

What Big Data Can Tell Us About Government Awards to the Nonprofit Sector: Using the FAADS

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Abstract

This article reviews the Federal Assistance Award Data System (FAADS), a comprehensive online archive of federal grant activity. Relatively few nonprofit scholars have used this extensive data source due to significant structural limitations in the data. This article aims to describe and mitigate those limitations while stimulating new research on government awards to nonprofits. The article profiles the process of federal award flows and reporting. We also identify the primary advantages and shortcomings in the current data structure. Finally, we post an electronic matching algorithm that links individual federal award records to recipient Form 990 financial data. This process allows researchers to analyze the influence of federal awards with greater fidelity than has been previously accomplished in the literature.

Keywords

nonprofit, grants, FAADS, awards, matching

Introduction

The aim of this article is to assist nonprofit researchers interested in exploring the complex financial relationship between Federal Government agencies and the nonprofit sector by introducing data available via the Federal Assistance Award Data System (FAADS). We describe the current capabilities and limitations of an online data archive, which contains the most comprehensive source of federal award data

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currently available. It is an expansive dataset, containing records of millions of federal grants and contracts each year. We also address a key limitation of the data: the absence of an appropriate identification that would make it possible to link federal award data directly with nonprofit financial data. We advance the field by offering a matching strategy, available for download, which allows researchers to link the FAADS to existing Internal Revenue Service (IRS) Form 990 financial data. This article offers nonprofit scholars the ability to incorporate FAADS data into existing research endeavors that might benefit from a granular view of government grants.

Government funding represents the second largest source of financial resources to the nonprofit sector (Blackwood, Roeger, & Pettijohn, 2012). A 2009 Government Accountability Office report estimates that nonprofits receive more than 25 billion dollars in grant awards and more than 200 billion dollars in contracts. However, that same report notes that relatively little is known about the channels of federal funding to nonprofits. Federal agencies use both direct payments—made directly to the individual or firm—and indirect support—via state agencies—to distribute awards. Concerns outlined in the GAO report include opaque tracing of federal funding that passes through the states (i.e., subawards) and inconsistent labeling of nonprofits in federal databases. This article describes how recent improvements in federal data reporting, along with the importance of federal funding for nonprofits, may help nonprofit scholars overcome some limitations of existing federal grant data.

The format for this article is similar to other articles that attempt to accelerate nonprofit research by explicating an available data source. Examples include Wilhelm (2006, 2007); Jalandoni, Petrescu, and Green (2005); and Salamon and Dewees (2002). The Wilhelm articles explain the Center on Philanthropy Panel Study (COPPS), a supplement to the Panel Study of Income Dynamics (PSID). Jalandoni et al. explore limitations and uses of the Federal Audit Clearinghouse, while Salamon and Dewees propose novel uses of Labor Department data for nonprofit employment.

The article proceeds as follows: “History of FAADS and FAADS-PLUS” section offers a brief history of the FAADS; “Summary of Government Awards” section summarizes the existing data in more detail, identifying points where our knowledge is limited; “Summary of Government Awards” section contributes to the field by introducing an algorithm for matching organizations between the FAADS and the National Center for Charitable Statistics (NCCS) database of nonprofit financial statements; finally, “Data Limitations” and “Directions for Future Research” sections outline some limitations and barriers to using the data, along with examples of the kinds of research questions that can benefit from better awards data.

History of FAADS and FAADS-PLUS

The original FAADS was established by the Consolidated Federal Funds Report Act of 1982. It has since been operated by the Bureau of the Census (<http://www.gpo.gov/fdsys/pkg/STATUTE-96/pdf/STATUTE-96-Pg1607.pdf>). Prior to 2006, the FAADS was released quarterly as a stand-alone report, stored as a large text file. Each award transaction was represented as a distinct record, comprised of 34 attributes. These

included information about the awarding agency, the recipient, and basic structural parameters of the award.¹ Some award records were aggregated to the county level and contained fewer attributes.

In 2006, the Federal Funding Accountability and Transparency Act (FFATA) improved the system by requiring agencies to report financial awards in excess of US\$25,000 within 30 days of obligation. Because the original FAADS process did not make it possible for agencies to comply with the terms of the act, a new FAADS-PLUS system was developed. A private contractor, REI Systems, was hired to aggregate Federal award data from federal, state, and local granting agencies. REI then submits the data to the National Aeronautics and Space Administration (NASA), which makes it available to the public at www.usaspending.gov.

The FAADS-PLUS is now the primary information clearinghouse for federal awards, including grants, cooperative agreements, various types of loans, and direct assistance. The FAADS-PLUS does not include procurement contracts, which are available in the Federal Procurement Data System—Next Generation (FPDS-NG).²

The process by which federal agencies originate an award is complex. Federal agency budgets are typically organized into programs, which are recorded in the Catalog of Federal Domestic Assistance (CFDA), a comprehensive taxonomy of all 2,231 federal assistance programs. When an agency receives permission (or budget authority) to make an award, it creates an obligation. A report is then filed with the FAADS-PLUS (or FPDS-NG in the case of procurement contracts), documenting the award obligation. Note that obligations only imply that the money has been allocated within a budget until they are subsequently forwarded to the U.S. Treasury for dispersal of funds.

Agencies also generate program-level reports of awards to the General Services Administration (GSA), which are organized according to the CFDA. Along with the general purpose of each program, the CFDA code links the award to basic information on eligibility requirements, assistance type, and the law by which the award was authorized. The GSA has operated the CFDA reporting function since 1984.³

Summary of Government Awards

In 2012, U.S. government agencies issued 510,218 grant assistance awards totaling 538.4 billion dollars. When creating award tallies for a specific year, it is important to note the FAADS-PLUS method of reporting awards. For new awards, the FAADS-PLUS will only list payments made in that year. It will report subsequent cash outlays as an award continuation. If an existing award is increased, then only the additional grant amount is reported. If an award is reduced, then the reduction is reported as a negative value. In 2012, 40% of awards listed in the FAADS-PLUS database were new and 36% were continuations of existing awards. The remainder were revisions to existing awards.

Table 1 summarizes the overall allocation of federal awards in 2012.⁴ The largest federal award recipients were other government agencies and programs. Eighty percent of government-to-government awards, or 431 billion dollars, were allocated to

Table 1. Federal Government Awards, by Recipient Type, 2012.

Name	Total grant dollars	Number of grants
State government	US\$431,230,098,724	226,456
Other nonprofit	US\$27,218,440,996	52,643
State-controlled higher education	US\$24,124,525,741	69,975
City or township	US\$13,359,042,084	57,067
Special district government	US\$12,112,973,346	10,905
Private higher education	US\$9,159,638,188	26,754
All other	US\$8,840,704,548	16,108
County government	US\$4,576,891,632	6,493
Small business	US\$2,569,489,153	6,964
Independent school district	US\$2,159,243,784	14,407
Indian tribe	US\$1,620,311,749	10,164
Profit organizations	US\$1,342,453,164	3,421
Individual	US\$127,685,661	8,861
Total	US\$538,441,498,771	510,218

Source. Federal Assistance Award Data System—U.S. Census Bureau.

states, of which 257 billion dollars was Medicaid funds. Awards made to other government agencies are typically passed along to the final recipients as subawards. These records are kept as a separate electronic database that is discussed in more detail in a later section. Other recipients of significant government support include highway programs, child nutrition, children's health, special supplements, and disaster relief.

Assistance to Nonprofits

Roughly, 7% of total award dollars were allocated directly from federal agencies to nonprofits, denoted by a nonprofit flag in the FAADS-PLUS data.⁵ Alternatively, funds may be funneled indirectly through state or local government entities and then distributed to nonprofits as subawards of larger umbrella programs. A diagram of funding flows is illustrated in Figure 1.

The grants listed in the FAADS-PLUS represent a portion of government allocations to nonprofits, as state and local governments can contract with nonprofits directly without using federal funds. Although incomplete, the 52,643 awards made directly to nonprofit organizations total 27.2 billion dollars. This represents a significant funding stream for the nonprofit sector. An additional 9.1 billion dollars was allocated to private higher education institutions, which are—based on visual inspection of the data—primarily nonprofits.

Table 2 provides disaggregated award totals to nonprofits by funding agency. More than half of all federal award dollars to nonprofits originate from the Department of Health and Human Services (HHS). HHS alone allocated nearly 16 billion dollars to the nonprofit sector. The next largest grantor, U.S. Agency for International Development (USAID), provided slightly more than 5 billion in award dollars.⁶

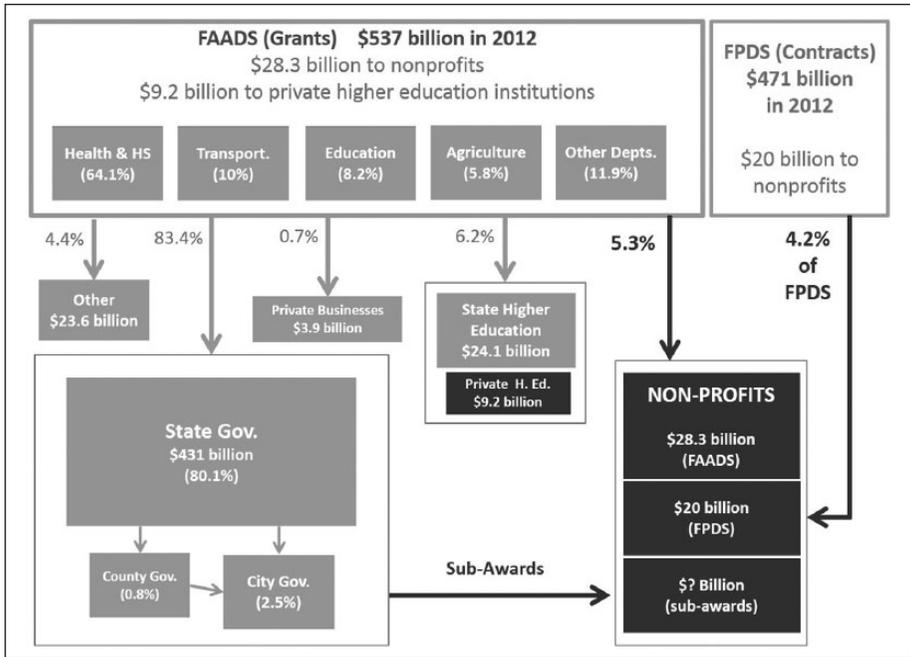


Figure 1. Flow of Federal Grants to Nonprofits.

Note. FAADS = Federal Assistance Award Data System; FPDS = Federal Procurement Data System; HHS = Health and Human Services.

Assistance Types

Federal award assistance may come in a variety of forms. The CFDA currently categorizes federal awards into 15 award types (www.cfda.gov). Only four of these appear as awards to nonprofits. A summary is offered in Table 3.

Nearly 60% of total dollars awarded to nonprofits are classified as project grants. Project grants imply awards targeted toward a specific project or program, typically for a fixed period. Common examples of project grants include research grants, evaluation or planning grants, scholarships, or construction grants.

One third of federal award dollars to nonprofits took the form of cooperative agreements. Cooperative agreements are used “when substantial Federal programmatic involvement with the recipient is anticipated by the funding agency during performance of the project. The nature of that involvement will always be specified in the offering or application guidance materials” (<http://www.hrsa.gov/grants/definitions.html>). Cooperative agreements are more customized and bilateral in nature relative to project grants, though their objectives are often similar.

The remainder of the awards to nonprofits include block and formula grants, each totaling around a billion dollars in 2012. Formula awards are typically allocated to entities based on some predetermined criteria, such as community demographics. The

Table 2. Awards to Nonprofits by Source, 2012.

Agency	Total amount	Number
Health and Human Services	US\$15,903,757,569	25,413
Agency for International Development	US\$5,177,622,140	2,956
State Department	US\$1,039,347,099	801
Labor Department	US\$760,611,505	879
Department of Education	US\$561,307,477	1,581
National Science Foundation	US\$484,036,654	1,141
Department of Defense	US\$415,526,089	924
Department of Agriculture	US\$353,860,525	3,141
Veterans Affairs	US\$299,792,246	3,691
Department of Justice	US\$299,459,874	589
Corporation for National and Community Service	US\$279,446,134	1,227
National Aeronautics and Space Administration	US\$272,673,263	2,104
Department of Commerce	US\$261,276,900	942
Department of the Interior	US\$191,976,876	1,882
Treasury Department	US\$186,892,457	789
Energy Department	US\$179,789,139	437
Environmental Protection Agency	US\$150,537,927	1,056
Transportation Department	US\$144,407,564	102
Housing and Urban Development	US\$70,289,365	369
National Endowment for the Arts	US\$68,752,987	1,926
Small Business Administration	US\$52,344,344	352
Homeland Security	US\$35,005,954	85
Appalachian Regional Commission	US\$19,852,371	161
National Endowment for the Humanities	US\$9,952,663	63
Nuclear Regulatory Administration	US\$621,125	8
Social Security Administration	-US\$699,251	24
Total	US\$27,218,440,996	52,643

most common are funds from USAID for disaster relief and matching funds from the Administration for Children and Families for child care and energy assistance. More than half of all formula grants to nonprofits are either food assistance from the U.S. Department of Agriculture (USDA) or child support enforcement supplements from the Administration for Children and Families. The objectives of block grant awards are usually broad in scope, where recipient entities have some latitude over the precise allocation of the award. Examples include community development or social services block grants.

Contract duration has been an active area of study for nonprofit awards (Fernandez, 2009; Sclar, 2000). Table 4 depicts average award duration by recipient and award type. The average award to a nonprofit organization lasts 3.9 years, although there is wide variance based on the type of award. Cooperative agreements and project grants on average last twice as long as block or formula grants.

Table 3. Total Award Dollars by Assistance Type, 2012.

	Block grant	Formula grant	Project grant	Cooperative agreement
State government	US\$29,425,343,566	US\$375,127,923,412	US\$17,310,923,723	US\$8,799,618,328
County government	US\$8,227,520	US\$1,485,267,548	US\$2,803,322,044	US\$230,719,613
City or township government	US\$17,154,210	US\$8,009,035,034	US\$4,907,232,420	US\$306,949,991
Special district government	US\$4,242,896	US\$10,588,566,499	US\$1,492,884,258	US\$37,314,115
Independent school district	US\$1,428,335	US\$683,094,292	US\$1,461,865,955	US\$12,177,670
State-controlled institution of higher education	US\$12,799,430	US\$4,159,483,606	US\$15,984,663,943	US\$3,880,994,584
Indian tribe	US\$334,755,612	US\$165,471,608	US\$982,354,691	US\$130,961,310
Other nonprofit	US\$1,168,012,941	US\$921,635,851	US\$16,098,094,117	US\$8,845,290,585
Private higher education	US\$3,707,914	US\$426,163,034	US\$6,832,431,998	US\$1,877,716,746
Individual		US\$14,690,540	US\$107,117,923	US\$5,602,390
Profit organization	US\$1,099,284	US\$149,862,619	US\$521,865,866	US\$656,342,699
Small business	US\$30,000	US\$54,040,235	US\$1,849,477,618	US\$656,185,863
All other	US\$792,310,499	US\$635,177,820	US\$5,762,718,420	US\$1,508,982,798
Total	US\$31,769,112,207	US\$402,420,412,098	US\$76,114,952,977	US\$26,948,856,692

Table 4. Average Grant Duration to Nonprofits, 2012.

Recipient Type	Block grant	Formula grant	Project grant	Cooperative Agreement	Average
State government	1.6	1.6	2.9	2.4	2.2
County government	1.3	2.7	4.9	3.9	4.4
City or township government	1.4	2.7	2.5	4.0	2.8
Special district government	1.1	2.2	2.5	3.5	2.5
Independent school district	0.9	1.2	5.3	4.0	3.7
State-controlled institution of high	1.5	2.5	4.7	3.8	4.6
Indian tribe	1.6	1.5	3.3	3.5	2.4
Other nonprofit	2.1	1.3	5.1	4.2	4.6
Private higher education	2.6	3.0	6.2	5.5	6.1
Individual		3.0	1.1	4.7	3.6
Profit organization	1.5	2.4	2.3	4.0	3.0
Small business	5.3	1.4	3.7	5.1	3.9
All other	2.1	1.6	2.8	3.7	2.9
Average	1.9	2.1	3.6	4.0	3.9

Subgrants

The 2006 FFATA generated a significant improvement through a requirement for the timely reporting of subgrant awards. This provision requires prime award winners to provide information on the identity, compensation, and location of subaward recipients. However, the process has been slow to develop. Initially, a phased procedure was planned, where large subawards (20 million dollars) would be reported by July 2010, with incremental increases in reporting requirements hereafter. Starting in March 2011, all subawards greater than US\$25,000 were required to be reported to FAADS-PLUS. It is not clear whether all agencies have satisfied these timelines.

The FAADS-PLUS reports 223,716 subawards in 2012. These awards totaled slightly more than 94 billion dollars. Ninety percent of all subawards come from just five sources: departments of education, agriculture, HHS, transportation, and justice. Table 5 displays the number, average amount, and total amount of subawards designated by major federal agency.

Identifying Nonprofits in the Dataset

The FAADS-PLUS dataset offers the opportunity to match individual grant awards to the recipient nonprofit. This process is currently limited because the Employer Identification Number (EIN) is used as the unique organizational identifier in the NCCS IRS 990 tax data, the most common source of financial data. In contrast, the FAADS-PLUS use the Data Universal Numbering System (DUNS) number, a propriety system operated by Dun & Bradstreet. Currently, the Census Bureau is either unable or unwilling to provide a DUNS–EIN crosswalk.

Table 5. Subawards by Funding Agency, 2012.

Agency	<i>M</i>	Sum	<i>n</i>	Cumulative %
Department of Education	US\$478,006	US\$42,081,708,658	88,036	39.35
Department of Agriculture	US\$331,430	US\$22,708,239,920	68,516	69.98
Health and Human Services	US\$421,161	US\$10,729,083,467	25,475	81.37
Department of Transportation	US\$725,050	US\$7,157,697,504	9,872	85.78
Department of Justice	US\$88,960	US\$745,391,707	8,379	89.52
Housing and Urban Development	US\$322,801	US\$2,367,744,843	7,335	92.8
Homeland Security	US\$334,324	US\$1,332,950,535	3,987	94.58
Department of Labor	US\$772,539	US\$2,811,270,753	3,639	96.21
Environmental Protection Agency	US\$1,722,144	US\$2,610,770,177	1,516	96.89
Agency for International Development	US\$359,091	US\$527,146,321	1,468	97.54
National Science Foundation	US\$195,601	US\$275,210,238	1,407	98.17
Department of Defense	US\$225,519	US\$227,999,917	1,011	98.63
Department of Energy	US\$260,870	US\$144,261,200	553	98.87
All other sources	US\$1,434,892	US\$355,674,688	2,522	100

Note. Sorted by number of grants.

This section describes an alternative process to match these two datasets by organization name and address. It is typically difficult to match on names because of abbreviations, misspellings, and nonunique names and “doing business as” instances. We present an approach to creating a crosswalk between the two datasets using multiple fields that are available in both datasets. This process provides a reasonably robust solution, with an approximately 70% match rate.

Data Matching Process

Organizations applying for grants or contracts with the federal government must complete a registration and screening process to be eligible for awards. As of 2012, this process is completed online through the System for Award Management (SAM; www.sam.gov), which replaces the old Central Contractor Registry (CCR) system. Once registered, organizations appear in the SAM database, the unified database for all federal grants and contracts applicants. As part of the registration process, organizations must obtain a DUNS number issued by Dun & Bradstreet. As foreign companies and other entities may apply for federal grants, but might not have a U.S. tax ID number, the 10-digit number is distinct from the EIN issued by the IRS for tax purposes. The DUNS serves a similar purpose as a tax ID number by providing unique identifier for organizations within the SAM database. More than 100 million businesses around the world have registered for DUNS numbers.

Unfortunately for nonprofit researchers, the NCCS database of IRS 990 tax returns uses the EIN as its firm identifier. The NCCS data are widely used because they contain detailed financial information as well as data about the organizations size, location, subsector, and number of employees. As a result of the differing conventions, there is no common data field that can be utilized to easily merge the datasets. The

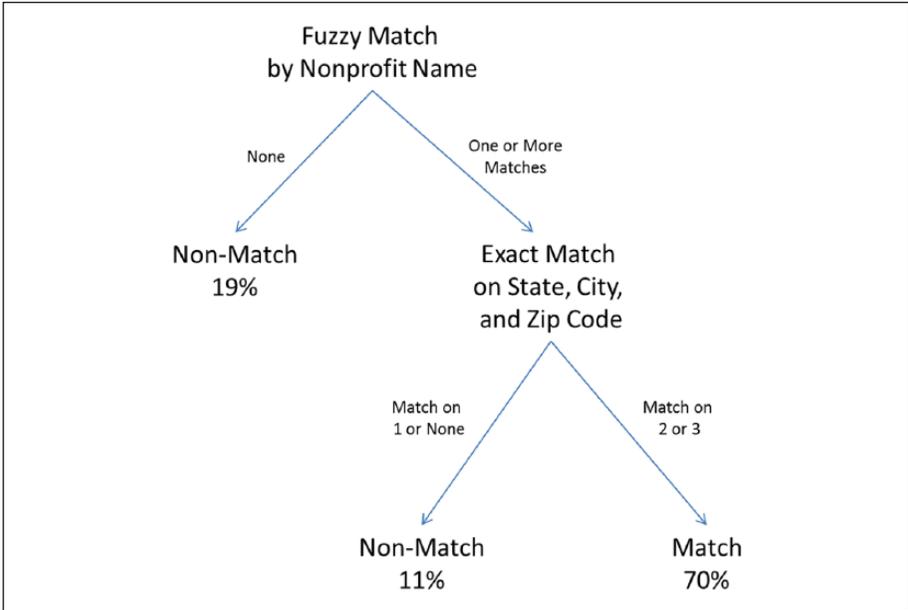


Figure 2. The general approach for matching nonprofits in the FAADS-PLUS dataset with nonprofits in the NCCS Business Master Files (Exempt Organizations). <http://nccsdataweb.urban.org> (2012).

Note. FAADS = Federal Assistance Award Data System; NCCS = National Center for Charitable Statistics.

SAM system contains both DUNS and EIN records for each nonprofit within the government registry, but this information is not made publicly available.⁷ The federal government appears to be in the process of replacing the DUNS with a nonproprietary organizational ID, which will hopefully resolve this issue and simplify the merging process in the future. But the timeline and certainty of this endeavor are unclear.

To demonstrate the feasibility of linking these two datasets using name and location variables, we have applied a “fuzzy matching” algorithm commonly used for natural language processing in databases.⁸ The process generates a match based on the similarity of nonprofit names in the FAADS-PLUS and NCCS databases (see Figure 2). Fuzzy matching is common in database applications where misspellings (e.g., Pittsburgh vs. Pittsburg) or abbreviations (e.g., Broad Street vs. Broad St.) will result in imperfect matches. As many nonprofit names are similar (e.g., the Seeds of Hope vs. the Seeds for Hope) and many nonprofits are local chapters of a national organization, thus sharing the same name, fuzzy matching will often result in multiple potential matches. To uniquely identify the nonprofit associated with the contract, we utilize additional information about nonprofit location to refine the match. A URL link to our code (in R format) and a detailed description of the matching process is contained in the appendix.

The appendix points the reader to a GitHub web address. GitHub is the current industry standard for online repositories of open access code. The link points directly to a README

page that offers detailed instructions regarding how to use the code, as well as links to the sources of data described in the text. The code can be directly copied from the README file and pasted into R. The executed code then downloads a FAADS Demo and a NCCS Demo dataset. These files mimic the problem faced by a researcher who would wish to combine the financial data from the NCCS data and the grant information from the FAADS. As explained previously, there is no common identifier for the nonprofits contained in these datasets. Once the algorithm is executed, R produces three files. A *yes.match* file contains the combined data of those organizations that have been successfully matched based on the parameters set in the algorithm. A *maybe.match* file contains the combined data for organizations that are likely matches (based on the algorithm parameters) but may require further inspection by the author. Finally, a *no.match* file contains the uncombined names of the organizations that were not matched by the algorithm.

After examining the model data, the user is pointed to a detailed set of instructions (Steps 1-5) that will call R to clean both the FAADS and NCCS data as well as run the algorithm on any portion of the two datasets desired by the user. The code, as written, replicates our analysis in the article. However, simple parameters can be changed (such as year) to call any data desired by the user.

In 2012, the FAADS-PLUS database reports 49,959 awards made to U.S.-based nonprofits. We were able to successfully match 70% of the nonprofits listed in the FAADS-PLUS database to corresponding records in the NCCS Business Master Files. These organizations received 68% of the nonprofit grants in the FAADS-PLUS database. The average grant size for the matched sample is US\$556,322 versus US\$635,365 for the unmatched sample (p value of .047 for a two-sample t test), so the two groups differ slightly. Also, when comparing the two groups based on the awarding agency for the grants, they differ (the p value is less than .001 for a chi-square test). Researchers should note that a 70% match rate is better than response rates in alternative data surveys but does not represent a random subsample of all awards. Thus, due caution is necessary when generalizing results.

Grant Allocation by Nonprofit Subsector

By matching FAADS-PLUS data with existing Form 990 data, we are able to use the National Taxonomy of Exempt Entities (NTEE) industry categories to approximate who in the nonprofit sector receives federal awards. Table 6 reports on federal awards to nonprofits by the 12 NTEE major categories.⁹ Importantly, this does not include subaward data. The health care sector is the largest recipient of federal awards, approaching 6 billion dollars awarded in 2012. Public and societal benefit and education subsectors received slightly more than 5 billion dollars each. Not surprisingly, religion and mutual benefit organizations receive relatively few federal awards.

Data Limitations

The FAADS-PLUS database is a significant source of information because it is unique in the scope of its coverage of awards to the nonprofit sector. There are,

Table 6. Nonprofit Award Recipients by Type, 2012.

NTEE major category (12)	Median	M	Total	n
Health	US\$268,240	US\$526,520	US\$5,938,088,452	11,278
Public and societal benefit	US\$114,698	US\$493,074	US\$5,389,297,295	10,930
Education	US\$163,125	US\$433,956	US\$5,305,113,454	12,225
Human services	US\$73,913	US\$433,845	US\$3,978,362,993	9,170
Higher education	US\$174,363	US\$307,147	US\$3,868,521,465	12,595
International	US\$360,000	US\$1,614,571	US\$2,764,144,774	1,712
Hospitals	US\$279,811	US\$413,744	US\$1,390,180,849	3,360
Environment	US\$40,997	US\$185,155	US\$477,885,604	2,581
Arts	US\$25,000	US\$104,326	US\$232,855,502	2,232
Religion	US\$45,137	US\$435,493	US\$111,921,578	257
Mutual benefit	US\$238,255	US\$313,092	US\$51,660,260	165
Unknown	US\$146,363	US\$508,626	US\$28,483,038	56

Note. NTEE = National Taxonomy of Exempt Entities. For more detail on NTEE classifications, see <http://nccs.urban.org/classification/NTEE.cfm>

however, substantive limitations to the data that the researcher should be aware of. The following are the most significant barriers that we have encountered:

1. Potential data integrity issues tied to variation reporting protocols across agencies.
2. The lack of a “useful” unique identifier for nonprofits.
3. Inconsistencies in reporting over time.
4. Incomplete subaward information.

First, since the 2006 FFATA, each federal agency is required to report all awards, contracts, and subawards of amounts more than US\$25,000 within 30 days of obligation. These reports are aggregated by NASA and posted to the FAADS-PLUS online archive that can be accessed through www.usaspending.gov. There is opportunity for simple data entry error or inconsistencies in protocols agencies use for entering data. These types of issues may arise when the data generation process is complex and spans hundreds of organizations at the federal, state, and local level.

Second, the Census Bureau identifies award recipients with DUNS numbers (<http://www.dnb.com/get-a-duns-number.html>). Nonprofit organizations within the NCCS data files are identified via their EIN numbers. A publicly available crosswalk of this sort would make the rich and expansive FAADS-PLUS and FPDS datasets readily available to nonprofit scholars who utilize nonprofit financial (NCCS) data. To date, finding this crosswalk has remained elusive. Although the matching algorithm provided in this article provides a reasonable work-around, a public DUNS–EIN crosswalk or deployment of a nonproprietary standard would improve the dataset’s

usefulness to researchers. Our matching process allows for a 70% match rate with reasonable levels of confidence. This exceeds many primary or survey research thresholds and could be improved by modifying the algorithm as preferred by the researcher.¹⁰

Third, there are internal inconsistencies in award categorization over time. A significant advantage of FAADS-PLUS award data is the ability to compare federal award activity across funding cycles. However, longitudinal analysis of award allocation for years 2002, 2007, and 2012 reveals large increases in “all other” categorization for 2007, accounting for more than 50% of all award allocations. Furthermore, some awardees changed organizational categorizations from year to year. For example, a particular organization may be categorized as a nonprofit one year but a government agency the next.

Finally, a comprehensive understanding of federal fund flows requires observing indirect transfers to nonprofits via state and local governments. Ideally, the subaward data system embedded within the FAADS-PLUS would accomplish this. In theory, the FAADS-PLUS data structure allows for the matching of prime awards to subsequent subawards. The subawards database includes fields for the amount and various recipient characteristics. Unlike the prime awards data, there is no field associated with the organization’s nonprofit status. More importantly, the existing 2012 subaward data appear incomplete. The subawards data process is improving, but it is still new.

Despite these limitations, Federal Agencies appear to be making steady progress improving the quality and consistency of the data. The FFATA of 2006 laid out an incremental path for data inclusion (including subawards) and data validation (<http://www.gpo.gov/fdsys/pkg/PLAW-109publ282/pdf/PLAW-109publ282.pdf>). The specific requirements of the act for federal agencies were further clarified in Office of Management and Budget (OMB) Circular M-08-04 and A-136.¹¹ Since 2009, agencies have been required to conduct and report detailed validity reports, which detail the timeliness and validity of federal contracts.¹² Finally, the 2014 Digital Accountability and Transparency Act sets out specific criteria by which agencies will improve the quality of their reported data and creates a data exchange to promote the usability of the data in machine readable format (<http://www.gpo.gov/fdsys/pkg/PLAW-113publ101/pdf/PLAW-113publ101.pdf>). These initiatives together should give the researcher confidence that the completeness and reliability of the FAADS data are increasing over time.

Directions for Future Research

Although there are limitations regarding data integrity and challenges in matching FAADS data to nonprofit financial data, the scope of the dataset still allows for it to be useful in addressing important research questions for the nonprofit sector. There is significant interdisciplinary and methodological heterogeneity in nonprofit sector research; however, a prominent theme across much of the literature is the financial relationships between government and nonprofits (Young, 2006). This list offers a few examples of applications that are tied to current research:

- What types of nonprofits are successful in attracting new federal awards (Ashley & Van Slyke, 2012; Lu, 2015; Lukseitch, 2008)? Previous research relies on surveys and Form 990 data. FAADS-PLUS would allow nonprofit data to be linked to individual awards over a much larger range of recipients.
- When should a government make, buy, or participate in the production of public goods (Hart, Shleifer, & Vishny, 1997; Milward & Provan, 2000; Salamon, 1995)? FAADS-PLUS data allow researchers to observe the types of goods, from which Federal agencies, and for what duration those services are financed.
- Government funding shapes both individual firm and sector behaviors (Brooks, 2000; Kingma, 1989; Lecy & Van Slyke, 2013; Thornton, 2014). By integrating FAADS-PLUS data with Form 990 financial data, it is possible to examine how nonprofit behaviors (e.g., fundraising, compensation, or overhead) change in response to federal awards.
- Conversely, government can become reliant on nonprofits for delivery of core social services. This has long-run implications for government capacity and effectiveness (Amirkhanyan, 2007; Johnston & Romzek, 2010; Smith & Smyth, 1996; Van Slyke, 2006; Warner & Hefetz, 2008). The FAADS-PLUS data allow researchers to observe how the relative mix, magnitude, and duration of federal awards have changed over time or in response to changes in the nonprofit sector.
- How do mission-oriented firms respond to the explicit and implicit incentives embedded in government awards (Bennett & Iossa, 2010; Bennett, Iossa, & Legrenzi, 2003; Besley & Ghatak, 2001, 2005)? The FAADS-PLUS data give us a rich pool of both nonprofit and for-profit awards. Differential analysis of for-profit and nonprofit contracts should be possible.
- FAADS-PLUS data will allow researchers to identify geographic and industry spillover effects of large federal awards (Case, Rosen, & Hines, 1993).
- By observing expansions and contractions of federal funding to sectors directly, it is possible to observe how nonprofits respond to changes in government funding (Bergstrom, Blume, & Varian, 1986).

Appendix

Complete code (R format), instructions, and a detailed example of data usage can be found at the following URL: <https://github.com/lecy/FAADS-NCCS-Crosswalk/blob/master/README.md>

The following steps were completed to generate a matching algorithm for the datasets used in this article:

1. Identify unique organizations within the FAADS-PLUS (Federal Assistance Award Data System) dataset using the Data Universal Numbering System

(DUNS) numbers. There are 497,231 awards made in 2012, but only 47,704 unique organizations within the dataset.

2. Identify nonprofit organizations using the criteria that Recipient Type = "12: Other nonprofit" and that Recipient Country Code = "USA" (we also include those that omit the country code). This results in a population of 13,615 nonprofits.
3. Match nonprofit names within the FAADS-PLUS dataset ("Recipient Name") against names within the National Center for Charitable Statistics (NCCS) Business Master Files ("NAME").¹³ We used the Levenshtein string distance algorithm available through the "agrep" function in the R statistical package with a maximum name difference of 10% (see the default settings of "agrep" in the documentation).
4. In most cases, multiple candidate matches are made, so we must select between the potential matches. Location data are utilized to differentiate potential matches. We compared the state, city, and zip code within the FAADS-PLUS database ("Recipient State Code," "Recipient City Code," and "Recipient Zip") with the state, city, and zip code information in the NCCS Business Master File ("STATE," "CITY," and "ZIP5"). Any observations that matched on at least two of these three fields, we treat as matches.
5. If multiple candidate matches are all located in the same state, city, and zip, then we select the case with the closest name match (the lowest Levenshtein match distance).

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Notes

1. A complete data dictionary can be found at http://usaspending.gov/sites/all/themes/usaspendingv2/Archives_Data_Feeds_Data_Dictionary.pdf
2. U.S. Code 31–6304 or <http://www.gpo.gov/fdsys/granule/USCODE-2011-title31/USCODE-2011-title31-subtitleV-chap63-sec6304/content-detail.html>
3. The Catalog of Federal Domestic Assistance (CFDA) was authorized under Public Law 98-169 or <http://www.gpo.gov/fdsys/pkg/STATUTE-97/pdf/STATUTE-97-Pg1113.pdf>
4. Table 1 is drawn from the original CFDA agency codes, which were aggregated further by USAspending.gov. See the USAspending.gov Data Fees and the 2012 Data Dictionary at <https://github.com/lecy/FAADS-NCCS-Crosswalk/blob/master/USAspending.gov%20Data%20Dictionary.pdf>
5. This figure includes private higher education. The fraction falls to 5% if private higher education is not included.

6. Agencies spend money through obligation or an intention to fund out of their budgets. Obligations only become disbursements when they are transferred to the U.S. Treasury. This implies that obligations can be negative if an agency reduces the award to a particular program.
7. An extract of the old Central Contractor Registry (CCR) database is available through a Freedom of Information Act request and can be downloaded at <https://catalog.data.gov/dataset/system-for-award-management-sam-public-extract>, but the public version unfortunately has the Employer Identification Number (EIN) and Data Universal Numbering System (DUNS) fields removed.
8. We employ the Levenshtein edit distance algorithm (Levenshtein, 1966) for fuzzy matching of the nonprofit names.
9. These include the 10 major categories listed in <http://nccs.urban.org/classification/NTEE.cfm>, while separating Hospitals and Higher Education from their major categories.
10. Both Fernandez (2009) and Brown and Potoski (2005) rely on surveys of local and county governments, with 48% response rates. Another common data source for contract research is the International City/County Management Association Survey, which has a roughly 25% response rate (Levin & Tadelis, 2010).
11. <https://www.whitehouse.gov/sites/default/files/omb/memoranda/fy2008/m08-04.pdf>; https://www.whitehouse.gov/sites/default/files/omb/assets/OMB/circulars/a136/a136_revised_2014.pdf
12. <https://www.usaspending.gov/about/Documents/Federal%20Government%20Procurement%20Data%20Quality%20Summary%202009%20-%202014.pdf>The report only discusses federal contracts not awards. However, FY 2014 completeness and accuracy are both reported as 98%, with upward trends over time.
13. We used the June 2012 version of the National Center for Charitable Statistics (NCCS) Business Master File for the article.

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