

Shifting Administrative Intensity and Employee Composition: Cutback Management in Education

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Abstract

Many public organizations are increasingly confronted with substantive and unpredictable reductions of financial resources. Despite growing research attention to this issue, empirical investigation of the organizational consequences of decline and turbulence has been limited. This article aims to understand the combined effects of decline and turbulence on personnel, one of the largest expenditure categories in organizations. Analyses use data from 2- and 4-year public institutions of higher education in the United States from 1988 to 2012. Findings in this context suggest that while decline alone has little to no effect on staffing, turbulence is associated with larger effects that are moderated by decline. Two-year institutions more closely resemble operational, efficiency-oriented responses to turbulence, and 4-year institutions reflect a more strategic reaction.

Keywords

cutback management, administrative intensity, financial decline, higher education

Public organizations are increasingly confronted with organizational decline, or a “substantial, absolute decrease in an organization’s resource base over a specified period of time” (Cameron, Whetten, & Kim, 1987, p. 224), as a result of economic downturns and policies of austerity. In the wake of economic and financial uncertainty, some scholars have argued that an organizational state of decline has become a long-term reality for public organizations (Bozeman, 2010). Indeed, organizational decline is now the norm rather than the exception for many organizations (Cameron & Smart, 1998). Moreover, the declining financial resources of public organizations often coincide with environmental turbulence, or the degree to which changes in the environment are unpredictable (Boyne & Meier, 2009a). Unpredictability affects organizational responses to decline because it decreases the ability of decision makers to analyze a situation with high levels of certainty (Jick & Murray, 1982; Levine, 1979). Decline and turbulence—as well as their combined effects—are of importance to both practitioners and researchers of public management given the continual constrain of financial resources with which public organizations have to work.

Despite recent calls for systematic, longitudinal assessments of substantive and unpredictable decreases in financial resources in the public sector (Bozeman, 2010; Pandey, 2010), contemporary public management research has not resulted in a substantial body of evidence concerning the organizational effects of decline and turbulence. Generic management research on organizational decline indicates that declining financial resources are related to a range of dysfunctions, such as increased centralization, reduced

innovation, and lower employee morale (Brockner et al., 2004; Cameron, Whetten, & Kim, 1987). Public management research has especially highlighted the negative consequences of decline for employee well-being (Esteve, Schuster, Albareda, & Losada, 2017; Kiefer, Hartley, Conway, & Briner, 2015; Van der Voet & Vermeeren, 2017). Because empirical evidence on other effects of decline remains scarce (Bozeman, 2010), several authors have called for increased longitudinal evidence regarding the consequences of organizational decline (Pandey, 2010). Research on environmental turbulence has indicated that turbulence is disruptive for organizational decision-making, work processes, and ultimately organizational performance (Boyne & Meier, 2009b; Van den Bekerom, Torenvlied, & Akkerman, 2015). In particular, there is a need to examine the combined effects of decline and turbulence, as these concepts have only been studied separately (cf. Cameron, Whetten, & Kim, 1987).

In this study, we examine how public managers respond to declining and turbulent financial resources by means of cutback management. We focus our attention on staffing and personnel management following the argument by Anderson and Mark (1985) that, “the effects of budget reductions and

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fluctuations should eventually make themselves felt in terms of staff allocation” (p. 297). Furthermore, Bozeman (2010) claims that, “One interesting question is whether administrative intensity (the ratio of administrative employees to production or services delivery employees) rises or falls during periods of decline” (p. 560). As such, we study the extent to which managerial reactions via resource allocation have consequences for organizational structures and staff compositions in two ways. First, we assess the effects of decline and turbulence on administrative intensity, defined here as the size of the bureaucratic component of an organization. Second, we consider consequences of decline and turbulence for full-time front-line staff.

In this study, we examine the effects of decline and turbulence in institutions of higher education in the United States between 1988 and 2013. In this context, colleges and universities have recently received varied levels of state financial support, challenging their ability to consistently operate at the status quo. In addition to decline, these institutions can experience turbulence with regard to multiple resource streams that are needed for organizational stability. As perhaps evidenced by popular discussions of the role of adjunct faculty and administrative bloat, we consider higher education a prime context for considering the questions in which we are theoretically interested. Of note, our analysis is not based on individual-level managers but focuses on organizations with the assumption that managerial reactions will be manifested at the organizational level.

We aim to contribute to the literature on organizational decline and turbulence in three ways. First, we aim to better understand the linkage between financial decline and personnel in public organizations. Staffing is one of the largest expenditure categories in public organizations, but the relationships between organizational decline, administrative intensity, and staff composition have received limited research attention (Bozeman, 2010). Second, we account for the moderating effect of turbulence in the relationship between declining financial resources and personnel. Turbulence can disrupt organizational adaptation to financial decline by limiting the information that decision makers have at their disposal (cf. Boyne & Meier, 2009b). We therefore propose that turbulence may decrease the organizational effects of decline as decision makers prefer to maintain the status quo or delay organizational response to decline (cf. Karim, Carroll, & Long, 2016). A third contribution is that we compare and contrast organizational settings to further consider responses to decline and turbulence. In our context, 2- and 4-year public institutions in the United States have different organizational characteristics that may give rise to important variation in terms of organizational responses to decline and turbulence. Both types of institutions are confronted with threatened financial resources, but 4-year institutions should have more flexibility in resource allocation due to a greater diversity of tasks, more opportunities to grow alternative sources of funding, and larger possibilities for strategic maneuvering. While

most research on decline and turbulence examines a homogeneous group of organizations (e.g., Boyne & Meier, 2009a; Cameron, Whetten, & Kim, 1987; Freeman, 1979; Greve, 2003; Latham & Braun, 2009), the comparison in this study can provide insight on how organizational characteristics give rise to divergent responses to organizational decline and environmental turbulence.

In the sections that follow, the literature on organizational decline, turbulence, cutback management, and staff composition is reviewed, and theoretical expectations concerning the relationships between our central concepts are formulated. We then review our data sources and methodology before presenting the results of our analyses. Finally, we discuss the implications of our analysis for public administration research and practice.

Development of Knowledge on Decline, Turbulence, and Cutback Management

There are several reasons why organizational decline is a managerial challenge. One perspective highlights the direct negative effect of decline on organizations. Such dysfunctions include increased centralization and conflict as well as decreased morale and innovation (Cameron, Whetten, & Kim, 1987). Second, decline can alter the conditions and expectations under which managers operate. Organizational decline is a deviation from management under normal (stable) conditions and imposes constraints on managerial behavior (McKinley, 1987). For example, organizational decline may cause managers to attempt to buffer negative performance effects or maintain employee well-being (Van den Bekerom & Meier, 2016; Van der Voet & Vermeeren, 2017). Third, public managers must respond to decline to address its cause and ensure the survival of the organization in the long-term. This perspective emphasizes that decline forces managers to make difficult trade-off decisions in the form of cutback management. This area in particular has received attention in public management literature (for a review, see Raudla, Savi, & Randma-Liiv, 2015).

Cutback management can be defined as “managing organizational change toward lower levels of resource consumption and organizational activity” (Levine, 1979, p. 180). The challenge of cutback management is to balance short-term objectives of maintaining the organization’s budget with longer term goals such as maintaining or improving organizational performance and staff morale. Despite ample attention to the challenges that are inherent to cutback management, this line of research remains in many ways a “wisdom-literature” in the sense that the empirical investigation of managerial responses to organizational decline has remained limited. Much of the early literature consists of conceptual reflections (Behn, 1980; Jick & Murray, 1982; Levine, 1978, 1979; Whetten, 1980), supplemented by case study evidence (Murray & Jick, 1985). Notable exceptions are the work by Cameron, Whetten, and Kim (1987; see also Cameron, Kim,

& Whetten, 1987) on the organizational consequences of decline in U.S. higher education institutions and the work by Brockner and colleagues (Brockner et al., 2004; Brockner, Wiesenfeld, & Martin, 1995) and Kiefer et al. (2015) on employee reactions to cutback-related organizational change.

Organizational Effects of Decline on Staff Composition

The decisions that managers make about resource allocation are likely to have consequences for staffing within the organization (Anderson & Mark, 1985; Freeman & Hannan, 1975). We focus our attention here on two staffing considerations: administrative intensity and full-time versus part-time front-line employees. From a cutback management perspective, both are relevant because reducing the share of full-time employees or administrative positions is a viable strategy for maintaining operational capacity while reducing costs. From a theoretical point of view, it is likely that public managers will attempt to lower costs by implementing adjustments in terms of personnel rather than changes in strategy or organizational processes, because strategic and processual changes are more disruptive and thus more costly for the organization (Koberg, 1987). Generally, it can be expected that the frequency of organizational adjustments in response to decline will be positively related to the degree of resource scarcity experienced by managers. As described below, we argue that while organizational decline can be expected to be negatively related to the share of full-time front-line employees, it may not have such a negative effect on administrative intensity.

Decline and Front-Line Personnel

To develop theoretical expectations about the relationship between organizational decline and full-time front-line personnel, we draw from literature on nonstandard employment relations (Kalleberg, 2000) and the structuring of employment (Beard & Edwards, 1995; Pfeffer & Baron, 1988). Increasing shares of part-time employees can, in part, be ascribed to the supply side of the labor market, such as changes in workforce composition and worker preferences (Kalleberg, 2000). However, organizational factors may also contribute to this development. For instance, the politics of manpower budgeting in large—and especially public—organizations dictate that personnel authorizations cannot be exceeded. This means that public organizations without the means to hire permanent staff may still have the resources to hire staff for fixed terms or through part-time contracts (Pfeffer & Baron, 1988, p. 272). In addition, increasing the share of part-time workers may be seen as an attempt to shift power away from full-time professionalized staff to management (Giroux, 2002), resist unionization, or increase performance pressure on permanent employees (Pfeffer & Baron, 1988).

We argue that a decrease of the ratio of full-time front-line employees may be prevalent in times of organizational decline in public organizations for multiple reasons. First, institutional costs for different types of employees vary; part-time workers earn lower wages, even after controlling for education, experience, and other factors (Kalleberg, 2000). In addition, part-time work is often temporary work, and temporary workers regularly do not qualify for benefits. A decreasing ratio of full-time employees can thus be understood as an attempt to maintain organizational capacity while reducing costs. A second reason for a decreasing proportion of full-time employees in times of organizational decline is an attempt to increase organizational flexibility. This reason may be especially salient in settings that have traditionally favored long-term employment such as universities. The replacement of full-time employees by part-time employees allows managers to form a buffer workforce to absorb future financial fluctuations. This not only increases the capacity of organizations to make more fluid adjustments to staffing compositions, but it also allows organizations to protect a core group of highly valued professionals. When faced with environmental constraints, organizations may thus decide to devote resources to hiring part-time rather than full-time employees.

A third reason why organizational decline may lead to a drop in the full-time employee ratio in employee composition is grounded in resource dependency theory (Pfeffer & Salancik, 1975). In many public sector organizations like hospitals and universities, highly skilled professional employees are key drivers of organizational performance. Research on decline and cutback management has shown that in times of organizational decline, skilled employees will be more prone to leave the organization (e.g., Cameron, Whetten, & Kim, 1987). Decline may contribute to dysfunctional phenomena such as the “free exit problem” (Levine, 1978) and “cesspool syndrome” (Bedeian & Armenakis, 1998): the early departure of the most qualified personnel and the retention and even promotion of less qualified personnel. In an attempt to reduce dependence on skilled, permanent workers, declining organizations may attempt to hire part-time workers instead. Based on the above arguments, we formulate the following hypothesis:

Hypothesis 1: Organizational decline is negatively related to full-time front-line employees.

Decline and Administrative Intensity

An intuitive expectation concerning the relationship between organizational decline and administrative intensity is that the relative size of the administrative component of organizations will decrease in times of resource scarcity. For instance, it can be expected that declining organizations will try to decrease organizational complexity and will therefore reduce the size and scope of their administrative component (McKinley,

1987). A negative relationship between decline and administrative intensity could be understood as an attempt to simplify organizational goals. Alternatively, it could be expected that declining organizations will carefully prioritize primary processes central to the mission of the organization to maintain or stabilize performance. Managers may reason that employees who do not partake in these primary processes can be cut without compromising organizational outputs. From this perspective, administrative functions are seen as slack resources during times of decline.

A contradictory observation, however, is that administrative growth has outpaced front-line growth both in organizations experiencing decline and experiencing growth (Leslie & Rhoades, 1995). In situations of decline, this means that administrative intensity does not decrease at an equal rate as other types of employees and thus grows in relative size. McKinley (1987, p. 87) states that a major conclusion of research on decline and administrative intensity is that “the behavior of the administrative component during decline is not simply the reverse of that observed during growth.” This perspective suggests that the relative size of the administrative component behaves like a “bumperjack” in that it steadily increases during times of organizational growth but then does not come down again in times of organizational decline (Freeman & Hannan, 1975). Freeman (1979), for instance, demonstrates that the administrative function of school districts grows rapidly in periods of organizational growth and remains stable in times of decline. Freeman and Hannan (1975) also propose a more political explanation for why administrative intensity reductions are not evenly matched with cuts in front-line personnel by suggesting that cutback management decisions are typically made by individuals who are themselves located in the administrative component of the organization. Their status in the organization grants them more power to resist or delay cuts in their own departments.

Other scholars have proposed that the administrative component of the organization is spared from cuts because administration is needed to address and reduce the causes of decline. When financial appropriations are decreased, administrators are still required to apply for other appropriations or replace the lost appropriations with alternative sources of revenue (Anderson & Mark, 1985). As is proposed by Leslie and Rhoades (1995), “The more an institution emphasizes the generation of alternative revenues, the greater the proportion of resources that are directed to administrative units perceived as (potentially) generating such revenues” (p. 193). From these arguments, we expect that organizational decline will lead to a stable or increasing number of administrators in an organization, thereby increasing the relative size of the administrative component. We formulate the following hypothesis:

Hypothesis 2: Organizational decline is positively related to administrative intensity.

The Moderating Role of Turbulence

In contrast to decline, turbulence does not concern the amplitude or direction of changes in available financial resources but the predictability of such changes (Van den Bekerom & Meier, 2016). Cameron, Kim, and Whetten (1987, p. 225) describe turbulence as fluctuation in the available resources of the environment that are “nontrivial, rapid, and discontinuous.” More recently, turbulence has been conceptualized as the extent to which changes in the environment are unpredictable (e.g., Boyne & Meier, 2009b; Van den Bekerom & Meier, 2016). In this study, turbulence is thus defined as the unpredictability of fluctuations in the available financial resources that organizations have at their disposal. Turbulence results in uncertainty and is therefore disruptive for processes of managerial decision-making (Boyne & Meier, 2009a). We argue that turbulence is a relevant concept to take into account when examining managerial responses to decline (cf. Boyne & Meier, 2009a; Cameron, Kim, & Whetten, 1987) because managers may respond differently to financial decline when decline is unpredictable.

Open systems theories of organizations state that managers initiate processes of organizational adaptation in response to decline (Audia & Greve, 2006). While we expect that managerial response to decline will result in a reduction of front-line personnel and an increase in administrative intensity, the generation of alternative managerial responses to decline depends on search and information processes that are initiated by managers when they are confronted with decline (Greve, 2003; Staw et al., 1981). When organizational decline coincides with turbulence, decreases in financial resources are not only substantial but also unpredictable. We argue that turbulence complicates managerial responses to decline in the sense that turbulence makes the information on which managers rely incomplete, unclear, or obsolete. As a result, turbulence may cause non-decision-making or delay responding to organizational decline. This results in a limitation of the available alternatives that are available for managerial response to decline and may cause managers to be subject to threat-rigidity (Staw et al., 1981). Rather than responding to decline by adjusting resource allocation, turbulence may strengthen stability rather than adaptation. Evidence from the general management literature is in line with these arguments. In a study of firms operating in the U.S. medical marketplace, Karim et al. (2016) find that turbulence decreases the likelihood that managers decide to make structural changes in the face of changing environmental munificence. This empirical result shows that turbulence dampens managerial responses to changing financial resources. We formulate the following hypotheses:

Hypothesis 3a: Turbulence reduces the negative relationship between organizational decline and full-time front-line employees.

Hypothesis 3b: Turbulence reduces the positive relationship between organizational decline and administrative intensity.

Empirical Context: U.S. Institutions of Higher Education

Data used to examine organizational staffing changes during times of decline and turbulence come from institutions of higher education in the United States. All institutions that receive federal funding, including Pell grants for low-income students, are required to submit yearly data reports to the Integrated Postsecondary Education Data System (IPEDS) in the National Center for Education Statistics (NCES). We use these data for public 2- and 4-year institutions as compiled by the Delta Cost Project within NCES. Among these institutions, we limit our sample to institutions that charge some type of tuition and fees (this excludes military campuses), have at least 100 students, and are not categorized as tribal or specialized institutions by the Carnegie Classification system. The resulting dataset includes just over 500 4-year institutions and just over 800 two-year institutions that are not outliers in their services. Data for the institutions in our sample are available from 1988 to 2012, though data between 1988 and 2002 are only reported for even years for the staffing variables of interest. As such, data are not provided for each individual year in this time frame.

The focus of this research is on variance within institutions rather than variance across institutions. We use institution fixed effects models in all analyses to best determine how decline and turbulence are managed within individual institutions across time. These models control for all time-invariant institutional characteristics such as geographic location or designation as a flagship or land-grant institution. We also include year fixed effects in all models to capture changes that occur over time that are otherwise unaccounted for by our models. Importantly, we include separate models for 2- and 4-year institutions as 2-year colleges often have quite different missions and priorities as compared with their 4-year counterparts. Furthermore, we expect that these two types of institutions are likely to vary in their capacity and strategy in responding to changes related to decline and turbulence.

Decline and Turbulence in Postsecondary Education

Institutions of higher education may experience cutbacks through multiple revenue streams (in addition to nonmonetary resources). Here, we focus on what has been arguably the most salient cutback for public colleges and universities in the United States in recent years—the loss in state appropriations per full-time equivalent (FTE) student. State appropriations have been the center of many debates regarding

higher education, particularly since the most recent economic recession. Most discussion has centered on trends illustrating a drastic decline in state dollars per student (Mortenson, 2012; but see also Wexler, 2016, about possible recent rebounds). For example, across all U.S. states, the educational appropriations per FTE (constant 2015 dollars) was \$8,220 in 2007 and \$6,177 in 2012 following an economic downturn (SHEEO 2015). Here, we calculate state appropriations per FTE student by dividing total revenues received by the institution through the state legislative body (not including grants and contracts or capital appropriations) by the total fall FTE student count.¹ Grants and contracts as well as capital appropriations are generally considered operating revenues that are used for particular purposes while appropriations are considered nonoperating revenues.²

To measure changes in the key independent variable, we calculate percent change as $((X_t - X_{t-1}) / X_{t-1}) \times 100$, where X = state appropriations/FTE student. To avoid noise surrounding small changes that are not substantively meaningful (e.g., small funding fluctuations that occur from year to year), we classify a cutback according to changes for the highest quartile in the data (similar quartile divisions are also considered in other lines of literature; see, for example, the use of quartiles in identifying low and high performing organizations like Boyne & Meier, 2009a).³ Just over 25% of institution-years (25.05) experience a decline in state appropriations per FTE student of 5 percentage points or more. After identifying colleges and universities that experience these 5% or greater losses in state appropriations per FTE student, we create a count variable that captures the number of years of consecutive decline an institution experiences. This allows us to capture whether an institution has a single year of decline or is experiencing persistent decline in state appropriations per FTE student. We expect that the longer the period of decline and resource scarcity, the more likely managerial reactions related to cutbacks will be observed. The final count variable ranges from 0 to 6 and has a mean of .368. Most periods of decline are 1 to 2 years in length, while slightly over 2% of institution-year observations are coded as decline that has persisted for 3 or more years.

Next, we control for turbulence in state appropriations per FTE student as a measure of uncertainty in the environment. We follow the work of Boyne and Meier (2009b) to operationalize turbulence by predicting logged resources in a single year using logged resources in the prior year ($t - 1$). The absolute values of the residuals in these models, or the variance from expected resources, become a measure of turbulence. The final measure has a mean of .153 and ranges from .001 to 3.921 for all institutions in our sample. Turbulence and decline as measured here are correlated at a mere .174 in this sample; those observations with a cutback have slightly larger average levels of turbulence ($mean = .268$) than the average institution not experiencing a cutback ($mean = .146$). Finally, we include an interaction between decline and turbulence in our models. This allows us to determine

whether the effect of cutbacks on organizational staffing is dependent on turbulence in the environment as described in Hypotheses 3a and 3b.

Staffing Changes as Cutback Management

In this study, we are interested in the extent to which decline and turbulence result in staffing changes. In the context of postsecondary education, two staffing comparisons have received a great deal of attention—that of full-time versus part-time faculty and that of top-level administrators versus other employees. Discussions of the trade-offs between full- and part-time faculty raise questions related to whether quality instruction can be delivered via part-time instructors who are less costly to institutions. Much research has argued that relying too heavily on part-time instructors can indeed lead to negative consequences for the institution (Jacoby, 2006; Umbach, 2007). While we do not test whether the trade-offs between full- and part-time faculty affect student performance here, we do measure whether decline in appropriations pushes institutions to shift their ratio of front-line staff. Our dependent variable for front-line staff is captured in two ways that include important distinctions. We first measure the percent of all faculty who are full-time to tap the ratio we are most interested in examining. However, we also include the logged number of all full-time faculty to consider what is happening to this group of employees outside of a percent in which both categories of faculty could be shifting at varying rates.⁴ By looking at both variables, we are better able to determine why one or both types of faculty are shifting in response to decline and turbulence.

In terms of administrative positions, there have been debates regarding whether bureaucracies, including colleges and universities, are bloated by executive administrative staff such that organizations become inefficient and top-heavy. Previous research has examined questions of the determinants (and effects) of administrative intensity in higher education (e.g., Rutherford, 2016), but most focus on changes in administrative intensity in relation to organizational size and complexity. Less is known about whether the share of top-level administrators fluctuates in response to decline, though we expect that relative changes are likely to occur as administrators attempt to reign in expenditures. Similar to our front-line staff measures, we capture administrative intensity in two ways. First, we calculate the share of all full-time staff employees—defined as executive/administrative and managerial, other professional, technical and paraprofessionals, clerical and secretarial, skilled crafts, and service/maintenance—who are categorized as either executive/administrative and managerial or other professional.⁵ Second, we also consider the logged total number of employees in these two categories to see whether absolute losses or gains are occurring outside of the comparison to other staffing categories.

Control Variables

Though all time-invariant institutional characteristics are absorbed in our fixed effects models, it is also important to consider characteristics of the student body that may affect changes in staffing ratios. All variables, including control variables, are defined and summarized in Table 1. First, we control for logged net tuition revenue coming directly from students given that institutions may try to boost tuition revenue in the face of changes in revenue from state appropriations. In other words, we hold this constant as not to test for trade-offs among sources of revenue but rather response to declines in one vital source of financial resources. We also control for size (total degrees granted, logged) and complexity (the percent of Black students, the percent of Hispanic students, the percent of part-time students, and Pell Grant dollars per FTE student as a proxy for low-income students), as both factors have been examined as common determinants of staffing components like administrative intensity and front-line workers.

Findings

Table 2 provides insight on whether changes in appropriations per FTE student have any effect on administrative intensity, measured as the percent of staff who are top-level administrators. Models 1 to 3 include only 4-year public institutions while Models 4 to 6 include only 2-year institutions. For both 2- and 4-year institutions, models are provided for a baseline that includes only decline (Models 1 and 4), an additive model that introduces turbulence (Models 2 and 5), and an interactive model for decline and turbulence (Models 3 and 6). It is clear from Table 2 that 2- and 4-year institutions are, on average, somewhat different from each other. While the decline coefficient is negative for all 2-year models, it is statistically insignificant and thus no different from zero. Turbulence just misses standard levels of significance in Model 5 and has a significant negative effect in Model 6, though the interaction variable is not meaningful. Overall, it appears that neither decline nor turbulence largely alter the share of administrators in 2-year institutions. It may be that these institutions have less slack to cut from administration—particularly as compared to 4-year institutions—or it may be that these institutions make cuts or changes in other areas of the organization so that the relative size of administration remains largely unchanged. What makes this more interesting is that decline appears to matter for 4-year institutions; in Models 1 and 2, decline has a significant negative effect on the share of administrators. Each year of a 5% cut in state appropriations per FTE student is linked to a .18 percentage point drop in administrators.

Next, the interaction in Model 3 is best interpreted via Figure 1. Contrary to our expectations, it is not the effect of decline that is moderated by turbulence but rather the effect of turbulence that is moderated by decline. The marginal

Table 1. Descriptive Statistics, 2- and 4-Year Institutions.

Variable	Definition	Four-year institutions				Two-year institutions			
		<i>M</i>	<i>SD</i>	Minimum	Maximum	<i>M</i>	<i>SD</i>	Minimum	Maximum
Share of administrators	Share of full-time staff who are executive/administrative and managerial or other professional	43.324	10.262	0.000	100.000	38.444	11.044	0.000	100.000
Number of administrators, logged	Number of full-time staff who are executive/administrative and managerial or other professional, logged	5.68	1.227	1.386	9.491	4.013	0.779	0.000	7.152
Share of full-time faculty	Percent of all faculty who are full-time	58.740	19.476	0.000	100.000	41.934	23.376	0.000	100.000
Number of full-time faculty, logged	Number of full-time faculty, logged	5.904	1.028	2.197	8.764	4.575	0.767	0.000	7.697
Years of decline in state appropriations/ FTE student	Number of years of decline (decline = drop of five percent or more in state appropriations per FTE student from prior year)	0.328	0.691	0.000	6.000	0.399	0.758	0.000	6.000
Turbulence in appropriations	Absolute value of residuals in model predicting state appropriations per FTE student this year from state appropriations per FTE student in prior year	0.084	0.099	0.000	3.385	0.123	0.188	0.000	3.729
Total degrees granted, logged	Total number of degrees granted, logged	7.377	1.036	2.565	9.917	5.985	0.923	0.000	8.833
Net student tuition revenue, logged	Total net tuition revenue, logged	16.642	1.563	8.451	21.024	14.549	1.521	6.288	18.592
Percent Black students	Percent of all students who are Black	11.647	20.096	0.000	98.154	9.342	12.187	0.00	94.958
Percent Hispanic students	Percent of all students who are Hispanic	4.802	8.703	0.000	92.326	5.440	8.515	0.000	88.694
Percent undergraduates attending part-time	Percent of all students who attend part-time	23.190	16.304	0.084	100.000	59.248	13.399	1.158	98.104
Pell grant dollars/ FTE, logged	Total Pell grant dollars received per FTE student, logged	6.505	0.700	1.185	8.448	6.558	0.755	2.623	8.748

effect of decline (not shown) simply becomes more negative as turbulence increases. However, even the sign of turbulence does not change sign in Figure 1 when confidence intervals are accounted for. At most, when turbulence is present but the institution is not experiencing any decline, the share of top-level administrators in 4-year institutions grows or remains constant while institutions experiencing decline shrink the share of top-level administrators. Given the confidence intervals in the figure, however, such an interpretation should not be overstated.

Though not the focus of our analysis, it is worth noting that size has stronger associations with the share of top-level administrators for 2-year institutions than 4-year institutions in Table 2. On the contrary, and largely as expected, tuition revenue streams matter more for administrative intensity in

4-year institutions than in 2-year institutions. Additional controls for complexity are mixed with Black students and part-time undergraduate students showing a positive correlation with administrative intensity for 4-year colleges while Hispanic students are negatively linked to administrative intensity in 2-year colleges.

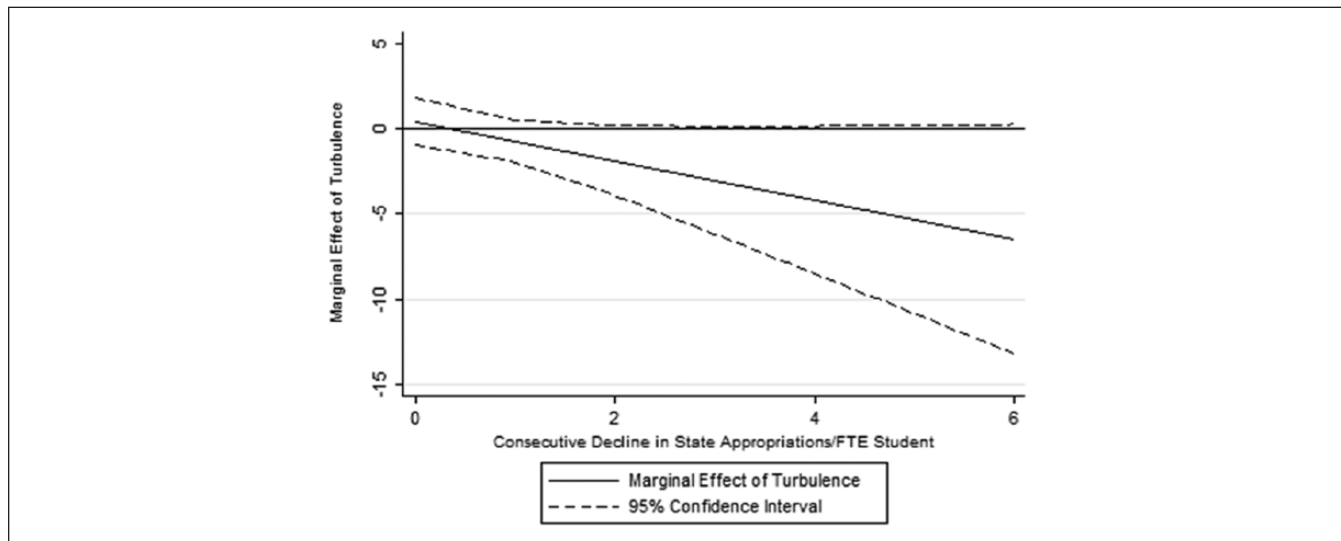
To determine whether we can gather better inferences of administrative staffing changes in these institutions, we next shift the dependent variable from a percentage to a logged count. This can be informative if, within the ratio reported in Table 2, multiple categories are changing at various rates in response to decline or turbulence, masking part of the change in administrative intensity. Table 3 reports the same models from Table 2 using a logged count of top-level administrators as the dependent variable. This change shifts the findings

Table 2. The Effect of Decline and Turbulence on the Share of Administrators in U.S. Institutions of Higher Education.

	Four-year institutions			Two-year institutions		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Years of decline in state appropriations/FTE student	-0.178* (0.089)	-0.171* (0.091)	-0.001 (0.130)	-0.004 (0.123)	-0.004 (0.154)	-0.112 (0.131)
Turbulence in appropriations		-0.270 (0.582)	0.433 (0.697)		-0.673 (0.463)	-1.097 [†] (0.589)
Decline × Turbulence			-1.150 [†] (0.627)			0.443 (0.381)
Total degrees granted, logged	0.598 (0.375)	0.604 (0.375)	0.627 [†] (0.375)	-1.077* (0.311)	-1.018* (0.311)	-1.032* (0.311)
Net student tuition revenue, logged	0.571* (0.144)	0.015* (0.144)	0.015* (0.144)	0.165 (0.130)	0.167 (0.130)	0.169 (0.130)
Percent Black students	0.015 [†] (0.008)	0.015 [†] (0.008)	0.015 [†] (0.008)	0.021 (0.018)	0.021 (0.018)	0.021 (0.018)
Percent Hispanic students	-0.004 (0.019)	-0.004 (0.019)	-0.003 (0.019)	-0.191* (0.023)	-0.190* (0.023)	-0.190* (0.023)
Percent undergraduates attending part-time	0.031* (0.011)	0.032* (0.011)	0.031* (0.011)	0.008 (0.015)	0.007 (0.015)	0.007 (0.015)
Pell grant dollars/FTE, logged	-0.021 (0.294)	-0.021 (0.294)	-0.021 (0.294)	0.351 (0.346)	0.368 (0.347)	0.388 (0.347)
Constant	19.353* (3.548)	19.375* (3.548)	19.178* (3.549)	33.837* (3.368)	33.873* (3.368)	33.842* (3.368)
N	7,453	7,453	7,453	7,757	7,757	7,757
Institutions	516	516	516	793	793	793
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R ²	.65	.65	.65	.17	.17	.17

[†]p < .10. *p < .05.

Note. Standard errors in parentheses. Years cover even years between 1988 and 2002 and all years from 2003 to 2012. The excluded year is 1988.

**Figure 1.** Marginal effect of turbulence on the percent of top-level administrators as decline changes, 4-year institutions.

such that decline and turbulence matter little for 4-year institutions but are more meaningful for 2-year institutions in terms of staffing. In the former case, while both decline and turbulence have negative signs, only decline is negative and significant in Model 1 with a substantively small coefficient. In the latter case, turbulence has a significant negative effect on total administrators, and this effect is moderated by decline—as opposed to our expectation of decline being moderated by turbulence—as shown in Model 6 and Figure

2. In Model 2, a one unit shift in turbulence is associated with a 6.5 percentage point drop in the number of administrators, all else equal. Figure 2 further illustrates that this negative effect is offset by decline. While the effect of turbulence never becomes positive (per confidence interval), it is greatly altered by decline.

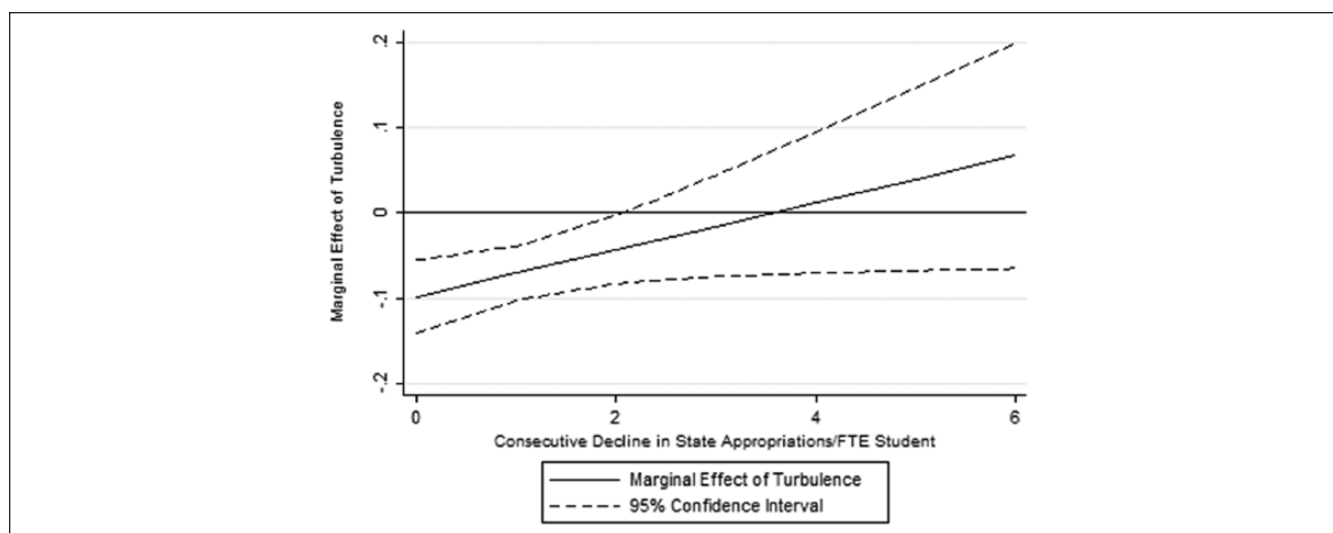
In comparing 2- and 4-year institutions, one way this may be interpreted is that 4-year institutions are able to be more strategic in their responses to decline and turbulence

Table 3. The Effect of Decline and Turbulence on the Number of Administrators in U.S. Institutions of Higher Education.

	Four-year institutions			Two-year institutions		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Years of decline in state appropriations/FTE student	-0.008 [†] 5(0.004)	-0.007 (0.005)	-0.009 (0.006)	0.001 (0.004)	0.005 (0.004)	-0.001 (0.006)
Turbulence in appropriations		-0.027 (0.030)	-0.036 (0.035)		-0.068* (0.016)	-0.098* (0.022)
Decline × Turbulence			0.014 (0.028)			0.027* (0.013)
Total degrees granted, logged	0.383* (0.019)	0.383* (0.019)	0.383* (0.019)	0.145* (0.011)	0.145* (0.011)	0.144* (0.011)
Net student tuition revenue, logged	0.004* (0.007)	0.043* (0.007)	0.043* (0.007)	0.028* (0.005)	0.029* (0.005)	0.029* (0.005)
Percent Black students	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.002* (0.001)	0.002* (0.001)	0.002* (0.001)
Percent Hispanic students	-0.003* (0.001)	-0.003* (0.001)	-0.003* (0.001)	-0.007* (0.001)	-0.007* (0.001)	-0.007* (0.001)
Percent undergraduates attending part-time	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.001* (0.001)	-0.001* (0.001)	-0.001* (0.001)
Pell grant dollars/FTE, logged	0.054* (0.015)	0.054* (0.015)	0.054* (0.015)	-0.018 (0.013)	-0.015 (0.013)	-0.015 (0.013)
Constant	1.549* (0.180)	1.551* (0.180)	1.557* (0.180)	2.457* (0.121)	2.451* (0.121)	2.456* (0.121)
N	7,602	7,602	7,602	8,982	8,982	8,982
Institutions	519	519	519	811	811	811
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R ²	.58	.58	.58	.50	.50	.50

Note. Standard errors in parentheses. Years cover even years between 1988 and 2002 and all years from 2003 to 2012. The excluded year is 1988.

[†] $p < .10$. * $p < .05$.

**Figure 2.** Marginal effect of turbulence on the number of top-level administrators as decline changes, 2-year institutions.

compared with 2-year institutions. Four-year universities do not experience a meaningful change in the number of administrators, on average, in response to these changes, though the share of administrators may appear to change relative to other staffing categories (in a manner that may look good symbolically for these organizations). For the average 2-year institution, on the contrary, turbulence generates a decrease in the number of administrators, though longer periods of decline taper this effect. This may be due to the fact that they cannot continue to cut administrators and maintain operations once any slack is depleted.

Beyond these key measures, it is intuitive perhaps to notice that size and tuition revenue are consistently associated with larger absolute numbers of top-level administrators in 2- and 4-year institutions. Among controls for complexity, only Pell grant dollars per FTE student have a positive linkage to the number of administrators in the case of 4-year institutions. All other complexity variables, where significant, are negatively correlated with the total number of administrators.

Our hypothesis that decline would be positively related to administrative intensity was not confirmed in Tables 2 and 3,

Table 4. The Effect of Decline and Turbulence on the Share of Full-Time Faculty in U.S. Institutions of Higher Education.

	Four-year institutions			Two-year institutions		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Years of decline in state appropriations/FTE Student	-0.325 (0.209)	-0.329 (0.212)	-0.689* (0.305)	-0.262 (0.260)	-0.278 (0.267)	0.159 (0.328)
Turbulence in appropriations		0.179 (1.360)	-1.292 (1.628)		-0.269 (0.959)	2.254 [†] (1.293)
Decline × Turbulence			2.420 [†] (1.469)			-1.811* (0.792)
Total degrees granted, logged	0.524 (0.871)	0.520 (0.872)	0.469 (0.872)	-1.302* (0.682)	-1.389* (0.682)	-1.330 [†] (0.682)
Net student tuition revenue, logged	-0.326 (0.334)	-0.324 (0.334)	-0.326 (0.334)	-1.092* (0.272)	-1.093* (0.272)	-1.093* (0.272)
Percent Black students	0.030 (0.019)	0.030 (0.019)	0.030 (0.019)	0.026 (0.041)	0.026 (0.041)	0.026 (0.041)
Percent Hispanic students	-0.019 (0.045)	-0.019 (0.045)	-0.021 (0.045)	0.199* (0.051)	0.199* (0.051)	0.200* (0.051)
Percent undergraduates attending part-time	-0.039 (0.026)	-0.040 (0.026)	-0.038 (0.026)	-0.040 (0.032)	-0.040 (0.032)	-0.040 (0.032)
Pell grant dollars/FTE, logged	1.340 [†] (0.697)	1.340 [†] (0.697)	1.347 [†] (0.697)	-0.105 (0.750)	-0.115 (0.751)	-0.150 (0.750)
Constant	63.167* (8.306)	63.144* (8.308)	63.556* (8.311)	76.360* (7.226)	76.381* (7.227)	76.087* (7.227)
N	7,584	7,584	7,584	9,050	9,050	9,050
Institutions	519	519	519	811	811	811
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R ²	.28	.28	.28	.16	.16	.16

Note. Standard errors in parentheses. Years cover even years between 1988 and 2002 and all years from 2003 to 2012. The excluded year is 1988.

[†] $p < .10$. * $p < .05$.

and we also did not find that administrators assume high risks of losing their positions in times of decline and turbulence, particularly in 4-year institutions. Overall, changes seem to be negative but small or insignificant, suggesting that these administrative positions are often fairly safe. We also see that organizational type can influence when and how these changes in the environment matter; 4-year institutions may be able to react in a more strategic manner while 2-year institutions likely already operate with lower levels of slack. The share of administrators decreases relative to other staffing categories in response to decline in 4-year institutions while the ratio changes little in 2-year institutions. When we look at raw numbers, administrators in 4-year institutions are fairly safe, while turbulence is correlated with a decline in the number of administrators in 2-year institutions (given the results in Table 2, most or all staffing categories may experience cuts in these 2-year institutions).

Does this extend to the trade-off between full- and part-time faculty members? Table 4 shows the effect of decline and turbulence on the share of faculty who are full-time employees. Here, decline and turbulence appear to lead to varying outcomes in 4-year and 2-year institutions. For both institutional types, decline and turbulence do not appear to have a meaningful linkage to the ratio of full-time faculty when both are present in Models 2 and 5. When interactions are tested, weak relationships are found that run in the opposite direction. For 4-year institutions, the marginal effect of turbulence becomes more positive as the period of decline lengthens (Figure 3) while, for 2-year institutions, the marginal effect becomes more negative

(Figure 4). Still, in both cases, confidence intervals are wide enough such that a meaningful change in the sign of the marginal effect cannot be solidified. As such, it appears that the share full-time faculty is not influenced in a large way in the face of decline and turbulence. Does this mean these individuals are safe or that part-time faculty are experiencing changes at similar rates?

Similar to administrative intensity, we rerun models using a logged count of full-time faculty rather than the percentage of faculty who are full-time; these results are presented in Table 5 and provide the strongest linkage detected in our study. While decline does not have a noticeable effect, turbulence is consistently associated with a drop in the logged number of full-time faculty in both 2- and 4-year institutions. In Model 2, a one unit change in turbulence—a rather large shift for this variable—is associated with a 14.2 percentage point drop in the number of full-time faculty for 4-year institutions. In Model 5, the same unit change in turbulence is associated with a 3.9 percentage point drop in full-time faculty. However, the interaction models (Models 3 and 6) tell slightly different stories. In both cases, the effect of turbulence on the number of full-time faculty is moderated by decline. This is particularly prevalent for 4-year institutions. As illustrated in Figure 5, extended decline moderates the effect of turbulence such that the marginal effects shift from negative to positive. The turning point of approximately 3 years of decline is, of course, substantial given that only a small portion of the institutions in our sample experience a 5% or more decline in state appropriations per FTE student for 3 or more consecutive years. The relationship is similar

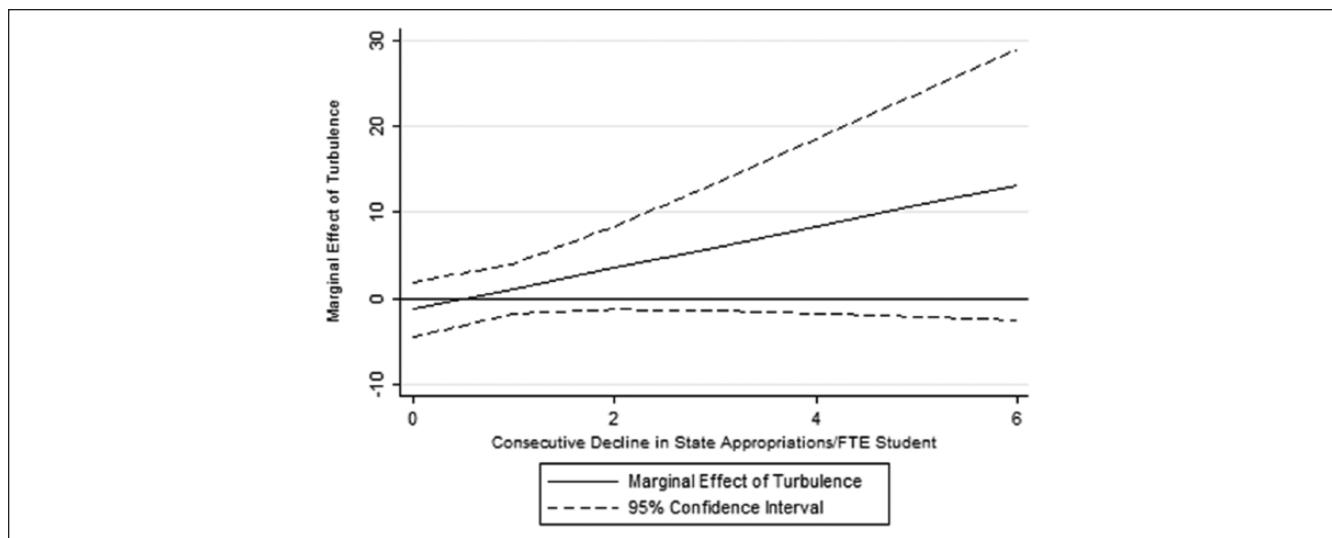


Figure 3. Marginal effect of turbulence on the share of full-time faculty as decline changes, 4-year institutions.

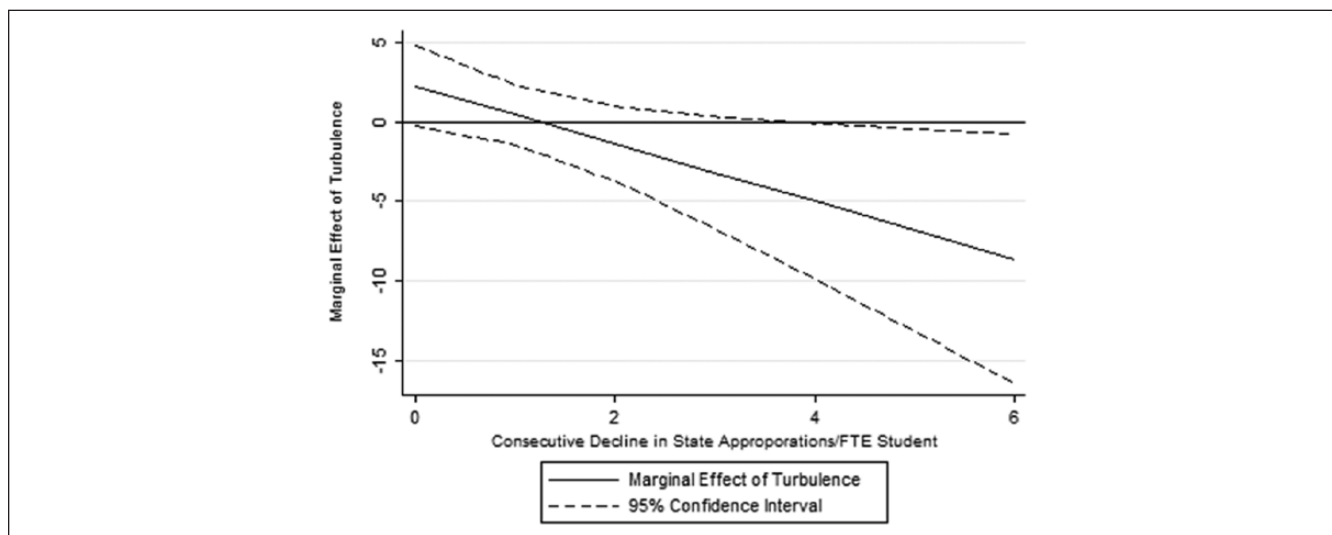


Figure 4. Marginal effect of turbulence on the share of full-time faculty as decline changes, 2-year institutions.

but not nearly as strong for 2-year institutions as shown in Figure 6. A change in sign in the marginal effect of turbulence is much less certain for the average 2-year institution in our sample. Both suggest that sustained periods of decline moderate how institutions respond to turbulence.

Overall, decline appears most important for the share of administrative staff in 4-year institutions in our sample while it changes little else in our study. On the contrary, turbulence is more likely to threaten upper administrative positions in 2-year institutions and full-time faculty lines in all institutions. Among eight interaction terms, one—in the case of the number of full-time faculty in 4-year institutions—produces results that include a sign flip in the marginal effect of turbulence. Furthermore, we observe that it is not the case that turbulence mitigates the effect of decline but rather the state

of decline that can moderate the effect of turbulence on the cutback management strategies for organizational personnel. Turbulence seems to have the largest effect when decline is not present, meaning that it may be least likely to be anticipated by institutions in these cases.

Discussion

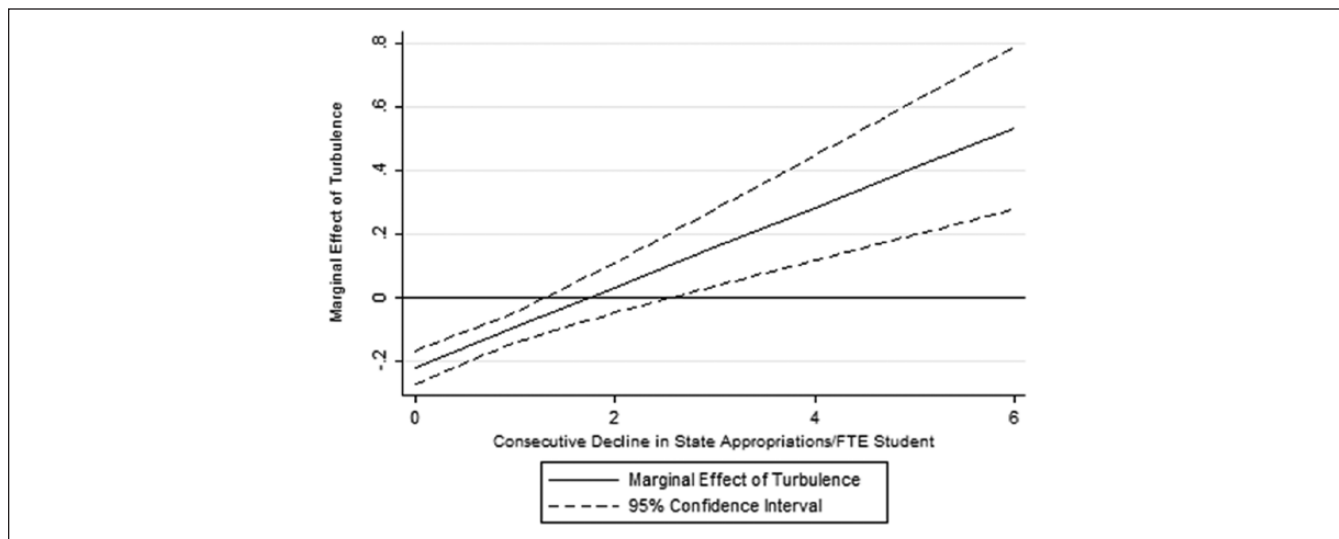
This study aims to make three contributions to the literature. First, to better understand the linkages between shifting financial resources and staffing, one of the largest expenditure categories in public organizations; second, to study the combined effects of decline and turbulence to examine how unpredictability matters in responding to decreasing financial resources; and third, to compare responses to decline and

Table 5. The Effect of Decline and Turbulence on the Number of Full-Time Faculty in U.S. Institutions of Higher Education.

	Four-year institutions			Two-year institutions		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Years of decline in state appropriations/FTE student	-0.003 (0.003)	0.001 (0.003)	-0.018* (0.005)	0.003 (0.003)	0.005 (0.003)	0.000 (0.004)
Turbulence in appropriations		-0.142* (0.022)	-0.219* (0.026)		-0.039* (0.011)	-0.061* (0.015)
Decline \times Turbulence			0.135* (0.024)			0.020* (0.009)
Total degrees granted, logged	0.447* (0.014)	0.449* (0.014)	0.446* (0.014)	0.194* (0.008)	0.193* (0.008)	0.193* (0.008)
Net student tuition revenue, logged	0.032* (0.005)	0.031* (0.005)	0.031* (0.005)	0.014* (0.003)	0.014* (0.003)	0.014* (0.003)
Percent Black students	-0.001* (0.000)	-0.001* (0.000)	-0.001* (0.000)	-0.001* (0.000)	-0.001* (0.000)	-0.001* (0.000)
Percent Hispanic students	-0.004* (0.001)	-0.004* (0.001)	-0.004* (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
Percent undergraduates attending part-time	-0.003* (0.000)	-0.003* (0.000)	-0.003* (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Pell grant dollars/FTE, logged	0.076* (0.011)	0.075* (0.011)	0.075* (0.011)	0.012 (0.009)	0.013 (0.009)	0.013 (0.009)
Constant	1.722* (0.136)	1.741* (0.135)	1.762* (0.135)	3.101* (0.084)	3.098* (0.084)	3.101* (0.084)
N	7,583	7,583	7,583	9,049	9,049	9,049
Institutions	519	519	519	811	811	811
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R ²	.33	.33	.33	.20	.20	.20

Note. Standard errors in parentheses. Years cover even years between 1988 and 2002 and all years from 2003 to 2012. The excluded year is 1988.

[†] $p < .10$. * $p < .05$.

**Figure 5.** Marginal effect of turbulence on the number of full-time faculty as decline changes, 4-year institutions.

turbulence between different organizational settings. In doing so, we have examined the combined effects of decline and turbulence on personnel allocation in 2-year and 4-year institutions of higher education in the U.S. context. How 2-year and 4-year institutions react to decline and turbulence is often different in important ways. In situations of decline and turbulence, 4-year colleges decrease their ratio of administrative intensity (though administrative numbers remain relatively stable) and actually increase their number of full-time faculty, contrary to our initial expectations. Table 2

indicates that decline reduces the ratio of administrative intensity, while Table 3 shows that the number of administrators remains stable. Similarly, Table 4 and Table 5 show that decline does not significantly alter the full-time ratio of front-line personnel while turbulence can threaten to decrease the total number of full-time faculty. These results may suggest that 4-year institutions respond to organizational turbulence by increasing specific types of personnel, especially through the appointment of part-time teaching personnel. In addition, Figure 5 shows that while 4-year colleges initially

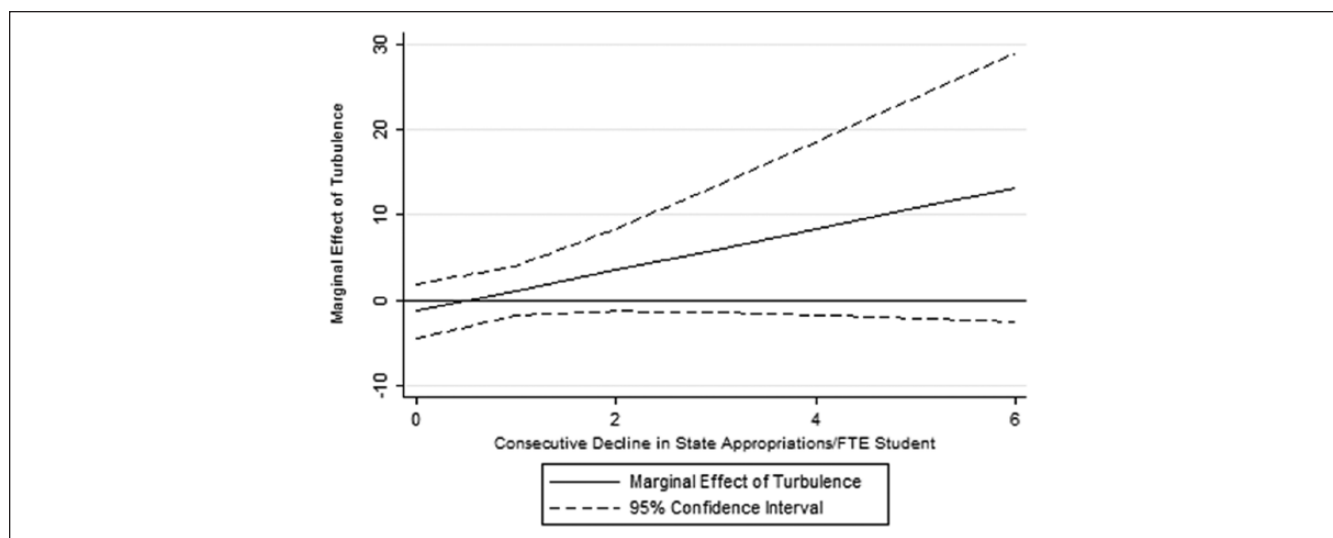


Figure 6. Marginal effect of turbulence on the number of full-time faculty as decline changes, 2-year institutions.

reduce the number of full-time faculty in response to turbulence and decline, the effect of turbulence can become positive when organizational decline persists for a longer period of time. Such shifts may thus be reflective of a strategic response to decline by means of increasing or diversifying the institution's teaching programs or attempting to rebuild some full-time faculty lines after initial years of decline and turbulence.

In contrast, we find that the organizational responses to decline and turbulence of 2-year institutions are more intuitive and more consistent with our hypotheses. Table 5 indicates that 2-year institutions reduce the number of full-time faculty in response to turbulence. Table 4 indicates that in situations of decline and turbulence, their share of full-time faculty decreases, and this decrease becomes somewhat stronger when decline persists. In addition, Figure 2 shows an initial decrease in the number of administrators in response to turbulence. However, this relationship is moderated by decline in such a way that the initial negative effect of turbulence becomes zero after 2 consecutive years of decline. This result could be interpreted as 2-year colleges having limited possibilities to keep cutting administrators as they already operate at minimum levels of organizational slack. Overall, the results show that 2-year institutions attempt to cut their ratio of full-time faculty and to a lesser extent cut the number of top administrators.

Relating our findings to the wider literature on organizational response and turnaround, we conclude that 2-year colleges more closely resemble operational, efficiency-oriented responses to decline by maintaining administration and decreasing full-time faculty (Boyne & Meier, 2009a; Trahms, Ndofor, & Sirmon, 2013a). In contrast, 4-year colleges reflect a more strategic reaction aimed at reorientation by attempting to increase resource allocation to full-time faculty while the number of administrators remains stable. This reaction could

be intended to preserve those parts of the organization that are vital for organizational performance (Levine, 1978) or as an attempt to reposition the institution and counteract the situation of decline (Boyne & Meier, 2009a). These differences between 2-year and 4-year institutions thus provide insight in how organizational characteristics shape responses to organizational decline and turbulence.

In relating our findings to empirical research on organizational responses to decline in the generic management literature (e.g., Greve, 2003; Latham & Braun, 2009; McKinley, Latham, & Braun, 2014; Mone, McKinley, & Barker, 1998) our study has an advantage in that we compare two different types of organizations. We propose that the divergent organizational responses of 2-year and 4-year colleges may be understood through differences in their environmental and organizational characteristics. For instance, based on Mone et al. (1998) and McKinley et al. (2014), it can be argued that the greater goal complexity and range of organizational activities of 4-year colleges may allow them to respond in a more strategic manner. It can also be that 4-year colleges tend to be larger organizations with higher levels of slack resources (Audia & Greve, 2006; Greve, 2003), which allows them to respond to decline and turbulence in a more flexible manner. However, this interpretation is not uncontested as Latham and Braun (2009) find that software firms with more slack are less likely to respond to decline in an innovative manner. In addition to highlighting contextual factors, our study suggests that it is especially the combined and longitudinal effects of decline and turbulence that shape organizational responses (cf. Cameron, Kim, & Whetten 1987). Additional micro-level work is needed to confirm the trends seen in our empirical analysis and to uncover the environmental and organizational characteristics that explain the different organizational responses between types of organizations.

Overall, our findings related to the effect of decline and turbulence on organizational staffing reveal a number of avenues for additional theorizing and empirical analysis. First, turbulence in the environment appears to have a larger influence on institutions than decline. Across all tables, decline in state appropriations per student had either no effect or a small effect on organizational staffing. Of course, institutions of higher education can attempt to offset this type of decline in other types of revenue, particularly through student tuition and fees, which we control for in our models. The ability to supplant revenue through other means is one characteristic of higher education than can distinguish these organizations from other types of public agencies. Turbulence has a negative effect on staffing outcomes in three of eight cases and was insignificant in five cases. When we also conducted robustness tests by defining decline through total student enrollment instead of state appropriations per student,⁶ decline had little direct effect while the effect of turbulence remained robust across models (negative effect in four models, null effect in three models). This indicates that unexpected changes have a meaningful influence on these institutions, likely through strategic planning and decision-making processes.

Second, we find that the effect of turbulence on organizational staffing is often contingent on decline; this is contrary to our original expectation that decline might be moderated by turbulence. For the share of top-level administrators and the share of faculty, the marginal effect of turbulence does not necessarily change signs but does shift. On the contrary, for the number of top-level full-time administrators or number of full-time faculty, the marginal effect of turbulence becomes less negative and, in one case, has a marginal effect that is even positive. In other words, the effect of turbulence, while often negative, is likely to be subdued in the presence of continued decline.

There remain additional avenues and questions that might be considered in this research. Two stand out to us as most important. First, discussions of measurement for decline and turbulence could likely fill multiple articles without any empirical analysis. For example, the size of change and decline can be altered. Cameron, Kim, and Whetten (1987) discuss approaches to measuring decline, including “(1) time 1 subtracted from time n , (2) a mean ratio of yearly changes, (3) yearly resource changes regressed on the previous year’s resource level, and (4) yearly resource changes regressed on the previous year” (p. 229). Within measures of change, there is much discussion on how large of a change signals decline as opposed to small noise or larger catastrophes. While there is no space here to discuss each of these approaches to measuring decline, scholars should continue to consider the advantages and disadvantages of each approach for any specific context in which they are working.

Second, we acknowledge that that decline and turbulence may have varied effects on other areas of these institutions (research spending, classroom spending, student contact

hours, plant operation or maintenance, for example). Yet we are most interested in how these changes influence staffing, as these changes are meaningful for how organizations operate and matter for discussions of administrative intensity as well as front-line bureaucrats. Of course, while we consider staffing in terms of number and shares of employees, we do not investigate whether staffing is influenced via wage freezes or other changes when organizations are faced with decline or turbulence. Given that staffing is often one of the largest expenses for organizations, some organizations may seek to alter staffing numbers while other organizations focus more on wage changes. Beyond staffing, future research on decline could take into account organizational performance as a dependent variable. It is important to study not only what staffing changes are implemented in response to decline but also what the performance effects of such cutback management strategies are. As is argued by Boyne and Meier (2009a), cutback measures that are aimed at enhancing organizational efficiency could have negative consequences in terms of organizational effectiveness. A focus on organizational performance can reveal to what extent staffing changes directly impact organizational performance as well as to what extent staffing changes may moderate the relationship between organizational decline and performance. The responses of 2-year and 4-year institutions are indicative of respectively efficiency-oriented (retrenchment) and more strategic responses (reorientation) to decline (Boyne & Meier, 2009a; Trahms et al., 2013a). Limited evidence exists concerning the short-term and the long-term performance effects of both responses in public sector organizations. Related to this point, future research can also compare episodes of decline and the organizational actions taken in response to decline to managerial action during organizational growth. By taking a life cycle perspective (cf. Bozeman, 2010), future studies can examine whether shifting staffing ratios in response to decline persist in subsequent periods of growth or whether such changes are reversed.

The practical significance of this research lies in the fact that administrators within organizations in this context are likely to continue to be cognizant of possible anticipated or unexpected change, as state appropriations for public institutions of higher education have fluctuated, particularly following the most recent recession. These same administrators are also likely watching to see if and how state or federal policy could shift with each new election cycle. A central point of emphasis in the higher education literature has been the steadily rising size of nonteaching personnel in past decades (Leslie & Rhoades, 1995). In addition, emphasis has been placed on part-time, adjunct professors in these institutions (Kezar & Sam, 2010). The staffing composition of education institutions has been stated to be a function of budget per pupil, the relative size of federal and state funding in the budget, and changes in enrollment (Anderson & Mark, 1985). This study contributes to understanding these trends

by investigating how organizational decline and turbulence are related to staffing shifts in both front-line faculty and nonteaching personnel. Our study indicates that the positions of administrators and full-time faculty have remained relatively safe in times of decline. It remains to be seen to what extent institutions have turned to other areas of expense reduction and how these decisions result in short- or long-term performance changes.

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Notes

1. A loss in state revenues per student is generally thought to be associated with an increase in student tuition and fees. Though not shown here, this proves true in our data, as a decline in state appropriations per student has a statistically significant negative relationship with an increase in in-state tuition and fees (also known as “sticker price”). Losses in state appropriations have larger effects on institutional sticker price than gains. Below, we control for tuition prices in all models as to move beyond considering trade-offs in revenue sources to focus on decline.
2. One additional source of funds can be through an institution’s endowment. We do not focus on endowments here as these resources can act in a very different manner than state appropriations. Furthermore, data on endowments vary by institutions (institutions can structure endowments differently) and because these data are not consistently available across time. That said, universities may likely work to grow endowments during times of turbulence or decline; if successful, this could help to soften the uncertainty that accompanies decline and turbulence.
3. We also considered measuring decline via a continuous variable, a dichotomous variable capturing any cut, and cuts that were summarized over 2 or 3 years. Though not shown here, these models are available on request.
4. Not all of these faculty are necessarily tenure-track positions but they are full-time in an instruction, research, or public service role.
5. While the category of executive/administrative and managerial remains relatively stable over time and captures on the highest positions in the institution (less than percent of employees), growth has been documented in the “other professional” category which includes many employees in student services-related roles.
6. Total student enrollment can heavily influence institutional revenue from tuition and fees, particularly where this revenue stream has become a larger source of resources than state appropriations for some institutions in recent years. Most institutions continue to aim to increase enrollment such that the bottom quartile of cases in this study was a decline in total enrollment of two percentage points (as noted above, we use a five percentage point drop to capture decline in state appropriations per FTE student).

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