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March 2019

MANUFACTURING EXTENSION PARTNERSHIP

Centers Cite Benefits from Funding Change, but Impacts Hard to Distinguish from Other Factors

GAO-19-219

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GAO Highlights

Highlights of GAO-19-219, a report to congressional committees

Why GAO Did This Study

Small and medium-sized manufacturers are an important part of the U.S. economy. In 1988, to enhance the competitiveness, productivity, and technological performance of U.S. manufacturing, NIST established what is now called the MEP program. The program supports manufacturers through services provided by MEP centers. The centers, located in all 50 states and Puerto Rico, are operated by nonfederal organizations. The MEP centers provide assistance, either directly or through third parties, to help improve manufacturing firms' processes and productivity; expand their capacity; and help them adopt new technologies, utilize best management practices, and accelerate company growth. NIST enters into a cooperative agreement with the nonfederal organization that runs each center to provide federal financial assistance conditional upon the center contributing nonfederal matching funds—known as a cost share.

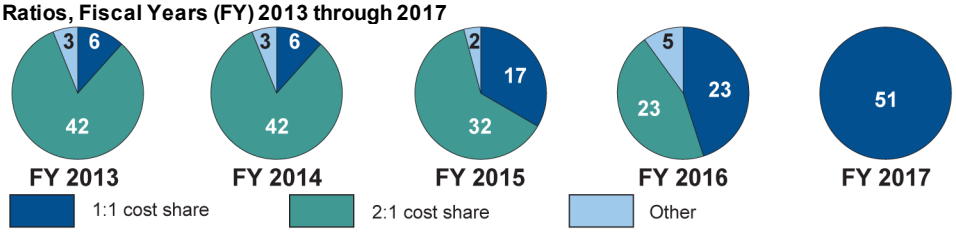
The AICA included a provision for GAO to review the effect of the 2017 cost share adjustment. This report describes (1) the MEP centers' views regarding the extent to which the recent cost share adjustment has helped them serve manufacturers and (2) the extent to which NIST data show impacts of the cost share adjustment on centers' finances and activities. GAO surveyed all 51 MEP centers, analyzed NIST data on the MEP program, and interviewed NIST and MEP center officials.

View GAO-19-219. For more information, contact John Neumann at (202) 512-3841 or neumannj@gao.gov.

What GAO Found

Most Manufacturing Extension Partnership (MEP) centers reported that the January 2017 American Innovation and Competitiveness Act (AICA) cost share adjustment has helped them serve manufacturers, especially very small (i.e., less than 20 employees) and rural ones. The AICA adjusted the cost share ratio to remain at 1:1, that is, $1 of nonfederal contributions for each $1 of federal assistance. Before the adjustment, MEP centers' cost share requirement increased over the course of their cooperative agreements from 1:1 to 2:1, requiring centers to obtain a greater proportion of revenue from nonfederal sources. In GAO's survey of all 51 MEP centers, 44 centers cited positive effects of the adjustment on center operations, such as helping to improve center services or better reach underserved manufacturers. Also, 41 centers indicated the adjustment increased their financial stability, which some centers stated has allowed them to focus less on revenue generation and to serve very small and rural manufacturers. However, some MEP center officials observed that the AICA cost share adjustment impact is hard to distinguish from other factors, such as the National Institute of Standards and Technology's (NIST) recompetition of nearly all centers' cooperative agreements between fiscal years 2014 and 2017. The recompetition increased the level of federal financial assistance for most centers and reset many centers' cost share ratio from 2:1 to 1:1 prior to the 2017 adjustment. Still, center officials said that if the cost share requirement reverted to what it was prior to the 2017 adjustment, centers would be less able to serve manufacturers, particularly very small and rural ones.

Number of Manufacturing Extension Partnership Centers Operating Under Various Cost Share Ratios, Fiscal Years (FY) 2013 through 2017



Source: GAO analysis of data provided by the National Institute of Standards and Technology. | GAO-19-219

NIST data show that there have been some changes in MEP centers' finances and activities since the AICA cost share adjustment; however, these changes generally began prior to the adjustment. For example, NIST data on centers' finances show an increase in federal assistance and a decrease in reported nonfederal contributions from fiscal year 2017 to 2018, but these changes generally began around fiscal year 2014, when NIST began the recompetition process. Similarly, NIST data on centers' activities show an overall increase in the numbers of very small and rural manufacturers served from fiscal year 2017 to 2018. While the change in the number of very small manufacturers served began around fiscal year 2014, the number of rural manufacturers served fluctuated from fiscal years 2014 through 2018. Like MEP center officials, NIST officials said the impact of the AICA cost share adjustment is intertwined with the recompetition impacts and, going forward, the AICA adjustment may help sustain recent increases in the number of very small and rural manufacturers served.

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Abbreviations

AICA	American Innovation and Competitiveness Act
MEP	Manufacturing Extension Partnership
NIST	National Institute of Standards and Technology
RUCC	Rural-Urban Continuum Codes

U.S. GOVERNMENT ACCOUNTABILITY OFFICE
441 G St. N.W.
Washington, DC 20548

March 7, 2019

The Honorable Roger Wicker
Chairman
The Honorable Maria Cantwell
Ranking Member
Committee on Commerce, Science, and Transportation
United States Senate

The Honorable Eddie Bernice Johnson
Chairwoman
The Honorable Frank Lucas
Ranking Member
Committee on Science, Space, and Technology
House of Representatives

Small to medium-sized manufacturers are an important part of the U.S. economy. According to the U.S. Census Bureau, in 2016 there were about 290,000 firms in the United States with fewer than 500 employees, representing nearly 99 percent of the nation's manufacturers and employing about 8.4 million people. To enhance the competitiveness, productivity, and technological performance of the U.S. manufacturing sector, in 1988 Congress directed the Director of the National Institute of Standards and Technology (NIST) to establish a public-private program, now known as the Hollings Manufacturing Extension Partnership (MEP) program.[1] NIST's MEP program supports manufacturers primarily through the efforts of nonfederal centers, known as MEP centers. The MEP centers provide assistance, either directly or through third parties, to help improve manufacturing firms' processes and productivity; expand their capacity; and help them adopt new technologies, utilize best management practices, and accelerate company growth. The program has grown from a pilot program of three centers for which Congress appropriated $7.5 million as part of the annual appropriations process for fiscal year 1989 into a national network of 51 centers, located in all 50 states and Puerto Rico, for which Congress appropriated $140 million as

[1]Omnibus Trade and Competitiveness Act of 1988, Pub. L. No. 100-418, Tit. V, pt. I, subpt. B § 5121(a) (codified as amended at 15 U.S.C. § 278k(b)). Prior to 1990, NIST was named the National Bureau of Standards. The MEP program has had different names over time but has been known as the Hollings Manufacturing Extension Partnership program since 2004.

part of the annual appropriations process for fiscal year 2018. In 2018, the MEP program employed around 51 full-time equivalent federal staff at NIST and about 1,400 nonfederal technical experts at the 51 centers.[2] According to NIST data, the MEP program served more than 8,400 manufacturers in fiscal year 2018.

NIST provides funding to the MEP centers on a cost share basis; that is, NIST and the MEP centers share the operating costs for the program. A nonfederal organization—generally a nonprofit institution, state agency, or university—is responsible for operating each MEP center. NIST enters into a cooperative agreement with the nonfederal organization to award federal financial assistance conditional upon the center contributing matching funds and receiving a positive performance evaluation; the agreement may be renewed annually.[3] The funding model for the centers has evolved over the years. Under the original legislation, every $1 contributed by a center was matched by $1 of federal assistance (or a 1:1 cost share ratio) for the first 3 years of the center's cooperative agreement, and federal assistance gradually decreased to zero by the end of the sixth year. For the fourth through sixth years of a center's cooperative agreement, the legislation directed the Secretary of Commerce to determine the cost share. In 1990, NIST established the cost share ratios for the fourth through sixth years as 3:2 after 3 years, 7:3 after 4 years, and 4:1 after 5 years. Three years later, NIST changed those ratios to 3:2 after 3 years and 2:1 after 4 years.[4] In January 2017, the American Innovation and Competitiveness Act (AICA) was enacted. Among other things, the AICA adjusted the cost share to 1:1 for the life of the cooperative agreement.[5]

[2]A full-time equivalent is a standard measure of labor that equates to 1 year of full-time work.

[3]MEP center eligibility requirements are set forth in 15 U.S.C. § 278k(a)(5). Each applicant for and recipient of federal financial assistance must be a United States-based nonprofit institution, or consortium thereof; an institution of higher education; or a state, United States territory, local government, or tribal government.

[4]A 3:2 cost share ratio means a $3 nonfederal contribution for each $2 of federal assistance. A 2:1 cost share ratio means a $2 nonfederal contribution for each $1 of federal assistance.

[5]Among other changes to the MEP program, the AICA requires NIST to recompete centers' cooperative agreements after 10 years. Pub. L. No. 114-329, § 501(b) (codified at 15 U.S.C. § 278k(h)(1)).

The AICA also includes a provision for GAO to submit a report within 2 years to the appropriate committees of Congress that analyzes, among other things, whether the cost share adjustment has any effect on the services provided. This report describes (1) MEP centers' views regarding the extent to which the recent cost share adjustment has helped them serve manufacturers and (2) the extent to which NIST data show impacts of the cost share adjustment on centers' finances and activities.

To describe the MEP centers' views regarding the extent to which the recent cost share adjustment has helped them serve manufacturers, we sent a survey to all 51 MEP centers and received a response from every center. To obtain additional information on MEP centers' views, we also conducted follow-up interviews with officials from nine MEP centers using a standard set of questions. We selected these centers to represent a variety of characteristics, such as the number of manufacturers in the state and whether the center is run by a nonprofit institution, state agency, or university.

To describe the extent to which NIST data show impacts of the cost share adjustment on centers' finances and activities, we obtained and analyzed NIST data on MEP centers' finances and activities for fiscal years 2013 to 2018. We reviewed NIST guidance for the MEP program and interviewed NIST and MEP center officials to gain an understanding of the data NIST collects and any changes in the data. We assessed the reliability of the data by reviewing agency documentation, verifying some data against other sources, and interviewing NIST officials and selected centers. While our efforts indicated some factors caused certain aspects of centers' financial and activity data to be underreported to some extent, as noted in the report, we believe the data are the best available and are sufficiently reliable for identifying general changes in MEP centers' finances and activities as a result of the cost share adjustment.

To gain additional insight on the impact of the cost share adjustment, we also interviewed NIST officials, members of the MEP Advisory Board, and the head of an association representing the MEP centers.[6] To see firsthand how a MEP center serves manufacturers, we visited a MEP center in Bothell, Washington, and a manufacturer in Woodinville, Washington, that used services from that MEP center. For additional

[6]The MEP Advisory Board provides advice and recommendations to the NIST Director on the activities, plans, and policies of the MEP program and consists of members that broadly represent the interests of the manufacturing sector.

information about our objectives, scope, and methodology, see appendix I.

We conducted this performance audit from March 2018 to March 2019 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

According to its strategic plan for 2017 through 2022, the MEP program aims to strengthen and empower U.S. manufacturers by providing them with the information and tools to improve productivity, assure consistent quality, and accelerate the transfer of manufacturing technology into production processes and new products.[7] MEP centers do not all offer the same services; however, across the network, their services span areas such as the following:

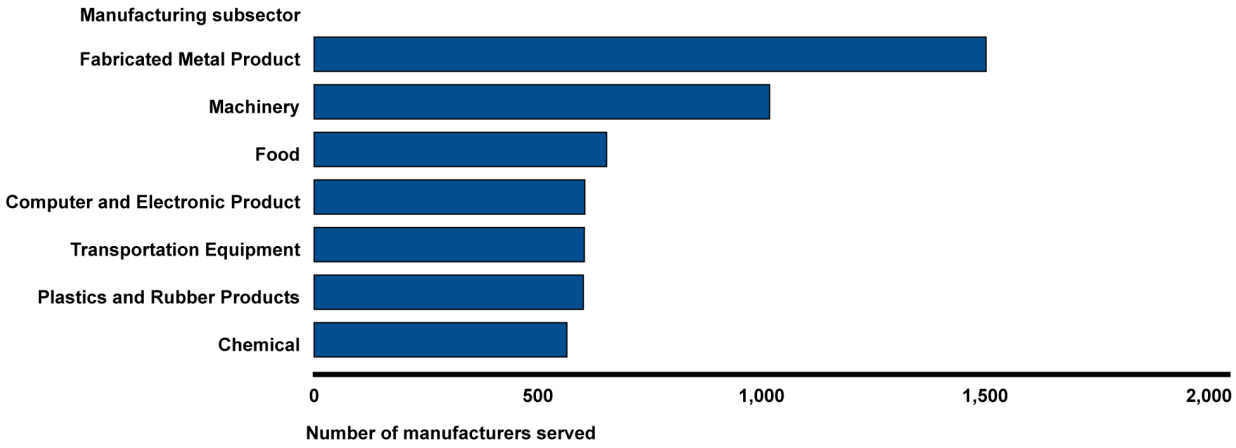
- **Lean services.** These services help manufacturers implement tools and practices to incorporate "lean" manufacturing principles, which involve producing more with existing resources through eliminating and reducing incidental work or non-value-added activities.
- **Quality services.** These services help manufacturers implement management systems to achieve a defined industry-specific or general quality certification or standard.
- **Growth services.** These services provide manufacturers with the tools and methods to identify and target opportunities to develop new products, markets, services, or customers.
- **Technology/product development services.** These services help manufacturers identify, develop, and diffuse technology and new products.
- **Workforce services.** These services help manufacturers recruit, retain, or develop human resources.

Some centers provide services directly to manufacturers, and others, to varying extents, use external consultants to provide services. In fiscal

[7]National Institute of Standards and Technology, *MEP National Network™ Strategic Plan 2017-2022* (Gaithersburg, MD).

year 2018, the 51 MEP centers served 8,425 manufacturers encompassing a variety of manufacturing subsectors (see fig. 1).

Figure 1: Top Manufacturing Subsectors Served by Manufacturing Extension Partnership (MEP) Centers in 2018



Source: GAO analysis of National Institute of Standards and Technology data. | GAO-19-219

Note: The manufacturing subsectors listed here are based on the North American Industry Classification System, a system in which manufacturing subsectors are classified according to the distinct inputs, equipment, and employee skills associated with that subsector's production processes. MEP centers served manufacturers across 21 manufacturing subsectors in fiscal year 2018. We include in this figure only subsectors with more than 500 manufacturers served. The MEP program also allows centers to serve companies under eight other related industry classifications, including Engineering Services and Testing Laboratories.

To receive federal financial assistance from NIST, MEP centers must match the federal contribution with a nonfederal contribution. MEP centers provide their nonfederal contributions through various means, such as fees collected from manufacturers for services provided or in the form of cash or in-kind contributions from other sources, such as state or local governments, trade associations, or community colleges. MEP centers may receive nonfederal resources in any of those forms in excess of the amount needed to match the federal contribution.[8]

Prior to the 2017 AICA cost share adjustment, we, NIST, and others reported on issues associated with the cost share structure for the MEP program. For example:

[8]In this report, we are referring to this excess as centers' nonfederal resources in excess of their nonfederal contributions because these additional resources are not necessary to meet centers' contributions toward their cost share match.

- In April 2011, we reported that MEP centers identified positive and negative effects of the cost share structure in place at the time.[9] Positive effects of the cost share structure included encouraging MEP centers to leverage resources and emphasize services relevant to manufacturers, and negative effects included MEP centers spending more time and effort seeking cost share matching funds and focusing more on larger clients that could pay higher fees and less on rural clients.
- In July 2013, NIST analyzed the cost share structure and found that it provided MEP centers with incentives to make strategic and operational decisions based largely on which services generated revenue rather than on which services manufacturers needed to be competitive.[10] NIST recommended several criteria upon which to base the MEP program's cost share, such as encouraging delivery of innovative services, providing financial stability, and enabling the program to adapt quickly to changing economic conditions and the needs of small and medium-sized manufacturers. NIST requested that the MEP Advisory Board review this analysis and provide recommendations on how best to structure the cost share requirement to provide for the long-term sustainability of the program.
- In October 2013, the MEP Advisory Board responded to a request in NIST's July 2013 report with a letter to the NIST Director largely echoing the findings of the earlier reports—for example, that the cost share structure in place at the time made it more difficult to serve smaller and rural clients and drove centers to focus on larger manufacturers that could pay fees. The MEP Advisory Board recommended, among other things, adjusting the cost share ratio to 1:1.[11]

In 2014, we reported on NIST's spending on the MEP program and found that NIST's financial assistance to MEP centers did not take into account variations across service areas in the demand for program services and

[9]GAO, *Factors for Evaluating the Cost Share of Manufacturing Extension Partnership Program to Assist Small and Medium-Sized Manufacturers*, GAO-11-437R (Washington, D.C.: Apr. 4, 2011).

[10]National Institute of Standards and Technology, *An Analysis of the Cost Share Requirements for the Hollings Manufacturing Extension Partnership Program* (Gaithersburg, MD: July 2013).

[11]MEP Advisory Board, *Analysis and Findings of the Cost Share Requirements of the Hollings Manufacturing Extension Partnership Program* (Gaithersburg, MD: October 18, 2018).

the cost of providing services.[12] We recommended that the Secretary of Commerce revise the program's cooperative agreements to account for such variations. Subsequently, from 2014 through 2017, NIST undertook a system-wide recompetition of MEP centers' cooperative agreements to better align center funding levels with the national distribution of manufacturing activity and cost of providing services. As a result, NIST recompeted most MEP centers' cooperative agreements and reduced the number of centers to 51, with a single center in each state and Puerto Rico.[13] Additionally, the recompetition provided for a new minimum annual funding level of $500,000 per center (previously eight centers were below this mark) and nearly $20 million more in federal financial assistance for 34 of the centers. According to NIST's 2017 congressional budget request, recompetition would increase the capacity and capability of the MEP centers to help small and medium-sized manufacturers, including very small manufacturers—those with fewer than 20 employees—and rural manufacturers.

Most Centers Reported that the Cost Share Adjustment Has Helped Them Better Serve Manufacturers, but Some Officials Noted that the Impact Is Hard to Measure

In response to our survey, most MEP centers reported that the AICA cost share adjustment has helped them serve manufacturers, but some center officials indicated that the impact is hard to measure. Specifically, most MEP centers we surveyed reported that the AICA's adjustment of the cost share to 1:1 for the life of a center's cooperative agreement has increased their financial stability and helped them serve very small and rural manufacturers. According to the survey results, centers run by nonprofit organizations reported greater impacts of the cost share adjustment than those run by states or universities. In follow-up interviews, some MEP center officials indicated that the impact is difficult to measure because of other recent changes that have also impacted their ability to serve manufacturers.

[12]GAO, *Manufacturing Extension Partnership: Most Federal Spending Directly Supports Work with Manufacturers, but Distribution Could Be Improved*, GAO-14-317 (Washington, D.C.: Mar. 27, 2014).

[13]Seven centers were not recompeted as part of this process because their cooperative agreements had recently been recompeted when NIST began the process. NIST refers to these centers as "legacy" centers.

Most Centers Reported that the Cost Share Adjustment Has Increased Financial Stability and Enhanced Their Ability to Serve Very Small and Rural Manufacturers

In response to our survey, most of the 51 MEP centers reported that the cost share adjustment has had a positive impact on their finances, particularly by increasing their financial stability. Specifically, in their responses to an open-ended question on the effect of the cost share adjustment on the overall financial resources to support center operations, 44 centers provided examples of how the adjustment has generally helped them in areas such as

- improving center services (23 centers),
- better serving underserved manufacturers (17 centers),
- improving collaboration with partners (10 centers),
- improving planning and financial stability (10 centers), and
- improving ability to secure funding (10 centers).[14]

In responses to a separate question about the impact of the cost share adjustment, 41 centers indicated that the adjustment has provided a more stable financial outlook. Centers noted that in the past, meeting the 2:1 cost share often meant diverting their focus from serving manufacturers to generating and documenting revenue. Some centers provided the following examples of how the financial stability provided by the 1:1 cost share has helped them:

- One center stated that its staff now spend less time accounting for the hundreds of small transactions used to count toward the 2:1 cost share and can now focus their time on managing the program.
- One center stated that its budget is now less complicated and center staff are now less distracted by having to generate matching funds.
- One center stated that before the cost share adjustment, it could not plan on growing its capabilities after the third year of the cooperative agreement because of the anticipated impact of increased cost share requirements. The center noted that since the cost share adjustment, it can continue to plan for growth and has modified its strategic plan to reflect this shift.

With a decreased focus on generating revenue, some MEP centers reported that they are now better able to serve manufacturers, particularly

[14]Three centers did not provide responses to this question in our survey. Some of the 48 centers that responded to this question provided more than one example of how the adjustment has helped.

very small and rural manufacturers. Overall, 47 of the 51 MEP centers (92 percent) reported that the cost share adjustment has helped them serve manufacturers to a moderate or greater extent.[15] In particular, in response to a question asking if MEP centers experienced certain changes as a result of the cost share adjustment, 43 (84 percent) reported conducting more work with very small manufacturers, and 39 (76 percent) reported conducting more work in rural areas. MEP centers reported that the cost share adjustment has allowed them to take a number of specific actions to serve manufacturers, such as conducting additional outreach (46 of 51), providing new services (45 of 51), offering a greater quantity of existing services (40 of 51), offering training events (39 of 51), and providing services at reduced cost (28 of 51). In follow-up interviews, officials from eight of the nine MEP centers we contacted stated that the cost share change has either already helped or should help them serve underserved manufacturers. These MEP center officials provided the following examples:

- One center official said that the cost share adjustment has allowed the center to donate time to help manufacturers that could not afford to pay the fees for the services provided.
- One center official said that the cost share adjustment could provide the financial stability to hire an additional staff person to serve rural parts of the state that were underserved before the adjustment.
- One center official said that the cost share adjustment has allowed the center to provide new services that it was not able to provide prior to the adjustment because the center struggled to meet its cost share requirement. For example, the center expanded its work to help manufacturers with Food and Drug Administration requirements pursuant to the FDA Food Safety Modernization Act.[16]

[15]MEP centers were asked to respond to the question, "Whether or not there were any specific types of manufacturers that may have previously underutilized your center's services, to what extent has changing the federal/nonfederal cost share to 1:1 for future years for all centers regardless of when they began operating helped your center serve manufacturers overall?" The response options were "very great extent," "great extent," "moderate extent," "some extent," "little or no extent," or "don't know." This result combines the responses in the "very great extent," "great extent," and "moderate extent" categories.

[16]The FDA Food Safety Modernization Act, which was signed into law in January 2011, provided the Food and Drug Administration with new enforcement authorities that were, according to the Food and Drug Administration, designed to achieve higher rates of compliance with food safety standards and to better respond to and contain problems when they occur, such as through mandatory recalls of food products.

- One center official stated that the cost share adjustment provided the center a strong financial basis upon which to begin offering Manufacturing 4.0 services throughout the state.[17]

Centers Run by Nonprofit Organizations Reported Experiencing Impacts to a Greater Extent than Centers Run by States or Universities

Our analysis of survey results indicates that MEP centers run by nonprofit organizations reported impacts from the AICA cost share adjustment to a greater extent than centers run by states or universities.[18] For instance, 22 of 26 centers (85 percent) run by nonprofits reported that the cost share adjustment has to a great or very great extent helped them serve manufacturers, compared to 14 of 25 centers (56 percent) run by states and universities.[19] As table 1 shows, a greater percentage of nonprofit centers reported experiencing certain changes, such as an increase in center staff and the development of stronger partnerships, as a result of the cost share adjustment compared to centers run by states and universities.

Table 1: Number and Percent of Nonprofit-, State-, and University-Run Manufacturing Extension Partnership (MEP) Centers Reporting Various Changes as a Result of the Cost Share Adjustment

Type of change	Nonprofit	State	University
Increase in center staff	19 of 26 (73%)[a]	5 of 8 (63%)	8 of 17 (47%)
Increase in overall financial resources	21 of 26 (81%)	5 of 8 (63%)	10 of 17 (59%)
More stable financial outlook	24 of 26 (92%)	5 of 8 (63%)	12 of 17 (71%)
Stronger partnerships	22 of 26 (85%)	6 of 8 (75%)	10 of 17 (59%)
More work in rural areas	21 of 26 (81%)	5 of 8 (63%)	13 of 17 (76%)
More work with very small manufacturers	24 of 26 (92%)	6 of 8 (75%)	13 of 17 (76%)

Source: GAO analysis of MEP center survey responses. | GAO-19-219

Note: The MEP centers receive federal financial assistance from the National Institute of Standards and Technology (NIST) conditional upon their providing matching funds—known as a cost share—at a certain ratio. In the past, a MEP center's cost share increased over the course of the center's

[17] In its 2016 MEP Annual Report, NIST defines Manufacturing 4.0 as the transformation of manufacturing enterprises resulting from the recent explosion of automation, connectivity, and computing power.

[18] Nonprofit organizations operate 26 of the 51 MEP centers.

[19] MEP centers were asked to respond to the question, "Whether or not there were any specific types of manufacturers that may have previously underutilized your center's services, to what extent has changing the federal/nonfederal cost share to 1:1 for future years for all centers regardless of when they began operating helped your center serve manufacturers overall?" The response options were "very great extent," "great extent," "moderate extent," "some extent," "little or no extent," or "don't know." This result combines the responses in the "very great extent" and "great extent" categories.

cooperative agreement with NIST. In January 2017, the American Innovation and Competitiveness Act, among other things, adjusted the cost share to remain at 1:1 for the life of a center's cooperative agreement with NIST.

[a]We present the percentages to make it easier to compare these counts; however, these percentages do not imply that these numbers are statistically representative of some larger population.

Officials from MEP centers run by states and universities stated that their centers are often directly funded by a state agency or educational institution and already enjoyed some degree of financial stability, which is why they generally reported fewer changes from the cost share adjustment compared to centers run by nonprofits. In a follow-up interview with the operations director of a MEP center run by a state agency, the operations director told us that one advantage of being funded by the state is that, even prior to the adjustment, the center had a steady source of income to help meet its cost share. In response to an open-ended survey question, one university-run MEP center noted that being part of a university provided access to professional services, support systems, and a network of resources that would not otherwise be available at an affordable rate. In responding to another open-ended question on the effect of the cost share adjustment on financial resources to support center operations, another university-run MEP center noted that the AICA adjustment has not resulted in significant changes to the center's financial resources but could put some of its university funding at risk in the future. In a follow-up interview with the director of this MEP center, she told us that in a university setting her center competes against other university priorities for grant funding and being on a 1:1 cost share puts the center on a less competitive footing against other candidates because the center will no longer need additional university grant funding to meet a higher cost share ratio in the later years of its cooperative agreement.

Center Officials Noted that Other Factors Have Impacted Their Ability to Serve Manufacturers, Making It Hard to Measure the Impact of the Cost Share Adjustment

In survey responses and follow-up interviews, MEP center officials noted that a number of factors have impacted their ability to serve manufacturers in recent years. For example, in response to an open-ended survey question, centers provided the following as possible factors other than the cost share adjustment that could have impacted their operations:

- the strength of the overall economy of the nation or of the state in which they are located (19 centers),
- budgetary or political stability in their state (e.g., stability of state funding) (19 centers), and

- NIST's recompetition of nearly all MEP centers' cooperative agreements between 2014 and 2017 (10 centers).[20]

According to several MEP centers we surveyed or officials we interviewed, it is difficult to identify the impacts of the cost share adjustment because of the other factors that have also impacted MEP center operations. For example, in its survey response, one MEP center noted that it would not be easy to isolate the impact of the cost share adjustment from the impact of factors such as the recent recompetition that doubled the center's federal financial assistance, new leadership at the center, and an improving economy and a tighter labor market that may have resulted in more companies needing the center's services. In our follow-up interviews, some MEP center officials said that the recompetition, in particular, makes it difficult to isolate the effect of the cost share adjustment. Officials from several MEP centers we contacted cited effects of the recompetition, such as increased baseline funding, resetting of the cost share to 1:1, center leadership changes, and consolidation of centers within states, as reasons why it would be hard to separate the effects of the recompetition from those of the cost share adjustment.

For certain centers, the impact of the cost share adjustment was clearer because they did not undergo recompetition, which meant that their cost share had not been reset to 1:1 through that process. Seven MEP centers were not included in the recompetition process that NIST began in 2014 because their cooperative agreements had recently been recompeted (i.e., within 2 years before 2014).[21] Four of these seven "legacy" MEP centers were at or past the third year of their cooperative agreements and, as a result, were at a greater than 1:1 cost share ratio when the AICA was enacted in 2017. These four centers reported that the AICA's cost share adjustment was helpful in the following ways:

- One center wrote that having to generate more matching contributions during its fourth year in operation coincided with a drop in its performance that continued until the 2017 cost share adjustment. This

[20]Four centers did not provide responses to this question in our survey. Some centers that responded provided more than one example of factors other than the cost share adjustment that could have impacted their operations.

[21]The seven "legacy" MEP centers were located in Arizona, Florida, Kentucky, Maryland, Nebraska, Rhode Island, and South Dakota.

center said the cost share adjustment allowed it to devote additional resources to maintaining its services to manufacturers.

- One center wrote that it was already scaling back its plans to expand manufacturer engagement by the second and third years of its cooperative agreement in anticipation of the higher cost share ratios that would start in the fourth year of operation. This center noted that following the 2017 cost share adjustment, it revised its strategic plan to focus on growing its capabilities instead of scaling them back.
- One center wrote that moving to the 1:1 cost share helped it increase its focus on service delivery to clients with less concern for cost matching.
- One center wrote that the 2:1 cost share incentivized a focus on larger manufacturers to meet the cost share requirement. Following the cost share adjustment, the center is now able to develop new services for small and very small manufacturers.

Should the cost share structure revert to what it was before the 2017 adjustment, most of the 51 MEP centers that we surveyed stated that they likely would be less able to serve manufacturers, particularly very small and rural manufacturers. In response to an open-ended survey question on the effect of changing the cost share requirement back to what it was before enactment of the AICA, 45 of the 47 MEP centers that responded to this question wrote that such a change would generally reduce their ability to serve manufacturers by causing them to do one or more of the following:

- shift to higher-revenue clients and services (23 centers),
- reduce center services and staff (21 centers),
- seek new revenue sources (11 centers),
- reduce staff (10 centers),
- reduce ability to collaborate with partners (7 centers), and
- increase fees (7 centers).[22]

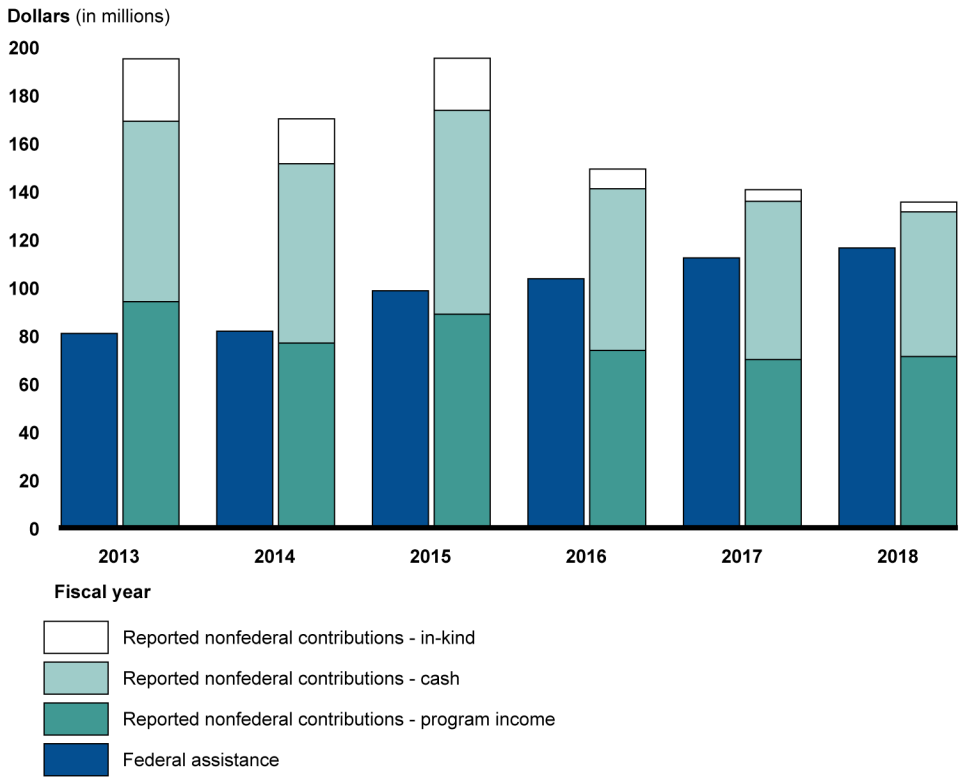
[22]Four centers did not provide responses to this question in our survey.

NIST Data Show Some Changes in Centers' Finances and Activities, but the Changes Generally Predate the Cost Share Adjustment

Our analysis of NIST data indicates that there have been some changes in MEP centers' finances and activities since the 2017 AICA cost share adjustment. However, these changes generally began around the time NIST recompeted the centers' cooperative agreements, before the enactment of the AICA, and cannot necessarily be linked to the cost share adjustment.

NIST data on funding for the MEP centers show that, from fiscal year 2017 to fiscal year 2018, the amount of federal assistance to the MEP centers increased and funds reported by MEP centers to meet cost share requirements decreased. However, these changes generally began around fiscal year 2013. As figure 2 shows, during the period from fiscal year 2013 through fiscal year 2018, federal assistance to MEP centers increased from about $81 million to $116 million while MEP centers' reported nonfederal contributions decreased from approximately $195 million to $135 million. The centers' reported nonfederal contributions generally decreased across all three of their primary sources of revenue—program income, cash contributions, and in-kind contributions. Specifically, the amount of program income centers reported to meet their cost share requirement decreased from approximately $95 million in fiscal year 2013 to $71 million in fiscal year 2018. Reported cash and in-kind contributions decreased from approximately $100 million in fiscal year 2013 to $65 million in fiscal year 2018. In particular, the MEP centers reported a substantial decrease in in-kind contributions over this time period, from approximately $25 million in fiscal year 2013 to $5 million in fiscal year 2018.

Figure 2: Federal Assistance and Reported Nonfederal Contributions, Manufacturing Extension Partnership Program, Fiscal Years 2013 through 2018



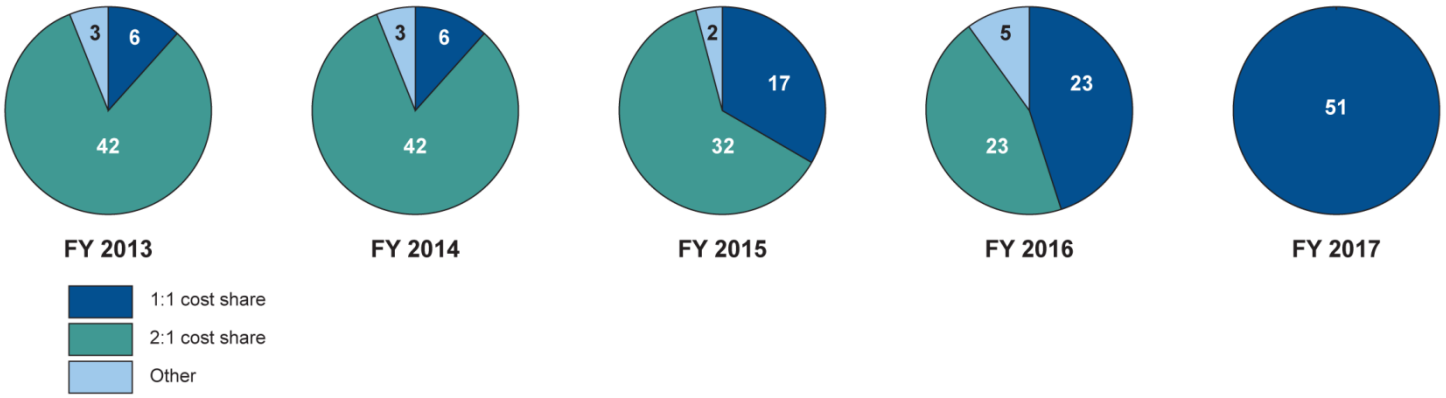
Source: GAO analysis of National Institute of Standards and Technology data. | GAO-19-219

Based on our analysis of NIST data, the overall changes in center financing—that is, the changes in both federal assistance and reported nonfederal contributions—were influenced by NIST's recompetition of nearly all MEP centers' cooperative agreements. When NIST recompeted the MEP centers' agreements, it increased the level of federal assistance for 34 of the 51 MEP centers, constituting an overall increase in base funding amounts for federal assistance from about $90 million before recompetition began in fiscal year 2014 to about $110 million after the recompetition process was complete.[23] Additionally, as MEP centers'

[23]Base funding amounts for federal assistance are higher than the federal assistance received because the MEP centers do not always receive full base funding federal assistance amounts. For example, NIST officials explained that, after recompetition, as MEP centers began operations under new cooperative agreements, they might not immediately generate sufficient program income and other nonfederal contributions to receive the full base funding federal assistance amount.

cooperative agreements were recompeted, the centers' cost share was reset to 1:1, and the centers' reported nonfederal contributions began to decrease. As figure 3 shows, in fiscal years 2013 and 2014, before the new cooperative agreements began taking effect, most MEP centers operated under a 2:1 cost share. After fiscal year 2014, the number of MEP centers operating under a 1:1 cost share began to increase. With enactment of the AICA, all MEP centers operated under a 1:1 cost share in fiscal year 2017.

Figure 3: Number of Manufacturing Extension Partnership (MEP) Centers Operating under Various Cost Share Ratios, Fiscal Years (FY) 2013 through 2017



Source: GAO analysis of data provided by the National Institute of Standards and Technology. | GAO-19-219

Note: The figure reflects the number of MEP centers operating under each cost share ratio at the end of each fiscal year.

NIST data show that there also may have been some changes in MEP centers' activities since the 2017 cost share adjustment. Our analysis of NIST data indicated that from fiscal year 2017 to fiscal year 2018, the total number of

- manufacturers MEP centers reported serving increased from approximately 8,000 to 8,400,
- very small manufacturers MEP centers reported serving increased from approximately 2,600 to 2,700, and
- rural manufacturers MEP centers reported serving increased from approximately 1,500 to 1,600.

As with the changes in MEP centers' finances, the changes in the numbers of total manufacturers and very small manufacturers these centers reported serving generally began before the cost share

adjustment. When we analyzed NIST's data, we found that the total number of manufacturers and the number of very small manufacturers served began increasing around fiscal year 2014, when NIST started recompeting centers' cooperative agreements, and this increase continued through fiscal year 2018. The overall direction of the change in the number of rural manufacturers served during this period was mixed. Specifically, the number of rural manufacturers centers reported serving increased from fiscal year 2014 to fiscal year 2015, then decreased through fiscal year 2017, and then increased in fiscal year 2018.

NIST officials, like MEP center officials, said that it may not be possible to separate the effects of the AICA cost share adjustment from the effects of the recompetition. NIST officials stated that a longer time span would be needed to identify trends in the manufacturers served by MEP centers; however, even then, confounding factors, such as overall economic conditions, could continue to make it difficult to analyze and isolate the effect of the AICA's cost share adjustment. Looking forward, NIST officials said one impact of the 2017 cost share adjustment is that it will help sustain recent increases in the number of very small and rural manufacturers served by MEP centers.

In addition, establishing a link between changes in MEP centers' finances and activities and the cost share adjustment is difficult not only because the changes generally predated the cost share adjustment, but also because MEP centers likely underreport certain data to NIST. Specifically:

- **Financial data underreporting.** NIST officials stated that because MEP centers are not required to report all of their nonfederal resources in excess of the nonfederal contributions required to meet their cost share, the amount of resources available to centers is likely underreported.[24] According to NIST officials, NIST's Grants Management Division policy provides that centers will generally be held accountable for any amounts that they opt to pledge in excess of the 1:1 cost share.[25] According to NIST officials, centers are thus

[24]NIST officials said that they were unable to verify the extent to which centers were underreporting nonfederal resources in excess of their nonfederal contributions.

[25]Department of Commerce, Office of Acquisition Management/Grants Management Division, *Grants and Cooperative Agreements Manual* (Washington, D.C.: October 24, 2016) (Interim Change 1, dated January 25, 2018). The Federal Assistance Law Division within the Department of Commerce's Office of General Counsel provides Commerce with all legal services associated with federal assistance.

operating rationally and legally in pledging and reporting only the amount needed to meet their nonfederal contribution for their cost share match.[26]

- **Activity data underreporting.** NIST officials said that because MEP centers are not required to report activity data on manufacturers served if the services provided used nonfederal resources that were not directly related to meeting the MEP centers' cost share, certain activity data, such as the number of rural manufacturers served, is likely underreported. During their discussions with some MEP centers leading up to the 2017 AICA cost share adjustment, the NIST officials learned that some centers were not reporting activity data on manufacturers served if the services provided used nonfederal resources that were not directly related to meeting the MEP centers' cost share. An official with one such center provided us with information indicating that the number of rural manufacturers served in fiscal year 2016 was about 36 percent more than the number the center reported to NIST. According to NIST officials, centers are not obligated to report activity data on manufacturers served if those activities are not directly related to funds used to meet the MEP centers' cost share requirements.[27]

Because of this underreporting, NIST officials stated that the amount of nonfederal resources in excess of the nonfederal contributions required to meet the cost share, as well as the total number of manufacturers served and the number of very small and rural manufacturers served, are likely higher that what centers reported to NIST. Moreover, the officials noted that, because of the recompetition and the 2017 AICA cost share adjustment, they believe that the extent of MEP centers' underreporting may have increased in recent years as more centers began operating under a 1:1 cost share ratio.

[26]NIST does not plan to issue guidance to change centers' reporting of their excess nonfederal resources.

[27]To obtain more comprehensive and reliable data on the number of manufacturers served by MEP centers, NIST announced to MEP centers during implementation of the AICA cost share adjustment in April 2017 that it added new data fields to the system in which centers report their data. These new fields would allow centers to report data on both manufacturers served directly with federal assistance and nonfederal contributions under their cooperative agreements, as well as manufacturers served with nonfederal resources in excess of their nonfederal contributions. NIST officials said that they will continue to work with centers on an individual basis to encourage more robust reporting of manufacturers served.

Agency Comments

We provided a draft of this report for review and comment to the Secretary of Commerce. NIST provided technical comments, which we incorporated as appropriate. NIST's comments also included some comments of a more general nature. For example, NIST highlighted the impact that the recompetition had on MEP centers. NIST also noted that while it cannot directly attribute recent increases in the number of manufacturers served to the AICA cost share adjustment, it believes the AICA cost share adjustment has fundamentally allowed MEP centers to deliver more value to clients rather than tie up resources in fundraising.

We are sending copies of this report to the appropriate congressional committees, the Secretary of Commerce, and other interested parties. In addition, the report is available at no charge on the GAO website at http://www.gao.gov.

If you or your staff members have any questions about this report, please contact me at (202) 512-3841 or neumannj@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix II.

John Neumann
Managing Director, Science, Technology Assessment, and Analytics

Appendix I: Objectives, Scope, and Methodology

The objectives of our review were to describe (1) Manufacturing Extension Partnership (MEP) centers' views regarding the extent to which the recent cost share adjustment has helped them serve manufacturers and (2) the extent to which National Institute of Standards and Technology (NIST) data show impacts of the cost share adjustment on centers' finances and activities.

MEP Centers' Views

To describe MEP centers' views regarding the extent to which the 2017 American Innovation and Competitiveness Act (AICA) cost share adjustment has helped them serve manufacturers, we sent a survey to all 51 MEP centers and received a response from every center. We administered this survey in July and August 2018. Because this survey was not a sample survey, there are no sampling errors. As part of developing this survey, we conducted pretests over the telephone with four MEP centers to ensure that the questions were understandable, that the data collected are uniform and usable, and that the survey would place minimal burden on center officials. We pretested our survey with the MEP centers for California, Kentucky, Virginia, and Washington. Using data on MEP center characteristics provided by NIST, we selected these centers to reflect a range of characteristics in the following categories, among others: the number of manufacturers in the state, the type of MEP organization (i.e., whether the center is run by a nonprofit, state agency, or university), and NIST's classification of the state as urban or rural. We made changes to the content and format of the survey based on the feedback we received.

In the survey, we asked the MEP centers about the effects of the cost share adjustment, both experienced and anticipated, using several different types of questions. For example:

- We asked the MEP centers whether the cost share adjustment has resulted in or will likely result in changes such as an increase in center staff; an increased use of contractors; an increase in overall financial resources to support the centers' operations; a more stable financial outlook; or the ability to develop stronger partnerships, conduct more work in rural areas, or conduct more work with very small

manufacturers (fewer than 20 employees).[1] If centers responded in the affirmative, we asked whether those changes have already allowed the center to take specific actions such as conducting additional outreach to manufacturers, providing new services to manufacturers, offering manufacturers a greater quantity of existing services, providing services to manufacturers at reduced cost, or offering training events to manufacturers.

- We asked questions that allowed the MEP centers to identify the extent to which they had experienced a change. For example, we asked, "Whether or not there were any specific types of manufacturers that may have previously underutilized the center's services, to what extent has changing the federal/nonfederal cost share to 1:1 for future years for all centers regardless of when they began operating helped the center serve manufacturers overall?" The centers could select one of the following responses: very great extent, great extent, moderate extent, some extent, little or no extent, don't know.
- We asked open-ended questions to gain additional understanding about the effect of the cost share adjustment, including the following:
  - What, if any, other factors might contribute to the changes or lack of changes identified in [the previous questions]? Please consider factors such as general economic conditions in the center's state, the recompetition of the center's cooperative agreement with NIST, or other factors.
  - What has been the effect of changing the federal/nonfederal cost share to 1:1 for future years for all centers regardless of when they began operating on the overall financial resources to support the center's operations?
  - What, if anything, would the center change about how it provides services to manufacturers in that state if the federal/nonfederal cost share were to change back to the way it was prior to enactment of the AICA in January 2017?

[1]NIST defines very small manufacturers as manufacturing establishments with fewer than 20 employees. NIST uses the U.S. Department of Agriculture's Rural-Urban Continuum Codes (RUCC) to determine whether a manufacturer is located in a rural area. The RUCC is a classification scheme that distinguishes metropolitan counties by the population size of their metro area, and nonmetropolitan counties by degree of urbanization and adjacency to a metro area. RUCCs range from 1 to 9. NIST defines an urban area as one with a RUCC of 1 through 3 and a rural area as one with a RUCC of 4 or higher.

We analyzed the survey responses using content analysis and descriptive statistics. Using content analysis, we analyzed the responses to the three open-ended questions listed above by identifying common themes in centers' open-ended survey responses to establish categories. Two analysts independently reviewed and coded the survey responses to the categories. Then the analysts compared their coding and if there was disagreement, they discussed their assessment and reached a final determination on the categorization. We also used descriptive statistics to analyze centers' survey responses to evaluate the impact of the cost share adjustment on different types of MEP centers. For example, we compared the number of centers responding to certain survey questions by center type (i.e., nonprofit institutions, state agencies, or universities) as well as centers whose cooperative agreements were or were not recompeted.

To further understand the impacts of the AICA cost share adjustment on different types of MEP centers, we conducted follow-up interviews with officials from nine MEP centers using a standard set of questions. We selected these MEP centers based on our analysis of centers' survey responses. Furthermore, we selected these centers to include the perspectives of a variety of MEP centers, accounting for factors such as when the center's agreement was recompeted, number of manufacturers in the state, and whether the center is operated by a nonprofit institution, state agency, or university. During these follow-up interviews, we asked the centers questions such as the following:

- To what extent did the cost share change affect the center and why? Please explain.
- Please explain how the center meets the cost share requirement. What has changed since the AICA set the cost share at 1:1?
- To what extent will the cost share change help or hinder the center's ability to reach underserved manufacturers?
- Is there any way that the center can isolate the changes in the cost share from the recompetition?

GAO Analysis of NIST Data

To describe the extent to which NIST data show impacts from the AICA cost share adjustment, we obtained NIST data on MEP centers' finances and activities for fiscal years 2013 through 2018. We selected this period to encompass the year prior to when NIST began recompeting MEP centers' cooperative agreements. NIST collects financial information from each MEP center, including the amount of financial assistance received

from NIST, program income received from manufacturers for services provided, cash received from other sources (such as grants), and in-kind contributions. We analyzed these data to identify any changes in centers' finances for fiscal years 2013 through 2018. We also obtained NIST data detailing the cost share under which each center was operating for fiscal years 2013 through 2017.[2] We assessed the reliability of centers' financial data by reviewing agency documentation, verifying some data against another data source, and interviewing NIST officials and officials from selected centers. We determined that NIST's data on MEP centers' federal assistance and nonfederal contributions are the best available data and are sufficiently reliable to describe general changes in these aspects of centers' finances during this time period. However, as noted in the report, we found that some centers underreport their nonfederal resources in excess of the nonfederal contributions required to meet their cost share. As a result, we expect that centers' total available resources—including their federal assistance, nonfederal contributions, and nonfederal resources in excess of their nonfederal contributions—are higher than what we present in the report. We determined this because the underreporting we identified with centers' nonfederal resources in excess of their nonfederal contributions would tend to understate the amount of these resources over time and because we did not find evidence of overreporting that would contradict this pattern. In addition, we did not independently verify the nonfederal contributions reported by the MEP centers because it was outside the scope of our work.

We also obtained and analyzed NIST data on MEP centers' activities, such as data on the size, location, and number of manufacturers the centers reported serving in fiscal years 2013 through 2018. NIST guidance for MEP centers calls for centers to report various information about the manufacturers that they serve, including company name, Dun and Bradstreet number,[3] and the North American Industry Classification System code.[4] NIST uses the Dun and Bradstreet number to compile other information about each manufacturer, including location and

[2]We did not obtain NIST data on centers' cost share for fiscal year 2018, specifically, because all centers' cost share was 1:1 per the AICA adjustment.

[3]Dun and Bradstreet is a commercial information vendor that provides information about companies.

[4]The North American Industry Classification System is the standard used by federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.

number of staff. We analyzed the data to identify any changes in centers' activities and to determine the extent to which any changes might be associated with the AICA cost share adjustment. We also reviewed NIST guidance for the MEP program and interviewed NIST and MEP center officials to gain an understanding of the MEP center activity data NIST collects. We assessed the reliability of the activity data by reviewing agency documentation and interviewing NIST officials and selected centers. As noted in the report, these efforts indicated that cost share changes caused some centers' activity data to be underreported. While we were not able to precisely determine the extent of underreporting or precise changes in centers' activities over time, as noted in the report, we believe the data are the best available data and are sufficiently reliable to describe general changes in centers' activities during this time period. We determined this because the underreporting we identified would tend to understate the increases in the total number of manufacturers and the number of very small manufacturers served over time and because we did not find evidence of overreporting that would contradict this pattern. Since the number of rural manufacturers served fluctuated during this time period, however, we were unable to determine whether complete data would indicate a general increase in the number of rural manufacturers served similar to the increases in the total number of manufacturers and the number of very small manufacturers served.

Other Efforts

To help us understand the legal framework for the cost share adjustment, we reviewed the AICA. We reviewed other documents to provide additional context regarding MEP centers' cost share requirements, including past GAO reports and reports from the Congressional Research Service and National Academies of Sciences, Engineering, and Medicine. We also reviewed reports on the MEP program's cost share structure from NIST and the MEP Advisory Board. To gain additional insight on the impact of the cost share adjustment, we also interviewed NIST officials, members of the MEP Advisory Board, and the head of an association representing the MEP centers. Further, we visited a MEP Center in Bothell, Washington, and a manufacturer in Woodinville, Washington, to obtain a more in-depth perspective on the services MEP centers provide to manufacturers.

We conducted this performance audit from March 2018 to March 2019 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that

the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: GAO Contact and Staff Acknowledgements

GAO Contact

John Neumann, (202) 512-3841 or neumannj@gao.gov

Staff Acknowledgements

In addition to the contact named above, Chris Murray (Assistant Director), Arvin Wu (Analyst in Charge), Stephen Betsock, Kevin Bray, Mark Braza, TC Corless, Ellen Fried, Jill Lacey, John Mingus, Calaera Powroznik, Sara Sullivan, David Wishard, and John Yee made key contributions to this report.