



Estimating the Impacts of Business Assistance Programs: The Case of the Manufacturing Extension Partnership

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What is the Manufacturing Extension Partnership?

MEP is a public-private partnership that provides small and medium-sized manufacturers (SMMs) technology-based services needed to thrive in today's economy and create well-paying manufacturing jobs. MEP is managed by the National Institute of Standards and Technology (NIST), a U.S. Department of Commerce agency, and implemented through a network of industry-led centers located in all 50 states and Puerto Rico. MEP centers are not-for-profit corporations or state/university-based organizations that employ or partner with industry experts who work with manufacturers.



MISSION

“ To enhance the productivity and technological performance of U.S. Manufacturing. ”

ROLE

MEP's state and regional centers facilitate and accelerate the transfer of manufacturing technology in partnership with industry, universities and educational institutions, state governments, and NIST and other federal and research laboratories and agencies.





MANUFACTURING EXTENSION PARTNERSHIP • NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY • U.S. DEPARTMENT OF COMMERCE



NATIONAL NETWORK

One Center in Every State and Puerto Rico

Nearly
2,100
Service Providers & Partners

Over
1,300
Manufacturing Experts

Over
400
Service Locations



Delivering Impacts for Clients

More than **122,000 JOBS** Created or Retained

**\$16.0
BILLION**
in New and
Retained Sales



**\$4.0
BILLION**
in Total Investment in
U.S. Manufacturing



**\$1.7
BILLION**
in Savings



Numbers are based on survey results from MEP Center clients.



W.E. Upjohn Institute for Employment Research

- The Institute is an activity of the W.E. Upjohn Unemployment Trustee Corporation, which was established in 1932 to administer a fund set aside by Dr. W.E. Upjohn, founder of the Upjohn Company.
- **MISSION:**
 - The W.E. Upjohn Institute for Employment Research is a private, nonprofit, nonpartisan, independent research organization devoted to investigating the causes and effects of unemployment, to identifying feasible methods of insuring against unemployment, and to devising ways and means of alleviating the distress and hardship caused by unemployment.

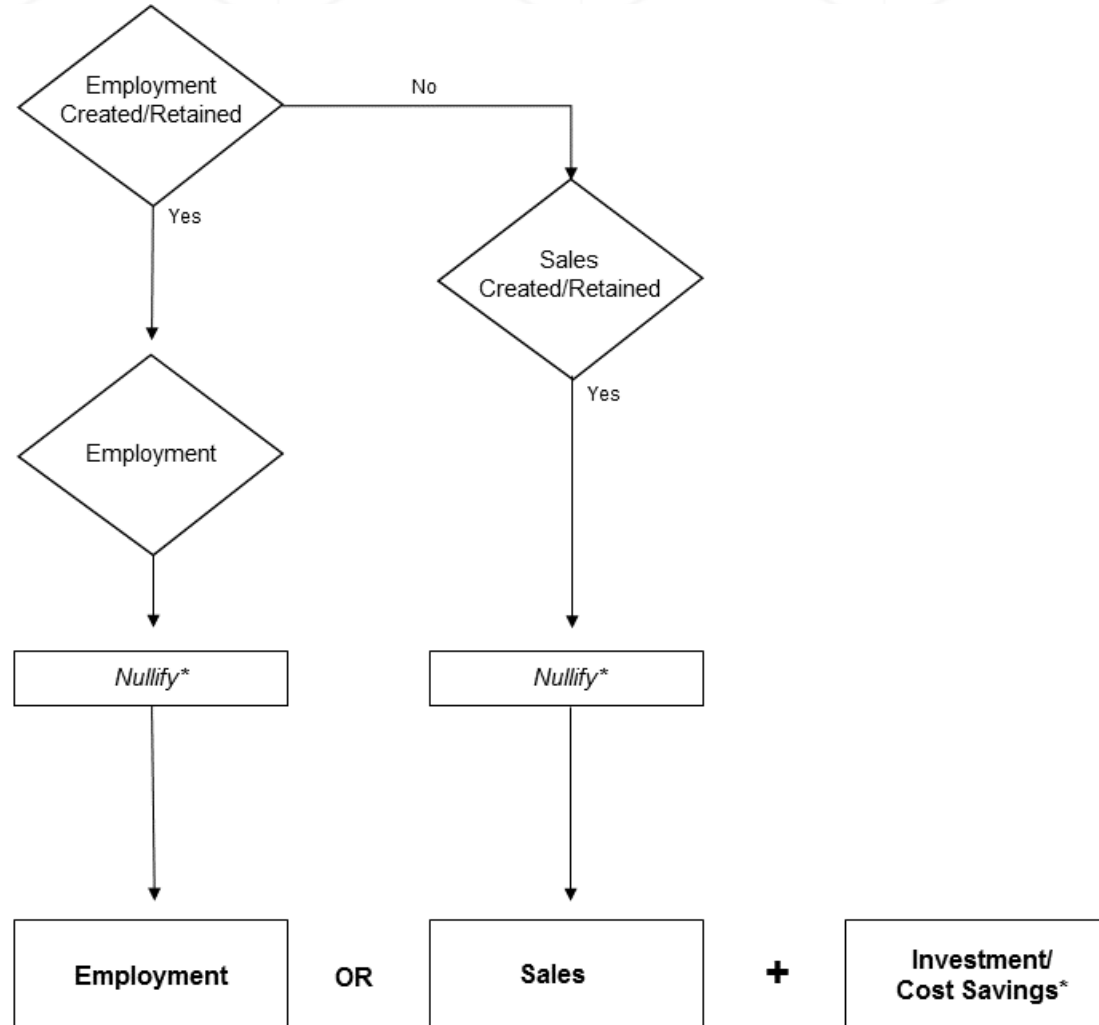
Study Purpose/Background

- The study's goal was to use the client-reported outcomes to estimate the overall effect of MEPs on the U.S. economy. We have now done a similar study for 3 years.
- NIST MEP contracted with the W.E. Upjohn Institute for Employment Research.
- Data from the national FY2018 NIST MEP client survey were provided to Upjohn. This was used to estimate the overall effect of the MEPs on the U.S. economy.
- The study used new and retained jobs, new and retained sales, new investment, and cost savings reported by clients and then aggregated.
- The study used the survey results in combination with an economic impact model developed by Regional Economic Models Inc. (REMI) to estimate the indirect and induced effects of the reported increase in jobs, sales, cost savings, and investments by MEP clients.

Study Assumptions

- The study takes the reported outcomes of MEP clients at face value. It did not attempt to validate the reported outcomes.
- It considers how the results would vary if only a fraction of the reported outcomes represented the actual effects of MEP activities.
- Recognizing that one use of this study is to determine whether the cost of the MEP program is justified by the benefits it generates, the study estimates the fraction of reported outcomes required for the program to break even, as measured by the projected personal income tax increases covering the annual cost of the program for FY2018 (\$140 million).

Modelling the Net Impact



Study Overview

- The study presents three scenarios:
 - Scenario One: The unconstrained approach in which it is assumed that an increase in sales of one firm does not effect or reduce the sales of another firm. This assumption is not entirely realistic, since it does not take into account competition among firms and the displacement effects that occur from the competition across firms. This scenario is included to serve as an upper bound on the results.
 - Scenario Two: A more accurate, yet conservative, scenario assumes that competition among firms reduces the outcomes as a result of competition.
 - Scenario Three: A third model was run to examine how much the overall survey impacts used in the model must be discounted to generate enough federal personal tax revenue to equal federal funding. This is intended to serve as a lower bound on the results.

Study Overview (continued)

Table 1: Differences in Survey Impacts, FY18 vs. FY 16 and FY17.

Category	FY16	FY17	FY18	FY16 to FY17 % Change	FY17 to FY18 % Change
Total Jobs	86,541	100,721	121,412	16.4	20.5
Created	19,653	24,210	26,486	23.2	9.4
Retained	66,888	76,511	94,926	14.4	24.1
Total Sales	\$9.33b	\$12.6b	\$15.9b	35.0	26.2
Increased sales	\$2.33b	\$3.5b	\$3.8b	50.2	8.6
Retained sales	\$7.0b	\$9.1b	\$12.0b	30.0	31.9
Cost Savings	\$857m	\$1.04b	\$976m	21.4	-6.2
Investment Savings	\$514m	\$703m	\$724M	32.8	30
Total Investment	\$3.5b	\$3.5b	\$4.0b	0.0	14.3
Products & Process	\$1.07b	\$1.07b	\$1.08b	0.0	0.9
Plant & Equipment	\$1.83b	\$1.86b	\$2.32b	1.64	24.7
Systems & Software Information	\$134m	\$178m	\$206m	32.8	5.7
Workforce Practices	\$210m	\$199m	\$202m	-5.2	1.5
Other	\$227m	\$233m	\$214m	2.6	-8.2

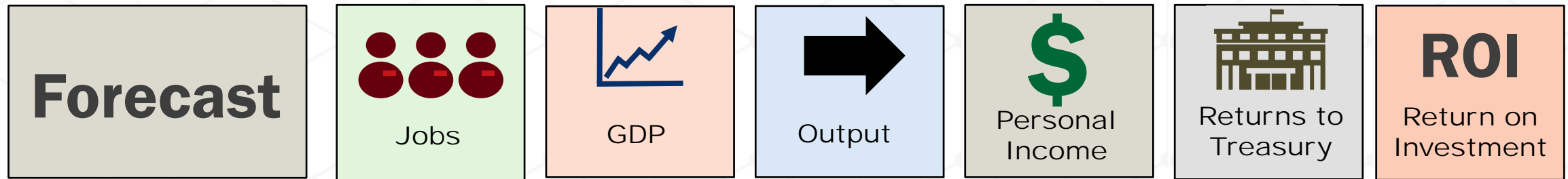
The Findings in Brief

- This study finds that the effects of MEP projects on the U.S. economy and the \$140 million invested in MEP during FY2018 generated just over a 14-fold increase in federal personal income tax – a 14.4:1 return.
- The study takes into account the competitive interactions among businesses and uses the client-reported effects of MEP projects, and are included in the model compared to when they are not.
- The W.E. Upjohn Institute for Employment Research conducted the national impact analysis based on results from the MEP Client Survey conducted by Fors Marsh using the REMI model, which forecasts the following outcomes in FY2018:
 - 236,802 additional jobs
 - Additional economic output of just under \$46.6B, and
 - A \$24.9 billion increase in GDP

Some Things to Consider

- It is likely that not all of a firm's revenue growth, investment, and cost savings are fully attributable to MEP center activities.
- The final forecast tests the sensitivity to this consideration. It asks, "How much of the changes to the firms must be attributable to MEP activities for the annual cost of MEP to equal its benefits?"
- By setting the return on investment (ROI) at 1:1, with personal income tax collection equal to MEP's FY2018 budget of \$140 million, the needed level of MEP attribution is about 6.9 percent. Even by claiming just under 7 percent of the reported client outcomes, MEP activities are associated with an additional 16,427 jobs and just over a \$1.6 billion increase in GDP.

Study Overview: Estimates of Impacts



Unconstrained Model Using Industry Variables	843,889	\$103.16*	\$203.38*	\$54.51*	\$7.19*	51.4:1
Constrained Model Using Firm Variables	236,802	\$24.9*	\$46.6*	\$15.0*	\$2.02*	14.4:1
6.9% of Reported Impact	16,427	\$1.62*	\$3.04*	\$1.04*	\$0.140*	1:1

The Study Team

The team contributing to this report are:

- Upjohn:
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 - Brian Pittelko
 - Claudette Robey
- Ken Voytek, NIST/MEP
- Chris Judson, REMI

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