2002 when the Department of Homeland Security was created, and the GAO has since published recommendations on succession planning (United States General Accounting Office 2003).

State and local agencies may or may not be on the same page. In some public universities (e.g., State University of New York 2016), policies governing presidential search procedures explicitly preclude succession planning because search committees for new permanent leadership representing various stakeholders cannot be established until after it

becomes known that a vacancy is going to occur. Other state and local agencies may tilt in the opposite direction, requiring more planning for succession prior to the occurrence of a vacancy. While nonprofits do not typically face the same degree of fundamental institutional obstacles that federal agencies and other public organizations do, research has found that the vast majority of nonprofits do not have a succession plan for senior leadership. For instance, sixty nine percent of non-profits surveyed by Nonprofit HR Solutions in 2013 did not have formal succession plans, with many citing that such plans were not a top priority or that the organization was too small to need such a plan (Nonprofit HR Solutions 2013).

H_{4a}: Across all sectors, the frequency of top executive vacancies will be negatively associated with organizational size.

H_{4b}: Across all sectors, the length of top executive vacancies will be negatively associated with organizational size.

We expect that larger organizations—that we assume often become large because of high levels of performance—will be less likely to experience vacancies and will find it easier to fill vacant leadership positions with well-qualified candidates. Yet, to our knowledge, there is relatively little research related to this topic across multiple sectors. We start with the expectation that larger organizations have more resources and will be more likely to have some organizational slack. This organizational slack can create capacity to consider succession planning, especially where other demands are given higher priority by key decision makers (see research linking slack to innovation and learning such as Julnes and Holzer 2001, Moynihan and Landuyt 2009). Coupled with this slack, we expect larger organizations can compete for CEOs through their salient reputations and resources. For example, once an administrator becomes the

CEO of one of these organizations, they may have reached the top of the ladder and may be less likely to voluntarily leave for some other opportunity.

Of course, it may also be the case that larger organizations—if successful—have higher expectations of their CEOs and may be more willing to replace them if other candidates are readily available in the market. For example, Grusky (1960) found that the frequency of succession among a set of board positions was positively related to firm size, which was hypothesized to be related to bureaucratization. Similarly, in a study of German universities, Röbken (2007) reporting a positive relationship between organizational size and presidential turnover, though he also found that as financial endowments increased, presidential tenures also increased. Further research on the relationship between organizational size and the likelihood of CEO vacancy is of clear importance. Research should examine alternative measures of size—budget, size of financial endowment, number of personnel, and so forth—as well as other measures of maturity and stability (e.g., age).

H_{5a}: Organizations with lower levels of performance will experience more frequent CEO vacancies.

H_{5b}: Organizations with lower levels of performance will experience longer-lasting CEO vacancies.

Low-performing organizations are more likely to experience pressure to replace leadership (e.g., McEachern 1975, Wiersema and Bantel 1993), which is expected to lead to more frequent vacancies. When an organization is not performing well, stakeholder groups, political principals, and clientele may pressure the organization to pursue personnel change. The executive could represent a scapegoat in some cases, or turnover at the top may be needed to make a meaningful shift in organizational priorities and policies (Salanick and Pfeffer 1980).

Thus, regardless of the extent to which the executive can influence performance, he or she will feel performance pressure and may be dismissed from the organization should the organization be lacking, or perceived to be lacking, in this area (Shen and Cho 2005).

When the CEO leaves, the underperforming organization will face a vacancy that needs to be filled. It is possible, however, that low levels of organizational performance extend to the management of search processes. If the organization is focused on turnaround efforts or attempting to minimize loses, they may not be prepared to quickly fill a vacancy at the top of the organization, as this requires some resources. Further, high-quality candidates may be less likely to find it attractive to assume leadership of low-performing organizations which could lead to failed searches. Of course, it could also be the case that some individuals willingly pursue these openings in an attempt to build their reputations as they climb personnel ladders. When a CEO is able to successfully lead an organization out of a crisis, it becomes material for case studies and popular news stories.

Causes of Vacancy- Individual Factors

H_6: Organizations with an unexpected CEO departure will experience longer-lasting vacancies.

Unexpected CEO or agency head departures may be the result of a sudden job change, death or illness, or, in some cases, unplanned removal by politicians or other stakeholders. When departure at the top is not anticipated, then reaction to departure and attempts to find a replacement is likely to be slower to start compared to instances when exit (whether voluntary or involuntary) has been anticipated in some way (e.g., announcing departure far in advance, internal plans for replacement after a forced departure, etc.). Particularly given that executives may leave for a number of reasons—political pressure, retirement, opportunities in other

organizations or other sectors—it can sometimes be difficult for organizations to eradicate all uncertainty of departure.

Though unexpected departures are expected to increase vacancy time across all sectors, we also expect such departures to carry more weight in some sectors compared to others. When little notice is provided, an organization must often still meet to discuss options, interview potential candidates, and make a hiring decision. This process is likely to take longer in public agencies, where hiring rules and other state or federal processes must be followed with few exceptions. For private or perhaps non-profit organizations, rules regarding hiring may be suspended more easily by the governing board or other C-Suite executives; even these rule suspensions may require majority support among various groups. On the other hand, where vacancies are well anticipated with plenty of notice, organizations in all sectors have greater opportunity to partake in more detailed succession planning and the process of searching for a permanent replacement to take over once the outgoing executive leaves.

Consequences of Vacancy- Environmental Factors

H_7: Longer lasting interim CEO appointments will lead to lower perceptions of organizational stability by stakeholder groups.

When shifting to the consequences of vacancy and executive transition, we expect that the longer an interim CEO is in place, the lower the perception of the organization by stakeholder groups (see, for example, discussion of stakeholders and uncertainty in Rueda-Manzanares, Aragon-Correa, and Sharma 2008). This may be due to several questions that arise from such uncertainty. First, stakeholder groups may question the ability of the organization to function if succession processes appear slow, unorganized, or incompetent. This could have some short-term consequences in how stakeholders interact with the organization, and it may

also lead to long-term effects should the availability of monetary or social capital decline during this period. Second, multiple groups, including donors, clientele, and interest groups may question the extent to which the interim CEO is given power to make decisions that stray from routine business and allow for change and innovation while the organization is seeking a new permanent executive (see hypotheses 9_a and 9_b below as well as Hambrick 1991 and Ballinger and Marcel 2010). Even networks with other organizations within the same sector or in other sectors may be questioned, as nodes in the network could be hesitant about whether decisions will be changed or reversed once a permanent CEO or agency head is in place.

Consequences of Vacancy- Organizational Factors

H_{8a}: More frequent interim CEO appointments will lead to more frequent interim appointments at other levels of the organization.

H_{8b}: Longer lasting interim CEO appointments will lead to longer lasting interim appointments at other levels of the organization.

This hypothesis argues that vacancies beget vacancies. The CEO is often involved in hiring other executives and managers in the organization (Hiller and Beauchesne 2014). It can prove difficult to successfully recruit other members of the top management team when there is uncertainty about the person to whom the individual would report (for example, see federal agencies at the end of presidential terms such as Shenon 2007). For this reason, organizations may tend to defer other senior searches until the top-level position is filled, though little to no research exists on the details of these processes. Moreover, the effects of vacancies may propagate down the organizational chart. In many contexts, an interim appointment at the CEO level makes it more likely that there will be an interim appointment at the next highest level, which will make it more likely that there will interim appointments at the third level, and so on.

The effects of frequent and lengthy interim CEO appointments are likely to reverberate throughout the organization until a more permanent CEO is announced.

H_{9a}: Across sectors, longer periods of vacancy will be associated with lower levels of innovation in an organization.

H_{9b}: Across sectors, higher frequencies of vacancy will be associated with lower levels of innovation in an organization.

Lower effort levels and less certainty may also threaten trust, creativity, and work satisfaction (Browning and McNamee 2012). As such, we argue that periods of vacancy are more likely to affect some types of organizational performance than others. For example, vacancies and interim leadership will be less likely to have a detrimental effect on the routine operations of the organization that require little discretion or complex decision making than on advanced, innovative, and strategic activities.

Significant changes in organizational mission, vision, objectives, or culture take time to achieve. Success in such change often relies on support and commitment from top-level managers (Fernandez and Rainey 2006). Frequent turnover in the CEO position is therefore likely to interfere with achievement of lasting organizational change, if change is indeed the objective. This proposition is likely to vary by organizational structure and, consequently, organizational sector, given that boards may direct long-term change at a higher order than some CEOs. For example, Westphal and Fredrickson (2001) find that the experience of the board of directors can sometimes trump the linkage between CEO actions and strategic change (see also Pugliese et al. 2009). For public agencies, politics may also intercede planned process and strategies.

H_{10}: Longer periods of vacancy will be associated with lower organizational performance.

While low performance may encourage the departure of a CEO, it may also be the case that such a departure and a subsequent vacancy can further threaten to erode organizational performance. While this may raise questions of whether organizational performance should be on the left or right side of the equation, similar issues have been raised in considering employee turnover and different levels of the organization. For example, Boyne et al. (2011) and Lee and Jimenez (2010) find that performance influences turnover rates and succession while Meier and Hicklin (2007) and Hur (2013) discuss the extent to which turnover affects organizational performance.

During times when no permanent leader is in place, we hypothesize that organizational performance will tend to be lower. In many cases, interim CEOs see their role as maintaining stability and moving staff along the path set by the previous permanent leader (Everly 1994, Ballinger and Marcel 2010, though see some contradictory evidence in the typologies in Browning and McNamee 2012). If the previous CEO was dysfunctional, such stability may be beneficial, but inaction may become a problem during periods of vacancy. Some amount of organizational energy has to be dedicated to finding a new executive as opposed to the performance of regular day-to-day duties (Everly 1994). Further, unexpected events or policies may require some level of proactive behavior or reactiveness despite whether the CEO is permanent or temporary. Routine changes in top-level officials may also incentivize careerists to complete tasks with less effort since such tasks may be ignored or even reversed by a new top-level official (O'Connell 2008). In other words, work done during a vacancy can be easily undone, and this may incentivize stagnant or suboptimal organizational performance during the vacancy period, even for average or high performing organizations. This may be especially

relevant to public agencies, where the polarization of political parties and periods of party switching further increase the likelihood of policy reversals.

Some contingencies are likely to be detected when researching this hypothesis. For example, the effect of a vacancy on performance may be dependent on the state of organizational performance when a permanent CEO leaves (see some similar discussion of the transition from one executive to the next in Boyne et al. 2011 and Petrovsky, James, and Boyne 2015). It may be the case that a voluntary departure of a talented CEO from a high performing agency means that some loss in performance is inevitable but can be minimized. For organizations experiencing a drop in performance, the goal of an interim may be to slow or stop such a loss or to maintain the current level of performance. In persistently underperforming organizations, the interim CEO may be encouraged to maintain the organization in the short-term or to try a few new strategies to bump performance, particularly given that there may be less to lose if performance is already quite low. Similar to much of the work by O'Toole and Meier in modeling organizational performance (O'Toole and Meier 2003, O'Toole and Meier 1999), we argue that additional contingencies may be based on organizational structures such as level or hierarchy, centralization, and complexity. As an example, in highly centralized organizations where more decisions are made at the top, an executive vacancy is likely to have a larger effect on the organization as compared to decentralized agencies or firms.

Consequences of Vacancy- Individual Factors

H_{11}: Longer interim CEO appointments will lower the likelihood of hiring a permanent CEO with a high level of fit.

Executive fit, referring to the congruence between a CEO and her organization or environment, has been discussed to some length in literature on private firms (Kristof-Brown et

al. 2005) and has gained some attention in recent years in public administration literature (Christensen and Wright 2011; Petrovsky, James, and Boyne 2015; Rutherford 2017). In this hypothesis, we generally assume that organizations will seek to hire a permanent CEO who has a high level of (perceived) fit with the organization. The longer the interim CEO is in place and the longer the search process, however, the more difficult it may become to identify which individuals have a high level of congruence with the organization and its environment. This may be due to a few mechanisms. First, fatigue by those tasked with finding a new permanent CEO could increase the likelihood of the use of shortcuts or lower standards in order to complete the search and fill the position. Second, it may also be that qualified candidates become wary of a position that has remained vacant for a long period of time (just as one might question the quality of a home that has not sold for several months). As related to earlier hypotheses, it could be that low performing agencies experience will experience longer periods of vacancies as compared to their higher performing counterparts; Petrovsky, James, and Boyne (2015) have hypothesized that these organizations may be aided by hiring an individual with a moderate amount of fit so that they can both bring new ideas to the organization but also understand the context in which the organization operates.

It is also possible that any linkage detected between the length of vacancy and executive fit is nonlinear. While a long search may impede attempts to secure a permanent CEO with a high level of fit, it may also be that an extremely short search produces the same result. This might be the case when organizations do not consider an adequate number of options for who might assume leadership of the company (of course the costs and benefits of this strategy would need to be weighed against the costs and benefits of having a slightly longer vacancy in the organization).

Conclusion

The purpose of this study is to raise the issue and importance of executive vacancies in organizations. While vacancies have been widely described and debated in specific instances, they have not been the subject of formal evaluation in the field of public administration. In fact, research on vacancies to date has originated in other fields and has been limited to a unique set of positions—U.S. federal executives that are influenced by a nomination and confirmation process—which are not easily comparable to other types of organizations. The data used here reveal significant differences across sectors, particularly when comparing federal agencies to private and non-profit organizations and well as to highly ranked universities. From these data, we proposed a conceptual model and discuss eight hypotheses, though we are aware many more propositions may emerge when work moves forward on the timing of vacancies and the decision to employ interim chief executives.

We also recognize possible challenges in collecting data that are comparable across organizations. Yet, such challenges are common in the field, and this should not deter scholars from moving forward to pursue questions that have yet to be addressed. Better production functions of the contexts in which vacancies occur and in which interim leaders are needed are useful as theoretical and practical tools for scholars and practitioners alike. It is likely the case that lab or field experimentation would be a difficult first step to flesh out this underexplored area. Instead, scholars can gather panel data on a number of organizations to take a first step in getting at mechanisms that can help to explain the vacancy trends we have noted in this study.[7] As an example, with the data currently in hand, this team is next able to consider specific

[7] We have spoken to colleagues collecting such data in the context of European and South American organizations. Such work could lead to potential cross-national work on vacancies. We do not know if and when these data will be available for public use. Others working on questions of turnover in the U.S. (e.g., Doherty, Lewis, and Limbocker 2015) have assembled data that can also likely extend to questions of vacancy.

hypotheses considering whether organizational characteristics and structures—size, prior performance, succession plan requirements, and more—correlate with either the instance of vacancy/no vacancy or the length of vacancies.[8] We can also turn to considering the effects of these phenomena on the organization. Reliable and valid ratings of agency performance will be necessary to carry out strong empirical tests regarding the causes and effects of lengthy vacancies, for example, and this is more likely to be possible within particular policy setting, such as educational institutions or hospitals where performance is more easily comparable across organization (e.g., student graduation, patient readmission). For example, with the higher education data, we can examine whether length of vacancy correlates with various shifts in budgeting, student enrollment, or the occurrence of vacancies at lower levels of the organization (such as vice presidents and deans).

Outside of these examples, researchers can compare vacancy trends in multiple, innovative ways using the same types of concepts related to vacancy as were used in this study. For example, the phenomena of vacancies in the federal government should be compared in a more detailed manner to state and local public agencies, where processes likely vary given different types of policies, practices, and regulations affecting timing and transparency. Sectors may also be compared across country contexts, such as considering vacancies and succession in the United States versus what occurs in the United Kingdom or other western democracies. Furthermore, other institutional contexts in the developing world can also present interesting contingencies on the phenomenon of vacancies.

This study raises more questions than answers in considering theory building around managerial succession, vacancies, and the use of interim leaders. That is precisely our intention,

[8] These data can be made available upon request to the authors.

and we have also provided the ability for many scholars to test the empirical propositions offered above. The frequency and length of vacancies in many organizations do not appear to be lessening or shortening, and the retirement of many career civil servants will challenge current norms and cultures in many organizations. Ideally, a comprehensive analysis of the questions and hypotheses we have raised here can lead to a better understanding of management and succession processes, and also to better practical planning by organizations.

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TABLES

Table 1. One-way ANOVA for vacancy as number of days per event

Bonferroni pair-wise comparisons			
	Public	For-Profit	Non-Profit
For-Profit	-119.94***		
Non-Profit	-40.37*	79.57***	
Higher Ed	-33.40	86.54***	6.972
F statistic = 20.99			
p value = 0.000			

*p values *<0.1, **<0.05, ***<0.01*

Table 2. One-way ANOVA for vacancy as percent of total vacant days

Bonferroni pair-wise comparisons			
	Public	For-Profit	Non-Profit
For-Profit	-6.87***		
Non-Profit	-5.24***	1.64*	
Higher Ed	-4.79	2.08***	0.44
F statistic = 24.69			
p value = 0.000			

*p values *<0.1, **<0.05, ***<0.01*

Table 3. One-way ANOVA for number of permanent CEOs

Bonferroni pair-wise comparisons			
	Public	For-Profit	Non-Profit
For-Profit	-2.34***		
Non-Profit	-2.66***	-0.32	
Higher Ed	-2.36***	-0.02***	0.30
F statistic = 49.31			
p value = 0.000			

*p values *<0.1, **<0.05, ***<0.01*

Table 4. One-way ANOVA for vacancy events

Bonferroni pair-wise comparisons			
	Public	For-Profit	Non-Profit
For-Profit	-3.16***		
Non-Profit	-2.91***	-0.25	
Higher Ed	-3.05***	-0.11	-0.14
F statistic = 103.99			
p value = 0.000			

*p values *<0.1, **<0.05, ***<0.01*

FIGURES

Figure 1. Vacancy length

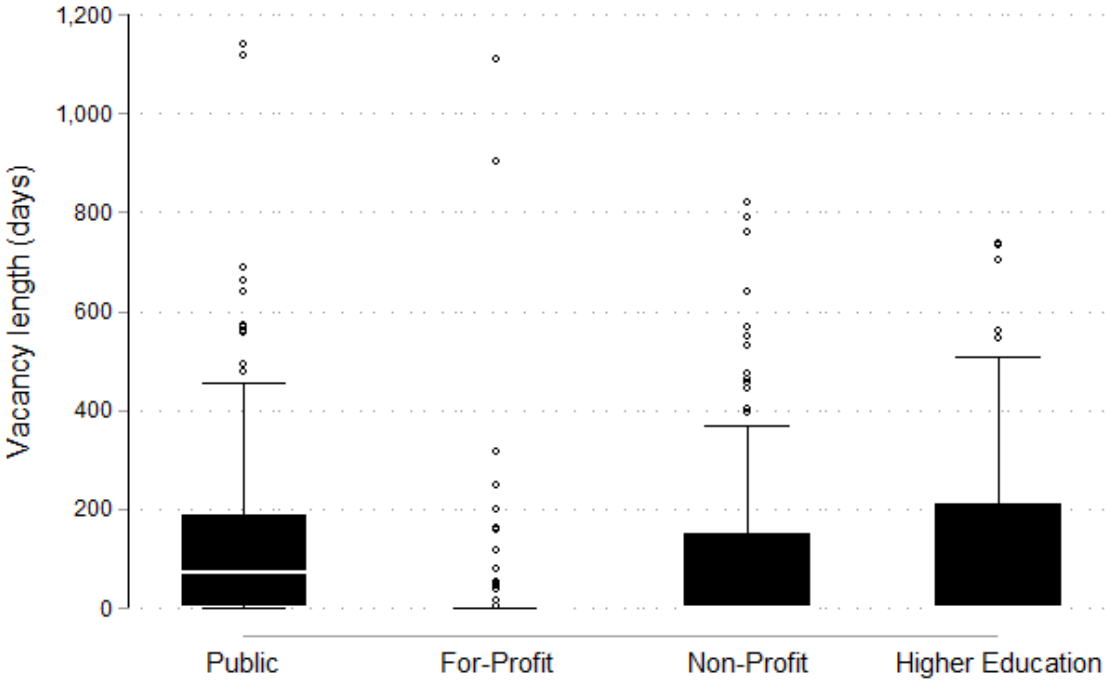


Figure 2. Percent of vacant time

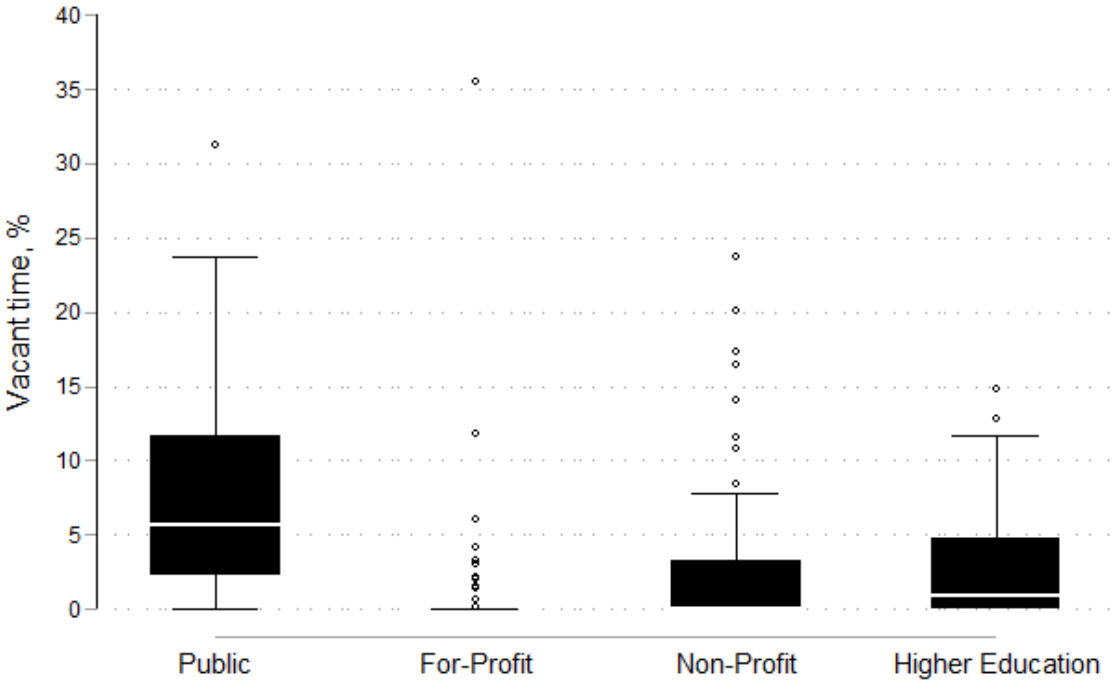


Figure 3. Number of permanent CEOs

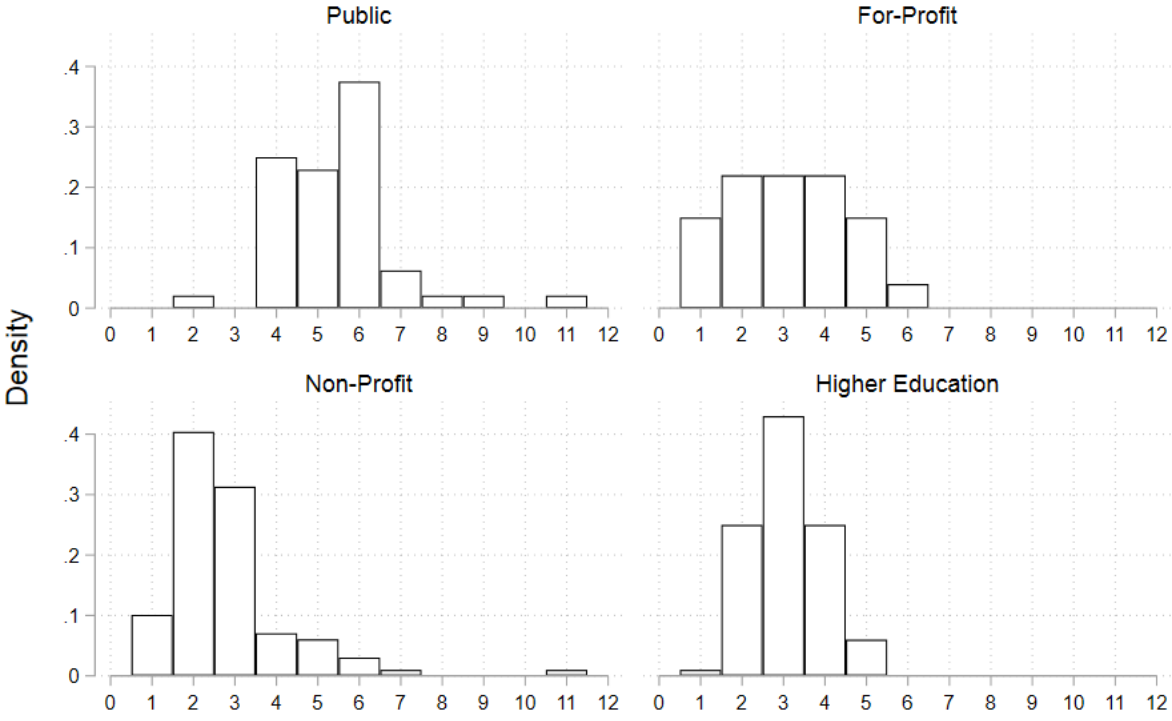


Figure 4. Number of vacancy events

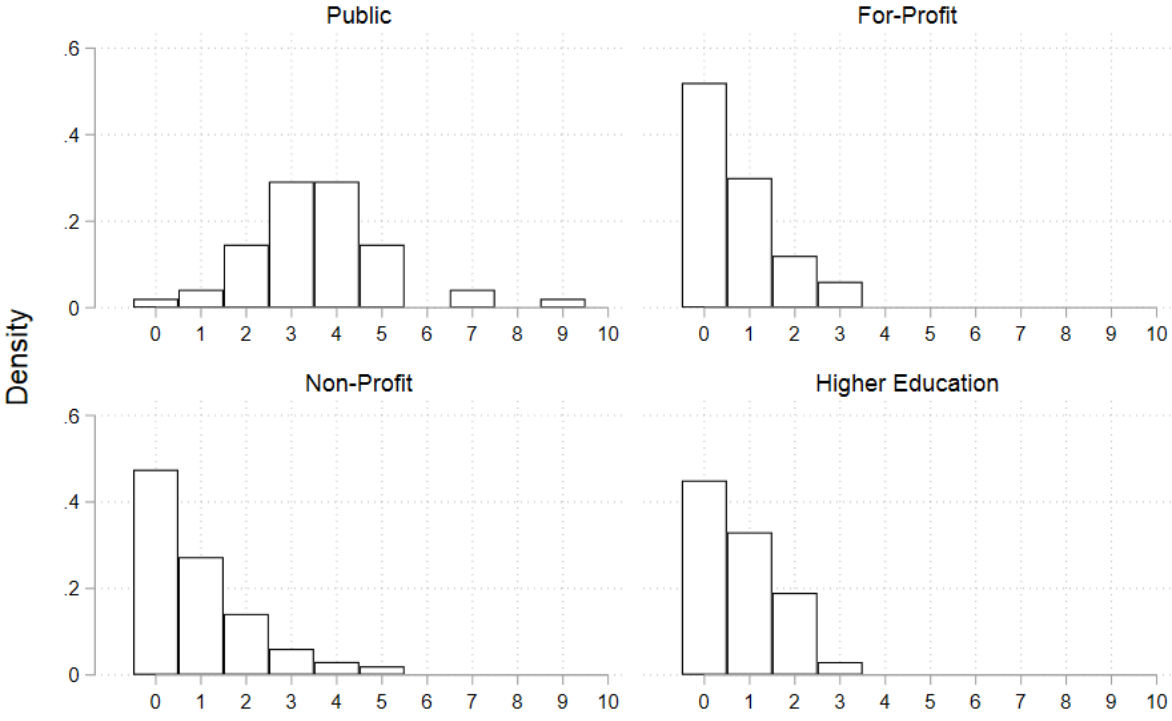


Figure 5. Vacant time for public universities and private non-profit universities

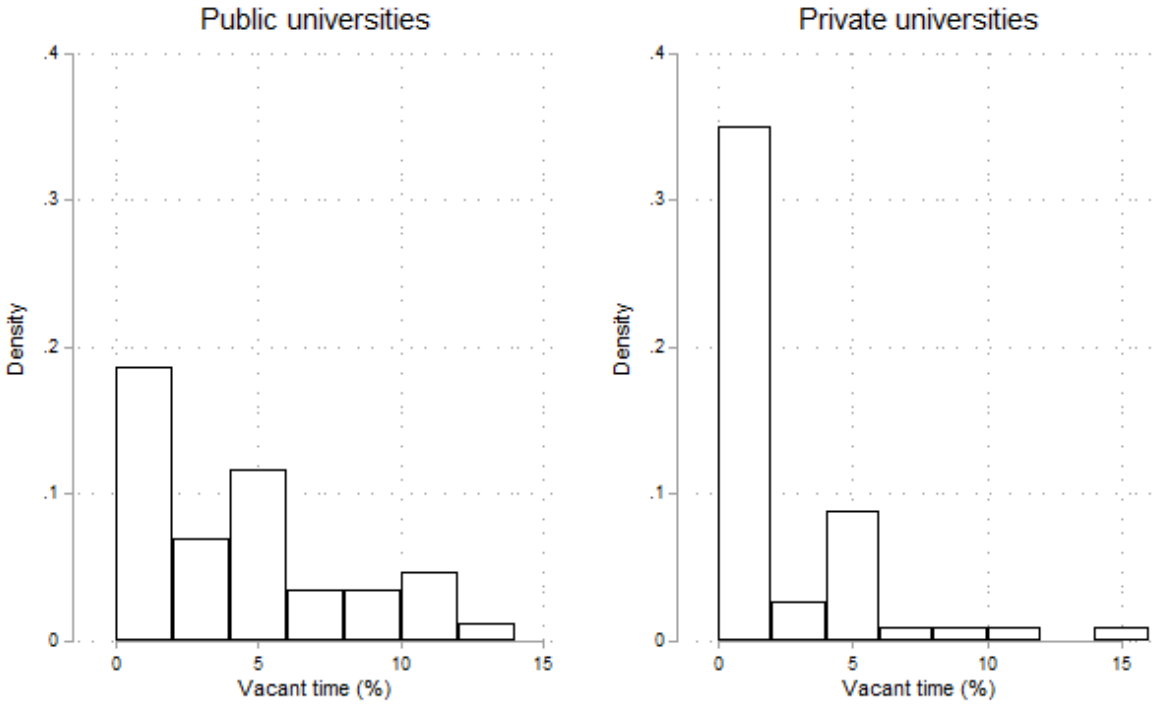


Figure 6. Vacant time for public universities and federal agencies

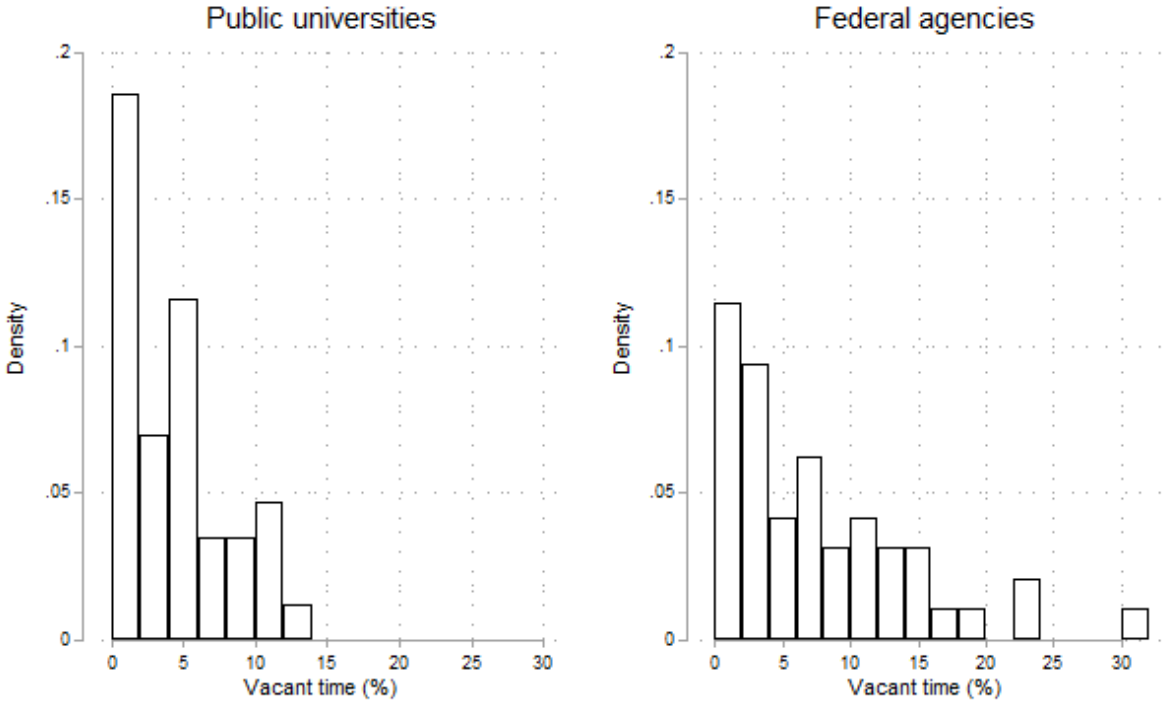


Figure 7. Vacant time for private non-profit universities and nonprofit organizations

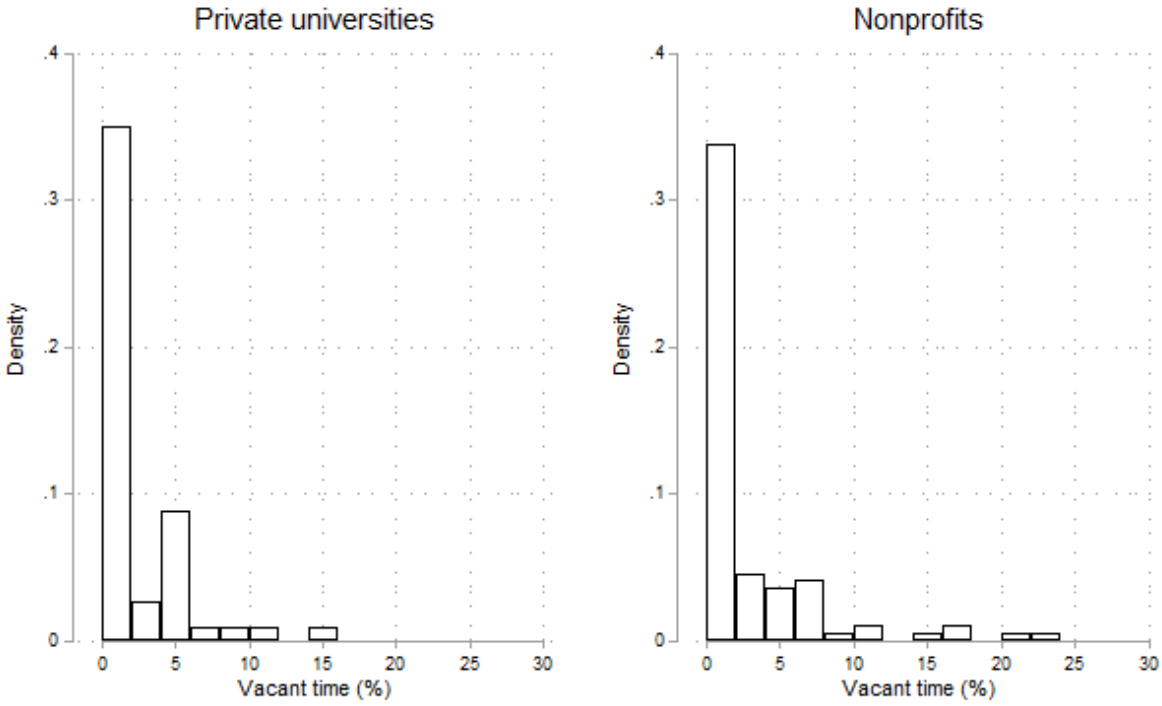
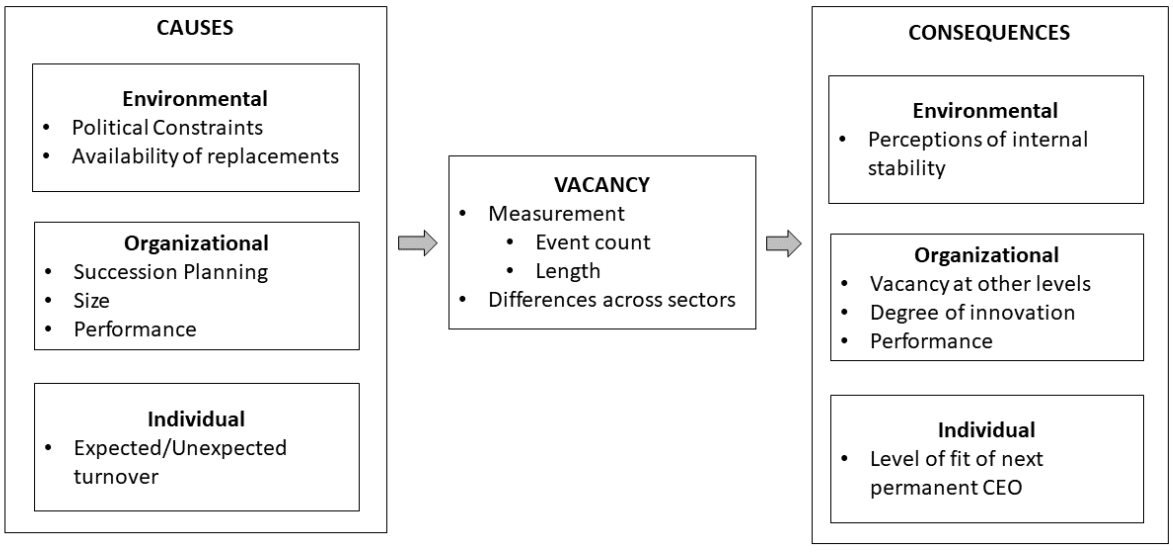


Figure 8. Conceptual Model of the Causes and Consequences of Executive Vacancy



APPENDIX

Table A1. Sample of Federal Agencies in the United States

#	Agency	2015 Outlays ($M)	#	Agency	2015 Outlays ($M)
1	Department of Health and Human Services	1,027,507	25	Federal Emergency Management Agency	9,384
2	Social Security Administration	944,122	26	Department of Commerce	8,958
3	Department of Defense	632,150	27	Federal Bureau of Investigation	8,153
4	Department of Treasury	485,623	28	United States Agency for International Development	7,228
5	Department of the Navy[a]	160,512	29	Environmental Protection Agency	7,007
6	Department of Veteran Affairs	159,216	30	National Science Foundation	6,837
7	Department of the Air Force[a]	153,567	31	Federal Reserve System[b]	3,875
8	Department of the Army[a]	150,887	32	Treasurer of the United States[c]	3,532
9	Department of Agriculture	139,115	33	National Park Service	3,061
10	Internal Revenue Service	128,881	34	Federal Railroad Administration	2,723
11	Office of Personnel Management	91,734	35	Fish and Wildlife Service	2,714
12	Department of Education	90,029	36	Food and Drugs Administration	2,393
13	Department of Transportation	75,425	37	Drug Enforcement Administration	2,387
14	Department of Labor	45,217	38	Small Business Administration[d]	1,126
15	Federal Highway Administration	42,606	39	Bureau of the Census	1,107
16	Department of Homeland Security	42,573	40	Central Intelligence Agency	514
17	Department of Housing and Urban Development	35,527	41	Peace Corps	384
18	Department of Justice	26,906	42	Federal Maritime Administration	378
19	Department of State	26,498	43	National Endowment for the Humanities	147
20	Department of Energy	25,424	44	National Endowment for the Arts	146
21	National Aeronautics and Space Administration	18,268	45	Office of Management and Budget	92
22	Federal Aviation Administration	15,641	46	United States Trade Representative	55
23	Department of the Interior	12,340	47	Office of National Drug Control Policy	24
24	Federal Transit Administration	11,909	48	Office of the Surgeon General[e]	12

Source: "Federal budget by agency and account, FY2017 budget explanatory note" (OMB, 2016) except for: [a] National defense budget estimates for FY2018 (DOD, 2017), [b] "2017 Reserve bank budgets" (Board of governors of the Federal Reserve System, 2016), [e] estimated outlays for the Office of the Assistant Secretary for Health from "Fiscal year 2016: Justification of estimates for appropriations committees" (HHS, 2015). [c] Outlays for the United States Mint and the Bureau of Engraving and Printing before offsets. [d] Outlays before deductions.

Note: Cabinet-dependent agencies are listed in gray. The outlays of cabinet-dependent agencies (e.g. Federal Highway Administration) are also counted as part of the respective cabinet-level agency (e.g. Department of Transportation).

Table A2. 2016 Fortune 500 Top 100 Private Firms in the United States

#	Organization	2015 Revenue ($M)	#	Organization	2015 Revenue ($M)
1	Walmart	485,651	26	Cardinal Health	91,084
2	Exxon Mobil	382,597	27	Boeing	90,762
3	Chevron	203,784	28	Citigroup	90,646
4	Berkshire Hathaway	194,673	29	Amazon.com	88,988
5	Apple	182,795	30	Wells Fargo	88,372
6	General Motors	155,929	31	Microsoft	86,833
7	Phillips 66	149,434	32	Procter & Gamble	84,537
8	General Electric	148,321	33	Home Depot	83,176
9	Ford Motor	144,077	34	Archer Daniels Midland	81,201
10	CVS Health	139,367	35	Walgreens	76,392
11	McKesson	138,030	36	Target	74,520
12	AT&T	132,447	37	Johnson & Johnson	74,331
13	Valero Energy	130,844	38	Anthem (prev. WellPoint)	73,874
14	UnitedHealth Group	130,474	39	MetLife	73,316
15	Verizon	127,079	40	Alphabet (prev. Google)	71,487
16	AmerisourceBergen	119,569	41	State Farm Insurance Cos.	71,160
17	Fannie Mae	116,461	42	Freddie Mac	69,367
18	Costco	112,640	43	Comcast	68,775
19	HP	111,454	44	PepsiCo	66,683
20	Kroger	108,465	45	United Technologies	65,100
21	J.P. Morgan Chase	102,102	46	AIG	64,406
22	Express Scripts Holding	100,887	47	UPS	58,232
23	Bank of America Corp.	95,181	48	Dow Chemical	58,167
24	IBM	94,128	49	Dell *	58,120
25	Marathon Petroleum	91,417	50	Aetna	58,003

Table A2 Cont.

#	Organization	Revenue ($M)	#	Organization	Revenue ($M)
51	Lowe's	56,223	76	Tesoro	40,052
52	ConocoPhillips	55,997	77	Liberty Mutual Insurance Group	39,796
53	Intel	55,870	78	United Continental Holdings	38,901
54	Caterpillar	55,184	79	New York Life Insurance	38,680
55	Prudential Financial	54,123	80	Oracle	38,275
56	Pfizer	49,605	81	Morgan Stanley	37,953
57	Disney	48,813	82	Tyson Foods	37,580
58	Humana	48,500	83	Safeway	36,643
59	Enterprise Products Partners	47,951	84	Nationwide	36,257
60	Cisco Systems	47,142	85	Deere	36,067
61	Sysco	46,517	86	Dupont	36,046
62	Ingram Micro	46,487	87	American Express	35,999
63	Coca-Cola	45,998	88	Allstate	35,239
64	Lockheed Martin	45,600	89	Mondelez International	34,244
65	FedEx	45,567	90	TIAA	34,230
66	Johnson Controls	43,855	91	INTL FCStone	34,063
67	Plains GP Holdings	43,464	92	MassMutual	33,572
68	World Fuel Services	43,386	93	Sprint *	32,180
69	CHS	42,664	94	Sears Holdings	31,198
70	Merck	42,237	95	General Dynamics	30,852
71	Best Buy	41,903	96	Philip Morris International	29,767
72	Delta Air Lines	40,362	97	Abbott Laboratories	22,323
73	Honeywell International	40,306	98	Hess	21,015
74	HCA Holdings	40,087	99	Supervalu	18,390
75	Goldman Sachs Group	40,085	100	News Corp.	8,574

Source: “Fortune 500 2016” (Fortune 2016).

Note: Sprint and Dell did not appear in the 2016 Fortune 500 list but were part of the list until 2013. Dell became a private company in 2014 and stopped sharing its revenue information publicly. Meanwhile, Sprint was mostly acquired by another company in 2014.

Table A3. 2016 NonProfit Times Top 100 Non-Profit Organizations in the United States

#	Organization	2015 Revenue ($M)	#	Organization	2015 Revenue ($M)
1	The Y (YMCA of the USA)	7,284	26	Compassion International	768
2	Goodwill Industries International	5,600	27	AmeriCares	742
3	United Way	3,887	28	Catholic Relief Services	731
4	Catholic Charities USA	3,721	29	YWCA	700
5	The Salvation Army	3,530	30	International Rescue Committee	689
6	American Red Cross	2,727	31	Save the Children	641
7	Feeding America	2,201	32	Samaritan's Purse	594
8	Boys & Girls Clubs of America	1,805	33	MAP International	547
9	Habitat for Humanity	1,771	34	Cru (Campus Crusade for Christ)	543
10	International Task Force for Global Health	1,661	35	C.A.R.E.	530
11	Smithsonian Institution	1,355	36	U.S. Fund for UNICEF	515
12	Planned Parenthood Federation of America	1,296	37	Fred Hutchinson Cancer Research Center	486
13	Dana-Farber Cancer Institute	1,203	38	Metropolitan Museum of Art	474
14	Volunteers of America	1,196	39	PBS	473
15	ALSAC/St. Jude Children's Research Hospital	1,182	40	Clinton Foundation	472
16	Food For The Poor	1,158	41	Step Up For Students	458
17	World Vision	1,005	42	Feed the Children	451
18	The Nature Conservancy	959	43	The Carter Center	408
19	Direct Relief	889	44	New York Public Library	404
20	American Cancer Society	838	45	Wounded Warrior Project	399
21	Patient Access Network Foundation	819	46	Museum Of Modern Art	385
22	Boy Scouts of America	815	47	Cross International	384
23	Girl Scouts of the USA	808	48	Good360	383
24	American Heart Association	780	49	American Bible Society	369
25	Shriners Hospitals for Children	769	50	Doctors Without Borders	351

Table A3 Cont.

#	Organization	Revenue ($M)	#	Organization	Revenue ($M)
51	Metropolitan Opera	335	76	National Jewish Health	244
52	Pew Charitable Trusts	331	77	Kennedy Center for the Performing Arts	239
53	Mercy Corps	329	78	Brothers Brother Foundation	238
54	New York Presbyterian Fund	324	79	ChildFund International	232
55	Rotary Foundation	318	80	Woods Hole Oceanographic Institution	228
56	Alzheimer's Association	315	81	Ducks Unlimited	226
57	Art Institute of Chicago	313	82	UNCF	221
58	Catholic Medical Mission Board	311	83	National Fish and Wildlife Foundation	220
59	Young Life	307	84	World Wildlife Fund	218
60	Teach For America	300	85	Museum of Fine Arts, Houston	216
61	Make-A-Wish Foundation	295	86	UJA-Federation of New York	215
62	Christian Broadcasting Network	294	87	The Conservation Fund	215
63	Special Olympics International	293	88	National Multiple Sclerosis Society	215
64	Wildlife Conservation Society	292	89	Susan G. Komen for the Cure	213
65	Mental Health America	286	90	Scholarship America	210
66	American Museum of Natural History	284	91	Jewish Federation of Metropolitan Chicago	208
67	Leukemia & Lymphoma Society	282	92	National Gallery of Art	208
68	Boys Town 6	273	93	ASPCA	207
69	Marine Toys For Tots Foundation	268	94	JDRF	205
70	American Kidney Fund	265	95	Communities in Schools	205
71	The Christian and Missionary Alliance	260	96	Lincoln Center for the Performing Arts	200
72	Big Brothers Big Sisters of America	259	97	Harlem Children's Zone	197
73	Operation Blessing	256	98	NPR	197
74	Project HOPE	254	99	Kingsway Charities	191
75	American Jewish Joint Distribution Committee	254	100	WGBH Educational Foundation	191

Source: “The 2016 NPT Top 100” (NPT 2016).

Table A4. 2016 US News and World Report Top 100 Colleges and Universities in the United States

#	Organization	Revenue ($M)	#	Organization	Revenue ($M)
1	Princeton University	3,388	26	University of Virginia-Main Campus	3,201
2	Harvard University	6,140	27	Wake Forest University	1,227
3	Yale University	4,900	27	Tufts University	805
4	Stanford University	5,913	29	University of Michigan-Ann Arbor	6,713
4	Columbia University in the City of New York	4,399	30	University of North Carolina at Chapel Hill	3,099
4	University of Chicago	3,205	30	Boston College	927
7	Massachusetts Institute of Technology	4,596	32	New York University	4,928
8	Duke University	5,612	33	University of Rochester	3,417
9	University of Pennsylvania	7,582	34	College of William and Mary	442
10	Johns Hopkins University	5,218	34	Brandeis University	358
10	California Institute of Technology	2,338	36	Georgia Institute of Technology-Main Campus	1,563
12	Northwestern University	2,163	37	University of California-Santa Barbara	999
12	Dartmouth College	1,222	37	Case Western Reserve University	913
14	Brown University	920	39	University of California-San Diego	4,443
15	Vanderbilt University	4,131	39	University of California-Irvine	2,562
15	Washington University in St Louis	2,783	41	University of California-Davis	4,081
15	Cornell University	2,045	41	University of Illinois at Urbana-Champaign	2,647
18	University of Notre Dame	1,918	41	University of Wisconsin-Madison	2,546
18	Rice University	693	41	Boston University	1,778
20	University of California-Berkeley	2,846	41	Tulane University of Louisiana	901
21	Emory University	4,060	41	Rensselaer Polytechnic Institute	434
21	Georgetown University	1,263	47	Pennsylvania State University-Main Campus	5,148
23	University of California-Los Angeles	6,631	47	University of Florida	2,866
23	University of Southern California	4,245	47	Northeastern University	1,087
23	Carnegie Mellon University	1,247	47	Lehigh University	361

Table A4 Cont.

#	Organization	Revenue ($M)	#	Organization	Revenue ($M)
51	University of Miami	2,806	75	Indiana University-Bloomington	1,511
52	Ohio State University-Main Campus	5,627	75	University of Massachusetts-Amherst	1,133
52	University of Washington-Seattle Campus	4,983	75	University of Delaware	983
52	The University of Texas at Austin	2,764	75	Colorado School of Mines	255
52	Yeshiva University	493	75	Stevens Institute of Technology	231
52	Pepperdine University	310	75	Clark University	120
57	University of Connecticut	2,512	82	University of Iowa	3,158
57	University of Maryland-College Park	1,813	82	University of California-Santa Cruz	752
57	George Washington University	1,305	82	Miami University-Oxford	615
57	Worcester Polytechnic Institute	241	82	Texas Christian University	550
61	Purdue University-Main Campus	1,815	86	University of Denver	451
61	University of Georgia	1,476	86	Marquette University	419
61	Syracuse University	883	86	University of Tulsa	251
61	Clemson University	805	89	Stony Brook University	2,241
61	Southern Methodist University	589	89	University of Colorado Boulder	1,365
66	University of Pittsburgh-Pittsburgh Campus	1,895	89	University of Vermont	642
66	Brigham Young University-Provo	1,307	89	SUNY at Binghamton	490
66	Fordham University	558	89	North Dakota State University-Main Campus	450
69	University of Minnesota-Twin Cities	3,093	89	University of San Diego	316
70	Texas A & M University-College Station	3,107	89	SUNY College of Environmental Science and Forestry	85
70	Virginia Polytechnic Institute and State University	1,352	96	Florida State University	1,129
72	Rutgers University-New Brunswick	3,124	96	The University of Alabama	1,009
72	Baylor University	627	96	Saint Louis University	713
72	American University	547	99	Drexel University	1,055
75	Michigan State University	2,410	99	Loyola University Chicago	556

Source: “2016 Best National Universities” (US News & World Report 2016).

Table A5. Sample of State Agencies in New York

#	Agency	2015 Appropriations ($M)
1	Department of Agriculture and Markets	120.17
2	Department of Corrections and Community Supervision	2902.91
3	Department of Environmental Conservation	469.87
4	Banking Department	73.30
5	Insurance Department	200.10
6	Department of Health	3025.86
7	Department of State	66.57
8	Department of Motor Vehicles	104.29
9	Department of Civil Service	50.87
10	Department of Taxation and Finance	459.37

Source: "State Operations" (New York State 2015).

Figure A1. Vacancy Length, New York State Agencies Included

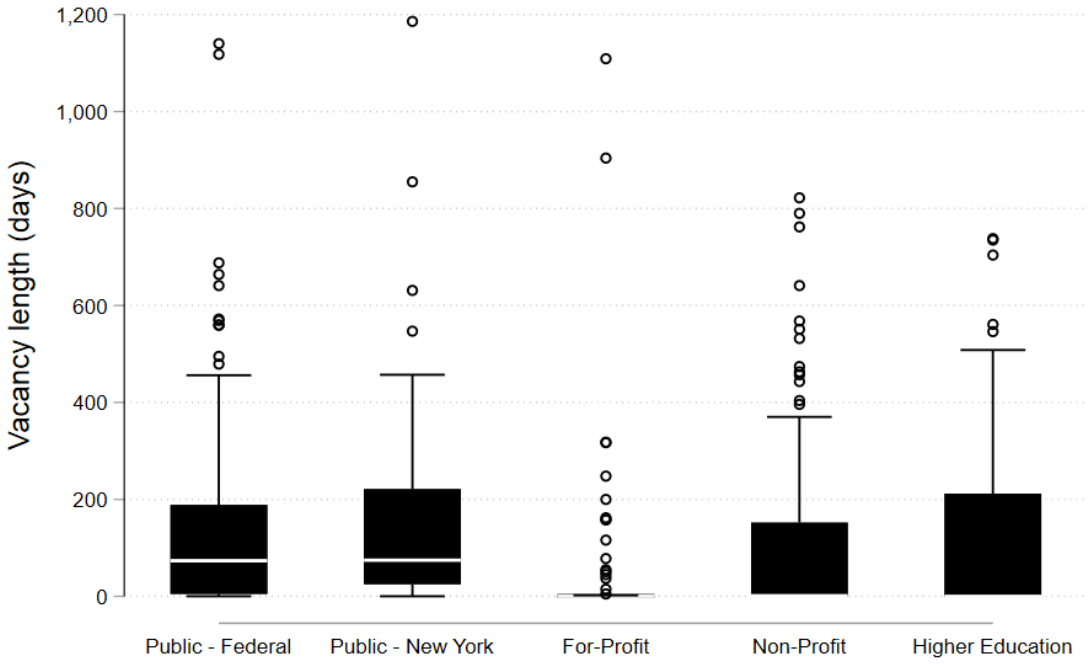


Figure A2. Percent of Vacant Time, New York State Agencies Included

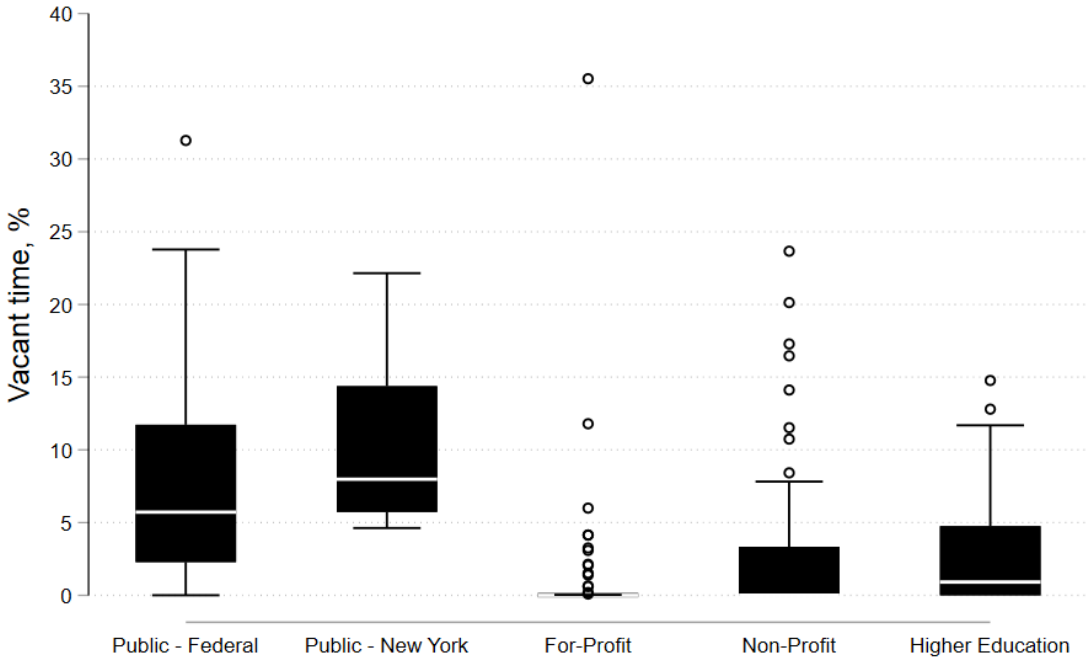


Figure A3. Number of Permanent CEOs, New York Agencies Included

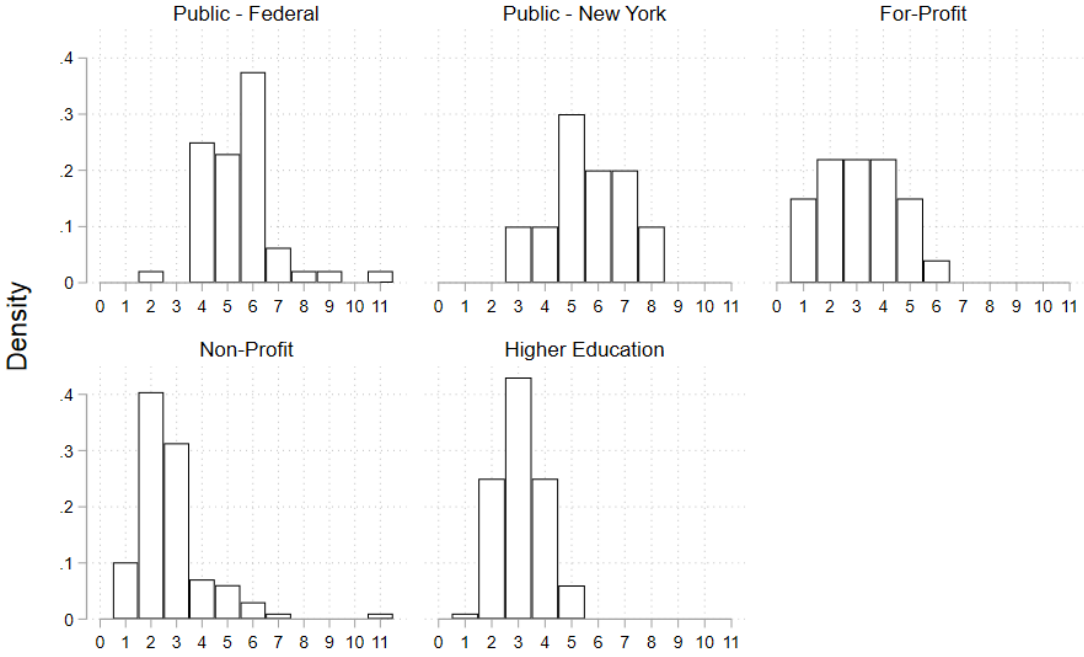


Figure A4. Number of Vacancy Events, New York State Agencies Included

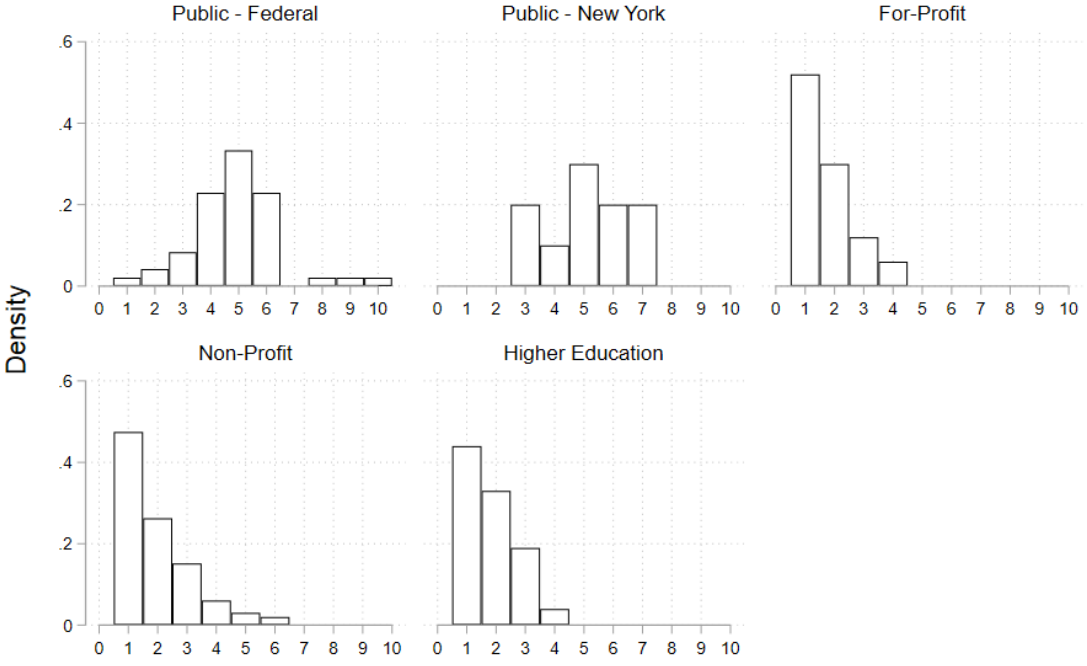


Figure A5. Vacancy Length for Federal Agencies by Presidential Administration

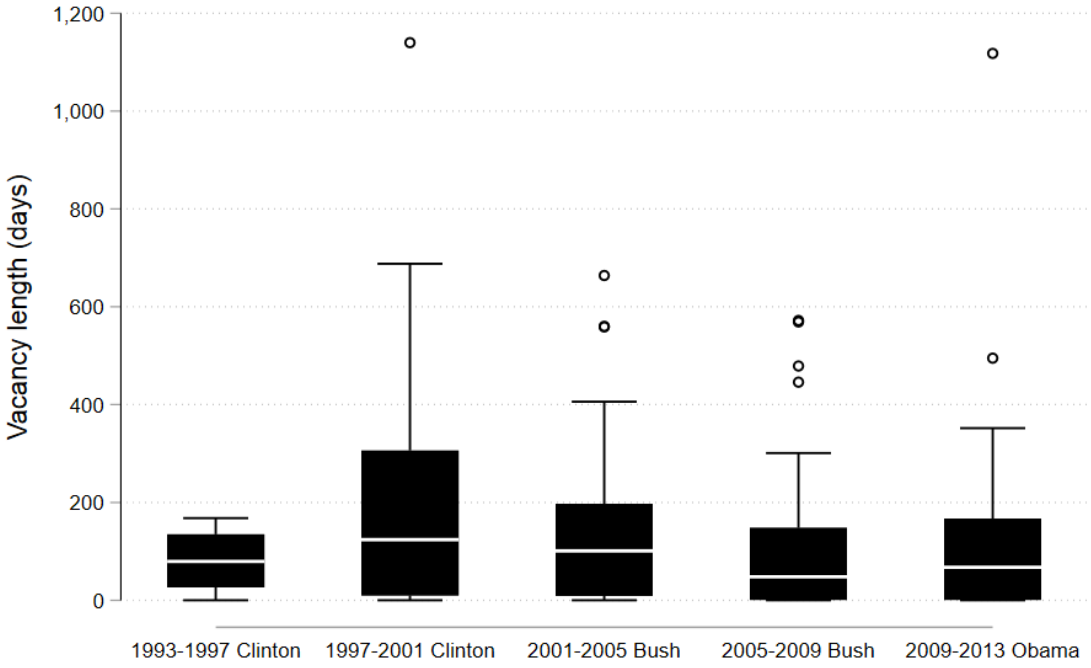
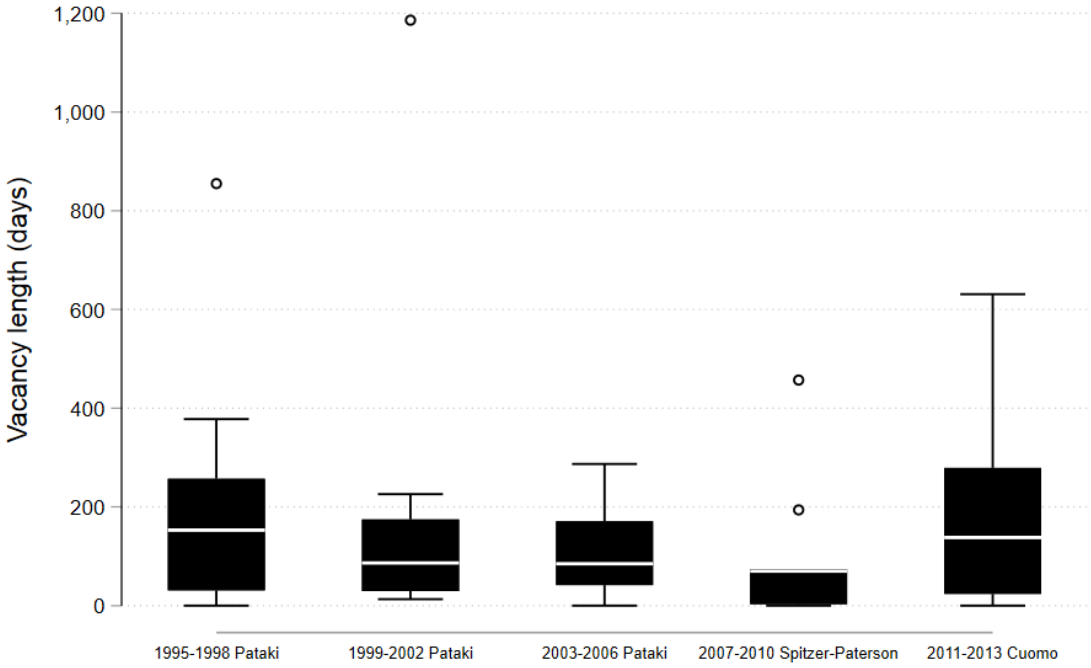


Figure A6. Vacancy Length for New York Agencies by Governor



Note: 2007-2010 corresponds to the administrations of two governors after Paterson resigned in a relatively short period of time.

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