

The National-Level Economic Impact of the Manufacturing Extension Partnership (MEP)

EXECUTIVE SUMMARY

NIST
National Institute of
Standards and Technology
U.S. Department of Commerce



MEP • MANUFACTURING
EXTENSION PARTNERSHIP

Study Overview

Manufacturing Extension Partnership (MEP) centers provide assistance to primarily small and medium-size manufacturing businesses to help them improve their productivity. A part of the National Institute of Standards and Technology (NIST), the MEP centers provide services such as assistance with product development, tools and resources for business expansion, and business continuity planning, which can contribute to cost savings, new investments, and improved products and processes. These improvements increase the profitability and competitiveness of the client firms, which in turn improves the economy by creating jobs, expanding the tax base, and increasing overall economic activity.

Each year, NIST MEP surveys their clients using an independent third-party vendor to obtain a reading of the impact of the services provided. The survey asks clients to report the effects of MEP services on the following possible outcomes:

- Jobs created and retained
- Sales created and retained
- Cost savings
- Investments

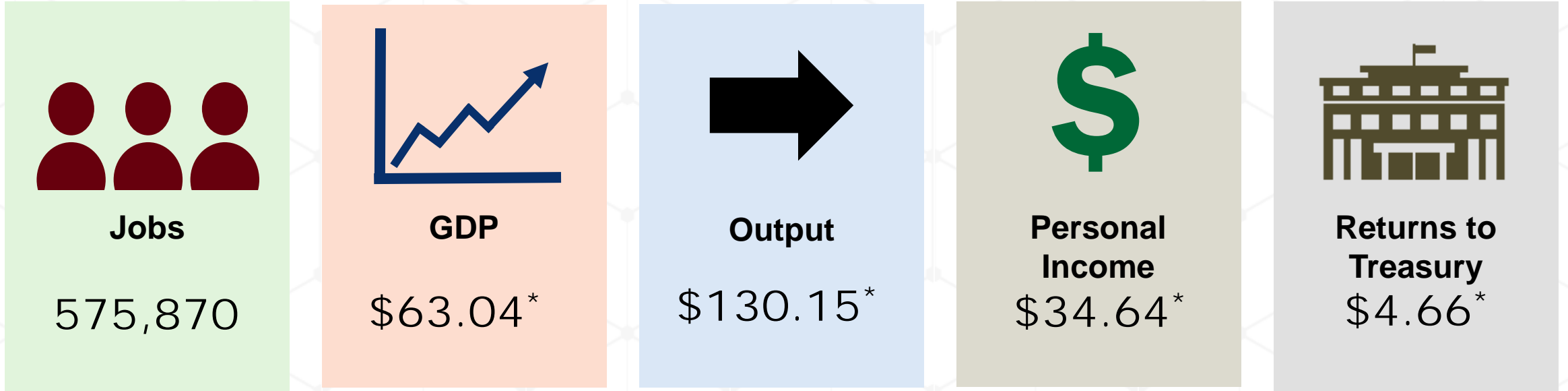
The study's purpose is to use the client-reported outcomes to estimate the overall effect of MEPs on the U.S. economy. Using an economic impact model developed by Regional Economic Models Inc. (REMI), the study forecasts the indirect and induced effects of the reported increase in jobs, sales, cost savings, and investments by MEP clients.

Study Overview

The study presents two scenarios. The first is 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. The second more accurate, yet conservative, scenario assumes that competition among firms reduces the outcomes as a result of competition.

The study takes the self-reported outcomes of MEP clients at face value, without attempting to validate the reported outcomes, and 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 FY2016 (\$130 million). The results of the analysis are displayed on the next three slides.

The Unconstrained Model Using Industry Variables



* Dollars in billions

The unconstrained model, assuming no competition or displacement between firms, adds 575,870 jobs to the United States that would not have been created or retained without the services and activities of the MEP centers. In addition to the annual increase in gross domestic product (GDP), output, and personal income, the MEP activities also increase personal income tax revenue by \$4.66 billion, which far exceeds the \$130 million cost of the program each year. These estimates of impacts set an upper bound on outcomes and are not entirely realistic and likely overestimate MEP impact.

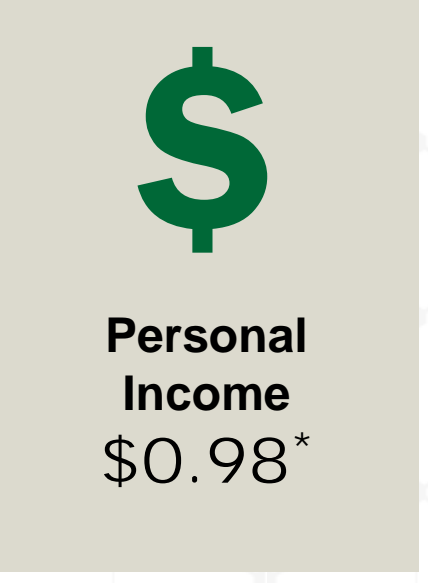
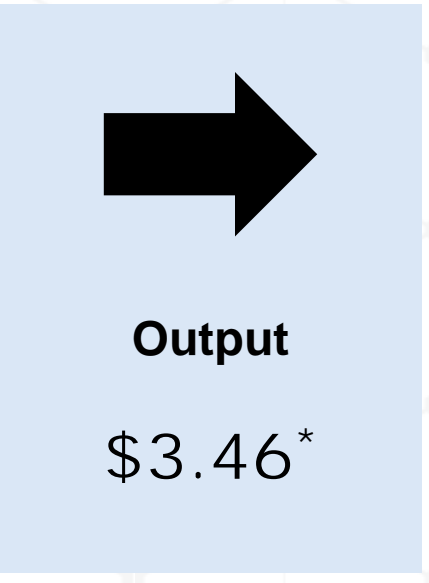
The Constrained Model Using Firm Variables



* Dollars in billions

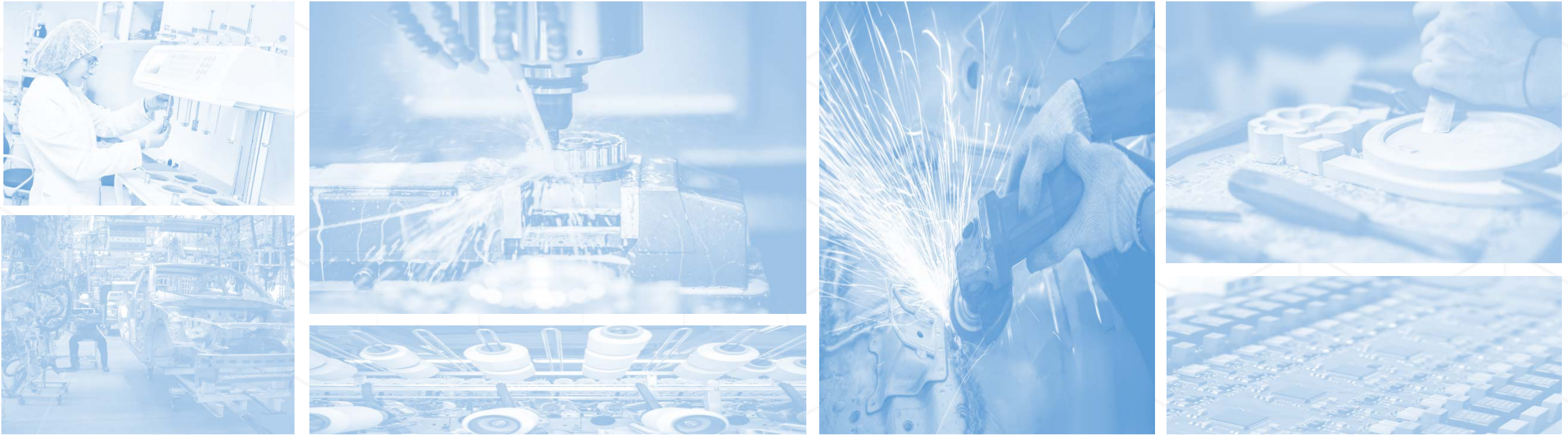
The constrained model, assuming competition or displacement between firms, adds 142,381 jobs to the U.S. economy, which would not have been created or retained without the services and activities of the MEP Centers. Under this more conservative and realistic approach, MEP activities add \$1.13 billion to the U.S. Treasury through an increase in personal income taxes. The increase in tax revenue to the U.S. Treasury would be higher if the model included corporate income taxes. Even with the model counting only personal income taxes, the tax revenues far exceed the cost of the program.

MEP Breaks Even at About 11.5% Using Firm Variables



* Dollars in billions

This scenario estimates the proportion of the client-reported results that would generate enough additional revenue from personal income taxes to exactly pay for the MEP program each year -- \$130 million. The proportion is estimated to be 11.5 percent of the reported client outcomes. Under this scenario, which assumes competition among firms, 16,532 jobs would be created and retained and GDP would increase by \$1.79 billion during the year of the MEP activities.



EXECUTIVE SUMMARY: MEP Economic Impact Analysis

SURVEY RESPONSES FROM MEP CENTERS

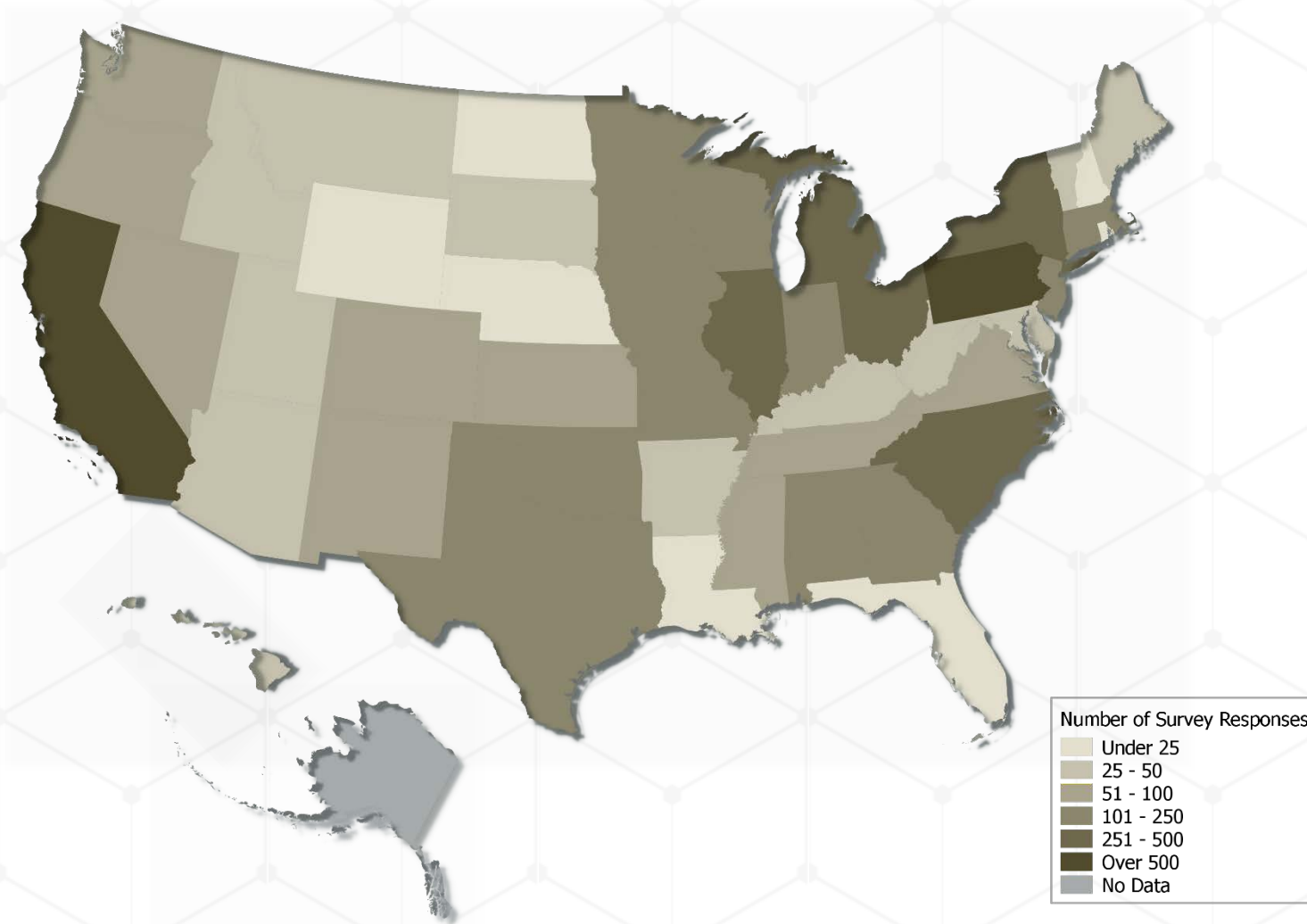
Survey Responses

MEP clients were surveyed and asked to indicate whether they believed that MEP activities affected each element of possible business outcomes. If they responded yes, then the respondent was asked to provide a quantitative estimate of the impact of MEP on that specific outcome, such as the number of jobs created or the dollar amount of cost savings. As shown in the table, the percentage of “yes” responses ranged from 17 percent (other investments) to 50 percent (investment in workforce training). Only roughly 400 responded “yes” to all 11 elements and provided a quantitative estimate of the impact. When responses to the two employment questions (created and retained) were combined, 56 percent of the respondents indicated a positive employment effect. Forty-five percent indicated a positive combined sales effect. About 40 percent of the surveys responded yes to both the employment and the sales questions, and a similar percentage responded no to both.

Even though most surveys did not indicate positive effects on all variables, we sum the responses at the state and national levels and treat the aggregate numbers as an overall direct effect (to MEP clients) of MEP activities. The national and state totals are reported in the following slides in this section.

Data Element (variable)	Number that Indicated MEP Affected a Positive Response
Number of jobs created	2,406
Number of jobs retained	2,811
Increase in sales	2,088
Retained sales	2,242
Cost savings	3,217
Investment in plant and equipment	2,748
Invest in products and processes	2,442
Investment in information system	1,853
Investment in workforce training	3,315
Other investments	1,116
Unnecessary investments	2,272
Total responses	6,507

Survey Responses

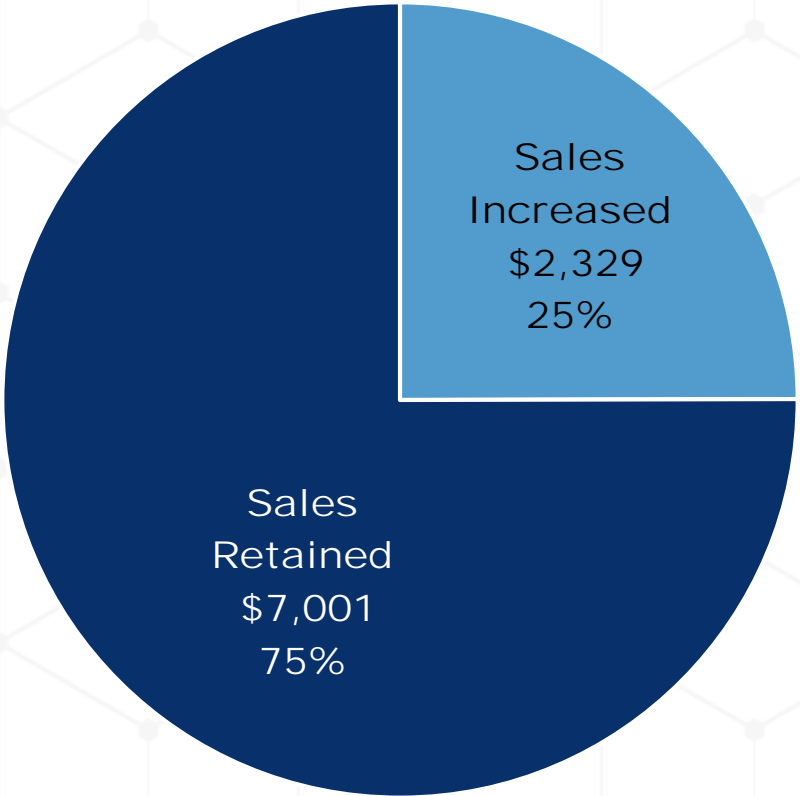


National Summary of Client-Reported Outcomes Resulting from MEP Center Activities: Q4 2015 to Q3 2016

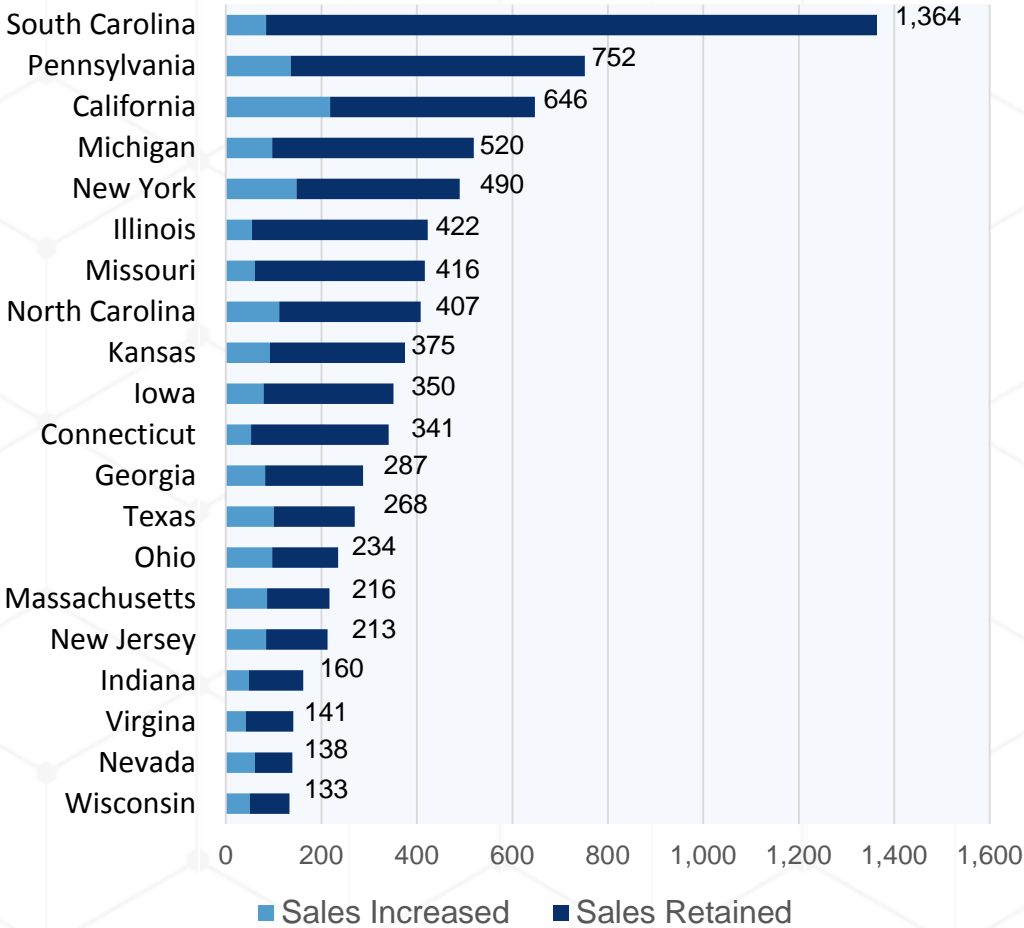
Sales:	+\$9.33b	Total Investment:	+\$3.5b
○ Increased:	\$2.33b	○ Products & Process:	\$1.07b
○ Retained:	\$ 7b	○ Plant & Equipment:	\$1.83b
Jobs:	+86,541	○ Systems & Software:	\$134m
○ Created:	19,653	○ Workforce Practices & Employee Skills:	\$210m
○ Retained:	66,888	○ Other Areas of Business:	\$227m
Cost Savings:	+\$857m		
Investment Savings:	+\$514m		

Overview of Total Sales

Total Sales Increased vs. Total Sales Retained (in millions)

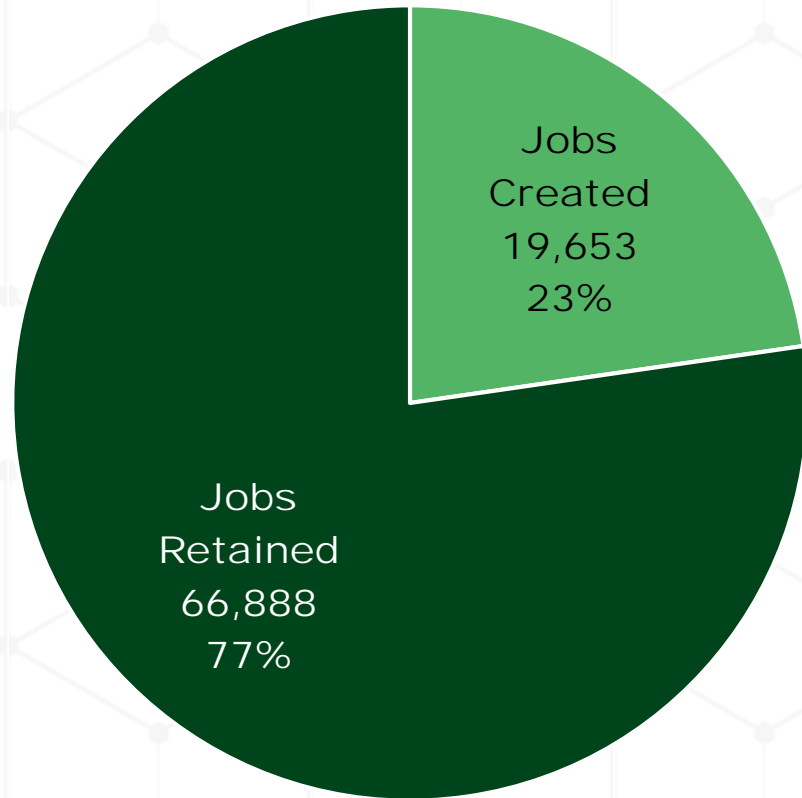


Top States and Territories for Total Sales (in millions)

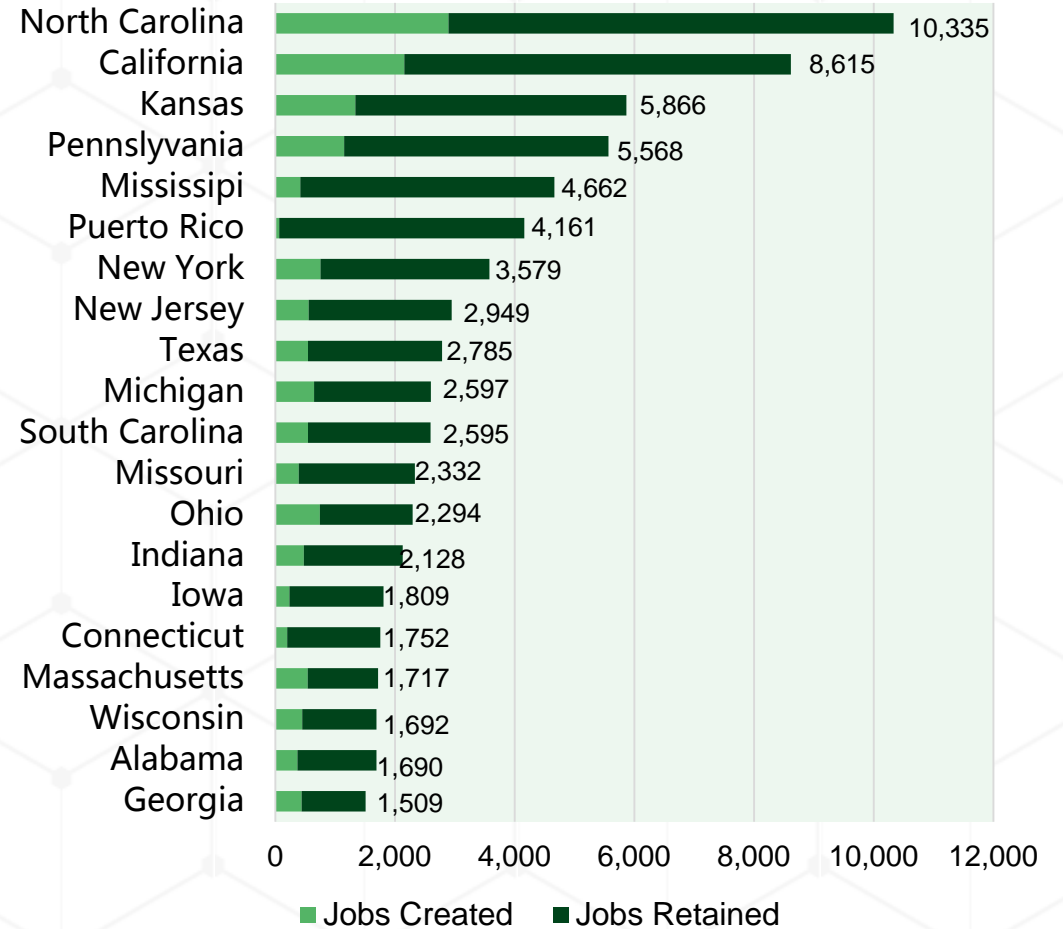


Overview of Total Jobs

Total Jobs Created vs. Total Jobs Retained

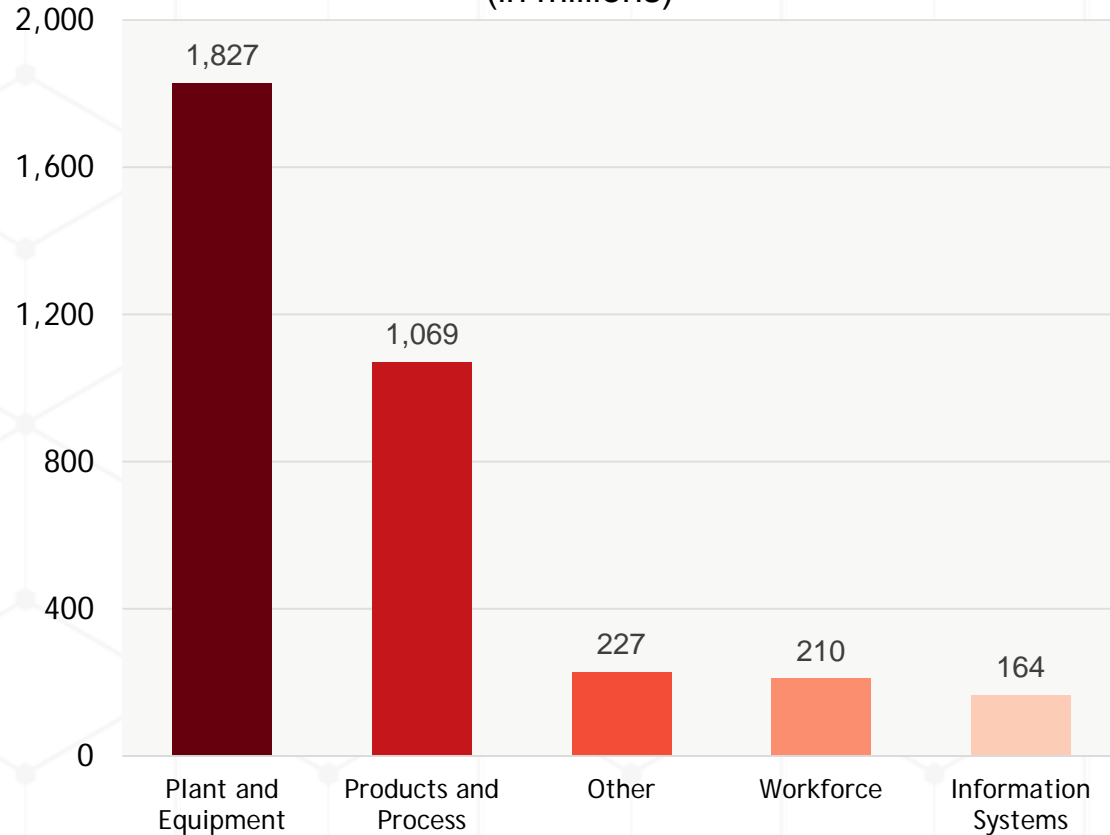


Top States and Territories for Total Jobs Created and Retained

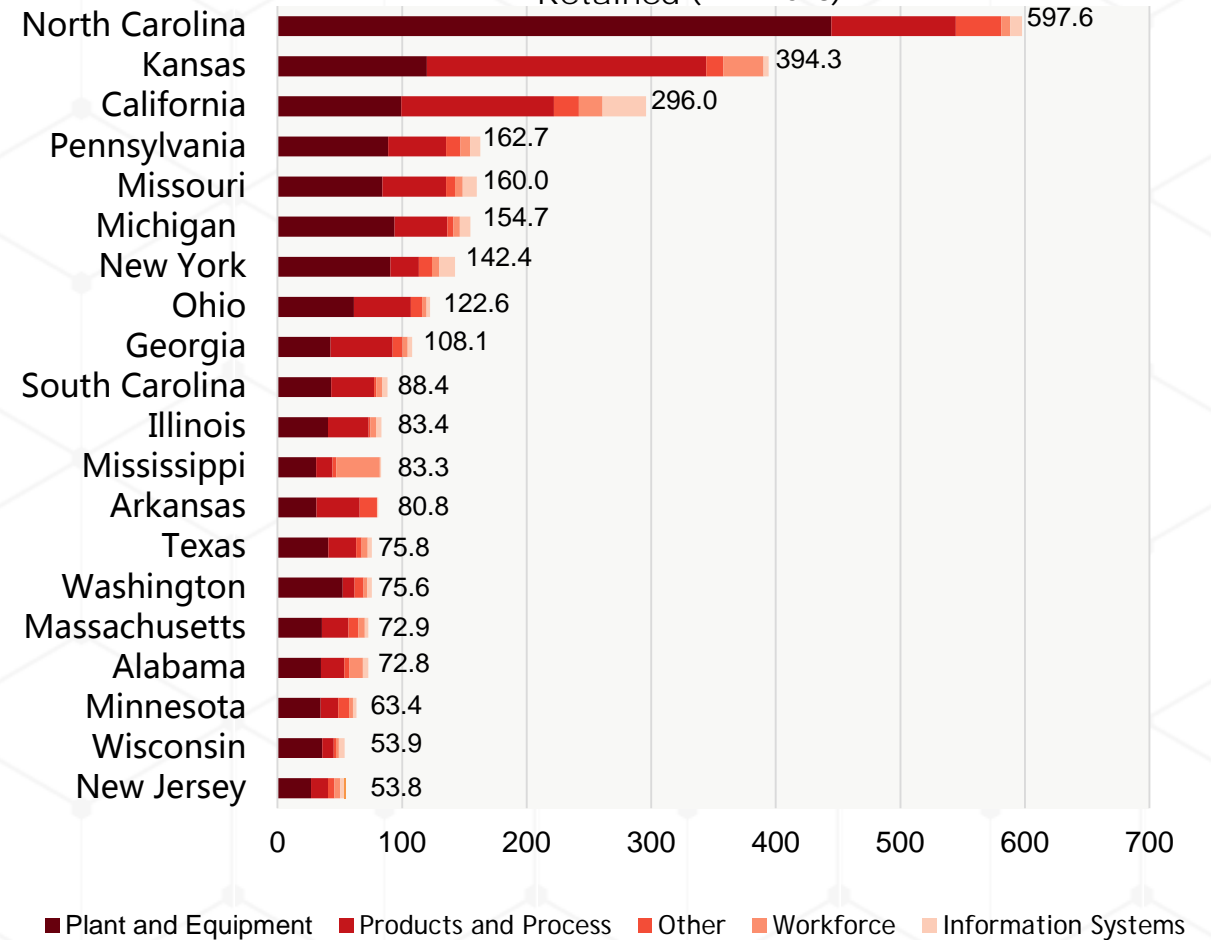


Overview of Total Investments

Breakdown of Total Investments
(in millions)

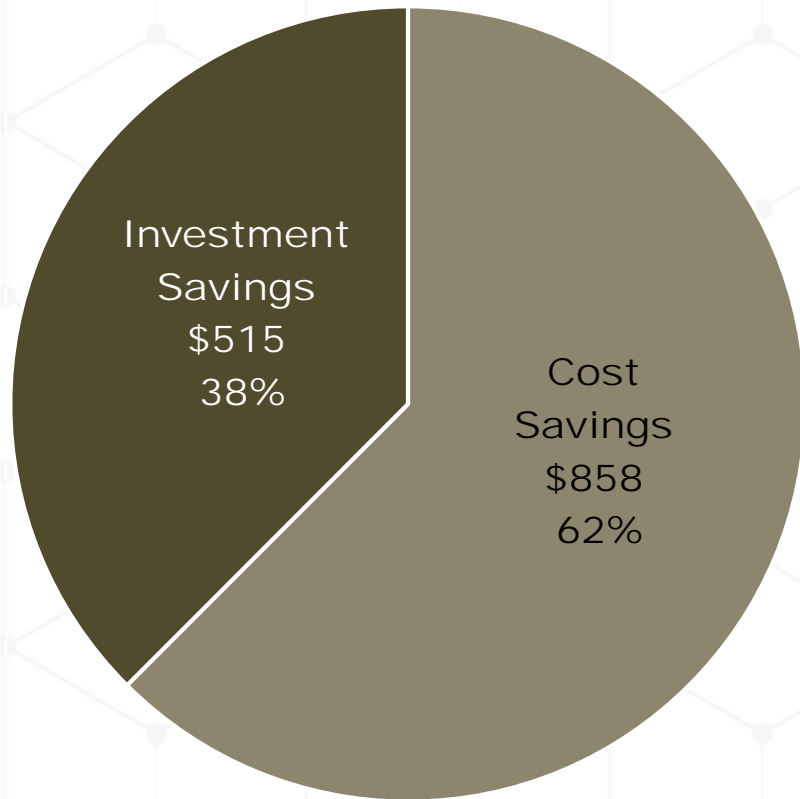


Top States and Territories for Total Jobs Created and Retained (in millions)

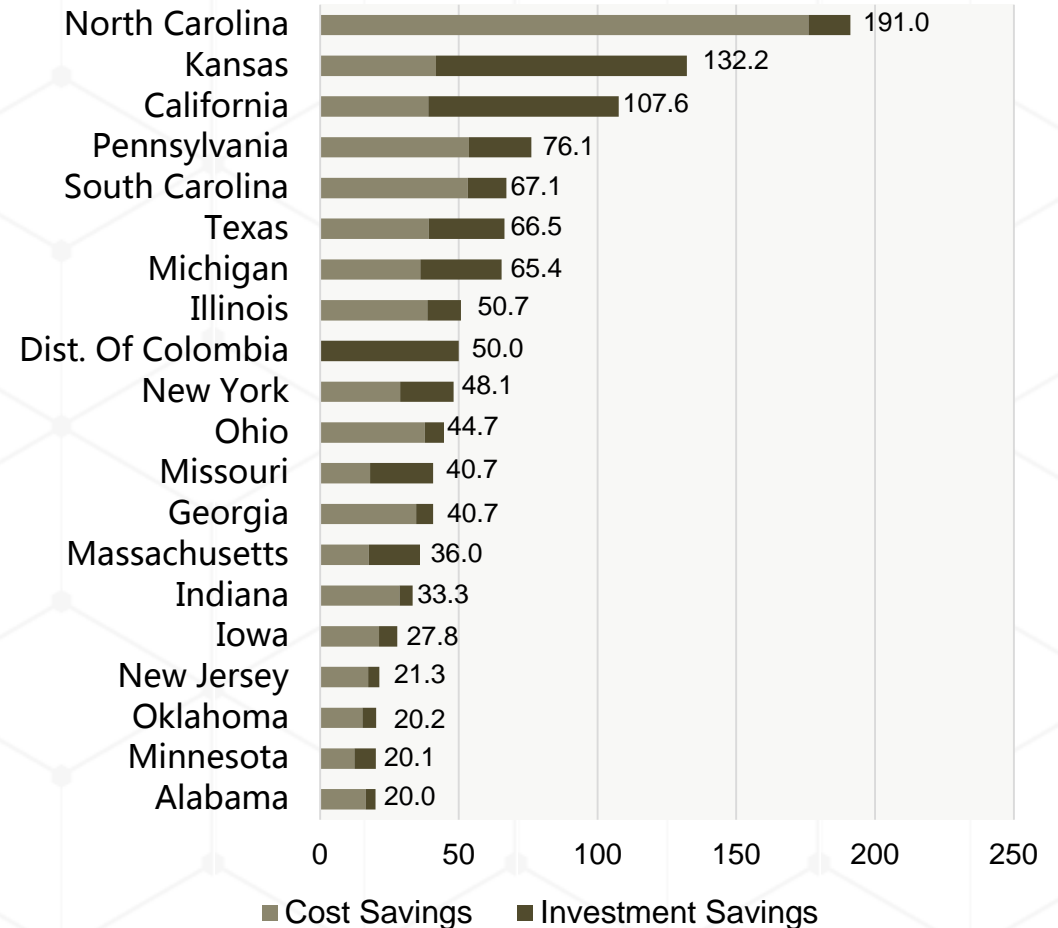


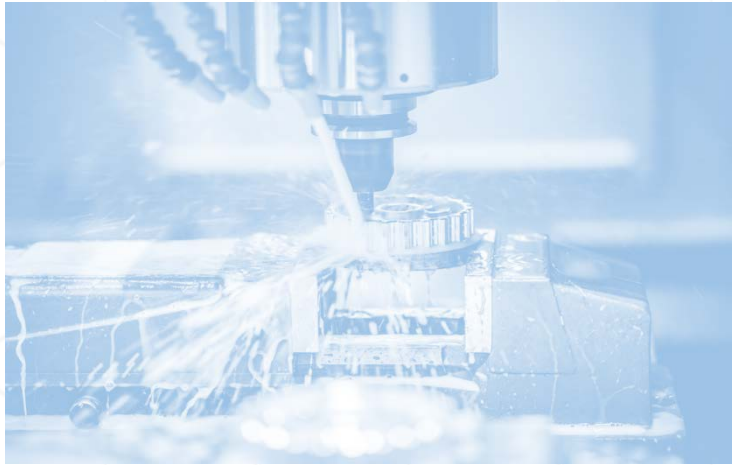
Cost Savings vs. Investment Savings

Total Cost Savings vs. Total Investment Savings
(in millions)



Top States and Territories for Total Savings
(in millions)





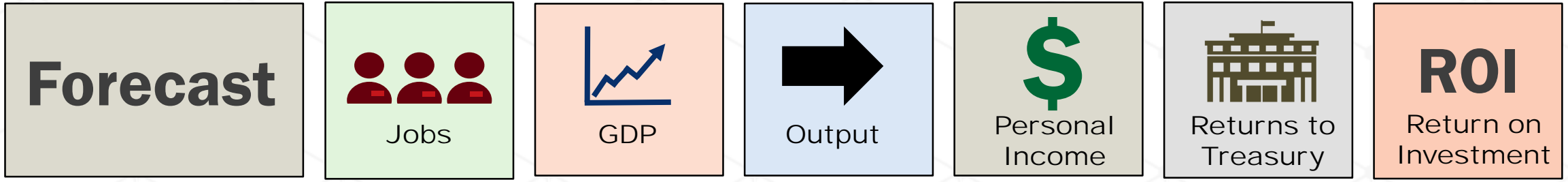
EXECUTIVE SUMMARY: MEP Economic Impact Analysis

STUDY FINDINGS

Study Findings

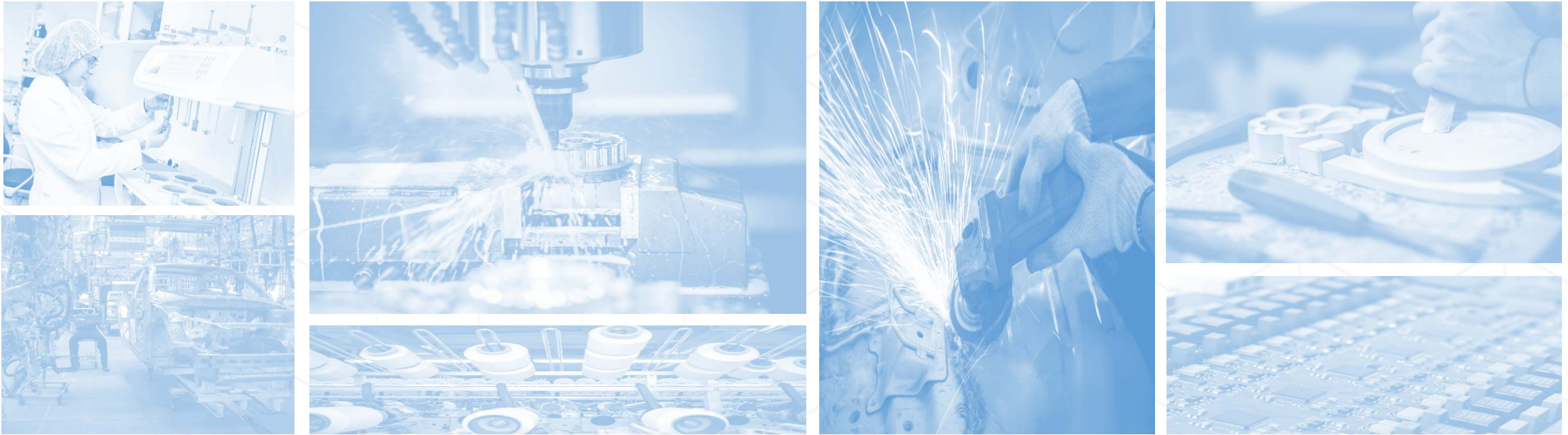
This study of the effects of MEP projects on the U.S. economy finds that the \$130 million invested in MEP during FY2016 generated nearly a nine-fold increase in federal personal income tax – a 8.7:1 return. The study uses the national REMI© model to forecast the economy-wide impact of the client-reported results from the FY2016 NIST MEP Client Impact Survey. Taking into account the competitive interactions among businesses, the REMI model forecasts 142,000 additional jobs and a \$15.4 billion increase in GDP during FY2016, when the client-reported effects of MEP projects 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.

It is likely that all of a firm's growth and savings are not 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 in order 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 FY 2016 budget of \$130 million, the needed level of MEP attribution is about 11.5 percent. Even by claiming slightly over a tenth of the reported client outcomes, MEP activities are associated with an additional 16,532 jobs and nearly a \$1.8 billion increase in GDP.



Unconstrained Model Using Industry Variables	575,870	\$63.04*	\$130.15*	\$34.64*	\$4.66*	35.8:1
Constrained Model Using Firm Variables	142,381	\$15.40*	\$29.89*	\$8.44*	\$1.13*	8.7:1
11.5% Solution Using Firm Variables	16,532	\$1.79*	\$3.46*	\$.98*	\$.132*	1:1

*Dollars in billions



EXECUTIVE SUMMARY: MEP Economic Impact Analysis

W.E. UPJOHN INSTITUTE

About the Upjohn Institute

The W.E. Upjohn Institute for Employment Research is an activity of the W.E. Upjohn Unemployment Trustee Corporation, which was established in 1932 to address issues of unemployment during the Great Depression. The Upjohn Institute 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.

Upjohn's broad objectives are to: (1) link scholarship and experimentation with issues of public and private employment and unemployment policy; (2) bring new knowledge to the attention of policy makers and decision makers; and (3) make knowledge and scholarship relevant and useful in their applications to the solutions of employment and unemployment problems.

Upjohn Institute professionals contributing to the authorship of this report are:

- Jim Robey, Ph.D., Director, Regional Economic and Planning Services
- Randall Eberts, Ph.D., President
- Kathleen Bolter
- George Erickcek
- Marie Holler
- Nicholas Marsh
- Brian Pittelko
- Claudette Robey

For additional information or questions, contact Jim Robey at 269-385-0450 or jim.robey@Upjohn.org. Additional information and research on the Upjohn Institute is available at www.Upjohn.org.