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Net impact of government funding on nonprofit fiscal health: burden or benefit?

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Abstract

This study examines the impact of federal grant awards on the financial health of recipient nonprofits. Although a modest body of research finds that government grants are beneficial to nonprofit fiscal health, a large Urban Institute study (2010, 2013, 2015) found that nonprofit managers receiving government grants consistently report fiscal harm due to awards that do not cover all program costs, late payments, and significant administrative burden. Those findings raise the question of whether government funding leads to net benefits or net harm for organizations given the administrative and fiscal burdens identified. This study tests that question using a large panel of federal grants to estimate the impact of government awards on three measures of nonprofit financial health. We find that government grants promote an increase in nonprofit size, improve operating margins, and increase financial reserves for recipient organizations. These benefits endure after the receipt of the award.

K E Y W O R D S

FAADS, federal grants, financial health, nonprofits

1 | INTRODUCTION

Communities that nurture robust nonprofit ecosystems reap benefits in myriad ways: expansion of recreational activities and parks, arts that improve quality of life and drive economic development, civic organizations that generate social capital, and service providers that fill gaps in government services and diversify program offerings (Grønbjerg & Paarlberg, 2001; Harrison &

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Thornton, 2014; Jeong & Shicun, 2019; Kim, 2015; Lecy & Van Slyke, 2013; Paarlberg et al., 2018). Nonprofits also serve as important contracting partners, policy innovators, and watchdogs in the era of third-party government.

Local nonprofit sector size can largely be explained by the degree to which the government partners with nonprofits (Kim, 2015; Lecy & Van Slyke, 2013). Government awards account for roughly 33% of revenues in US public charities, making them the second largest source after earned income and almost three times as large as private charitable donations (Pettijohn et al., 2013a). Government awards¹ to 501c(3) public charities comprise an average of 65% of all revenues for organizations that regularly receive government grants and are the largest source of funding for over half of all nonprofits (Boris et al., 2010). Strong intersectoral partnerships have also been highlighted as a strategy for nonprofits to scale (Foster & Fine, 2007; Searing & Lecy, 2021).

Given the importance of government funding to the sector at large, little is known about the impact of government awards on the fiscal health of individual nonprofit organizations (Never & de Leon, 2014). Most existing studies aggregate measures to the sector-level or use sub-samples to highlight successful cases but fail to examine the typical experience of nonprofits. This gap in knowledge was the impetus for a series of nationally representative surveys on government funding in the nonprofit sector implemented by the Urban Institute² (Boris et al., 2010; Fyffe, 2015; Pettijohn et al., 2013a). The surveys offer the most comprehensive and detailed information we have on the experience of nonprofits working with government agencies.

In those surveys, nonprofit managers reported adverse financial effects from government grants due to awards that do not cover full program costs, unreliable payment systems, and frequent ex-post changes to awards (Boris et al., 2010; Fyffe, 2015; Pettijohn et al., 2013a; Pettijohn & Boris, 2014). These challenges added to the overall financial impacts of the recession and post-recession period. Over half of the respondents indicated that the combined economic challenges, government cutbacks, and late payments precipitated a reduction in services, staff layoffs, budget shortfall, or the use of loans or credit to compensate for late payments. Forty-seven percent of nonprofits reportedly had to draw on reserves to cover program costs (Boris et al., 2010; Fyffe, 2015; Pettijohn et al., 2013a; Pettijohn & Boris, 2014).

The severity of these administrative burdens and other challenges identified in the Urban Institute studies present an interesting paradox. On the one hand, past research has shown that government funding can stabilize program revenue streams and help nonprofits attract new sources of funding (Heutel, 2014; Okten & Weisbrod, 2000). Strong intersectoral ties create denser and more resilient social service sectors (Ni & Zhan, 2017) and sector growth is best predicted by the level of interdependency between the government and nonprofit sectors (Lecy & Van Slyke, 2013). On the other hand, nonprofit managers responding to the surveys identified administrative burdens and material fiscal harm from chaotic and poorly managed government partnerships. It is uncertain whether these reports depict unavoidable but benign frictions inherent in principle-agent relationships that generally exist in government-nonprofit funding, if the costs identified were specific to economic conditions, or if they instead represent malignant dimensions of government partnerships that can more generally negatively impact nonprofit financial sustainability.

Our current evidence on the topic is limited because the impact of government funding on nonprofit fiscal health is challenging to estimate. Even when data reveals a positive relationship between nonprofit size and level of government funding, a strong correlation does not allow one to conclude that government funding drives the growth or improves fiscal health. The positive relationship could be explained if government prefers to work with nonprofits that are already large and stable as opposed to higher levels of support leading to better fiscal health. Additionally, nonprofits that are negatively impacted by government partnerships would suffer higher rates of failure and thus exit the sample, resulting in a selection or survivor bias scenario. These subtle data issues could make government funding appear to positively impact the average nonprofit when it does not.

One empirical strategy is to observe organizational changes as they first establish government partnerships. Data limitations pose a significant challenge, though. Measuring levels of government funding can be difficult: government contracts, vouchers, and reimbursements are combined with commercial activities on 990 tax forms, leaving grants as the only government category reported separately. Blurred distinctions between contracts and grants and lags between when a grant is awarded, services performed, and payments received cause inconsistent reporting and lead to measurement error (Gordon et al., 1999; Gordon & Khumawala, 2007). Government awards often pass through several levels of government agencies before disbursement to a nonprofit, making flows nearly impossible to track with current data systems (Government Accountability Office, 2009; Thornton et al., 2016). As a result, the level of government support for an individual nonprofit has been difficult to observe in current tax data, limiting the ability to connect government funding to fiscal health.

This study advances the literature by linking the Federal Assistance and Awards Database (FAADS) to a panel of nonprofit finances from 990 tax forms to overcome some of the existing data limitations. As a result, federal awards granted to individual nonprofits can be observed over a five-year period, as well as simultaneous changes to nonprofit financial performance during that time. This allows to test the claim that nonprofits experience a decline in operating margins and fiscal health as a result of tumultuous government partnerships. We ultimately find that access to government awards leads to improved, not diminished, fiscal health.

This research is important for nonprofit managers and boards that are looking for growth strategies but needing to manage risks associated with change. The results thus help clarify the nuanced relationship between revenue diversification and organizational growth and contributes to the growing literature on portfolio theory in nonprofit financial management. Our findings provide evidence of the fiscal benefits associated with new streams of government funding, despite the expressed challenges of such partnerships.

2 | REVIEW OF EXISTING LITERATURE

This paper seeks to determine whether pursuing government awards has an impact, either positive or negative, on nonprofit financial health. It is an interesting question because research finds a strong relationship between government funding and nonprofit density, suggesting that government resources have a salubrious effect on nonprofits. But recent large-scale surveys identify significant operational challenges associated with government contracts and over half of the nonprofit managers surveyed in 2009 and 2012 reported financial harm as a result. Thus, current research presents ambiguous conclusions with empirical support for either claim.

2.1 | Government awards will improve nonprofit fiscal health

Organizational ecology asserts that organizations compete by specializing in a concentrated set of products or services to occupy a narrow but stable market niche, or they become generalists

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that offer a diverse set of products across multiple markets. An important early work on nonprofit growth, James (1983) develops the argument that constraints associated with organizational form will force nonprofits to diversify activities more often than their government or for-profit counterparts, and only those that are able to successfully diversify programs and operations will achieve significant growth. Since then, there has been a steady stream of nonprofit scholarship that advocates for diversification of revenue streams as an effective strategy for growth (Chang & Tuckman, 1994; James, 1983; Kerlin & Pollak, 2011).

Many nonprofits operate in three-part markets where services are consumed by one group and subsidized or paid for by another group such as foundations or government. As a result, nonprofits cannot always gain market share simply by reaching more customers because they need funding to expand offerings. As a result, diversification of products or services in the nonprofit sector often requires diversification of funding sources as well. Government funding has many favorable attributes such as size, stability, and the status it confers, making it a more desirable avenue for growth than philanthropic alternatives.

Several studies find that revenue diversification has a positive effect on long-run fiscal stability (Carroll & Stater, 2009; Chikoto & Neely, 2014; Lin & Wang, 2016). Similarly, nonprofits with government funding have lower failure rates relative to peer organizations without government funding (Vance, 2011). Additionally, government funding can have positive spill-over effects on other sources of revenue. The receipt of government funding serves as a signal of nonprofit quality and good governance, which can be perceived as a virtue signal and make it easier to compete for additional awards from other government sources or foundations (Bennett & Iossa, 2009; Spector et al., 1998). Grasse et al. (2021) highlight instances where government awards can attract or crowd-in other sources of funding.

More recent work, however, has cast doubt on James' theory of diversification being the most effective avenue for growth. A large meta-analysis of diversification studies, for example, finds that nonprofits with diverse revenue sources tend to have more financial stability during periods of economic downtown and are more resilient, but they tend to grow slower than non-profits with concentrated revenues (Hung & Hager, 2019). Similarly, a Bridgespan study examined 110 nonprofits founded since 1970 that have surpassed \$50 million in annual revenue and found that 90% have a single dominant funding source (Foster & Fine, 2007). Many specialists of the dominant revenue sources, however, were government. Thus, adding government partnerships to a broader portfolio of revenues can improve fiscal health through financial protection against market volatility via revenue diversification. Or alternatively specializing in government partnerships can serve as a useful strategy for growth.

2.2 | Government awards will harm nonprofit fiscal health

Although government awards can be financially beneficial, there is a growing concern that the onerous administrative burdens and compliance costs may harm recipient organizations. Building new programs requires significant investments while returns are uncertain. Lack of success in pursuing government funding can result in high opportunity costs and erosion of capital, while success can also catalyze significant organizational change, making organizations vulnerable. Periods of organizational change pose an existential threat to firms as they disrupt established routines and cultures leading to fiscal distress and organizational failure (Hannan & Freeman, 1989). In general, approximately 70% of organizational change efforts will ultimately fail, often with lingering negative consequences (Burnes & Jackson, 2011). Building new revenue streams, for example, requires significant investment in partnerships, human capital, data systems, and management processes. Niswonger (2019) found that successful diversification requires systematic strategic planning processes, intense relational-specific investments with partners and collaborators, and implementing data-driven approaches to assessment of customer satisfaction. Diversification also introduces resource dependencies that require active stakeholder management and can create culture clashes when logics of charity and commercialization mix (Brown, 2005; Gazley & Brudney, 2007; Kerlin & Pollak, 2011).

These challenges identified by the organizational literature were echoed by managers in the Urban Institute surveys. They emphasized significant administrative burdens that accrue through myriad ongoing reporting and compliance requirements while government awards rarely provided adequate administrative or overhead expenses to compensate for costs associated with reporting. Roughly one-third of nonprofits surveyed reported that the complexity and time associated with reporting on government awards was a "big problem," 45% had to draw from reserves to satisfy reporting requirements, and 28% had to reduce their number of employees. The 2015 report emphasizes negative impacts of government partnerships attributed to state budget declines, local government systems, and bureaucratic inertia. Seventy percent of human service organizations experienced modifications to contracts and awards after both parties had agreed to the terms of the partnership.

Although there is evidence that revenue diversification may be advantageous there are significant downside risks associated with seeking new government awards. Nonprofits need to make expensive up-front investments in managerial systems when success is uncertain in competitive markets. If funded they catalyze organizational change that can amplify internal conflicts, introduce mission creep, erode organizational culture, and threaten stability. Success also increases costs of compliance and can increase financial volatility because of the unpredictable nature of government partnerships.

2.3 | Study hypothesis

The literature on government funding and nonprofit financial stability is non-uniform and inconclusive. To clarify the relationship, we use a novel dataset to test the following hypothesis:

H1. Nonprofits will experience adverse fiscal health shocks following the receipt of a government grant.

The empirical evidence for this hypothesis is examined by measuring changes to fiscal health that occur after the receipt of a federal government grant. A primary contribution of the paper is linking nonprofit data to a federal database that allows us to directly observe federal grants made to nonprofits to measure their impact on the fiscal health of the organization. Government grant data is matched to Form 990 tax data to observe performance before and after a federal award is received.

The Urban Institute surveys do not present detailed summaries of assets or revenues; thus it is not possible to compare the study sample directly to the surveys. However, given the panel nature of the data, within firm changes can be observed to examine the financial impact of award receipt. Using a fixed effect model, firms who have received an award are compared to their former state before they had yet received the grant. The model tracks nonprofit financial health measures before, during, and after the receipt of a federal grant.

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3 | DATA

Understanding the impact of government grants on nonprofit financial performance requires the combination of two large databases. Financial performance is measured using financial data from the IRS Form 990 Core Trends tax database provided by the National Center for Charitable Statistic (NCCS). The 990 data is not ideal for tracking government grants, however. They are reported in an annual aggregate, making it difficult to isolate any particular grant from other types of awards. Furthermore, federal funding may be structured as contracts or payments for services, and thus reported as revenue on other parts of the financial statement. As a result, it is not straightforward to measure federal funding using 990 tax forms alone.

To overcome these limitations, 990 financial data is supplemented with grant data from the Federal Assistance Award Data System (FAADS- PLUS), the primary clearinghouse for the federal grants, cooperative agreements, loans, and direct assistance to nonprofits. The FAADS-PLUS includes a range of characteristics for each individual grant, including the following: whether the grant was awarded to a nonprofit, the specific date of issuance, the purpose of the grant, its duration, and whether the grant is newly issued or a renewal.³ From the combined dataset, we construct a panel of federal awards to nonprofits (2008–2013), identified by the fiscal years in the NCCS core files. This panel is designed to roughly overlap the period covered by the 2010 and the 2013 Urban surveys. The 2010 Urban report draws its sample from the 2010 Core file. For more detail on the Urban surveys' methodologies, see their respective methodologies sections in the original reports.

Award data from the FAADS-PLUS is linked to nonprofit financial data from the National Center for Charitable Statistics (NCCS) Core Trends longitudinal file. The Core Trend file harmonizes IRS Form 990 variables across time to form a consistent panel of nonprofit financial metrics. In this way we are able to observe the finances of recipient nonprofits before, concurrent with, and subsequent to, receiving federal grants.⁴ Matching FAADS-PLUS grants to their recipient nonprofit entities is a challenge because of idiosyncratic reporting conventions. Forprofit and nonprofit recipient firms are uniquely identified in the FAADS-PLUS database using the DUNS identification number. This is a proprietary ID system operated by Dun & Bradstreet and issued globally to firms.⁵ In contrast, IRS 990 data uses the Employer Identification Number (EIN), a federal tax ID issued to US firms. Currently, we are not aware of any publicly available, comprehensive crosswalk for these classification schemes. Thus, it is difficult to connect FAADS-PLUS government grant data to the financial data of recipient nonprofits contained in the Core files (Lecy & Thornton, 2016).

To circumvent this problem, a crosswalk has been constructed from the Federal Audit Clearinghouse (FAC), operated by the Census Bureau on behalf of the Office of Management and Budget. All non-Federal entities that expend \$500,000 or more of Federal awards in a year (\$300,000 for fiscal year ending on or before December 30, 2003) are required to obtain an annual audit in accordance with the: Single Audit Act Amendments of 1996, OMB Circular A-133, and the OMB Circular Compliance Supplement and Government Auditing Standards. A single audit is intended to provide a cost-effective audit for non-Federal entities in that one audit is conducted in lieu of multiple audits of individual programs. Basic information from the audit process is downloadable in annual files from the Federal Audit Clearinghouse Image Management System. For our purposes, the audit filed contains both EIN and DUNS numbers for those contracts that fall under the audit requirements. Thus, we are able to construct a DUNS-EIN crosswalk for those grant awards that exceed \$500,000 in value.⁶

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To operationalize the research questions, the sample of federal grants has been limited in two important ways. First, the analysis only looks at the marginal impact of newly awarded grants on nonprofit health. The impact of renewed awards, revisions made to existing awards, or the discontinuation of prior awards is not explored. Second, only federal grants made directly to nonprofits by the issuing federal agency are identified in the analysis, thus supporting an estimate of the impact of direct federal grants on nonprofits. Federal funding that passes through state or local governments, however, is not observed. Many nonprofits receive pass-through grants when federal funding is channeled indirectly through state or local governments to nonprofits and other contractors.⁷ There is reason to expect that results generated by isolating federal grants should generalize to other levels of government grants, but there is no way to test this assumption directly in the current data. This important extension of the research is a notable limitation of the study and should be explored in future work.

The study sample consists of active nonprofit firms that can be "matched" with the FAADS-PLUS award database. We observe active nonprofit firms based upon IRS 990 tax form filings using the NCCS Core Trend File. Because an organization may receive more than one grant in a given year, we aggregate all new awards received by organizations in the same year. Thus, our unit of observation is the organization *i* in year *t*. Our panel extends from 2008 to 2012, or 5 years. Organizations were included in the dataset if there could be matched, via the EIN-DUNS crosswalk between the Core and FAADS-PLUS datasets. The organizations included in our study are described in Table 1 by NTEE major category. The Urban surveys do not identify their sample weights by NTEE category; however, the 2013 Urban survey methodology section lists a number of organizational types that were screened out of their survey (e.g., Higher education, vocational schools, libraries, etc.). Because of these screens and the subsequent weighting to generate a nationally representative sample, it is likely that our sample composition differs from those in the NCCS surveys.

Our empirical strategy requires the panel to be strongly balanced, where only those firms that appear in every year are included in the sample.⁸ As Table 1 reports, the sample contains 6301 nonprofit firms over 5 years, for 31,505 firm-year observations. Table 1 also summarizes the total award value for each NTEE major category and year. For example, there are 2503

NTMAJ10	2008	2009	2010	2011	2012	# NPOs	s # Obs
Arts	\$116	\$195	\$12	\$180	\$145	158	790
Education	\$1,004	\$1,872	\$280	\$1,775	\$2,188	574	2,870
Environment	\$122	\$229	\$43	\$431	\$280	231	1,155
Health	\$3,439	\$5,190	\$889	\$5,244	\$19,374	1,731	8,655
Human Services	\$2,611	\$3,650	\$772	\$3,463	\$3,653	2,503	12,515
International Relations	\$1,036	\$1,919	\$163	\$3,278	\$3,899	208	1,040
Public Benefit	\$1,284	\$1,956	\$1,032	\$2,537	\$3,145	873	4,365
Religion	\$7	\$7	\$2	\$16	\$11	23	115
					TOTAL:	6,301	31,505

TABLE 1 Value of federal grants (\$m) received within NTEE major categories in the sample

Note: Yearly aggregates are reported in millions of USD. The panel is strongly balanced, only firms that contain a full 5 years of data are kept in the sample. Only firms which appear in all 5 years are included in the sample (strongly balanced). Nonprofit firm data is drawn from the NCCS core trend file. NTEE Major Categories represent primary subsector codes.

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Human Service nonprofits in our sample for each year (for a total of 12,515 firm-year observations). In 2008 those 2503 firms received just over 2.6 billion in federal awards. Similarly, 158 Arts nonprofits received over 116 million in federal awards in 2008.

The treatment variable is operationalized in the following two ways. First, a set of binary variables is constructed to measure the extensive margin (whether a firm receives a new grant or not in each of the study periods). These variables are constructed as five dummy variables, D1 through D5, which capture the discrete and persistent effects of receiving one or more new awards in a given period. D1 is activated (changes from zero to one) in the year that the non-profit receives its first new award and remains active for the remainder of the panel. D2 is activated if another new award is received in a subsequent period. They thus serve as a step function in that only one indicator variable can be activated in each time period, and once activated they remain on for the remainder of the panel. For example: if a firm receives a new award in 2008, then the firm is "treated" by setting D1 = 1 for the full panel. If instead, the firm does not receive its first new award until 2010, D1 remains off (=0) for the first two periods of the panel, then turns on (=1) in 2010, and remains on for the remaining panels.

Federal grants are large relative to other grants, and they usually require specialized compliance systems and additional monitoring costs, so it would be reasonable to assume that the first federal grant has the potential to be disruptive in potentially positive or negative ways. It would also be reasonable to assume that the marginal impact of each new federal grant would diminish. Thus, these step-wise dummy variables remain on after the initial treatment period to measure effects that persist after receiving a government grant, and to allow effect sizes to vary by the number of new awards a nonprofit has received. Note that 25% of nonprofits in the sample receive no federal awards in the panel. These are nonprofits that were "matched" with the FAADS-PLUS database (implying that they have received a federal award in the past) but did not receive a new award during the panel time frame.

Four additional binary (dummy) variables for additional award periods are constructed in a similar fashion (D2 through D5). If a firm receives its first new award in 2008, then D1 turns on, and the firm remains treated for the remainder of the panel. If the firm receives another new award in 2010, then D2 turns on (=1) in 2010 and remains on for the remainder of the panel. If that same nonprofit receives an additional new award in 2012, then D3 would turn on (=1) in the final 2012 panel. Importantly, D2 for a particular nonprofit cannot turn on (=1) until after the firm has received its first award period (only after D1 has been activated). A firm receiving a new award in every year of the panel would have the following treatment matrix:

Table 2 offers a summary of the binary treatment variables. Note that 74.3% of the sample received at least one new award during the panel, and 46.3% of the panel received at least two awards in independent years. Only 1.1% of the sample received at least one new award in each of the 5 years.

Table 2 measures the influence of grant size as the intensive margin (a dosage effect for firms that received a new award). AWARD_AMNT is the total value of new awards given to a firm in a particular panel year.⁹ The average government award is \$2,485,352 in the sample. The sample distribution for AWARD_AMNT, however, is skewed because of a few very large awards.¹⁰ The median award (\$35,732) is much smaller than the mean. Different methods to handle extreme values were tested, and the natural logarithm for AWARD_YEAR, EXPS, and FUNDBAL were the most transparent and robust methods to deal with outliers.

Recall that firms are placed into the sample when their Core files are matched with the FAADS-PLUS system that reports federal grant awards. It is likely that firms which apply for and receive federal awards are different in many ways than organizations that do not apply or

Dependent Variables	Variable	Obs	Mean	Median	S	td. Dev.		Min		Max	
Firm expenditures	EXPS	31,505	\$50,663,44	2 \$6,179,909	÷,	318,200,00	0	\$0		\$16,780,00	000,00
Net fund Balances	FUNDBAL	31,505	\$58,088,80	7 \$2,569,228	Š	530,400,00	0	\$905,000,0	00	\$43,860,00	00,000
Profit margin	PMARGIN	31,505	0.02	0.01	0	15		-1.00		1.00	
Binary treatments			Ext	tensive margin		Obs	Mean	Median	Std. Dev.	Min	Max
Stepwise indicators of numb	er of years in which	new awards are	D1	= 1 (first award obs	erved)	31,505	74.3%	I	Ι	0	1
observed ^a			D2 0	= 1 (second award bserved)		31,505	46.3%	I	I	0	1
			D3	= 1 (third award of	served)	31,505	18.9%	I	I	0	1
			D4 o	= 1 (fourth award bserved)		31,505	8.3%	I	I	0	1
			D5	= 1 (fifth award ob	erved)	31,505	1.1%		I	0	1
Continuous treatments	Intensive m	argin 0	bs	Mean	Median	Sto	l. Dev.	Mi	in	Max	
Award amount ^b	AWARD_AM	INT 3.	1,505	\$2,458,352	\$35,732	\$8	1,327,738	\$0		\$14,230,00	00,000
Covariates		Obs	Mean	Median	Std	. Dev.	Ĩ	Min		Max	
Private contributions	CONT	31,505	\$14,075,762	\$3,393,152	\$6	2,088,783			\$0	\$1,969,00	000,00
Program revenues	PROGREV	31,505	\$36,030,462	\$722,559	\$29	9,800,000		-\$65,7	62	\$17,600,00	000,00
Investment income	INVSTINC	31,505	\$858,548	\$7,630	\$	9,405,746		-\$88,354,3	40	\$668,10	000,00
Other income	OTHER	31,505	\$674,817	\$3,749	\$	7,646,907	·	-\$691,100,0	00	\$266,40	00,000
Firm assets	ASSETS	31,505	\$96,164,969	\$4,520,900	\$98	2,300,000		-\$13,3	73	\$63,580,00	000,00
-											

TABLE 2 Summary statistics for nonprofits in the balanced panel

^aMultiple new awards received in a given year are aggregated into one step-wise indicator D_i. ^bIntensive margin estimates only includes new awards, where D1 = 1. 9

Description	Variable	In sample	Out of sample
Dependent variables		•	-
Firm expenditures	EXPS	\$50,663,442	\$4,320,893
Net fund balances	FUNDBAL	\$58,088,807	\$4,745,584
Profit margin	PMARGIN	0.02	0.04
Binary treatments			
Stepwise indicators of number of years in which new awards are observed	D1 = 1 (first award observed)	74.3%	0
	D2 = 1 (second award observed)	46.3%	0
	D3 = 1 (third award observed)	18.9%	0
	D4 = 1 (fourth award observed)	8.3%	0
	D5 = 1 (fifth award observed)	1.1%	0
Continuous treatments			
Award amount	AWARD_AMNT	\$2,458,352	0
Covariates			
Private contributions	CONT	\$14,075,762	\$949,587
Program revenues	PROGREV	\$36,030,462	\$3,340,087
Investment income	INVSTINC	\$858,548	\$89,521
Other income	OTHER	\$674,817	\$63,852
Firm assets	ASSETS	\$96,164,969	\$7,911,165
Number of firms			

TABLE 3 Summary statistics for sample panel of federal grant recipients versus full nonprofit panel

are not awarded government grants. Table 3 from our own sample supports this conjecture. Those organizations which have received a federal grant have firm expenditures (EXPS) that are more than 10 times larger than those organizations that are out of sample (\$50,663,442 relative to \$4,320,893). Firm assets (FUNDBAL) are 11 times larger for firms within the sample (\$58,088,807 relative to \$4,754,584). Consequently, we favor within firm variation to test our hypothesis. Superficially, our models were constructed to examine how nonprofit finances deviate from their baseline measures prior to receiving the grants. The identification strategy is described in the next section.

Ν

31.505

1,198,940

4 | EMPIRICAL MODEL AND ESTIMATION

Potential adverse effects of federal funds are tested by estimating the marginal impact of a new federal grant award (both the extensive and intensive margin) on the financial health of

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recipient nonprofits. Because financial health can be measured in a variety of ways, metrics are tied as closely as possible to the claims made in the Urban Institute surveys. The dependent variable Y_{it} consists of three measures reported in Table 2: total nonprofit output measured by *Firm Expenditures, Profit Margin,* and *Net Fund Balances*.

Nonprofit firm expenditures (EXPS) represent the total output of charitable goods or services for the organization.¹¹ Declining or stagnant output in the presence of an award would be an indicator of financial harm. Within our sample, the mean expenditure (EXPS) is \$50,663,422 while the median expenditure is \$6,179,909.¹² The second dependent variable, "profit margin" (PMARGIN), is operationalized as the firm's net income divided by total revenue.¹³ This is a measure of short-term financial health for the nonprofit. If incremental revenues are insufficient to cover the project expenses, as suggested by some survey respondents, then PMARGIN should be (more) negative. Nonprofits in our sample have a mean profit margin of 2%. PMARGIN was deliberately bounded between negative and positive ones to protect from bias generated from inaccurate or unusual revenue data.¹⁴ Note that PMARGIN is already scaled as a percentage, thus it is not logged in subsequent regressions.

Finally, fund balances (FUNDBAL) measure the assets net-of-liabilities held by the firm.¹⁵ Because losses over time will accrue as lower fund balances, FUNDBAL proxies for the long-term health of the organization. FUNDBAL had a mean level of \$58,088,807 in the full sample. Appendix A offers a set of correlation coefficients for all variables in the model.

Recall, new award D_i is interpreted as a step-function,¹⁶ describing the incremental impact of *an additional* award on the nonprofit's fiscal health, above and beyond the impact of the previous award-year.¹⁷ The advantage of this specification is that it allows for the first, second, third, fourth, and fifth award-year that a nonprofit receives to have different magnitudes of impact. More importantly, it allows the impact of the first award to be isolated from the impact of subsequent awards in the panel, which we believe best captures the effects described in the study hypothesis. The total impact of all awards for all awards firms can be derived by taking the sum of the dummy variables $\sum_{i=1}^{n} D_i$.

$$Y_{it} = \alpha_i + \sum_{n=1}^{5} \beta_n \mathbf{D}_{ni} + \gamma X_{it} + \eta Y E A R_t + u_{it}$$
(1)

We estimate Equation (1). The model contains both year and firm-level fixed effects.

Where Y represents one of our three dependent variables for financial health, (EXPS, PMARGIN, FUNDBAL). The new award indicator D_{ni} is the set of binary indicators which turn on starting in the period when the firm receives its nth new award. X_{it} represents our vector of covariates described in Table 2. A set of common financial covariates are included to account for other factors that might explain changes in fiscal health other than government awards. These variables include revenue sources (private contributions, program revenues, investment income, and other income) as well as firm assets.

Next, Equation (2) tests the dosage effect of grant size using intensive margins. Recall that AWARD_AMT is the sum of all direct federal awards to firm i in year t. The elasticity between the logged value of the award (AWARD_AMT) and the logged change in Y are estimated. We include the set of model covariates (X_{it}), along with YEAR and firm-level fixed effects. The model is as follows:

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$$Y_{it} = \alpha_i + \beta \ln \text{AWARD AMOUNT}_{it} + \gamma X_{it} + \eta Y EAR_t + u_{it}.$$
(2)

Again, three measures of financial health are used. Since it is a log-log model, the AWARD_AMT coefficient is interpreted as the average impact of an additional percentage point increase of award funds on the percentage change in financial health measure, conditional on those firms which received a new award.

There are a variety of estimation challenges to overcome. It is likely that unobserved characteristics of the firm (manager aptitude, organizational sophistication, etc.) embedded in the error term are correlated with the treatment, leading to an omitted variable bias (OVB) problem. To mitigate this issue, the model is estimated using firm-level fixed effects (a_i) which will absorb time-invariant characteristics of the firm. A simple Hausman test indicated that a Fixed Effect model is preferable to a Random Effects model. Finally, the distribution of the dependent variables and treatment variables is highly non-normal. To normalize the distributions of the variables and reduce the influence of outlier observations, we take the natural logarithms of (EXPS, FUNDBAL, and AWARD_AMT). Note that the distribution of PMARGIN, by construction, was already in percentage terms, thus it was not highly skewed and no further transformation was necessary (Table 8).

5 | RESULTS

The model described by Equation (1) examines the change in firm fiscal health with each additional new award period D_{ti} . Firm and year-fixed effects are included in each regression. For clarity, the full models are reported in Appendix B, while the main effects are presented in Table 4. The positive and significant results show us that nonprofit fiscal health improves from receipt of federal grants. Firm expenditures increase after receiving a federal grant, more so than firms that did not receive a new award in the same period. Both the short and mediumterm financial position of the firm generally improves with the receipt of additional new awards. These effects are strongest with the first government award that is observed, but they taper off quickly. For profit margins (PMARGIN) and fund balances (FUNDBAL) there are no

Treatments/ outcomes:	Change in expenses (EXPS)	Change in profit Margin (PMARGIN)	Change in net assets (FUNDBAL)
EXTENSIVE MARGIN:	(1)	(2)	(3)
First award (D_1)	10.4%***	1.0%**	6.0%***
Second award(D_2)	1.8%***	1.4%***	2.4%*
Third award (D_3)	2.4%***	-0.2%	5.0%***
Fourth award (D_4)	4.1%***	-0.3%	3.0%***
Fifth award (D_5)	-0.2%	0.3%	-1.0%

TABLE 4 Summary of extensive margin main effects

 $\textit{Note: Results are statistically significant: ***p-value < 0.01; **p-value < 0.05; *p-value < 0.10.$

perceived impacts above the second level of government awards. These findings indicate that the net financial impact of new grant awards appears to be positive for recipient nonprofits.

5.1 | Full sample extensive margin: The impact of receiving one or more federal awards

Table 4, Column 1, reports changes in nonprofit firm size, measured by expenditures (EXPS), as a result of new awards. Since expenditures are logged to account for skew, the coefficients are interpreted as a percent change in expenditures. Thus, on average, when firms receive their first award in the initial year of the panel, firm expenditures increase by 10%. On average, the receipt of a new award in the subsequent year (D2 = 1) raises firm expenditures by an *additional* 2% over and above expenditures from the first award (D1 = 1). Nonprofits with a third new award (D3) experience increases in expenditures by an additional 2% over D1 and D2, and the fourth award adds an additional 4% growth. By the fifth award, the marginal impact of additional awards is no longer statistically significant. The cumulative effect of four periods in which new awards are received is an 18% increase in expenditures compared to a firm that received no new awards during the study period.

Column 2 of Table 4 reports the impact of new awards on the net revenue gains or losses of each nonprofit firm, that is, the profit margin (PMARGIN). Upon the receipt of an initial award (D1 = 1) the profit margin for the recipient firm rises by 1%. Upon receipt of a new award in any subsequent year (D2 = 1), net income rises by an additional 1%. Subsequent new awards have no statistically significant impact on the nonprofit firm's profit margin. The cumulative effect of two new awards in the sample window is a profit margin increase of 2%, a benefit that persists over time. These results indicate that federal awards have a positive impact on nonprofit operating margins. Importantly, the rise in expenditures observed in Model 1 is more than offset by increased revenues.

Column 3, of Table 4, reports on the impact of new awards on the nonprofit's fund balances or endowments (FUNDBAL), a long-term measure of financial health. With the receipt of the first new award, fund balances rise – on average – by 6%. With an incremental award in the second period, fund balances rise by 2%. For the third period, additional new award increase revenues by another 5%. For the fourth period, new award increases fund balances by an additional 3%. The fifth new award does not have a statistically significant impact on FUNDABL. Overall, the cumulative effect of new awards over the sample window is a 16% increase in fund balances. This finding is consistent with our results from PMARGIN, indicating that new Federal awards appear to significantly improve a recipient nonprofit's financial position.

These binary treatment models provide evidence that federal grants increase firm output and the increases appear to be accompanied by relative improvements in the firm's short-run and long-run financial position. Firm profit margins rise after the grant, and fund balances improve at an even faster rate. The models do not test whether impact is relative to the magnitude of the awards, so we turn to the intensive margin approach below.

5.2 | Full sample intensive margin: How large of a grant did the firm receive?

The next set of results examine only those firms which received a new award sometime during the sample frame. We begin with firm expenditures (EXPS), which are reported in Table 5

Treatments/ outcomes:	Change in expenses (EXPS)	Change in profit margin (PMARGIN)	Change in net assets (FUNDBAL)
INTENSIVE MARGINS:	(1)	(2)	(3)
Elasticities:	0.60%***	0.03%**	0.30%***

TABLE 5 Intensive margin main effects

Note: Results are statistically significant: ***p-value < 0.01; **p-value < 0.05; *p-value < 0.10.

Column 1. The full regression tables are again available in Appendix C, but for simplicity main effects are presented in Table 5.

Because both EXPS and AWARD_AMOUNT are logged, the coefficients can be interpreted as elasticities. Thus, a 1% increase in the award amount corresponds to a six-tenths of 1% increase in firm expenditures. Statistical significance is strong and consistent with our previous findings on the extensive margin. Both the existence and the magnitude of the grant increase overall expenditures by the firm.

Recall that PMARGIN, reported in column 2, is a percentage of revenue and can be positive or negative, thus this model takes a linear-log form. In our model, a 10% increase in award value corresponds to a 0.3 percentage point increase in a firm's profit margin or doubling the award amount would lead to a 3 percentage point increase in the profit margin. This coefficient is statistically significant. The coefficient is small but consistent with the extensive margin findings; an increase in award value results in a modest increase in the firm's profit margin.

Finally, fund balances (FUNDBAL), reported in column 3, increases by three-tenths of 1% for a 1% increase in AWARD_AMOUNT. The result is statistically significant at the 5% level. Both coefficients are consistent with our extensive margin regressions that, along with increases in nonprofit expenditures, the financial position of award recipients measurably improves with its receipt.

5.3 | Robustness check: Human service organizations

The previous section includes all nonprofit organizations that directly received Federal grant awards. In contrast, the Urban Institute surveys target Human Service nonprofits, a specific subcategory of this population. It is possible that Human Service nonprofits are not well represented by the full population of nonprofits. To test this claim, this section isolates the sample to only Human Service organizations as defined by the National Taxonomy of Exempt Entities (NTEE).¹⁸ As with the full sample, we test both extensive and intensive margins, which are found in Tables 6 and 7.

Results are consistent with estimates created from the full sample. For the extensive margin (Table 6), EXPS for Human Service nonprofits increases by 7% (Column 1) with the first award year. Similar to the full sample, the impact of subsequent awards on output (EPXS) is reduced for subsequent award years, and becomes statistically indistinguishable from zero by the fifth year of grants. We do not observe an impact of grants on profit margins (PMARGIN) for the human service sector. This is less than the full sample, where a small (1%) increase in profit margins was observed for the first and second grant years. Initial awards (NEW AWARD 1 = 1) award increases fund balances (FUNDBAL) by 4%. Subsequent awards

TABLE 6 Extensive margin human service only

Model: DV	(1) EXPS	(2) PMARGIN	(3) FUNDBAL
D1: First award	0.072**	0.003	0.043**
	6.450	0.580	2.180
D2: Second award	0.001	0.00	-0.011
	0.160	0.060	-0.760
D3: Third award	0.010	-0.004	0.001
	1.070	-1.010	0.070
D4: Fourth award	0.00	0.00	-0.02
	0.53	0.01	-0.95
D5: Fifth award	-0.040*	-0.003	0.008
	-1.570	-0.460	0.200
CONT	1.12E-08**	2.89E-09**	7.71E-09**
	3.49	2.8	3.92
PROGREV	1.13E-08**	2.33E-09**	6.84E-09**
	4.13	3.64	4.38
INVINC	4.17E-08	2.14E-08*	3.80E-08
	1.27	1.53	1.55
OTHINC	8.08E-09	4.29E-09**	7.19E-09*
	1.59	2.04	1.93
ASS_BOY	2.70E-09	8.87E-12	2.51E-09
	1.38	0.03	1.53
Firm-level fixed effects:	Yes	Yes	Yes
Year fixed effects:	Yes	Yes	Yes
Ν	12,206	12,158	11,367

Note: t statistics in italics, *p*-values based upon robust standard errors. Only positive values of NETINC and FUNDBAL Included. #_Award represents the incremental value of an award.

do not have a statistically significant impact on fund balances. Again, this is less than the impact of grants on fund balances for the entire sample. In practical terms, it is encouraging to see that the pattern of impacts for human service organizations is consistent with our entire sample. This supports our conjecture that grants have a net positive impact on financial performance, inclusive of the human service sector. Yet, the magnitude impacts are modest for human sector, relative to the entire sample. These results suggest that while the impact of grants on the financial health of human service nonprofits is still positive, their positive impact is relatively small compared to the larger nonprofit sector.

Recall that the intensive margin estimates the elasticity of an increase in the magnitude of the grant award, conditional on the firm receiving an award. Table 7 reports that a 1% increase in new grant award value results in a four-tenths of 1% increase in firm expenditures. The result is statistically significant. Increases in new awards appear to have no statistically detectable effect on Human Service profit margins (Column 2). However, fund balances (Column 3) demonstrate an increase of two-tenths of 1% for a 1% increase in new award value. Again, while the

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Model: DV	(1) EXPS	(2) PMARGIN	(3) FUNDBAL
Log award amt.	0.004**	0.000	0.002**
	8.270	1.310	2.510
CONT	1.11E-08**	2.89E-09**	7.68E-09**
	3.470	2.800	3.910
PROGREV	1.13E-08**	2.32E-09**	6.85E-09**
	4.120	3.640	4.390
INVINC	4.24E-08	2.15E-08*	3.83E-08*
	1.300	1.540	1.560
OTHINC	8.16E-09*	4.27E-09**	7.10E-09*
	1.630	2.040	1.920
ASS_BOY	2.69E-09	5.09E-12	2.49E-09
	1.380	0.020	1.520
Firm-level Fixed effects:	Yes	Yes	Yes
Year fixed effects:	Yes	Yes	Yes
Ν	12,206	12,158	11,367

Note: t statistics in italics, *p*-values based upon robust standard errors. Only positive values of NETINC and FUNDBAL Included.

TABLE 8 Example stepwise treatment matrix for a nonprofit receiving at least one new award each period

	2008	2009	2010	2011	2012
D1 (First New Award Period)	1	1	1	1	1
D2 (Second New Award Period)	0	1	1	1	1
D3 (Third New Award Period)	0	0	1	1	1
D4 (Fourth New Award Period)	0	0	0	1	1
D5 (Fifth New Award Period)	0	0	0	0	1

magnitudes of the relevant coefficients are smaller for the Human Service sub-sample, sign and statistical significance are similar to the overall sample. This indicates that the specific experience of the Human Service sub-sector is not dissimilar to that of the overall nonprofit sector. Direct Federal awards to recipient nonprofits appear to have a positive net financial impact that is both immediate and durable over time.

6 | DISCUSSION AND IMPLICATIONS

We began with a paradox. There is a body of empirical evidence that government awards are a positive force for the nonprofit sector. This finding is intuitive, more (or more diverse) revenue streams should improve organizational health. The literature, however, has nebulous support for a causal argument because Form 990 data only offer aggregate information on government

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awards. It may be the case that government awards improve financial health, or it may be the case that government tends to fund financially healthy nonprofits that can overcome the hurdles required to access and support government awards.

The Urban Institute surveys make this issue salient to nonprofit managers. Nonprofit managers articulate the substantial administrative and financial burdens for nonprofits that have received government funding. As a result of these challenges, nonprofit managers may hesitate to apply for government awards for fear of the significant operational costs described by survey respondents. Nonprofit managers will thus be faced with the dilemma of determining whether government grants offer net positive returns, or whether the associated management costs will wash out gains or lead to neg negative fiscal returns. This paper provides a partial resolution to the question by testing the hypothesis with direct federal grants. Our methodology offers an intuitive counterfactual, where organizations are compared to themselves before they received their first government award.

Our approach is distinctive from the existing literature, which compares across organizations that did and did not receive an award. Instead, we construct a panel of nonprofit data covering fiscal health over a five-year period to estimate within-firm effects of the award recipient. We find that nonprofit financial health improves after the receipt of an award over a range of measures. For firms that received a single federal grant expenditures increase by 10%, profit margins increase by 1%, and net assets increased by 6%. For firms that received federal awards in each of five periods expenditures cumulatively increase by an average of 19%, profit margins improve by a cumulative 2%, and net asset fund balances increase by a total of 11%. Similarly, the magnitude of changes correspond with the size of the federal awards.

We conclude that the empirical evidence drawn from federal grants to nonprofits shows overall net benefits from government funding relationships. This is encouraging news to non-profit managers. Not only are government awards positively associated with nonprofit financial health, but the impact appears substantive and causal. This holds true despite the administrative and fiscal challenges of managing those funding relationships that were identified by the Urban Institute studies.¹⁹

Some weaknesses of the empirical analysis presented in this paper must be acknowledged. First and foremost, only awards given directly from federal agencies to nonprofits can be observed. Nonprofits that receive awards indirectly as pass-through grants through state programs or block grants are not considered in this analysis. This data limitation makes it challenging to generalize the results to all nonprofits that receive federal awards through subaward processes or state and local government programs. We conjecture that if the data were available, one would observe similar outcomes in nonprofits that receive subawards instead of direct awards, but there is no way to test this with current data due to poor subaward tracking. Similarly, while we examine federal grant awards obtained from the FAADS database, we do not include federal contracts in the analysis. More work is needed to determine whether the results extend to all types of federal funding.

The study design skews the sample toward larger firms. This is driven by crosswalk that is necessary to join nonprofit financial data with government awards. The crosswalk is limited to organizations that receive more than \$500,000 in federal grants. While the Urban Institute surveys do not include summary statistics for firm size of respondents, the mean value of the grant award in the surveys is \$2,543,870 (Pettijohn et al., 2013b). This is roughly equivalent to the mean award value of \$2,458,352 for the study sample (Table 3). While it is impossible to determine the impact of grants on smaller (<\$500,000) awards, it is plausible that limiting smaller awards biases our point estimate. This would be the case if the truncated awards went to

smaller organizations, where government awards would have an even larger positive proportional impact. A broader circulation of the full DUNS crosswalk or the regular use of EIN numbers for government contracts would allow this question to be investigated.

7 | CONCLUSION

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Although we acknowledge the limitations of the study, the findings support the growing empirical nonprofit literature that establishes a largely positive impact of government funding on nonprofit firms and the nonprofit sector. The results from our sample show that, on average, nonprofits are better off after receiving government awards, and the benefits increase with award size. We do not consider these results to be conclusive, but they are the first to empirically test whether the costs to government grant relationships identified in the Urban Institute survey on nonprofit-government grants and contracts lead to overall net costs to government grants. The findings still raise important questions about the need to disentangle potential heterogeneous effects for direct versus subaward recipients, or inherent weaknesses of surveys of managers. Future work should extend the results to other types of government grants by estimating similar models using state subaward databases or looking at state and local grant programs. These refinements will help us better understand the important and complex relationship between government resources and nonprofit sector health in an era of third-party government.

DATA AVAILABILITY STATEMENT

Data will be made available upon acceptance for publication.

ENDNOTES

- ¹ The Urban reports are not always precise whether they are referring to contracts or grants in their survey results. Admittedly, the distinction is not always clear in practice. This paper will use the term government awards when referring to both government grants and contracts. The empirical analysis of this paper will only focus only on grants, which are identified as such in the FAADS-PLUS database. We will analyze government contracts in a separate paper.
- ² Human service nonprofits refer to one of the 10 large classification codes identified by the National Center Charitable Statistics. Historically, Human Service organizations have been the largest nonprofit category by number of organizations and include organizations that are most associated with charitable activities.
- ³ FAADS-PLUS data was downloaded from www.usaspending.gov. Federal contracts to nonprofits are reported in a separate databased called the Federal Procurement Data System – Next Generation (FPDS – NG). We analyze federal contracts with nonprofits in a separate paper.
- ⁴ Nonprofits are identified in the FAADS-PLUS data by the identified "Recipient Type." We included those identified as "12: Other Nonprofit," but did not include "20:Private Higher Education."
- ⁵ https://fedgov.dnb.com/webform/pages/dunsnumber.jsp
- ⁶ The crosswalk is available from the authors upon request.
- ⁷ We hope to be able to eventually include pass through grants as the FAADS-PLUS database improves. For a comprehensive review of nonprofit data available in the FAADS-PLUS and federal fund flows to nonprofits, see Lecy and Thornton (2016).
- ⁸ 1192 organizations (or roughly 3% of the sample) were removed to balance the panel. It is not possible to determine why these organizations did not report in a particular year. The organizations were, on average, much larger (by about 3x) than the average organizations kept in the sample. There was no observable

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systematic bias in the NTEE categories of organizations that were removed. Given that the organizations were larger (and this is correlated with a higher probability of government grants) it is plausible that their removal biases our subsequent point estimates downward (toward zero). We report summary statistics of the dropped organizations in Table 3.

- ⁹ Note that a firm could receive more than one new award in a particular year.
- ¹⁰ The largest award-year observation was the Henry M Jackson Foundation for the Advancement of Military Medicine in 2012. Over that year, this nonprofit received a total of more than 14 billion in federal grants.
- ¹¹ Line 18 in the IRS Form 990.
- ¹² As with the Award Amount, we observe some extreme cases with the dependent variables. The largest expenditure is nearly 17 billion dollars and comes from Kaiser Foundation Hospitals in 2012. As with Award Amount, normalizing the distribution by taking the natural logarithm provides the most transparent and robust method to deal with large extreme values. There were 24 firms that reported zero expenditures at some point during the sample frame. We are cognizant of the literature that examines Inaccuracies in Form 990 data reporting, particularly the issue of zero reported expenditures has been a significant topic of the research literature. For comprehensive reviews of this topic see (Froelich, Knoepfle, & Pollak, 2000; Gordon et al., 1999). However, given that these firms are interacting with federal agencies for government grants, we chose to leave them in the sample. Results are robust if zero filers are excluded.
- ¹³ Line 19 divided by line 12 in the IRS Form 990.
- ¹⁴ Approximately 3% of the sample was trimmed because of PMARGIN less than negative one, or greater than positive one. These were considered implausible values.
- ¹⁵ Line 22 in the IRS Form 990.
- ¹⁶ It is also possible with this data to analyze the impact of different funding agencies (i.e., Homeland Security vs. HHS). This analysis is beyond the scope of this study and is handled in a separate paper.
- ¹⁷ Since we cannot separate out the independent effects of each new award when multiple awards are received in the same year, we operationalized the extensive binary measure as one or more new awards in a year, and we include measures of size in the next phase of analysis to control for this limitation.
- ¹⁸ NTEE category V of the NTEE 10 Major Groups http://nccs.urban.org/classification/national-taxonomyexempt-entities.
- ¹⁹ It is plausible that survey results are systematically biased negatively in their impression, either by self-selection of survey respondents or by asymmetry in the incentive to answer the survey questions. Those that experienced negative effects from government grants are more likely to reply to the survey to report the challenges they encountered and their perceptions of fiscal harm. Similarly, nonprofits that plan to apply for additional government grants in the future might use the survey as a lobbying mechanism to advocate for more generous administrative support, more flexibility, and fewer reporting requirements. Negative experiences are more salient and thus easier to recall, even if overall experiences with federal grants are positive.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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APPENDIX A: CORRELATION COEFFICIENTS

		V1	V2	V 3	V4	V5	V6	V 7	V 8	V9	V10	V11
V1	Firm expenditures	1										
V2	Profit margin	0.00	1									
V3	Net fund balances	0.38	0.01	1								
V4	D1: New award indicator	0.06	-0.01	0.05	1							
V5	Award count	0.01	0.00	0.01	0.04	1						
V6	Award amount	0.07	-0.01	0.05	0.88	0.05	1					
V7	Private contributions	0.29	0.01	0.52	0.10	0.04	0.10	1				
V8	Program revenues	0.98	0.00	0.27	0.04	0.01	0.05	0.12	1			
V9	Investment income	0.28	0.01	0.69	0.03	0.00	0.03	0.33	0.21	1		
V10	Other income	0.28	0.01	0.20	0.03	0.00	0.04	0.16	0.25	0.16	1	
V11	Firm assets	0.54	0.01	0.93	0.06	0.01	0.06	0.47	0.45	0.66	0.25	1

APPENDIX B: EXTENSIVE MARGIN FOR FULL SAMPLE

	EXPS	PMARGIN	FUNDBAL
Variable	(1)	(2)	(3)
NEW_AWARD_1	0.10***	0.01**	0.06***
	10.88	2.03	3.77
NEW_AWARD_2	0.02***	0.01***	0.02*
	2.76	2.46	1.78
NEW_AWARD_3	0.02***	0.00	0.05***
	2.60	-1.13	3.86
NEW_AWARD_4	0.04***	0.00	0.03***
	5.28	0.84	2.42
NEW_AWARD_5	0.00	0.01	-0.01
	-0.11	0.84	-0.35
CONT	1.65E-09***	7.79E-10***	1.12E-09***
	3.25	3.27	2.73
PROGREV	5.56E-10***	6.94E-11*	1.68E-10
	2.78	1.68	1.53
INVINC	8.32E-10	1.30E-09***	2.29E-09***

Ν

	EXPS	PMARGIN	FUNDBAL
Variable	(1)	(2)	(3)
	0.93	3.64	3.35
OTHINC	6.52E-10	8.52E-10***	1.84E-10
	0.94	4.28	0.58
ASSETS	-1.54E-11	-1.27E-11	9.97E-12
	-0.85	-0.73	1.04
YEAR			
2009	0.04***	-0.03***	0.04***
	7.73	-8.04	3.78
2010	0.11***	-0.02***	0.11***
	15.25	-4.73	10.12
2011	0.11***	-0.01^{**}	0.16***
	9.52	-2.25	10.47
2012	0.08***	-0.02^{***}	0.18***
	5.74	-4.70	9.29

Note: t statistics in italics. Results are statistically significant: ****p*-value < 0.01; ***p*-value < 0.05; **p*-value < 0.10. Only positive values of NETINC and FUNDBAL Included. #_Award represents the incremental value of an award. Model includes firm-level fixed effects. Robust standard errors.

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APPENDIX C: INTENSIVE MARGIN FOR FULL SAMPLE

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	EXPS	PMARGIN	FUNDBAL
Variable	(1)	(2)	(3)
Log award amt.	0.006***	0.0003**	0.003***
	12.69	2.02	4.57
CONT	1.64E-09***	7.79E-10***	1.13E-09***
	3.23	3.26	2.75
PROGREV	5.48E-10***	6.87E-11*	1.72E-10
	2.73	1.66	1.57
INVINC	8.38E-10	1.30E-09***	2.29E-09***
	0.94	3.63	3.33
OTHINC	6.34E-10	8.52E-10***	1.97E-10
	0.88	4.29	0.59

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(Continues)

	EXPS	PMARGIN	FUNDBAL
Variable	(1)	(2)	(3)
ASSETS	-1.31E-11	-1.24E-11	1.17E-11
	-0.73	-0.71	1.21
Year			
2009	0.06***	-0.02***	0.05***
	17.01	-8.85	6.98
2010	0.17***	-0.01^{***}	0.15***
	31.18	-3.3	15.98
2011	0.15***	-0.001*	0.2***
	25.38	-1.65	21.42
2012	0.16***	-0.02**	0.25***
	21.91	-6.53	22.82
Ν	30,719	30,507	29,209

Note: t statistics in italics. Results are statistically significant: ****p*-value < 0.01; ***p*-value < 0.05; **p*-value < 0.10. Only positive values of FUNDBAL Included. Model includes firm-level fixed effects. Robust standard errors.