



Michigan Business Development Program Effectiveness Study

Prepared for the Michigan Economic
Development Corporation

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Executive Summary

The Michigan Economic Development Corporation requested third-party input to assess the effectiveness and return on investment (ROI) of the Michigan Business Development Program (MBDP). Since 2012, MBDP has provided grants and loans to businesses for “highly competitive projects in Michigan that create jobs and/or provide investment.”

The Center for Regional Economic Competitiveness (CREC) and the W.E. Upjohn Institute for Employment Research examined three aspects of the MBDP to assess effectiveness: the MBDP’s economic return on investment, the importance of the MBDP incentive to securing projects and generating results for Michigan, and a comparison to other states’ incentive program management practices. The analysis is based on MBDP-funded project reports and original research using MBDP project histories. The ROI estimates were developed using the Upjohn Institute’s cutting-edge state-level model for incentive evaluation research.

Return on Investment

The study estimates that the MBDP has an ROI of 3.86. That is, for every \$1 the state invests in the MBDP, the program results in a net gain of \$3.86 in per capita income for Michigan residents. This ROI is higher than that for many other state incentive programs because:

- Michigan has targeted relatively high multiplier industries with an extensive network of local manufacturing suppliers that benefit when their incentivized customer grows;
- Michigan’s MBDP incentives are provided up-front, which increases cost-effectiveness because many businesses pay the most attention to near-term investment returns;
- Michigan’s MBDP incentives are relatively modest in size, which increases effectiveness per dollar as incentives tend to experience declining returns as size increases.

This study’s ROI approach is different from MEDC’s current method of calculating ROI, so the study results vary from MEDC-reported results. The main difference is that this study considers a broad range of economic and fiscal benefits and costs to the state while MEDC’s current approach emphasizes anticipated cash flow to the state from growth in taxes. Incorporating economic effects is important for understanding whether incentivized projects have a positive economic impact in a manner consistent with MEDC’s mission and vision.

Importance of the Incentive

A key finding is that even when the incentive’s impact on company decisions is estimated to be modest, the MBDP still generates the positive program ROI of nearly 4:1 as described above. The estimated long-term benefits of even one new full-time job are such that the program

reaches a breakeven ROI point with a “but for” percentage of less than 1 percent. This is because the long-term earnings benefits far outweigh the MBDP’s modest costs.

This study provides a more systematic approach than prior studies in assessing whether proffered incentives help secure projects and the effect those investments may have on ROI. MEDC’s current ROI methodology implicitly assumes that 100 percent of the estimated benefits can be attributed to the incentive, as is the practice in most states. The study team suggests an alternative approach for two reasons. First, in practice, it is impossible to know with certainty whether a company would have made an investment without the incentive. Second, many factors, such as workforce and infrastructure quality, influence business investment decisions. Incentives are considered in combination with these other factors. Therefore, incentives rarely are 100 percent responsible for an investment. Similarly, they rarely have zero impact.

In response, the study team developed two different approaches to adjusting the calculation of net benefits when estimating ROI for the MBDP. Both approaches indicate that the incentive played a role in the investment decision and that varying proportions of project outcomes can be attributed to the effect of the incentive.

State Comparisons

MEDC’s procedures for pre-award analysis and post-award program management are consistent with standard practices in comparable state incentive programs. No state has a perfect program, and all states face the same challenges around calculating returns, managing compliance, and evaluating performance. Nevertheless, comparing analytical and management procedures to similar programs in other states can yield helpful insights for improving effectiveness. The program examination suggests:

- ROI is not calculated consistently across states. ROI is typically one of several factors used to decide whether to grant incentives and to calibrate the amount of the incentive.
- “But for” is frequently considered although seldom well-defined. Most programs do not have a statutory “but for” requirement. Even so, most states ask applicants to provide project-specific information that would indicate either the level of competition for the project or a rationale for requesting the incentive.
- As in Michigan, other states prepare performance agreements with companies receiving incentives that detail job creation and other requirements, and incentives are typically paid after performance is achieved, often with intermediate milestones and payments.
- Annual company reporting requirements, including payroll documentation, ability to conduct audits, site visits, and ability to verify company inputs with state unemployment insurance and/or revenue offices are common compliance procedures.

- States are improving their reporting on outcome metrics, including compliance with performance agreements and actual jobs created compared to projected jobs. However, the process of tracking and reporting on outcomes is complicated by timing issues, project amendments, and dismissed or terminated projects. States lack an industry standard to guide incentive reporting.

Options for Consideration

One reason for assessing the MBDP's effectiveness is to identify ways to enhance the program's economic impact for Michiganders. Options for consideration include:

Reorient the ROI analysis to emphasize economic impact over a 10-year time horizon

The MBDP's internal measure of ROI is currently limited to fiscal gains to state government even though the program is expected to generate economic benefits related to job creation. MEDC may consider adapting its impact model to include economic as well as fiscal impacts. The timeframe for ROI analysis should be extended beyond the current 2- to 3-year time horizon in order to more completely capture benefits and costs. This study's findings suggest that a 10-year timeframe for analysis would capture most benefits and costs.

Address costs more explicitly in ROI estimations

Economic impact estimates are viewed with skepticism if they overstate the benefits and ignore costs such as greater public service expenses associated with growth, higher prices for local businesses, and opportunity costs. The MEDC specifically asked that this effectiveness study take into consideration several of these cost factors. The ROI estimation procedures should be adapted to reflect these costs as well as economic benefits.

Account for the incentive's level of influence on investment decisions

ROI measures can overstate benefits by assuming that the incentive is responsible for all positive outcomes. This study provides two methods of calculating a percentage that estimates the incentive's importance for individual projects and across the program. Alternatively, MEDC can simply discount the estimated net benefits at set levels, such as 10%, 50%, 70% and 100% of the estimated ROI for potential projects. This basic method would also allow MEDC to identify the break-even point for projects and, with experience, establish either target levels or minimum levels for project approvals.

The ROI model can help direct incentives toward projects with the greatest economic impact . . .

The model used to estimate ROI is designed to highlight how the ROI varies by project characteristics. Prioritizing higher-return projects would mean targeting areas with high unemployment rates, emphasizing industries with high multipliers, and recognizing the dampening economic impact of rising local prices due to job and population growth.

. . . But ROI should be used in concert with other project review criteria to drive decisions that reflect economic objectives

States seek many benefits that cannot be captured in a single ROI calculation. In some cases, MEDC should be willing to accept lower ROIs when projects help achieve important objectives not included in the ROI, such as bringing abandoned properties back into productive use, hiring populations with barriers to employment, or positioning Michigan-based operations for future growth. ROI should not be the only factor driving the decision to provide incentives.

Revisit MBDP's purpose and eligibility rules to assess match with current state needs

The economic, political and incentive environments have changed since MBDP was created. MEDC may wish to consider how to improve MBDP's effectiveness in today's economic development setting. As companies struggle to find workers, is it sensible to focus exclusively on job creation? Should a worker training option be evaluated? Should the MBDP consider revising its own eligibility criteria to expand its reach to smaller, Michigan-based enterprises?

Continue to pursue options to use unemployment insurance data to verify company-provided data on job creation

States are increasingly striving to verify jobs and payroll data provided by incentive recipients with information that companies submit to state unemployment insurance (UI) agencies. While these records provide a useful check on data that incentivized firms submit, they are not foolproof. In Michigan, the unemployment insurance agency generally does not collect site-specific data for employers paying into the system, meaning the data currently is inadequate for MBDP compliance verification. One option would be to require or request MBDP applicants to create "chargeable locations" in their firm's UI records to simplify compliance and allow for milestone verification.

Strengthen cooperation with local partners

The MBDP could be improved by strengthening cooperation with local economic development partners. Options include providing local partners greater transparency on local projects, sharing updates on milestones from companies in their communities, and implementing a joint customer-oriented compliance process through which MEDC can stay engaged with MBDP-funded companies.

I. Introduction

Since 2012, the Michigan Economic Development Corporation (MEDC)¹ has offered the Michigan Business Development Program (MBDP), which provides discretionary grants and loans to businesses via an application and due diligence process for “highly competitive projects in Michigan that create jobs and/or provide investment.” MEDC has requested external assistance to determine the effectiveness and return on investment (ROI) of this incentive program. The goal of this effort is to help MEDC better allocate its limited resources and to invest in economic development programs that yield net benefits for the state.

The MEDC requested the following three analytical elements to understand the MBDP’s impact and effectiveness:

- Return on investment by project and program, including a comparison of findings to the ROI projected by the REMI model currently used by MEDC;
- Assessment of how important the incentive was to securing the project for Michigan and creating jobs; and
- Comparisons of ROI, up-front project analysis, and program management of MBDP to similar incentives offered in other states.

The study concludes with a set of options to improve MBDP ROI practices and up-front analyses prior to making award decisions, plus suggestions for improvements to program design and administration that could enhance the effectiveness of MBDP.

II. Methodology

The Center for Regional Economic Competitiveness (CREC) and the W.E. Upjohn Institute are nonprofit organizations that work on topics related to economic development incentive evaluation research, including data sharing, economic modeling, legislative action designed to improve incentive goal setting, and ROI analysis. The methodology for this assessment incorporates these services. The resulting analysis is built around project-specific data and original research using MBDP project histories.

¹ The Michigan Strategic Fund (MSF) receives an annual appropriation from the legislature for a number of economic development programs, including the Michigan Business Development Program (MBDP). The MSF Board of Directors has granted authority to the Michigan Economic Development Corporation (MEDC) to provide administrative services to the MSF for the MBDP. All recommendations for awards under the program and approval or modifications of the program guidelines are presented to the MSF Board for consideration.

ROI

MEDC's ROI formula defines net benefits as the expected increased state revenue over the term of the MBDP incentive, taking into account incentive costs. Upjohn's ROI estimation model differs from the model MEDC currently uses by capturing a broader set of economic costs and benefits in addition to fiscal impact. The Upjohn-developed ROI model represents an improvement over most other tools used to calculate ROI for incentive programs; it includes the ability to take into account opportunity costs and the importance of the incentive in securing projects for the state – two critical factors requested by MEDC for this assessment.

Accordingly, this study defines net benefits as the present value of the gains in real income per capita for Michigan residents. Specifically, the Upjohn model includes the analysis of benefits, such as increases in state and local tax revenue, gains in worker earnings due to both increases in the employment-to-population ratio and increases in real wages, and gains in property values. Increases in public spending to accommodate population change, effects on local firms that face higher costs due to increased wages and property costs, and effects of financing the incentive are among the costs. Opportunity costs are built into the model by incorporating the need for states to account for the resources required to provide the incentive.

This new methodology captures the idea that economic development incentives such as MBDP are primarily aimed at giving a state's residents better economic opportunities due to increased access to good jobs. The model's inclusion of gains in real earnings per capita due to higher employment to population ratios and higher real wages captures the value of such opportunities. But this study's methodology also captures various offsets; for example, new jobs, while they may increase a state's tax revenue, also increase the state's population, which requires additional state and local public spending to maintain the same quality of public services.

This study's present value of net benefits is calculated over an 80-year and 10-year period. This timeframe differs significantly from MEDC's current approach of looking at the 2- to 3-year term of the MBDP incentive. A longer time period is appropriate for understanding both the longer-term economic costs and benefits from incentivized projects. In most model simulations, the present value of the 10-year and 80-year estimates are similar, as most of the net benefits of new jobs for a state's residents accrue in the first 10 years after the jobs are created.

For this study, we adapted the baseline Upjohn model to make it specific to Michigan and the MBDP. The model was modified to use the actual jobs created as reported in the MEDC program database for each MBDP project. Actual incentive disbursements and repayments from the database were also incorporated. For all projects, the model assumes that the last-reported cumulative number of jobs created will persist and that no future incentive disbursements or repayments will be made. Finally, the model incorporates Michigan-specific information on value-added per industry, county-level unemployment rates, taxes and spending patterns and effects, industry multipliers, and housing price elasticities.

Full details are provided in Appendix A.

Importance of the Incentive

A common question in evaluating incentives is whether a project would have happened without the incentive. Put another way, would the project not have happened “but for” the incentive? “But for” is a challenging analysis for both individual incentive deals and program evaluation because we cannot know with certainty the relative values of the multiple drivers (including incentives) behind each individual business’s location decision. Incentives themselves are often layered, and it can become impossible to assign any one incentive full responsibility for making a deal happen.

Our approach, therefore, is not to require that a specific incentive account for 100 percent of a project decision or outcome in order to be considered valid. Instead, we have estimated a set of percentages to indicate the expected impact of the incentive on a project using two different approaches, as described below. We have also determined the “but-for” level that would need to be assumed for projects to break even according to the ROI model used for this analysis.

- The first approach (referenced as the “cost sensitivity” approach) builds on the research literature addressing how location decisions in general are sensitive to tax costs and how incentives help firms reduce those costs.
- The second approach (referenced as the “firm choice” approach) draws on the research literature describing factors that affect “but for” and applies these factors to individual MBDP projects to create a scaled score hypothesizing the likely level of influence of the MBDP incentive on the business decision.

Cost sensitivity approach

The first approach is based on literature findings that state location decisions in general are sensitive to tax costs and how incentives help firms reduce those costs. Upjohn’s cost sensitivity approach used for most of the ROI estimates, and applied to all 239 projects, is based on estimates of how businesses respond to taxes.

The research literature suggests that a 10 percent reduction in state and local business taxes holding the quality of public services constant will, in the long run, increase a state’s level of business activity by about 5 percent. The cost sensitivity approach assumes that “a cost is a cost,” and that changes in business costs due to other factors, such as incentives, will have similar effects per dollar as business tax changes.

To operationalize this, we re-express the business tax effects by effects on overall business costs associated with a business’s activity. There are a variety of ways to measure the magnitude of a business’s activity. One standard measure of a business’s scale is “value-

added”: the value of its output minus the value of the material inputs it purchases. As a percentage of business value-added, state and local business taxes have historically averaged around 5 percent (Bartik 2017; Phillips, Sallee, and Peak 2016). Therefore, if a 10 percent reduction in business taxes increased desired business activity by 5 percent, the implication is that a 0.5 percent reduction in costs as a percentage of value-added will increase desired business activity by 5 percent, or a 1 percent reduction in costs as a percent of value-added will increase desired business activity by 10 percent

For the but-for percentage to be consistent with these effects, a 1 percent reduction in business costs as a percent of business value-added due to incentives would have to increase the probability of the business making that location or expansion decision by 10 percentage points. In calculating incentive costs as a percentage of value-added, we must consider how business decision-makers make investment decisions, and how they weigh immediate investment costs versus changes in profits next year, five years from now, and ten years from now. In practice, this is operationalized in the model by estimating the stream of value added associated with a project over an infinite time horizon. This stream of value added is discounted at a real discount rate of 12 percent (Poterba and Summers, 1995). MBDP incentives are also discounted using a 12 percent discount rate. The ratio of the two is then taken. This percentage is then used to project the but-for percentage for that individual project.

Firm choice approach

For the second approach, we no longer assume that “a cost is a cost,” but that a discretionary grant offered during a competitive site selection process would have a different impact than a general reduction in costs. The MBDP is a discretionary grant program to which firms must apply and receive approval - as opposed to a statutory tax program available to all eligible companies. We therefore assume the MBDP could have a different level of influence on individual firm decisions than would be assumed from the tax cost sensitivity literature.

The cost sensitivity approach built into the aforementioned ROI model also implicitly assumes that location decisions do not vary with the characteristics of the local area or take into consideration national incentive competition.² We know that location decisions do vary by local area characteristics and are affected by national incentive competition. Many location-specific factors influence business investment decisions, including access to customers and suppliers, talent availability, infrastructure, quality of place, and availability of sites or buildings, as well as incentives. The competitive environment drives much of incentive use and is therefore necessary to consider when striving to assess the importance of incentives to investment decisions.

Taking these factors into consideration, CREC developed the firm choice approach. Instead of assuming “average” responsiveness to incentives based on sensitivity to costs, we examined

² Bartik 2018a, p. 148.

individual company statements regarding the nature of each MBDP project, Michigan's competitive advantages and disadvantages, and competing locations under consideration. We also incorporated interviews of local partners to gain their understanding of the role the MBDP incentive played in each project decision.

This project-specific documentation allowed the study team to compare information provided by the company to a set of characteristics from the research literature that have been determined to increase firm sensitivity to location-based incentives when making investment decisions. The result was a weighted list of relevant project characteristics that affect "but for." These characteristics were scored for each individual project and then translated into a percentage indicating the hypothesized level of influence the MBDP incentive had on the investment decision.

Additional details on both approaches are provided in Appendix B.

State Comparisons

Comparing analytical and management procedures to similar programs in other states can yield helpful insights for improving effectiveness. This analysis compares information on four programs similar in structure to MBDP to illuminate how different states evaluate projects to determine an incentive award ("pre-award analysis") and how states monitor and evaluate the expected impact of projects that have received incentive support ("post-award program management"). No state has a perfect program, and all states face the same issues around calculating projected ROI, managing compliance, and evaluating performance. The state comparison analysis is intended to highlight only how different states assess and use ROI estimates and "but for" analyses in their incentive programs.

CREC developed and maintains the C2ER State Business Incentives Database, a national database of more than 2,000 active and inactive state business incentive programs. It is a portal designed to be a one-stop resource for economic developers to compare incentive programs across states. Data provided in the database is fully searchable by more than 50 different indicators. To find comparable programs to MBDP, CREC used the database to search for 'discretionary' incentive programs that award \$10 million or less in grants and loans to a single applicant for relocating or expanding net new jobs.

From the resulting list, four state programs were selected in consultation with MEDC, based primarily on similarity to the MBDP purpose and structure. The programs included in this review are Minnesota's Job Creation Fund (JCF), North Carolina's Job Development Investment Grant (JDIG), Ohio's JobsOhio Economic Development Grant, and the Texas Enterprise Fund (TEF). Based on available information, CREC prepared profiles for each incentive program describing their purposes, eligibility requirements, program provisions and guidelines, and the application

processes. The format of the profiles matches the MBDP summary available on the MEDC website. The four state program profiles are available in Appendix C.

For each state program, the CREC team accessed publicly available materials found online. Some state contacts provided confidential information. CREC requested interviews with program experts in each state to obtain additional insight into the respective program management procedures and performance measurement approaches. The interview protocol is included in Appendix C.

III. Overall ROI and Factors Impacting the ROI

This section describes the MBDP's ROI, which was calculated using the economic model developed by the Upjohn Institute for incentive evaluation research and analysis. The estimated overall return on investment of the MBDP is 3.86 – the net benefits of the MBDP to the state of Michigan outweigh the net costs of the program by nearly 4 to 1. The overall ROI determination is based on a range of economic and fiscal benefits and costs to Michigan residents. How the overall ROI is determined for the MBDP program, as well as an analysis of how the ROI varies across projects that are in process, complete, or have ended, is discussed in this section.

Overall ROI

A summary of different types of project benefits and costs and the overall ROI is shown in Table 1. This summary includes the 41 projects considered by MEDC to be completed or terminated, and the 198 projects for which some incentive payments have been made and some jobs have been created for a total 239 projects. Table 1 also reports a separate analysis for the 32 projects (out of the 41 completed/terminated projects) that were formally completed or terminated. The results are shown by different types of benefits and costs, including increases in per capita earnings; fiscal benefits from increases in state and local tax revenues that exceed public service needs from a higher population; capital gains from higher property values due to job growth; benefits from exporting some incentive costs to out-of-state business owners; costs for local businesses from higher local prices and wages; and incentive costs.

Table 1 Benefits and Costs of Completed/Terminated Projects vs. In-Process Projects and Total

	Completed/ terminated (41 projects)	In process projects (198 projects)	Total projects (239)	Formally Completed/ terminated projects (32 projects)
Earnings benefits	\$122.2	\$578.0	\$700.2	\$79.1
Fiscal benefits	\$13.2	\$73.9	\$87.1	\$8.4
Property value benefits	\$19.7	\$93.5	\$113.3	\$14.4
Benefits from exporting business taxes	\$5.3	\$18.8	\$24.1	\$4.3
Costs for local businesses	\$(8.2)	\$(39.3)	\$(47.5)	\$(6.0)
Gross benefits (= sum of above)	\$152.3	\$725.0	\$877.2	\$100.2
Incentive costs	\$33.7	\$146.7	\$180.4	\$24.9
Net benefits	\$118.5	\$578.3	\$696.8	\$75.3
“ROI” = Net benefits/incentive costs	3.51	3.94	3.86	3.02

NOTE: All dollar figures are presented as 2018 present values, using 3 percent real discount rate, and are in millions of real dollars.

MEDC considers all 41 Completed/terminated projects as likely to be complete, but only 32 are formally finished.

The overall ROI for the MBDP program is 3.86. The ROI is slightly lower for the completed/terminated projects at 3.51 and even lower for the formally completed and terminated projects at 3.02. Although there are some differences, overall the program has a very high rate of return – net benefits are more than 300 percent of MEDC’s costs of incentives. To put it another way, the overall net benefits of the MBDP program are nearly 4 times that of every \$1 invested in the program by MEDC.

The bulk of program benefits are earnings benefits. As seen in Table 1, property value gains and fiscal benefits are important, but even when combined, their total is less than one-third of the earnings benefits. The main benefit from the MBDP program for Michigan residents is the effect the created jobs have in boosting earnings per capita, mainly by boosting Michigan employment-to-population ratios. These earnings benefits from all 239 projects have a present value of around \$700 million, which nearly equals the net benefits from the entire program. In other words, the MBDP program roughly breaks even from its fiscal benefits and property value benefits; it is its labor market benefits in higher earnings per capita that cause it to have a positive ROI.

These benefits and costs are present values of benefits and costs over an 80-year period. These present-value calculations use discounting; for example, one dollar 20 years from now is worth only 57 cents today. There may be some concern about whether an 80-year ROI provides reliable estimates. Some would argue that a shorter time horizon would better reflect returns to the state, based on business decisions and market conditions.

To address this concern, Table 2 considers how benefits and costs vary when a 10-year perspective is taken, rather than an 80-year perspective. A 10-year perspective does eliminate some long-term benefits; however, the bulk of the benefits and costs in this baseline model

occur within the first 10 years. Moving from an 80-year to a 10-year perspective only lowers the overall ROI for all 239 projects about 7 percent; from 3.86 to 3.60. Note that, for the rest of this ROI analysis, the discussion is based on the 80-year estimates.

Table 2 80-Year vs. 10-Year Perspective on MBDP

	10-year ROI	80-year ROI
Completed/terminated projects (41 projects)	3.28	3.51
Pending/in-process projects (198 projects)	3.67	3.94
Total (239 projects)	3.60	3.86

NOTE: ROI is net benefits/costs over number of years listed in each column, discounted at 3 percent real discount rate.

It should be emphasized that this result is for the baseline model, which assumes that the MBDP program is implicitly financed by business taxes being higher than they otherwise would be. If we instead assumed that the MBDP program was financed by lower K-12 spending, then the ROI would likely be lower due to the likely impact that reduced educational spending would have on the wages of the next generation of Michigan residents. Appendix A provides additional detail on how the model addresses the opportunity costs of government financing for incentives.

Table A1 in Appendix D reports the individual ROI for each of the 239 total projects, along with other project characteristics.

Factors Determining ROI

Several factors drive the ROI to be higher or lower. This analysis considers industry type, project type, deal size, deal structure, and location as factors affecting ROI.

Industry type

Table 3 reports average project ROI and other project characteristics by four industry categories: autos (3361-3363); other manufacturing industries in NAICS code 33; other manufacturing that includes NAICS 31 and 32; and non-manufacturing industries. One noticeable pattern is that the completed and terminated projects, which were generally initiated further in the past, were more dominated by auto industry-related projects. Roughly two-thirds of incentive dollars were devoted to autos for the completed/terminated projects, \$21.2 million out of a total of \$33.7 million. In contrast, among the pending projects, only about one-third of incentive dollars were devoted to auto projects, \$48.7 million out of \$146.7 million.

In general, it appears that auto industry-related projects have a somewhat lower ROI, averaging 2.92. The non-auto-related industrial categories all have ROIs exceeding 4.

Table 3 ROI by Industry Group

NAICS	Autos	Other NAICS-33 33 except 3361-3363	Non-33 manufacturing 31,32	Non-manufacturing All except 31-33	Total
	3361-3363	3361-3363	31,32	31-33	Total
Number of Completed/Terminated projects	15	11	5	10	41
Number of Pending projects	45	60	32	61	198
Total projects	60	71	37	71	239
PV of incentive costs, Completed/Terminated projects	21.2	3.0	3.6	5.9	33.7
PV of incentive costs, Pending projects	48.7	30.1	24.4	43.5	146.7
PV of incentive costs, all projects	69.9	33.1	27.9	49.4	180.4
ROI Completed/Terminated	2.80	4.65	4.98	4.63	3.51
ROI Pending	2.97	4.55	4.80	4.13	3.94
ROI total	2.92	4.56	4.83	4.19	3.86

Note: Present value of incentive costs are in millions of 2018 dollars

Table 3 indicates that the higher ROI for the pending projects, compared to the completed/terminated projects, is due in part to the switch of incentive dollars from auto-related to non-auto-related projects. The actual ROI for the pending projects by industry group, versus the completed/terminated projects, is lower in some industry groups. For example, for non-manufacturing projects, the ROI for completed/terminated projects is 4.63, versus 4.13 for pending projects.

This finding is somewhat puzzling. The auto industry has a relatively high input-output multiplier, at 4.15, compared to the overall average multiplier of 3.69 for all 239 projects.³ The model's structure also leads to the finding that, other things being equal, a higher multiplier will increase the project ROI. For example, as shown in Table 4, if we rerun the model for all 239 projects and increase each project's multiplier by 1.0 (e.g., the auto multiplier of 4.15 becomes 5.15), then the overall program ROI increases considerably by over one-third, from 3.86 to 5.43.⁴

³ This average multiplier is a weighted average, using incentive costs for each project as weights.

⁴ To understand this, the key phrase is "other things equal." Auto projects also tend to have a much higher than average value-added per worker. The autos' projects have a value-added per worker that is generally above \$235,000 (the exact amount varies by year). The average value-added per worker for the 239 MBDP projects is \$169,000. Thus, autos have a value-added per worker of over one-third greater

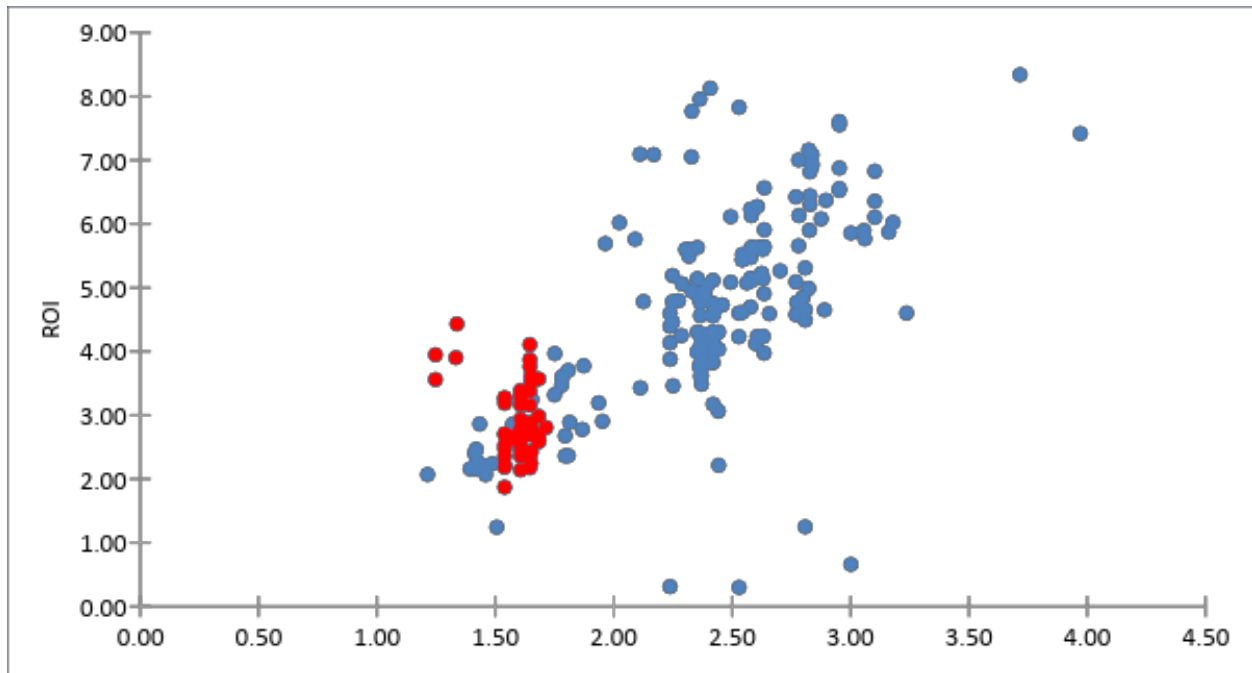
Table 4 How Increasing the Multiplier by 1.0 Affects Program ROI

	Completed/terminated projects (41)	Pending Projects (198)	All Projects (239 projects)
Baseline	3.51	3.94	3.86
Multiplier increased by 1.0	4.86	5.56	5.43

Note: The multiplier takes each project and makes one change: the multiplier goes up by 1.0.

Figure 1 shows why auto projects have a somewhat lower ROI. The vertical axis shows the ROI for each of the 239 projects. The horizontal axis is 100,000 times the ratio of the project’s input-output multiplier to the project’s value added per full-time-equivalent (FTE) worker. As the figure shows, there is a strong positive relationship between this ratio and project ROI. Autos tend to have a below-average value for this ratio and therefore tend to have a below-average ROI.

Figure 1 Project ROI vs. Ratio of Multiplier to Value Added per Worker for 239 Projects



NOTE: Horizontal axis is 100k times multiplier/value-added per FTE worker. Each dot corresponds to one of the 239 projects. Dots in red are in auto industry.

The intuition here is straightforward. For a given incentive cost per worker, the “but for” percentage will be lower if projects have a higher value-added per worker, yielding lower

than the average MBDP project. The multiplier also goes up, but by less than 13 percent ($4.15 / 3.69 = 1.125$). The model also says that, holding incentive costs per worker constant, if the value-added per worker increases by x percent, the but-for probability should decline, perhaps by close to that percentage value.

benefits. If the multiplier is higher, however, benefits will be higher. Ideally, in choosing projects, one wants to choose those in industries with high job multipliers relative to their value-added per worker, meaning that the job creation effects will be relatively high per dollar of incentive costs.

Project type

Table 5 expands the analysis of how project ROI varies between completed/terminated projects and pending projects to also consider how the ROI varies between completed projects and terminated projects. This table also analyzes the differences in ROI between projects that involve a new site or a relocation, versus those that involve an expansion or an acquisition of an existing company.

Table 5 How ROI Varies by Project Status, and by Expansion vs. New Site Projects

	Expansion/Acquisition			New site/relocation		
	Number of projects	Incentive cost	ROI	Number of projects	Incentive cost	ROI
Completed	18	\$15.6	3.59	7	\$12.1	3.75
Terminated	12	\$4.8	2.82	2	\$1.2	2.90
Total completed/terminated	30	\$20.4	3.41	9	\$13.3	3.67
Pending	152	\$108.2	3.91	46	\$38.5	4.04
Overall	182	\$128.6	3.83	55	\$51.8	3.95

Note: Two projects with zero net costs are not in this project count. Zero benefits and zero costs. Incentive costs are in millions of 2018 dollars. ROI is present value of net benefits divided by present value of incentive costs.

Completed projects have satisfactorily fulfilled their agreement with MEDC, whereas terminated projects have not. Terminated projects are expected to have a lower ROI. This is the case; however, the ROI only declines a little more than 20 percent. The ROI decline is not greater because most terminated projects involve at least some job creation, and in many cases some incentive payments were never paid or were refunded. Thus, there are at least some benefits, although less than for completed projects, and costs are also lower.

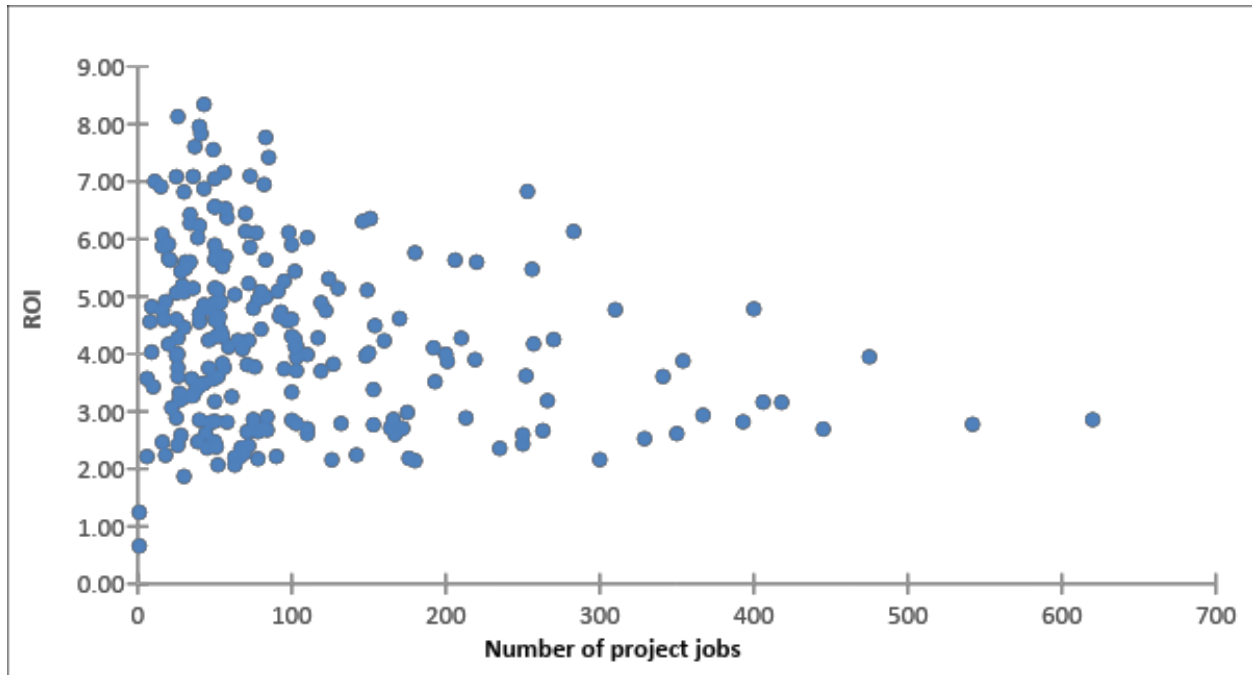
There is little difference overall between projects that are new sites and those that are expansions. The overall ROIs are quite similar, at 3.95 for new sites/relocations and 3.83 for expansions or acquisitions. It is important to note that this ROI is based on the returns of the operations phase of each project and doesn't include benefits from construction and capital expenditures.

Deal size

When considering how ROI varies with deal size (defined by the number of jobs involved with the project), large projects tend to have a somewhat lower ROI. Figure 2 shows the project ROI for each of the 239 projects versus the final number of jobs reported as being created by that project. As the figure shows, a regression of project ROI on the projected number of jobs yields

a coefficient that suggests that each extra 100 jobs will reduce the project ROI by -0.321 (standard error of 0.096). This relationship is highly statistically significant (t statistic absolute value greater than 3) and of meaningful size.

Figure 2 Project ROI vs. Project Jobs, 239 Projects

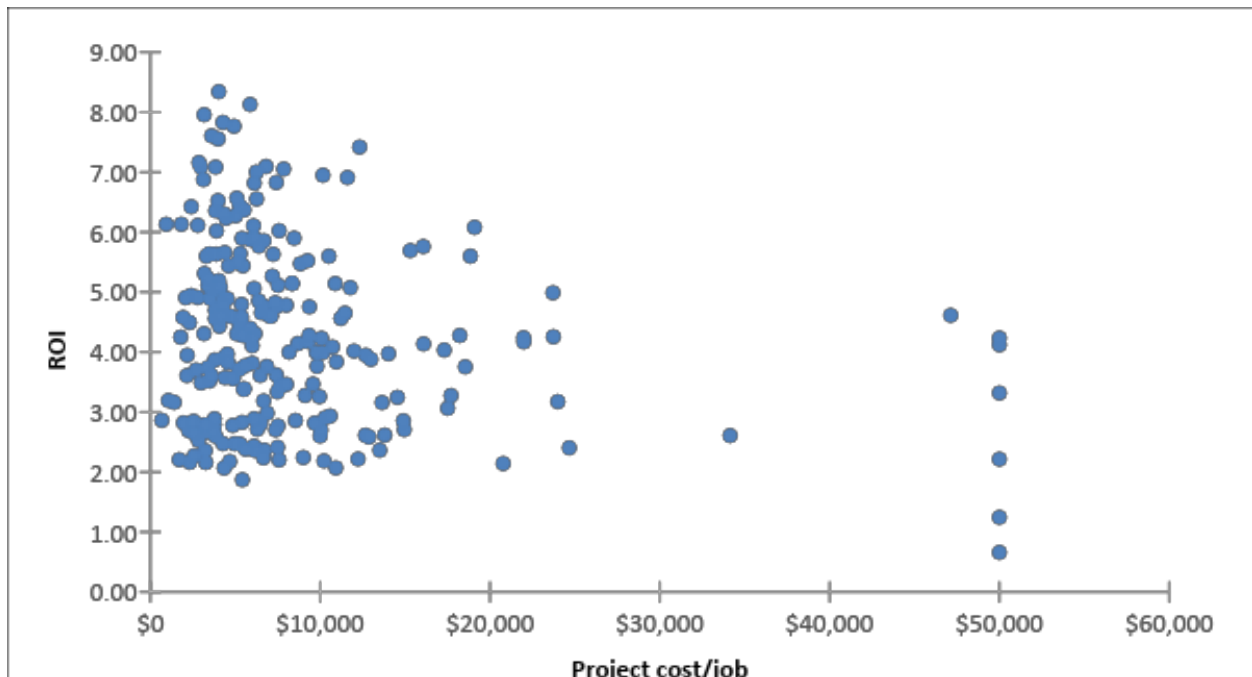


NOTE: Horizontal axis shows final number of jobs created by project. Vertical axis shows ROI.

The model’s structure in no way dictates the results. Presumably, there are various reasons why the larger deals have lower ROIs, such as deals not working out as often or larger deals tending to involve auto industries.

Deal size can also be defined as project cost per job. Figure 3 compares project ROI with the MBDP incentive cost per final job created. (Included are top codes at \$50,000 per job for a few projects that were relatively expensive yet created few jobs.) This figure also shows that more expensive projects tend to have lower ROIs. A regression suggests that each extra \$1,000 of MBDP costs per job reduces the project ROI by -0.0367 (standard error = 0.0112). This relationship is highly statistically significant (t statistic absolute value greater than 3) but is not a huge substantive effect.

Figure 3 Project ROI vs. Project Cost per Job



NOTE: Horizontal axis is present value of costs divided by final project jobs, top-coded at \$50K to deal with some very expensive projects that created few jobs.

The model is also used to explore how increasing incentive costs affect project ROI. Table 6 takes the model and considers a hypothetical ROI: What would happen to the ROI if the incentive costs for the project were exactly doubled and all other project characteristics stay constant? As discussed in the model description, the model assumes some diminishing returns to higher incentive costs. Doubling incentive costs will not quite double the “but for” for the project, thus will not quite double benefits. Therefore, the ROI, which depends upon the ratio of benefits to costs, is expected to decline. This is the case, as shown in Table 6, but the ROI is lowered only slightly. Doubling the incentive lowers the ROI by about 5 percent.

Table 6 Effects of Doubling Incentive Costs on ROI

	Completed/Terminated projects (41 projects)	In process projects (198 projects)	Total projects (239 projects)
Baseline costs	3.51	3.94	3.86
Doubling incentive costs	3.36	3.72	3.65

NOTE: All figures in this table are ROIs, defined as equal to present value of project net benefits divided by present value of incentive costs. The doubling incentive costs alters original project by imagining counter-factual where project incentive costs are doubled.

Deal structure

In the model, more front-loaded incentives tend to have higher ROIs. Up-front incentives tend to affect investment and job creation decisions more for business decision makers with high

discount rates for future cash flows, while not increasing the present value of costs as much for policy makers, assuming policy makers are appropriate in using lower social discount rates.

However, in practice, for the MBDP program, this appears to make little difference. Table 7 shows that if all payments for the MBDP program were made up front, the ROI would be almost the same as it is now. The probable reason for this result is that MBDP payments are already substantially front-loaded. As shown later, when considering similar programs in other states, incentive payments that are excessively long term can lead to a lower ROI for state incentives.

Table 7 Effects of Totally Front-Loading Incentives on ROI

	Completed/Terminated projects (41 projects)	In process projects (198 projects)	Total projects (239 projects)
Baseline time pattern of costs (already substantially front-loaded)	3.51	3.94	3.86
Totally front-loaded	3.46	3.93	3.84

NOTE: All figures in table are ROI, equal to present value of net benefits divided by present value of incentive costs for some category of projects. The total front-loading of incentive costs assumes that all incentives are paid in first year of project.

Location

For many reasons, the location of a project may influence its ROI. This analysis considers how project ROI is affected by the following features of its location: local unemployment rate, local housing price elasticity, and location on a state border.

As mentioned in the model description in Appendix A, the unemployment rate of a location has significant effects on ROI because it affects who gets the new jobs. Research has shown that if the local unemployment rate is higher, job growth tends to have greater effects on the local employment-to-population ratio and lesser effects on attracting in-migrants. Therefore, in higher unemployment areas, a given amount of job creation will have greater effects in boosting local earnings per capita – a key benefit from a successful incentive investment.

Simulations of how the model ROI varies with the local unemployment rate were run, holding all else constant. Additional simulations of the model were run for all 239 projects with the county unemployment rate higher by just one percentage point (e.g., if the observed county unemployment rate was 5 percent, this counterfactual simulation increased the county unemployment rate to 6 percent).

Even this very slight increase in the unemployment rate significantly boosts the ROI. As shown in Table 8, a one percentage higher county unemployment rate boosts the overall ROI by about 10 percent, increasing it from 3.86 to 4.22. This implies that there are substantial increases in

ROI attainable by choosing projects in counties with unemployment rates higher by 3 or 4 percentage points than other counties, or by being more aggressive in starting projects when the overall state unemployment rate is higher, implying a greater state need for new jobs.

Table 8 Effects of Increasing County Unemployment Rate by 1% on ROI

	Completed/terminated projects (41 projects)	In process projects (198 projects)	Total projects (239 projects)
Baseline actual unemployment rate in county	3.51	3.94	3.86
County starting unemployment rate increased by 1 percentage point	3.88	4.30	4.22

NOTE: All figures in table are ROI, equal to present value of net benefits divided by present value of incentive costs, for some group of projects. The counterfactual presented here takes each project and alters one location characteristic: the unemployment rate in the county is increased initially by 1.0 percentage points. (That is, if the county unemployment rate in the real world was 7 percent in 2016 when the project was started, this was altered to 8 percent.)

The analysis also considers the effect of being in a local economy in which a given shock to jobs increases housing prices by a greater amount, implying that there are restrictions on developing land for new housing. As mentioned in the model description, restrictions on housing supply will reduce project ROI because job growth in incented firms and multiplier firms will boost local costs more, which will in turn hold back growth in other private employers.

The current model only contains information on housing supply elasticities for the Detroit and Grand Rapids metro areas. The Detroit metro area has a higher effect of job growth on housing prices (a less elastic supply of new housing) than is true of the Grand Rapids area. In the absence of better information, the model assumes that the Grand Rapids housing price response (supply elasticity) applies to all of Michigan except for the Detroit metro area. Note that the ease of developing new housing is not the same everywhere in the state outside of the Detroit metro area, or for that matter, that the ease of developing new housing is the same within the city of Detroit as it is in the Detroit suburbs.

As shown in Table 9, a project located in an area with a higher housing price elasticity in response to job growth (implying a lower elasticity of supply of new housing) will have a much lower ROI. The assumed Detroit/Grand Rapids differential lowers the ROI by almost one-quarter.

Table 9 Effects of Project being in Detroit Metro Area vs. Non-Detroit Metro on ROI, Due to Model’s Assumptions about Housing Supply Being Less Elastic in Detroit Metro

	Completed/Terminated projects (41 projects)	In process projects (198 projects)	Total projects (239 projects)
Baseline (107 Detroit metro projects, 132 non-Detroit projects)	3.51	3.94	3.86
If all projects were inside Detroit metro	3.03	3.43	3.36
If all projects were outside Detroit metro	3.99	4.45	4.36

NOTE: All figures in table are ROI, equal to present value of net benefits divided by present value of incentive costs, for some group of projects. Two counterfactuals are considered here: all projects inside Detroit metro area; all projects outside metro area. In context of model, the only difference this makes is that housing prices go up more for same job growth in Detroit metro area, so this is really test of whether housing price effects matter to model.

This analysis implies that there might be payoffs for the state government being more sensitive to the ease of developing new housing. Local elasticity can have a substantial aggregate impact on whether job growth has broad benefits. If local rules severely restrict housing supply, the consequence can be to lower job growth and increase the proportion of benefits from economic development programs that go to property owners rather than unemployed workers.

Table 10 explores how the ROI varies in counties bordering another state. As discussed in Appendix A, border counties have lower multipliers for the state of Michigan because some of the multiplier effects spill over into the adjacent state, but have a higher “but for” percentage, as the competitor state is nearby.

Table 10 Effects on ROI of Project Being in “Border County” with Another State

	Completed/Terminated projects (41 projects)	In process projects (198 projects)	Total projects (239 projects)
Baseline (17 border projects, 222 non-border projects)	3.51	3.94	3.86
If all projects were in border counties	3.73	4.20	4.11
If all projects were in non-border counties	3.44	3.91	3.82

NOTE: All figures in table are ROI, equal to present value of net benefits divided by present value of costs for some group of projects. Two counterfactuals are assumed: all projects in border county; all projects not in border county.

Table 10 compares the baseline results, with 17 projects in border counties and 222 in non-border counties, with two counterfactuals: all projects in border counties and all projects in non-border counties. Being in a border county increases the ROI, but the effect is slight, only about 5 to 10 percent.

Summary of Factors Determining ROI

This analysis of factors determining the MBDP program’s ROI is summarized by doing a regression of each project’s ROI on various possible determining factors. To do this, the actual

ROIs for each of the projects are combined with some hypothetical alternative: adding 1.0 to the multiplier, adding 1 percent to the county unemployment rate, switching the project's border county status to the opposite of what it actually is, and switching the project's status of being in a metro area or not with a high response of housing prices to growth.⁵

Instead of directly explaining the determinants of the ROI, the model attempts to explain the gross benefit to cost ratio, which is exactly equal to the ROI plus 1. The model also specifies the dependent variable as the natural logarithm of the benefit-cost ratio, or $\ln(\text{ROI} + 1)$. This is done because many of the possible determinants of the ROI would be expected to have percentage effects on gross benefits before considering incentive costs. A change in the logarithm of a variable is approximately a percentage change in proportional terms and specifying the model as the logarithm of growth benefits over costs captures the percentage effect on the benefit-cost ratio.

Among the most statistically significant and large effects are the effects of the multiplier and value-added-per-FTE-worker variables (see Table 11). A 10 percent increase in the multiplier (say from 4 to 4.4) is associated with the benefit-cost ratio for the project going up by 7 percent, with the t statistic on this coefficient of 0.701 of over 10. A 10 percent increase in the project's value added per FTE worker is associated with the project's benefit-cost ratio decreasing by almost 8 percent, with the absolute value of the t statistic on this estimated coefficient of -0.781 being over 20.

⁵ Only 237 projects are included in this regression because two of the 239 projects have no incentive costs. Hence, the model assumes that the zero incentive costs induced no jobs, thus the ROI cannot be defined: There are no net benefits in the numerator and no incentive costs in the denominator.

Table 11 Regression Analysis of Factors Determining Benefit-Cost Ratio of MBDP Projects

Dependent variable: natural logarithm of (Benefit/Cost) Ratio = $\ln(\text{ROI} + 1)$

Explanatory variables	Coefficient (standard error)
ln(multiplier)	0.701*** [0.0618]
ln(value-added per FTE worker)	-0.781*** [0.0367]
County unemployment rate	-1.336** [0.588]
Dummy for border county	0.0190 [0.0199]
Dummy for Detroit metro project	-0.207*** [0.0144]
Dummy for project completed	0.194*** [0.0345]
Dummy for project still in process	0.145*** [0.0284]
Constant	10.16*** [0.357]
Observations	1,185
Adjusted R-squared	0.506
Reg Type	Unweighted
SE Type	Robust
Mean DV	1.683

NOTE: Robust standard errors in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Observations are original 237 projects (two projects have no ROI because zero net costs), plus four hypothetical variations: add 1 to multiplier, add 1 percent to county UR, switch border county status, switch Detroit metro status. Implicit omitted dummy from project status is project was terminated.

There also are large effects of being in an area where housing supply is more restricted and growth has larger effects in boosting housing prices. The dummy variable for being in the Detroit metro area indicates that projects in such an area have a benefit-cost ratio that is lower by 20 percent, with a t statistic that has an absolute value of around 15.

In addition, compared to terminated projects, completed projects have a benefit-cost ratio that is higher by over 19 percent, with a t statistic of over 5. Compared to these same terminated projects, the projects in process have a benefit-cost ratio that is higher by a little over 14 percent, with a t statistic of over 5.

One unexpected result is that the county unemployment rate is associated with projects having a lower ROI. This result is statistically significant, with a t statistic absolute value of over 2; however, the magnitude is very small. The coefficient implies that a 1 percent higher unemployment rate will reduce the benefit-cost ratio by about 1.3 percent. This result should not

override the prior result that, holding everything else constant, a higher unemployment rate increases ROI. The regression here does not completely hold other factors constant. The negative correlation between county unemployment rate and the benefit-cost ratio must reflect other features of these projects that lead to a lower ROI, not the unemployment rate. Finally, being in a border county does not have statistically or substantively significant effects on project ROI.

Overall, most of these results are consistent with the prior analysis. These results emphasize choosing projects with a high ratio of the multiplier to the industry value added per worker.

Why is the MBDP Program’s ROI Much Higher than the Typical U.S. Incentive Program?

Why are the returns to Michigan’s incentives program so much higher than for typical U.S. state and local business incentive programs? Bartik (2018a) estimates that the typical state and local incentive program in the United States has an ROI of 0.22 (see Table 4 of Bartik, 2018a). In contrast, this study finds an ROI of 3.86 for the MBDP program. What factors cause this divergence?

To determine what factors cause this divergence, the overall U.S. model is tweaked to better match some characteristics of the Michigan model used in this study (Table 12). These model adjustments are cumulative: Each row in the table modifies one additional aspect of the model, keeping all the adjustments done in the previous row.

Table 12 Comparison of Michigan ROI vs. ROI of Average Incentive Program in the United States

	ROI
U.S. average incentive program	0.22
Assuming no future incentives awarded to retain jobs	1.31
Business tax financing rather than mixed financing	2.01
Upfront incentives	3.04
Increase multiplier from 2.5 to Michigan's 3.69	4.76
Reduce scale of incentives to Michigan's smaller scale	4.93
Michigan ROI in this study	3.86

NOTE: All except the last row are modeled based on characteristics of average state in U.S., and use model described in Bartik (2018). The last row is taken from the current study's results for 239 MBDP projects

The U.S. model assumed that the average state and local incentive package would be accompanied by future incentives to retain those jobs. If the current study’s assumption is followed – that a state does not have to repeatedly pay incentives for the same jobs – the ROI increases from 0.22 to 1.31.

The U.S. model also assumed that incentives would be financed half through spending cuts and half through tax increases. Of the tax increases, only 44 percent would be financed through business tax increases. This study's assumption is that increased business taxes are used as the sole source of financing, thus the ROI further increases from 1.31 to 2.01 because this change reduces the negative effects of financing incentives via cuts to education spending. (We will further explore the implications of alternative ways to finance incentives later).

The U.S. model additionally assumed that incentives were only modestly front loaded, with large incentives being provided through at least year 10 of the project. If the U.S. model were tweaked to make incentives totally up front, which is more like the MBDP program, the ROI increases from 2.01 to 3.04.

Further, the U.S. model assumed an input-output multiplier of 2.5, which is typical for an economic development project in the United States. (For example, this multiplier is similar to estimated multipliers for the Foxconn and Amazon HQ2 projects.) The 239 projects under MBDP, however, have an average multiplier of 3.69. If the U.S. model is tweaked to increase the multiplier from 2.5 to 3.69, the ROI increases from 3.04 to 4.76.

Finally, the typical size of total state and local incentives in the United States, which is used in the U.S. model in Bartik (2018a), is about three times the size of the MBDP incentive, as a percent of a firm's value added. If the average incentive size assumed in the U.S. model were scaled back, the ROI in the U.S. model increases from 4.76 to 4.93.

There are other features of the Michigan model (e.g., different fiscal system, different value added per worker, different housing price elasticities with respect to growth, projects that don't work out) that presumably lower the estimated 4.93 ROI that might be expected from a mechanical application of the U.S. model. These do not account for special features of Michigan's economy and fiscal system, nor the special features of the MBDP program. The big lesson here is that the details of incentive programs matter. For instance, making incentive investments up front enhances ROI beyond that achieved when spreading the same amount of incentive investment over a longer term. Furthermore, targeting higher multiplier projects improves ROI, as does financing incentives through higher business taxes rather than through cuts to other programs that have their own economic benefits.

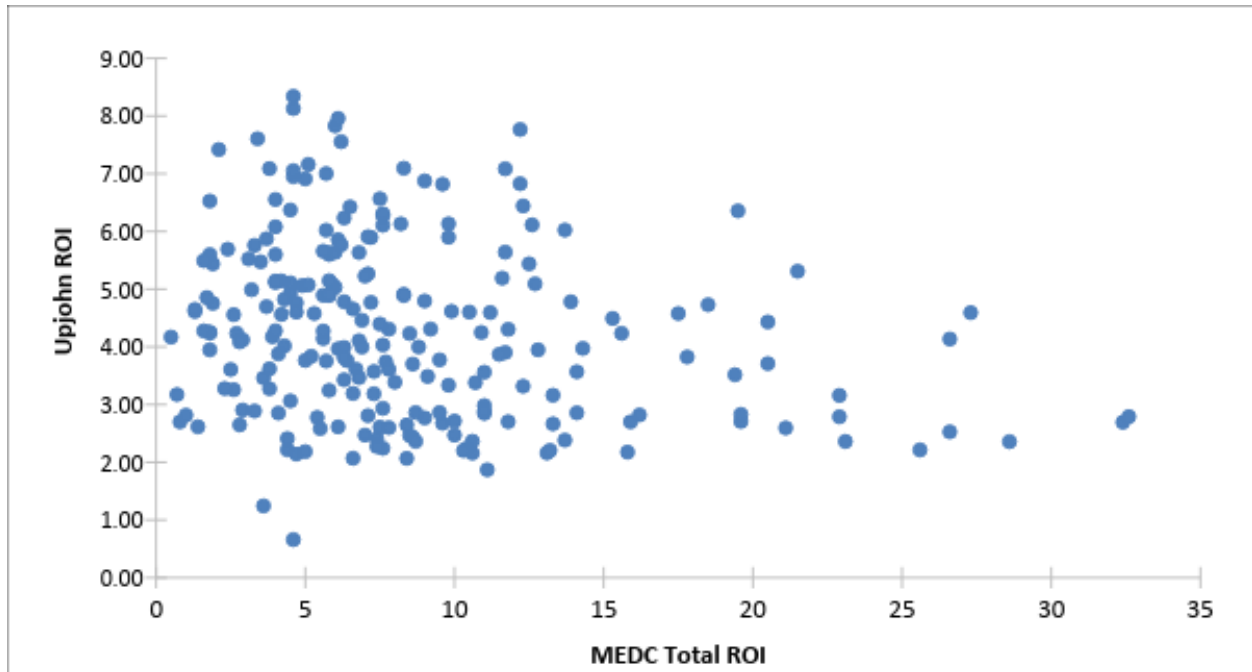
How This Study's ROI Differs from the ROI Currently Produced by MEDC: Methodology and Results

As mentioned above, this study's ROI is based on a methodology that counts a much broader range of benefits than is currently counted by MEDC in calculating its own ROI. These differences arise in several areas:

- The time period considered for capturing costs and benefits: This study includes benefits and costs over an 80-year and 10-year period after a project's start, discounted using a social discount rate. MEDC's current methodology counts benefits over the term of the MBDP incentive agreement, typically either 2 or 3 years.
- The "but for" assumption: MEDC's current methodology assumes 100 percent; that is, it is assumed each project would not have occurred "but for" the incentive. Upjohn's cost sensitivity "but for" method is based on the average estimated sensitivity of business location decisions to costs in the state and local business tax literature. The resulting percentage is lower than CREC's firm choice "but for" method. The Upjohn cost sensitivity approach averaged 9.7 percent over the 239 MBDP projects. The CREC customized firm choice approach averaged 61 percent for the 41 completed and terminated projects.
- The MEDC ROI methodology only tracks state tax revenue increases as a program benefit. This study's methodology also includes many other benefits and costs, including gains in local tax revenue; increased state and local public service costs due to a larger population; higher real earnings due to higher employment rates and real wage rates; capital gains for Michigan residents due to higher property values; and profit losses for locally owned businesses due to higher local costs.
- This study does not account for local incentive costs, either for their costs or how they might affect the "but for" of a project. (The model could be modified to handle such local incentive costs, with good data on the magnitude and timing of such incentives.) MEDC's ROI methodology subtracts out local incentive costs from the numerator in counting net benefits.
- MEDC's ROI is totally "ex ante"; that is, it is based on agreed-upon job milestones and incentive payments that may or may not ultimately occur. This study's ROI is "ex post facto" or based on reported job creation and incentive payments that have occurred up until now. The study does do some implicit projections in assuming that the final jobs created will persist unchanged in the future, and that no future incentive payments or repayments will occur.

The differences between this study's ROI and MEDC's ROI for each project is shown in Figure 4. The figure shows this study's ROI using the cost sensitivity "but for" methodology versus the MEDC's current ROI, reported in the MEDC files. Over all 237 projects with a calculated ROI, the average Upjohn ROI is 3.86, compared to 8.05 using the MEDC methodology.

Figure 4 Upjohn ROI vs. MEDC ROI, 237 projects



There is a slight negative relationship between the Upjohn ROI and the MEDC ROI. This disappears controlling for project value-added/worker (Table 13). Projects with higher value-added/worker have a lower ROI in the Upjohn model due to lower “but for” percentages for a given incentive cost. The lack of relationship between the two sets of ROIs is due to all the many differences between the two ROI calculations.

Table 13 Regression of Upjohn Benefit-Cost Ratio on MEDC Benefit-Cost Ratio and Project Value Added Per Worker, 237 Projects

Dependent variable: $\ln(\text{Upjohn BC ratio}) = \ln(\text{Upjohn ROI} + 1)$

Regression Statistics	
R Squared	0.43
Observations	237

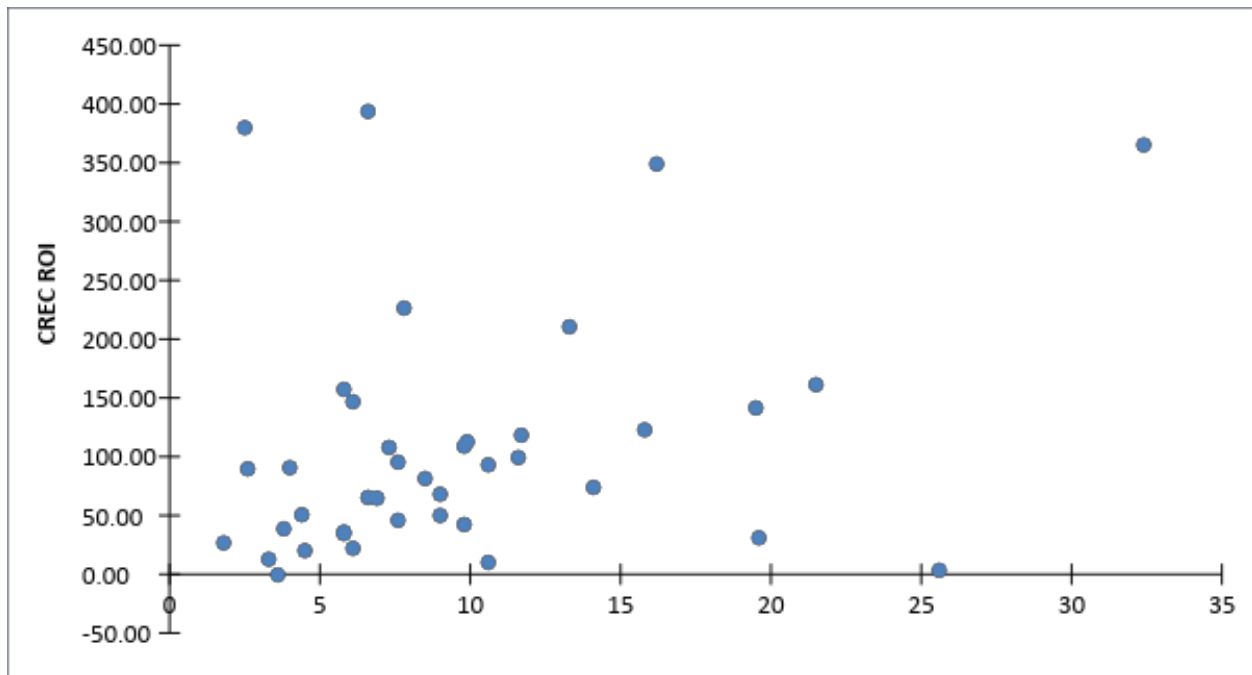
	Coefficients	Standard Error
Constant term	6.965	0.412
$\ln(\text{MEDC ROI} + 1)$	-0.0193	0.0257
$\ln(\text{VA per FTE})$	-0.449	0.036

The comparison is quite different when the firm choice “but for” method (generated by CREC) is used (in lieu of the Upjohn-derived cost sensitivity approach) in the study’s benefit-cost simulation model. This CREC-derived firm choice “but for” estimate is based on various project-specific factors. The firm choice “but for” assumption is only calculated for the 41 completed and

terminated projects. The average “but for” in the firm choice model is 61 percent, compared to MEDC’s implicit assumption of a 100 percent “but for.” Despite the lower firm choice “but for,” the more extensive benefits included in this study’s model yield a much higher ROI. The average ROI across the completed and terminated projects is 10.2 in the MEDC model, versus 86.2 when combining the firm choice “but for” with this study’s model.

Figure 5 shows the MEDC ROI versus CREC’s firm choice “but for” ROIs. As the figure shows, there is not much of a relationship between the two sets of ROIs. For further discussion, see the Technical Note in Appendix A.

Figure 5 CREC ROI vs. MEDC ROI



IV. Assessment of MBDP’s Importance to Securing Projects and Generating Results

This section describes the findings from the study team’s two approaches to estimating the importance of the MBDP to business investment decisions (the “but for” percentage) and the impact of those estimates on ROI. The “but for” percentage required to reach a breakeven ROI within the model is also calculated.

Findings From the Cost Sensitivity Approach

For MBDP, the average incentive has a present value of about \$7,500 per job; that is the incentive is equivalent to giving each firm cash of \$7,500 per job today. The average value-added per job of the incented firms is \$168,000 annually per job. The present value of this incentive, evaluated at a 12 percent discount rate, is \$1,568,000 per job. Therefore, the average MBDP incentive is about 0.5 percent of the present value of value-added for the firm. To put it another way, the MBDP incentives are equivalent to lowering the state and local business taxes owed by the firm by 10 percent. Based on the research literature on how state and local business taxes affect business location decisions, a simplistic aggregate projection is that the “but for” for the MBDP program should average around 5 percent. In practice, the estimated average “but for” ends up being higher, as we will see, at almost 10 percent. This slightly higher average is due to the variation across individual projects in incentive amounts and value added per job.

As explained in more detail in Appendix B, the rationale for this “but for” projection is based on the research literature on how business location decisions respond to state and local business taxes. This research literature suggests that, holding public services constant, lowering all state and local business taxes by 10% will increase the likelihood of businesses choosing that state by around 5%. The Upjohn approach therefore is assuming that incentives will have similar effects as a reduction in business taxes whose present value is of a similar dollar amount.

It could be argued that, by being more targeted, the MBDP program and other incentive programs will be able to have greater effects than tax reductions. That is, an incentive program may be able to exclude some applicants whose location decisions seem less likely to be affected by incentives, and this will tend to increase the “but for” percentage over what would be predicted based on the tax literature. The excluded applicants would be those who do not really have a viable alternative to a Michigan business location. A counter-argument is that the applicant businesses have far more information on the value of their location alternatives than is feasible for any state incentive program. This makes it difficult for state officials to target incentives only on firms that are most likely to be affected by incentives.

A review paper looked at the more limited number of studies that simply estimated the “but for” percentage for incentives (Bartik 2018b). Across 34 estimates from 30 studies, the mean “but for” percentage was around 23%. Some studies had much higher “but for” percentages, but others had much lower “but for” percentages. Therefore, it seems prudent to consider the possibility that the but-for percentage might be lower than 25%, perhaps much lower. Perhaps the MBDP does better than that, but it seems from the research literature that many incentive programs do not do so.

Surveys of corporate CEOs on how they make investment decisions (Poterba and Summers, 1995) suggest that firms discount future income streams by 12 percent annually when

compared with immediate revenues. This discount rate is higher than the 3 percent or so that is more typical for public sector investments, but it is consistent with our casual observation that many firms are very focused on their short-term stock price and how it is affected by near-term cash flows. Consequently, the Upjohn cost sensitivity “but for” approach assumes that firms use a discount rate on the order of 12 percent in making business location investment decisions, so it is incorporated into out-year calculations of incentive costs and benefits and compared to similarly discounted firm costs and value-added estimates resulting from the incentives.

Such a relatively high discount rate means that incentive programs offering up-front benefits tend to be more cost-effective. This is an advantage of the MBDP program’s upfront approach compared to some other states’ incentive designs, as seen in a previous section.

When we use the Upjohn cost sensitivity approach across all 239 projects, the mean “but for” percentage ends up being estimated as 9.7% for the MBDP. This “mean” is incentive cost-weighted – that is, larger projects have a greater impact on the calculation than smaller ones. We take the “but for” percentage individually estimated for each project and calculate the mean over all 239 projects when each project is weighted by its present value of incentive costs. For the completed/terminated projects, the incentive-cost-weighted mean for the “but for” percentage is 6.8 percent.

Findings From the Firm Choice Approach

The CREC team examined applications and supporting documents to calculate “but for” percentages for the 25 completed projects and 16 of the terminated projects that met a first milestone, in accordance with Upjohn’s initial but-for and ROI analysis.

Completed projects overview

The 25 completed projects served as the primary focus for much of our analysis. These completed projects met the job creation terms of their agreements, and they had no further milestone deliverables or payments due. During the project research period, some of these projects were still in their monitoring phase, which is the defined period after the final milestone has been met for ensuring jobs remain in the state. For the purposes of analysis, however, they were considered complete.

Relevant findings for this set of projects on factors likely to influence the importance of the incentive are:

- Manufacturing operations comprised 21 of the completed projects; only 4 were services-based. Of the 21 manufacturers, 12 were in the auto industry sectors (defined as NAICS 3361-3363)

- Twenty-three (23) companies conducted the 25 completed projects. Most already had operations of some type in Michigan. Our team considered two to be new to the state (Fairlife and Sakthi). Using MEDC internal categorizations, 5 were considered new facilities, two relocations, and the rest expansions.
- Most completed projects involved companies with existing locations outside of Michigan. Two projects involved companies with operations only in Michigan. In many cases, the Michigan operations were competing for new investment with existing company operations in other states.
- Eighteen (18) of the completed projects occurred in non-border counties; 7 projects were in counties along the Canada, Indiana, or Ohio borders.
- Thirteen (13) of the 25 projects involved a foreign-owned firm or a foreign-owned parent company.
- Fourteen (14) of the projects involved companies that had previously received Michigan Strategic Fund investments.
- Three (3) companies could be considered small businesses, with fewer than 500 employees.
- Eleven (11) projects were in an “eligible distressed area,” defined by the Michigan State Housing Development Authority May 2018 designation list.
- The completed projects reported the creation of over 4,000 new jobs in their compliance documentation. In some cases, companies may have created additional new jobs but did not include them in their milestone reports.
- Five (5) projects involved an amendment, a dismissed milestone, or both.
- The offered incentive averaged 10% of the projected business investment across completed projects, with a range of 2% to 36%.
- The incentive offer averaged nearly \$7,500 per job across completed projects, with a range of \$3,000 to \$27,000.

Completed project characteristics and sensitivity to incentives

The CREC firm choice “but-for” approach combined the research literature on factors that affect the likelihood that incentives influence company investment decisions (see Appendix B) with project-specific information available from MBDP applications and MEDC briefing memos. We then selected seven factors for which we had consistent data from project applicants that aligned with factors identified in the research literature:

- Whether the company considered multiple locations
- The existence of a financing gap or competitive disadvantage
- The ratio of the incentive to the projected investment
- Whether the company already had operations in multiple locations
- Whether the company already operated in Michigan or was new to the state
- Foreign or US parent company ownership, and
- Cost-sensitivity of the industry in which the company operates

The weighting and scoring approach for these seven factors is provided in Table 14. The weights are based on input from state and local economic development professionals and the project team's own judgment. The weights need not be considered definitive. Future use of this approach should consider alternatives. For example, the research literature suggests that credible consideration of multiple locations could have a much higher weight than that used here. The importance of foreign ownership has been considered either very important or not at all important; the low factor weight is therefore somewhat skewed.

We sought to create a scoring approach that offered simple but comparable scores (scaled from 0 to 1) for each factor. We determined that the scoring approach should reflect the uncertainty that all parties have, and that the approach should be adjusted over time to reflect continuous efforts to improve our understanding of how different factors affect industry or business location decisions. For example, the MBDP does not have completed projects where the incentive amount relative to projected investment exceed 0.5, but this may not always be the case, requiring the scoring approach to be adjusted. We judged incentives to be most influential for a company or project characteristic that received a score approaching 1. Additional details on how the factors, weights, and scores were developed are provided in Appendix B.

Table 14 Weighting and Scoring of Factors Influencing the Importance of Incentives

Factor	Scoring Approach	Factor Weight
Considered multiple locations	0=no; 0.5=yes, among its own operations; 1=yes, multiple locations not limited to its own operations	0.25
Described financing gap or disadvantage	0=did not describe gap or MI disadvantage in application; 1=did describe specific gap or disadvantage	0.25
Incentive amount relative projected investment	0=0.125=0.25; 0.126-0.25=0.5; 0.26-0.375=0.75; 0.376-0.5=1	0.15
Company has operations in multiple locations	0=no; 1=yes	0.15
Cost sensitive or capital-intensive industry	0=other; 1=NACIS 31, 32, 33, 56	0.10
Expansion or new to Michigan	0=expansion; 1=new	0.05
Foreign owned	0=US parent; 1=foreign owned company	0.05
Total Factor Weight (combination of above factors)		1.00

Each of the 25 completed projects and 16 of the terminated projects were then scored using this factor weighting system. The scoring also required project team judgment, and there are cases where different judges might have scored individual projects differently. For example, when asked in the application, companies described their financing gap or competitive disadvantage. It is notable that the project team considered statements about other states offering alternative incentives an adequate rationale only if the company were able to provide other competitive details that helped the analyst judge whether the gap or disadvantage existed.

Data for the scoring came primarily from project applications, MBDP term sheets, MEDC briefing memos, and additional research on the companies as needed. Each project’s total score indicates that project’s “but for” percentage based on the characteristics described in Table 14. Recognizing the inherent uncertainty in creating a “but for” score, and to avoid conveying unwarranted precision, we translated each individual score into a rounded percentage⁶ representing the likelihood that the incentive influenced each firm’s decision.

The scores for all completed projects and 16 terminated projects are provided in Appendix B. The calculated percentages range from 30% to 90%, with the “but for” percentage for most

⁶ The Score translates to a “But For” percentage score in the following ways: Score= 0.05-2 translates to 10% but for percentage; Score = .21-.4 translates to 30% but for percentage; .41-.6 translates to 50% but for percentage; .61-.8 translates to 70% but for percentage; and .81-.99 translates to 90% but for percentage.

projects estimated at 50 or 70%, indicating that incentives would be responsible for approximately 50-70% of the choice to invest in Michigan. These findings suggest that the incentive likely played an important role in influencing most companies' investment decisions.

While these estimated “but for” percentages are lower than the typically assumed 100% level, they reflect the reality that no analyst (including those within the company) can be certain about whether the incentive tipped the investment in Michigan's favor. However, the evidence also suggests that there was a pretty large risk that without the incentive, the investment would have occurred outside the state.

This approach results in substantially higher “but for” percentages than the Upjohn cost sensitivity approach. The cost sensitivity approach does not examine specific project characteristics but looks at the relative value of the incentive when compared to the industry-wide value-added and makes a judgment about whether the project would have gone forward without the incentive. Beyond this fundamental difference, there are several reasons that the CREC firm choice approach results in a relatively higher “but for” estimate than does the cost sensitivity approach.

In short, the two approaches examine different aspects of the company's decision-making process. In developing the custom firm choice ‘but for’ estimates, CREC relies on the company's application for the incentive. These data may overstate the company's case but reflects the fact that the firm is at a particular point in the site selection process in which the company has specified several feasible options in which small differences – such as the incentive – are much more likely to affect the final decision.

Other states use this sole point (whether companies credibly considered other locations) to determine whether companies meet their “but for” standard. The high percentage of firms with operations in multiple locations and in cost-sensitive industries also suggest that an incentive is likely to influence their investment decisions. The cost sensitivity model examines the need for the incentive at a more abstract level, focusing on its importance when compared with broad tax and business climate issues. This approach is particularly relevant in determining the full array of public investments that influence a company's willingness to consider locating in a location.

Examining an individual project in greater depth can help demonstrate the dynamics behind the CREC firm choice “but-for” probability estimation approach. In 2012, AGS Automotive, headquartered in Toronto, was deciding whether to produce new parts at one of its existing locations in Ontario or to purchase and retrofit a building in Sterling Heights near one of its current facilities. AGS had operations in multiple locations and was choosing among a set of viable facilities for its new production. The company identified a Michigan-specific disadvantage based on the additional costs for the building purchase and retrofit. The firm is in a cost-sensitive industry that tends to value incentives. For these reasons, the customized firm choice approach estimates a relatively high – but not 100% -- “but for” level for this project of 70%.

However, the cost sensitivity “but for” estimation approach based on the value of the incentive relative to industry value-added estimates a “but for” level of 4%. The Upjohn cost sensitivity approach demonstrates that other factors may have determined the company’s decision to make an investment while the CREC customized firm choice approach indicates that the incentive offer was an important factor in the company selecting Michigan over a very viable alternative option.

Interview findings

To validate our understanding of the importance of incentives, we reached out to 21 local partners (representing 23 of the completed projects) who were familiar with the completed projects to gain their perspectives. The MBDP requires a local partner contribution (typically a property tax abatement), and the local partner perspective is important to understanding the MBDP’s effectiveness to securing the deal and achieving outcomes. The local partner is directly involved in a supporting role to the state during the investment decision process. Since the property tax abatement has a 12-year timeframe, the local incentive also remains active for most of the completed projects. Furthermore, the local partner often has current knowledge of the investment’s status and latest developments.

When asked to compare factors influencing the business’s decision to locate or expand in Michigan, describing each factor on a five-category scale (from unimportant to very important), most interviewees agreed that ability to serve markets and customers and the availability of incentives were “very important”. Many interviewees also ranked overall cost of operations and availability of sites and buildings as very important. Access to skilled workers and availability of infrastructure and utilities ranked slightly less important among the top responses. (Table 15)

Table 15 Local Partner Rankings of Factors Affecting Firm Investment Decisions

	Very important	Important	Somewhat important	Little importance	Unimportant
Ability to serve markets/customers	15	3			
Access to skilled workers	6	11	1		
Availability of infrastructure/utilities	7	5	4		2
Availability of site/building	11	6	1		1
Overall cost of operations	11	7	1		
State and local incentives	12	6	3		
Other(s)	2	2	1		

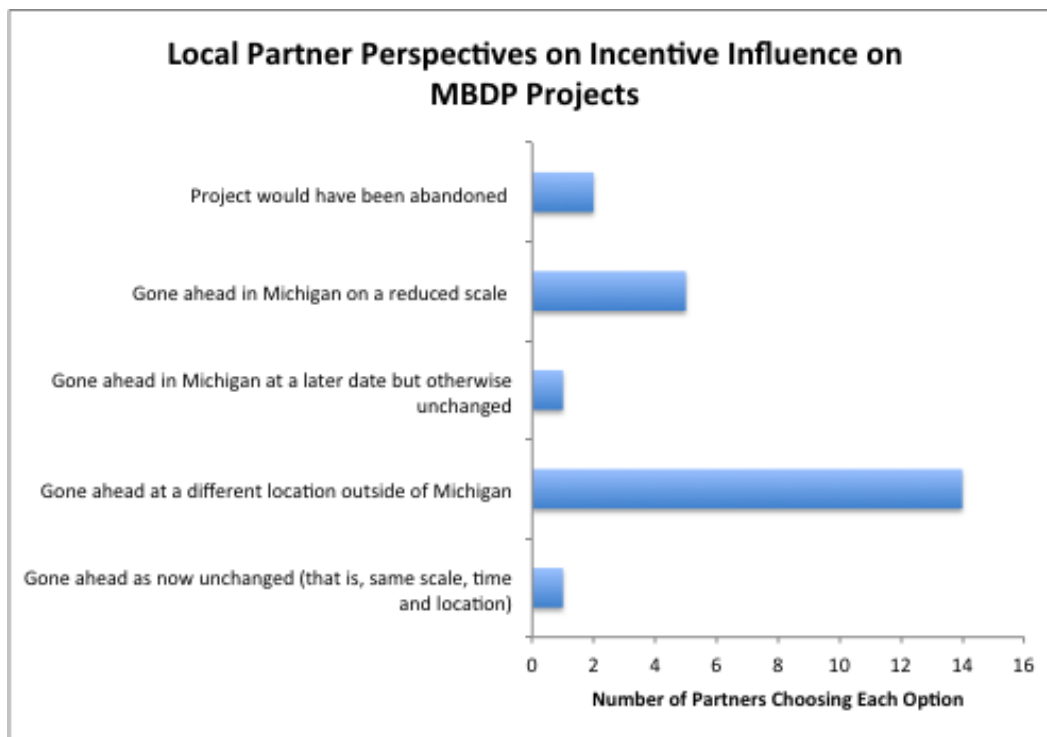
CREC also asked local stakeholders to rate the incentive’s importance with the following question:

In the absence of grant assistance, in your opinion, would the project have (choose one option only) ⁷:

- (a) Gone ahead as now unchanged (that is, same scale, time and location)
- (b) Gone ahead at a different location outside of Michigan (but otherwise unchanged)
- (c) Gone ahead in Michigan at a later date but otherwise unchanged (delayed but otherwise unchanged)
- (d) Gone ahead in Michigan on a reduced scale (but otherwise unchanged)
- (e) Project would have been abandoned

In response to this query, 14 of 25 interviewees stated that they believe the project would have gone ahead outside of Michigan if the incentive had not been provided. An additional six expected the project would have proceeded in Michigan but would have been either delayed or reduced without the incentive. Two believed the project would have been abandoned. One respondent thought that the project would have gone ahead unchanged without the incentive. (Figure 6)

Figure 6 Local Partner Perspectives on Incentive Influence



⁷ Adapted from Lenihan 2004

These perceptions suggest that the scoring system described in the previous section provides a reasonable proxy in support of a “but for” analysis. In most cases the estimated “but for” percentage aligned with the local partner perspective that the incentive was important or very important in motivating the firm’s decision. In three cases, local partners considered the incentive very important while the scoring indicated a “but for” level of 50%. In three cases the scoring indicated a higher “but for” level of 70% while the local partners considered the incentive “somewhat important.”

Comparison to terminated projects

As a final point of understanding, we examined the characteristics of terminated projects with the expectation that, by definition, the incentive would have been less meaningful to the investment since the project did not fully proceed despite receiving the incentive. The average firm choice “but for” percentage for the 16 terminated projects that met at least one milestone was 54% compared to 66% for the 25 completed projects.

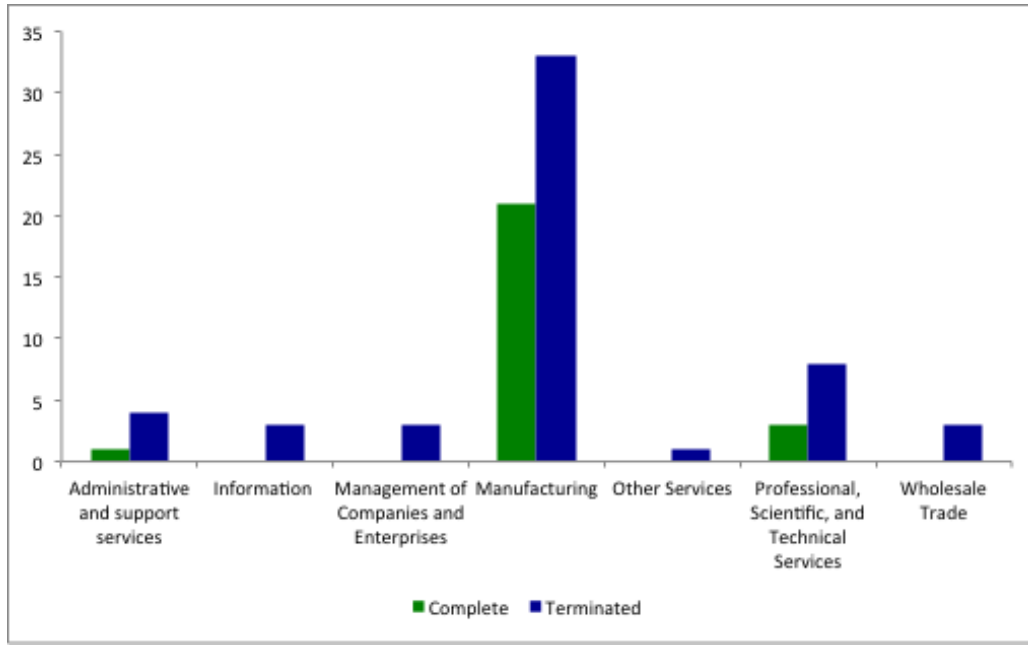
The study team also compared the features of 55 total terminated projects, including those that completed no milestones, to see how they varied from the completed projects. Relevant findings on factors likely to influence the importance of the incentive are:

- 33 of the terminated projects were manufacturing operations; while 22 were services-based.
- MEDC defined 43 as retention/expansion projects and 12 as attraction projects. Eleven of the total are not recorded as having other Michigan locations and so were likely new to the state.
- 53 of the 55 projects considered multiple locations, both among their own operations and other locations, and described them in their applications.
- 47 of the terminated projects occurred in non-border counties.
- 14 of the 55 projects involved a foreign-owned firm or a foreign-owned parent company, based on application data.
- 28 projects were located in an “eligible distressed area,” as defined by the Michigan State Housing Development Authority in May 2018.
- The incentive offer averaged 24% of the projected investment across completed projects, with a range of 0.6% to 250%. The projects with high incentive-to-investment ratios were in service operations proposing job creation without substantial investment.

Figure 7 shows the distribution of completed and terminated projects by industry. Most of MEDC’s completed projects were manufacturing operations with few services industries. The

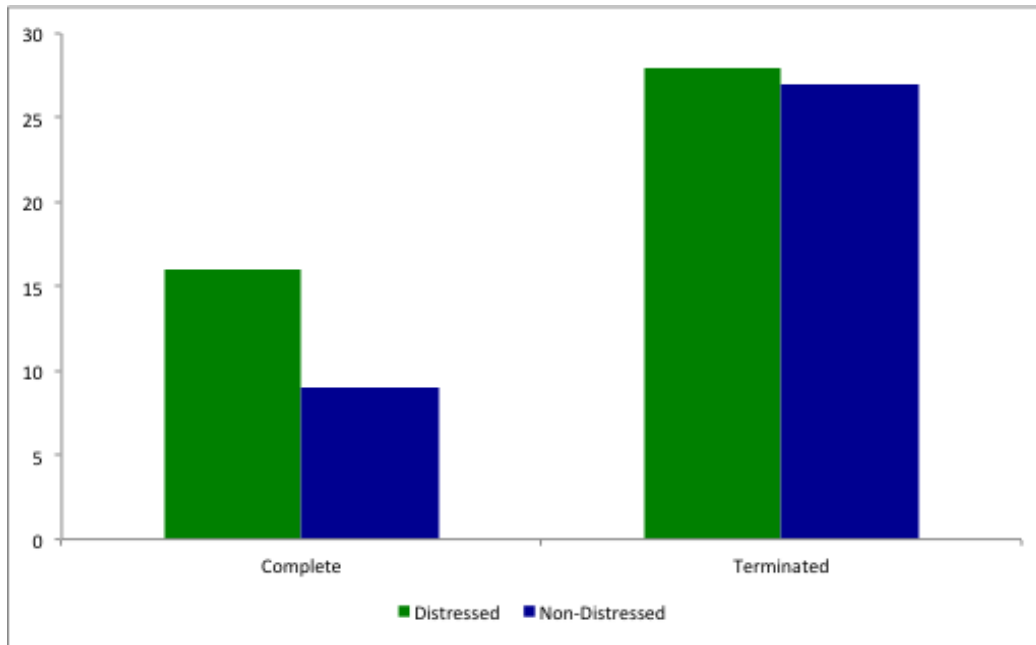
terminated projects were still heavily manufacturing-oriented but with more services operations in more industries. 84% of completed projects were in manufacturing compared to 60% of terminated projects.

Figure 7 Completed and Terminated Projects by Industry Category



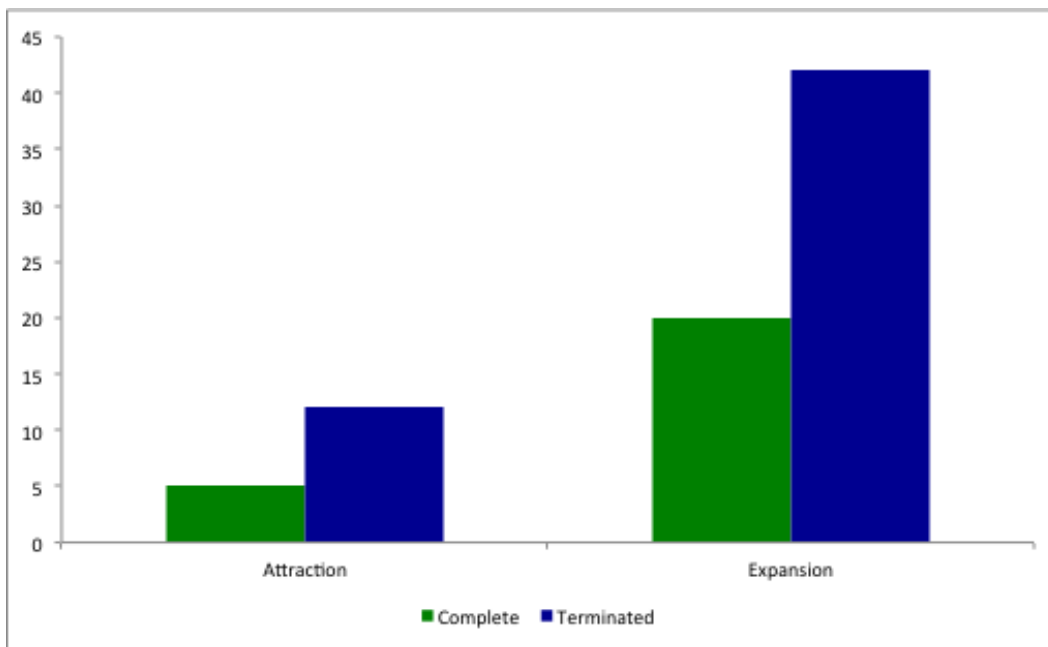
Overall, MBDP funded projects were more likely to be concentrated in distressed communities than in non-distressed locations. 64% of completed projects and 51% of terminated projects occurred in distressed communities. (Figure 8)

Figure 8 Completed and Terminated Projects by Distressed Location



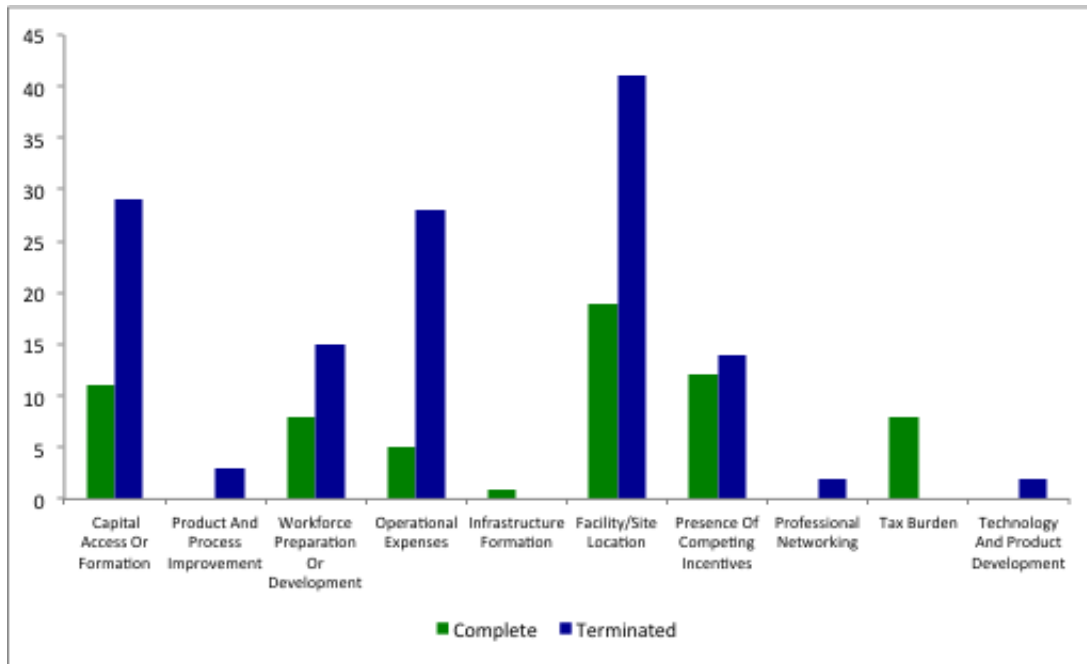
The proportion of attraction and expansion projects were nearly the same for both completed and terminated projects. Approximately 80% of both sets of projects were considered expansions. (Figure 9)

Figure 9 Completed and Terminated Projects by Attraction/Expansion



The project team assessed the business reasons cited for requesting the incentive as described in the applications to MBDP. An analysis suggests that terminated projects were more likely to request the incentive to address capital access or operational expense needs, while completed projects were more likely to cite workforce development issues, the presence of competing incentives, or tax burden. However, the dominant business need driving the request for incentives among both completed and terminated projects was facility/site location. (Figure 10)

Figure 10 Completed and Terminated Projects by Stated Business Need for the Incentive



Break-even “But For” Levels For the MBDP Program and How Break-evens and ROIs Vary with Project Opportunity Costs

In contrast to the assertion that MBDP induced every funded project to move forward when they would not have otherwise done so, both the Upjohn cost sensitivity and CREC firm choice approaches reduces the estimated net benefits of the MBDP program. But even the most conservative adjustment (made with the lower Upjohn cost sensitivity but-for estimates) still generate the positive program ROI of nearly 4:1. Using higher but-for estimations result in a higher ROI. Given the difficulties and controversy with estimating the “but for” percentage for diverse projects, one alternative is to focus on assessing what “but for” probability would be sufficient for MBDP to achieve a net positive ROI. This proportion may vary with how MBDP is financed. Up to now, it is assumed that the MBDP program is implicitly financed by having overall business taxes be a bit higher than they otherwise would be (baseline). However, MBDP

could also be financed with a balanced state budget by increasing other taxes or by reducing various types of public spending.

Break-even “but for” percentages under baseline financing mechanism

As shown in Table 16, the break-even “but for” levels for the MBDP program are quite small. For all 239 projects, the break-even “but for” is 0.8 percent. That is, if the MBDP program tipped more than 8 out of 1,000 projects, it would have a would yield a positive ROI.

Table 16 Break-Even “But For” Percentages, with Baseline Financing

	Break even but for	Upjohn but for	CREC but for
Completed/terminated projects	0.7%	6.8%	56.1%
All projects	0.8%	9.7%	

NOTE: The break-even “but for” is defined here as the minimum “but for” percentage, assigned uniformly to all projects in a group, that yields a positive overall ROI for that group of projects. All calculations in this table use the baseline assumption that the MBDP program is financed by business taxes being slightly higher than they otherwise would be.

This break-even “but for” is far below the “but for” estimated by the Upjohn cost-sensitivity model or the CREC firm choice approach. For example, for all 239 projects, the Upjohn cost-sensitivity model estimates the “but for” is almost 10 percent, or 9.7 percent, equivalent to tipping 97 out of every 1,000 projects. This is over 10 times the “break-even” but for.

This break-even “but for” probability estimate as well as all MBDP ROIs estimated so far in this study, assume that the MBDP program is financed by having Michigan business tax rates be a bit higher than the rates would be if MBDP did not exist. However, if MBDP were financed with a balanced state budget that increased other taxes or reduced various types of public spending, then ROI estimates and the break-even estimate would be lower.

Implications of financing the MBDP program by other tax increases or by spending cuts

We also considered different financing mechanisms for the MBDP program and how they affect the MBDP program’s ROI for different groups of projects. Table 17 reports results for four different financing mechanisms: business tax financing (the already-reported baseline results); financing by increases in non-business taxes; financing by cutting K-12 spending; and financing by reducing other state and local government spending.

Table 17 How MBDP’s ROI Differs with Different Types of Financing for the Program

Type of project	Baseline (financing by business taxes)	Financing by non-business taxes	Financing by reduced K-12 spending	Financing by reduced non-K-12 spending
Completed/terminated projects	3.51	3.41	-0.86	3.32
In process projects	3.94	3.86	0.51	3.83
Total projects	3.86	3.78	0.25	3.73

As Table 17 shows, the only dramatic change in ROI comes when the financing of the program is achieved by reducing K-12 spending. In the study’s model, K-12 spending is highly productive, with a 10 percent reduction in K-12 spending reducing future wages by about 8 percent. As a result, the program ROI drops to only 0.25 for all 239 projects and turns negative at -0.86 for the completed/terminated projects. In other words, based on the returns from for the completed/terminated projects, the ROI to the state from K-12 spending is higher than the ROI achieved from the MBDP program. Cutting K-12 spending to pay for MBDP would result in net reductions in state residents’ per capita income levels. Essentially, the model is saying is that if one is targeting “economic development,” defined broadly as higher per capita incomes for state residents, then it doesn’t make sense to expand one program that increases state residents’ per capita incomes while cutting another such program.

The case of K-12 cuts indicates the potential importance of a long-term perspective in calculating program impacts. As shown in Table 18, most of the negative consequences of cutting K-12 spending occur after 10 years. These negative consequences occur as the lower quality of K-12 education has negative effects on wages when the students impacted by less education investment enter their prime earnings years some 30 or more years after the education cuts were made.

Table 18 How ROI Differs with Different Time Horizons, Baseline Financing vs. Education Cut Financing

	Baseline (business tax financing)	Education cut financings
ROI over 80 years	3.86	0.25
ROI over 10 years	3.60	3.23

Table 19 shows how the break-even “but for” varies with project financing. Consistent with the earlier discussion, the break-even “but for” only changes dramatically when we consider financing by K-12 spending cuts. In the K-12 financing scenario, the break-even “but for” increases significantly to 3.4 percent for the completed/terminated projects, and 4.3 percent for the all 239 projects.⁸

⁸ It might seem odd that the break-even “but for” for the 41 completed and terminated projects, at 3.4 percent, is less than the Upjohn “but for” for these projects which averages 6.8 percent, yet the overall

Table 19 How Break-Even “But For” Varies with MBDP Financing

	Break even “but for” (baseline business financing)	Non- business tax financing	K-12 spending cut financing	Non-K-12 spending cut financing	Upjohn cost sensitivity “but for”	CREC firm choice “but for”
Completed/terminated projects	0.7%	0.8%	3.4%	0.9%	6.8%	61%
All projects	0.8%	1.0%	4.3%	1.1%	9.7%	

V. Findings from Comparison Programs

In this section we discuss how different states calculate and use ROI and “but for” analyses in incentive programs similar to MBDP. The goal is to help MEDC further improve its processes for allocating limited resources and investing in projects that demonstrate the greatest net benefit to the state. This assessment is timely as state economic development leaders across the country have embraced the need to report program outcomes of publicly used dollars to document the impact of their efforts in ways that demonstrate results and can be readily verified.

The analysis below compares information on Minnesota’s Job Creation Fund, North Carolina’s Job Development Investment Grant, the JobsOhio Economic Development Grant, and the Texas Enterprise Fund to illuminate how different states evaluate projects to determine an incentive award (“pre-award analysis”) and how states monitor and evaluate the impact of projects that have received incentive support (“post-award program management”).

Pre-Award Analysis

States may consider many elements before investing in a project. Our first line of inquiry to other states was to assess what each does to calculate return on investment. If they do something formally, how do they calculate the ROI and with whom does the state share that information. Another consideration we explored was to what extent do others take “but-for” statements into account. The following section describes what we learned in asking four key questions.

ROI for those 41 projects (Table 16) is -0.86 . This occurs because among the 41 projects, there are large differences in “but for,” which leads to some quite negative returns for some projects with education financing. The break-even but for imposes a uniform but for across all projects, which is a different sort of calculation.

- How do states calculate the return on investment prior to making an award?
- What is the role of ROI calculations in incentive decision-making?
- Are ROI calculations reported to lawmakers or other external audiences?
- Is there a process to account for “but-for” in the decision to award incentives?

How do states calculate the return on investment prior to making an award?

All four states studied in this comparative analysis calculate a project’s return-on-investment prior to awarding incentive support. While the purpose of most incentive programs is to improve economic benefits to a state, the states studied also consider fiscal benefits in making their incentive investments. Of the four states, three consider a project’s ability to provide state revenue in excess of incentive support in its return-on-investment (ROI) calculations addressing primarily fiscal impact, while one primarily considers a project’s ability to provide economic benefits.

To calculate a project’s return on investment, two states utilize modified commercial economic modeling software, one utilizes a proprietary economic model, and one utilizes a proprietary formula. The use of a commercial model can ultimately be less expensive than creating one’s own model, but it has limitations in terms of flexibility and adaptiveness to a state’s unique program. Different models of calculating an ROI will lead to different numbers, so it is extremely difficult to compare outcomes from one model to another.

All four states’ return-on-investment calculations consider a project’s direct, indirect, and induced benefits. Two of the incentive programs consider a payback period greater than ten years in their ROI calculations, while the other two consider a period less than seven.

In North Carolina, the state uses a proprietary economic model to calculate the fiscal ROI of each potential Job Development Investment Grant (JDIG) awardee. North Carolina calculates a project’s ROI according to the project’s ability to provide fiscal benefits to the state in the form of tax revenue in excess of the incentive provided by the state over the given period of support. Typically, North Carolina calculates a project’s ROI over a 12-year period, the standard period during which JDIG provides incentive support. North Carolina may also calculate a project’s ROI for up to 25 years in the case that it is deemed ‘transformative’ and eligible to receive additional support.

The JDIG program calculates project ROI using a model developed by Michael L. Walden (William Neal Reynolds Distinguished Professor and Extension Economist at North Carolina State University), which utilizes industry data, economic impact modeling techniques, and JDIG application information to estimate the project’s direct, indirect, and induced employment effects and impact on state expenditures and revenues over the given period of incentive support.

Factors considered in the state's ROI calculations include the number of newly created jobs; the duration of newly created jobs; total project investment; project industry; company sales output; project location in a development zone or similar distressed county; and the amount and duration of total state and local incentive support received by the project, including from the JDIG. By estimating the complete impact of a potential JDIG recipient project on North Carolina's expenditures and revenue, the state can identify projects with a positive ROI that generate more public revenue than they receive in public incentive expenditures.

In Texas, the state uses an adapted version of the Beacon Hill Institute's STAMP model to calculate the fiscal ROI of each potential Texas Enterprise Fund (TEF) awardee. The Texas dynamic revenue analysis model, entitled T-STAMP, calculates a project's ROI according to the project's ability to provide fiscal benefits to the state, primarily in the form of sales tax revenue, in excess of the incentives provided by the state and municipalities in support of the project. In addition to considering the cost to Texas, in the form of state general revenue fund support, Texas also considers municipal incentive support provided to a project in its calculation of project ROI.

In its calculation of project ROI, Texas considers the project's 20-year Net Present Value (NPV) benefit to state, county, and city tax revenue against the 20-year NPV cost of TEF and other general revenue fund expenditures by the state in support of the project. The primary sources of variance among projects are the number of jobs created, the expected timeframe for hiring, and the average salaries. Factors considered in the state's ROI calculations include the estimated direct annual payroll; total construction payroll; capital investment in construction and operating equipment; and the indirect and induced effects of all inputs. The state estimates sales tax revenue of \$0.015 per every \$1 of payroll. By calculating a project's discounted benefit to the state, less any discounted costs, Texas can identify projects with a positive ROI that generates public revenue in excess of public costs, in consideration of the period during which the state will receive this benefit. Texas also requires applicants to submit an independent economic impact analysis describing capital investment and employment plus the economic and fiscal impacts of construction and 10 years of annual operations.

In Ohio, the state uses a proprietary formula to calculate the fiscal ROI of each potential recipient of a JobsOhio incentives package, including the Economic Development Grant. Ohio's formula calculates a project's ROI according to the project's ability to provide fiscal benefits to the state in excess of the incentives provided by the state in support of the project over the typical three-year period of incentive support. This period of support and ROI payback period are modified to seven years in the case of research and development projects. JobsOhio's formula considers a project's ROI, along with the payback period – projects without a positive ROI over the three-year period of incentive support will not be selected. Because JobsOhio often makes its economic development grants available in association with other state incentives, the aggregate cost of these incentives is considered. JobsOhio selects projects with a rapid payback period, and over 60% of selected projects break even in their first year. By only

selecting projects with a positive 3-year ROI, JobsOhio can ensure its self-sufficiency and only select projects with a positive fiscal impact on the state.

In Minnesota, the state uses the REMI model to calculate the economic ROI of each potential recipient of the Job Creation Fund (JCF) award. Minnesota calculates a project's ROI according to its ability to provide direct, indirect, and induced economic benefits to the state in the form of impact on employment, earnings, and investment in the state. In its calculation of ROI, Minnesota considers a project's complete economic impacts over a five-year period if located in the Twin Cities region and over a seven-year period if located in Greater Minnesota. Factors considered in the state's ROI calculations include the project's location, projected job creation and earnings, projected investment, and projected other expenditures, less any public expenditures in support of the project. By calculating a project's overall benefit to the state, Minnesota can identify projects with large multiplier effects to the economy to support with its Job Creation Fund.

In Minnesota, applicants for JCF incentive support typically have an economic return on investment of 25 to 1. This means that for every dollar of incentive support provided to a project in the JCF program, there is \$25 worth of economic benefits accrued by the state. Officials interviewed as part of this process indicated that many projects have a ROI well above this amount.

What is the role of ROI calculations in incentive decision-making?

The ROI should not be the only factor that states consider in making an investment decision; it is but one of several. Other factors might relate to the state's economic development goals, including the equitable distribution of program investments, a mixed portfolio of the types of projects (different industries have different ROIs), the importance of economic benefits over fiscal benefits, etc. Of the four states studied, three utilize the ROI in addition to other project factors. Two states use the ROI calculation to determine the amount of incentive support to provide a project.

North Carolina uses a combination of project factors and ROI in its decision to award a project. JDIG administrators decide to award a project by weighing several factors, including the location of the project, the county tier designation, projected job creation and wages, projected investment, and project industry. Prior to deciding to award a project, JDIG administrators utilize the Walden Model to conduct a cost-benefit analysis evaluating each project's impact on North Carolina's tax revenue according to the project ROI. Only projects with a ROI indicating North Carolina will fully recoup the incentive award provided to the project over the award period in tax revenue are eligible to receive JDIG support. The typical award period is up to 12 years.

While Texas does not consider project ROI in its decision to award a project, the state does utilize project ROI in its determination of the amount to award a project. When determining the amount to award a project, TEF administrators consider a project's ROI in the form of the 20-

year NPV of the state sales and local tax revenue generated by the project, against the 20-year NPV of the incentive award provided to the project. Since Texas considers the 20-year NPV of the project generated revenue, projects with a shorter payback period will receive more TEF funding, because the future revenue provided by the project will be discounted less. The decision to award a project is based on several economic factors, primarily the projected job creation and wages, hiring timeframe, and projected capital investment. These are all also inputs into the ROI model.

Ohio considers a project's ROI in the form of fiscal benefits to the state, among other project factors in its decision to award a project. JobsOhio administrators will only award projects with an ROI that ensures the state will recoup the full value of the incentive awarded to a project over the three-year period (seven for R&D) of incentive support. In addition to ROI, JobsOhio administrators also consider a project's projected job creation and wages, industry, projected investment, and location in their decision to provide an incentive. The threshold for these values varies across projects, although the Economic Development Grant program is typically open to companies with annual revenue in excess of \$3 million.

In Minnesota, the state utilizes a project's ROI in addition to seven other economic factors in its decision to award a project incentive support. Other factors considered include local business conditions in the project's respective industry, project location, projected job creation and wages, project readiness (i.e. funding availability), hiring timeframe, and hiring of targeted populations, including Greater Minnesota residents, minorities, women, veterans or persons with disabilities. The combined eight factors are considered in scoring the amount a project is eligible to receive in JCF support. Projects that score below a certain threshold are not eligible to receive support. The JCF job creation requirement helps to ensure that applicants meet the threshold. Currently, Minnesota does not use ROI to competitively score projects as part of a selection process. Instead, ROI is used with other factors to determine the size of incentive support.

Are ROI calculations reported to lawmakers or other external audiences?

North Carolina and Texas require incentive administrators to provide reports to non-administrators; however, legislation does not call for explicit reporting specifically on ROI calculations. Minnesota and Ohio do not require the administrators to report any ROI figures to external parties.

In North Carolina, state statute Article 10 § 143B-437.55 requires the North Carolina Department of Commerce, the administrator of the JDIG program, to provide an annual report to the House of Representatives Finance Committee, the Senate Finance Committee, the House of Representatives Appropriations Subcommittee on Natural and Economic Resources, the Senate Appropriations Committee on Natural and Economic Resources, and the Fiscal Research Division. Included in this report are a "listing of each grant awarded during the preceding calendar year, including the name of the business, [and] the cost/benefit analysis

conducted by the Committee during the application process.” The fiscal ROI calculation performed for each potential JDIG satisfies the General Assembly’s cost/benefit analysis requirement.

In Texas, state statute Title IV § 481.078 requires the Texas Office of the Governor and the TEF program administrator to provide the Lieutenant Governor, Speaker of the House of Representatives, and other legislators with a report detailing each Fund recipient’s direct economic and fiscal impact on the state prior to the start of each regular session of the legislature (biannually). Included in this report are projected job creation and earnings, and the “additional amount of ad valorem taxes, sales and use taxes, and fee revenues projected to be generated” by the recipient of the incentive award, against the “total amount of tax credits” received by the recipient. Thus, while not explicitly required to supply the ROI for each project, the TEF administrator must supply the legislature with the two pieces of information ultimately used to calculate ROI.

What process, if any, does the state use in accounting for “but-for” in the incentive award decision process?

Across the United States, states are increasingly challenged to consider whether an incentive investment is required to influence the company considering an investment in their state. As described in this study, the concept is challenging in theory and extremely difficult to implement in practice. For many states, the “but-for” determination is largely done on an ad hoc basis with no standardized methodology.

One of the most important factors used to determine ‘but-for’ is the perception of whether the project would have taken place in the state without the incentive, usually implying outside competition from other states. Two of the programs, Minnesota and Texas, require that applicants must be considering locations outside of the state.

In Ohio, “but-for” is a qualitative analysis based on an application question, where JobsOhio requests information on project competitors and a mix of capital expenditures and jobs depending on the industry. However, there does not seem to be a pre-set requirement.

Minnesota and North Carolina have more structured criteria. Minnesota considers other sites outside of the state, financial strength, and whether the project operates in a basic industry. Through these qualitative measures, companies provide specific reasons why this project would not move forward “but for” the assistance of the program. In North Carolina, a statute addresses “but-for” through the grant applications, requesting information on “the competitive nature of the project” including other locations being considered and the benefits of those locations. Although this information is required by statute, it does not determine a project’s overall eligibility.

In Texas “but for” assessments focus on whether there is a viable option for the project in another state because only such projects are eligible to be funded. This means that a company

cannot have previously signed a lease, purchased land, or hired employees in Texas before receiving their grant approval. Those actions, if completed before the grant approval, suggest the company has already made their location decision and does not need the state's help to move forward. The application also requires information on the primary competition for the project including city, state and incentive type.

Post-Award Program Management

Once an incentive has been awarded, it is important for states to monitor the performance of recipient companies in reaching the agreed upon incentive goals. As performance is monitored, there is the difficult task of determining how to verify a company's performance report and what to do if the defined commitments are not met. Our analysis examined how other states managed incentive awards after they were made by focusing on the following three questions:

- How do states monitor and report on the progress of projects that have received incentives?
- How is the data submitted by companies verified?
- What actions can a state take when commitments are not met?

How do states monitor and report on the progress of projects that have received incentives?

As part of the program monitoring process, all the states require project reporting. Some are more customer-oriented and continuous in their relationship with the company while others are more hands off – waiting for periodic reports from companies required under their performance agreement. Two states provide support to companies that look like they may not be able to fulfill their obligations to help them address compliance issues and to work out arrangements either to improve performance and identify alternative programs that may represent better fits for their needs.

In Minnesota, businesses are required to submit annual reports through the local government to the Minnesota Department of Employment and Economic Development (DEED) documenting job creation and investment performance. Required documentation includes payroll reports or human resources headcounts for jobs, invoices, and sworn construction statements, among other documents for investment.

In North Carolina, companies are required to submit an annual payroll report to the Economic Investment Committee showing withholdings and identifying eligible positions as a condition of continuation in the grant program. State and federal tax returns or an audit may also be requested. Annual reports submitted to the Committee must include social security numbers of individual employees identified in the reports to determine eligible positions that have been

created during the base period that remain filled at the end of each year of the grant. These data are used to validate employment claims independently against unemployment insurance wage record filings.

In Texas, the process requires recipients to submit annual compliance verification reports to the Office of the Governor. With job creation being the focus of their program, the state requires information that includes employee identifiers, job functions or titles, hire dates, annual compensation, and transfer information.

In Ohio, recipients are obligated to submit an annual report each year throughout their metric evaluation period to the JobsOhio Project Performance Team. The JobsOhio Project Performance Team also meets with grantees multiple times per year to discuss compliance to ensure they are on target to meet their milestones. If not, JobsOhio works with underperformers and has demonstrated a willingness to amend performance agreements to reflect changing economic or financial circumstances. Additionally, JobsOhio conducts periodic audits of businesses receiving investments.

Jobs are reported to the public in multiple ways. For example, JobsOhio releases Annual Metrics Reports, and monthly reports are available on its website. A separate Independent Performance Assessment of JobsOhio in 2018 provided the numbers of “committed” new and retained jobs compared to “actual” reported jobs. Texas prepares an annual Legislative Report that includes Funded Project Statistics that describes projects that were active or completed at the time of publication and includes both the number of jobs “committed” and jobs “created to date.” The Office of the Governor also provides a listing of TEF projects by year in PDF format on its website. Minnesota provides data only on ongoing projects on its website, with an emphasis on projected outcomes; data on completed projects and actual outcomes was provided upon request. North Carolina publishes JDIG Annual Reports that include grantee terms for active and completed projects and has certified jobs data associated with payments for that calendar year. A separate Economic Development Grant Report provides additional information on “certified” job creation compared to projected job creation over the life of the program.

Michigan also has two primary reports, the MEDC Annual Report and the MSF-MEDC Annual Report to the Legislature. The legislative report provides valuable information on actions taken during the fiscal year plus a running list of active projects, including “new jobs committed” and “actual new jobs created” by project. The MEDC Annual Report includes a summary graphic tracking “original contractual jobs,” “revised contractual jobs,” and “actual jobs created” over the life of the MBDP. In the other states, it can be difficult to obtain this information because it is scattered among different reports or put in tabular form that is hard to interpret. MEDC’s chart clearly summarizes the number of original or announced jobs, the number of jobs that are currently contractually obligated, and the number of jobs that have been created by firms receiving an incentive.

How do states verify the data submitted by companies?

Verification of company reports is done differently in the four states. Some states require the companies to attest to their report's accuracy, some require the company to submit documentation from their payroll or tax records, and others use third-party data sources (such as corporate or UI tax filings). However, problems can arise when relying on third-party sources because the data from those administrative records may not be aligned with the reporting requirements.

In Minnesota, the JCF requires businesses to work with local governments where the project is located. Minnesota will use data provided by the local government and business to verify job performance and investment data and may ask for additional information prior to payment authorization. Minnesota may also conduct on-site monitoring and examine documents relevant to the project.

To assess actual versus projected jobs, Minnesota utilizes unemployment insurance (UI) records to compare data from the annual reports submitted by local government and business. However, unemployment data does not always provide the exact data required for performance monitoring, so it is not effective enough to be the sole verification procedure. This has pushed Minnesota to rely on business payroll reports to verify job creation and retention activities.

In Ohio, companies self-report to JobsOhio. Those reports are provided monthly and are summarized in monthly and yearly metrics reports that describe the companies who received monetary assistance. In some cases, JobsOhio may request a third-party audit to supplement performance reports.

North Carolina utilizes the Department of Revenue to certify the company's reported withholdings and the absence of overdue tax debts. North Carolina also utilizes unemployment insurance data to compare actual versus projected jobs.

Texas utilizes annual company-produced compliance verification reports for information on recipients' job creation. In these reports, companies attest to their compliance with other requirements in their award agreements. Information may be verified with the Texas Workforce Commission in certain cases, and the state may conduct site visits as part of this process.

What actions can a state take when commitments are not met?

Most of the programs that we reviewed are similar in that they are performance-based incentives. That means that the company must meet its performance targets before receiving incentive funds. Minnesota has the strictest rules, in that a company must demonstrate that incentive-induced jobs must continue to exist at least a year before funds are disbursed. Two of the states actively work with the company client in cases where they may not meet performance metrics. Both Minnesota and Ohio work with the client before removing them from a program, to

either redefine the performance metrics or determine whether another program may suit the company's end goals and needs.

In cases where the company clearly defaults on its commitment to create jobs or make local investments, all of the programs have procedures in place to terminate the agreement and in some fashion recapture disbursed funds. Since Texas is the only state that makes payments in advance of performance, it is the only state to heavily emphasize clawback terms.

In North Carolina, if the business receiving a grant fails to meet a commitment, the Committee, in consultation with the Attorney General can reduce the amount of the grant or the term of the agreement, may terminate the agreement, or both. If the company fails to maintain employment or fails to comply with the agreement for two consecutive years, North Carolina can withhold payment or terminate the agreement. If there is evidence of manipulation, the committee can immediately terminate the agreement and recapture grant funds. Furthermore, the state can recapture funds if a grantee fails to maintain operations at the project location for at least 150% of the grant term.

In Minnesota, if a business does not make progress on the project within six months (i.e. building permits, construction contracts, etc.), meet the one-year capital investment goals or the two-year job creation goals, it will be removed from the program but may apply for future designation. Minnesota allows one opportunity to amend a contract and adjust the award level if the project over-projected its performance; if that milestone is not reached it then can be removed from the program. To limit nonperformance and clawbacks, Minnesota disburses payment only after jobs have existed for one year.

Like Minnesota, Ohio strives to limit nonperformance and may reassign the company to other programs if it is not performing.

In Texas, performance agreements stipulate terms for repayment in the case of non-performance. If the grantee fails to maintain its employment figures or meet other contract terms, money is returned in one of three ways. First is the clawback, in which the penalty for nonperformance is calculated for each job for each year by multiplying the job shortage for the year by the penalty that is specified in the agreement. Another method is termination repayments, which differ from clawbacks, where repayment is based on adjusting funds already disbursed by a specified interest rate. Lastly, funds not disbursed due to termination, but that had been obligated, can be recovered for the program.

Summary of State Comparison Findings

High quality project assessment, monitoring and evaluation efforts help economic development programs increase economic impact over time. Based on our research on select issues in the

use of ROI and “but for” statements before awards are made, and how states then monitor companies for compliance post award, we can summarize our findings as follows:

1. ROI is typically one of several factors used to determine whether to grant incentives and to calibrate the amount of the incentive. Initial ROI estimates on project return are best used as one element among other strategic criteria when evaluating opportunities.
2. “But for” is frequently required but seldom well defined. Most programs do not have a statutory requirement to establish that the project would not have occurred “but for” the incentive. That said, most states ask applicants to provide some project-specific information that would indicate either the level of competition for the project or a rationale for requesting the incentive.
3. Annual company reporting, including payroll documentation, ability to conduct audits, site visits, and ability to verify company inputs with state unemployment insurance and revenue offices are common compliance procedures.
4. States are improving their reporting on outcome metrics, including actual jobs created compared to projected or announced jobs. Each state’s process and method of reporting is slightly different.
5. Performance agreements ensure that companies know what to expect in terms of their performance requirements. Among the comparison programs, incentives are typically paid after performance is achieved, often with intermediate milestones and payments. Where clawbacks are necessary, terms are clearly defined and enforced.
6. The review of management practices indicated that high quality project assessment, monitoring and evaluation efforts help economic development programs increase economic impact over time.

Lessons from the states suggest that MBDP might consider the following changes to current MEDC practice. First, MEDC may choose to improve its return on investment/cost-benefit practices by extending its pre-award analysis to include economic impacts and incorporate a “but for” range in its analyses. Second, MEDC could enhance its up-front project analysis by including the effects of all incentives, including local government incentives, recognizing the important role that local partners play in making these investments successful. Third, it could strive to modify program management procedures to strengthen the data verification process by using administrative records from the Michigan Departments of Technology Management and Budget as well as Michigan Treasury in ways that could improve data quality for reporting purposes while reducing the burden on companies. In addition, MEDC could enhance the reporting process by examining the process to identify ways to make compliance more customer-friendly while ensuring data accuracy.

Applying This Study’s ROI Model to Comparison State Programs

The study’s ROI model was also used to consider comparison state programs. Because of the lack of detailed project-specific data on the four comparison states, the original version of the model was used (described in Bartik, 2018a). The model was tweaked so that the ROI matched the overall ROI of Michigan’s completed and terminated projects. (The original model assumes that all projects are the same, so the original model will not match the average ROI from using the rich set of project-specific data used in the full analysis.) This tweaked model was then applied to a stylized version of the incentive structure in each of the four comparison states.

Table 20 depicts the results. The first row shows the ROI in Michigan and the four comparison states if each state’s average project matched Michigan’s average multiplier of 3.69. The resulting ROIs would be very similar in Ohio and Texas to Michigan. This is because all three states use relatively up-front incentives. In contrast, Minnesota and North Carolina have significantly lower ROIs. These lower ROIs occur because Minnesota and North Carolina provide multi-year incentives rather than up-front incentives. Multi-year incentives have lesser effects than up-front incentives, per social present value dollar of incentive costs. The “but for” is swayed less with more protracted incentives, as business decision makers heavily discount the future.

Table 20. Average Multiplier Effects

	MI	OH	TX	MN	NC
Assuming all states have average MI multiplier of 3.69	3.51	3.54	3.51	2.93	2.17
Assuming all state assist same industry mix as MI (OH multiplier = 3.78, TX = 3.20, MN = 2.84, NC = 3.17)		3.64	2.97	2.13	1.79
Assuming OH and TX have multipliers suggested by their industry mix (OH = 3.16, TX = 2.78)		2.95	2.51		

Row 2 in Table 20 considers the implications of switching the other states from using Michigan’s multipliers to using the multipliers that would occur if each state provided incentives to the same industry mix as Michigan does with the MBDP program. The multipliers from all five of the states are obtained from the U.S. Bureau of Economic Analysis (BEA) and differ for the same industry by state. These cross-state differences are largely due to the strength of state supplier networks. BEA essentially assumes that if a state has more extensive activity in different supplier industries, then the multiplier will be higher because new export-base industries will use more in-state suppliers.

Michigan and Ohio tend to have higher multipliers than the other three states due to more extensive manufacturing supplier networks. As a result, substituting the lower state multipliers for Texas, Minnesota, and North Carolina tends to reduce the ROI for their incentive programs.

Finally, Row 3 uses some data on the industry mix awarded incentives by Ohio and Texas. (No such data were obtainable for Minnesota and North Carolina.) Ohio and Texas incentives tend to be less targeted to high multiplier industries. As a result, the realized ROI in Ohio and Texas is estimated to be significantly lower than it would be if they targeted a high-multiplier industry mix similar to Michigan.

VI. Options for Consideration

The primary goal of this study is to assess the effectiveness of the MBDP. One reason for doing so is to identify ways to enhance the program's economic impact for Michiganders. This section provides options for improving ROI practices and up-front analyses to make good incentive choices that create the expected benefits for Michigan's residents. Options for changes to program design and administration to increase effectiveness are also offered.

Reorient the ROI analysis to emphasize economic impact

MEDC's mission is to "market Michigan's opportunity and provide the tools to assist job creation and investment," which serves the larger vision of becoming "a top 10 state for low unemployment, GDP growth, per capita income and talent retention and growth." The Michigan Business Development Program (MBDP) supports the mission and vision by providing "grants, loans, or other economic assistance to businesses for highly competitive projects in Michigan that create jobs and/or provide investment." To date, job creation has been the program's primary measure of merit.

While the expected program outcomes are economic benefits primarily related to job creation, the MBDP's internal measure of "return on investment" (ROI) is currently limited to fiscal gains to state government. MEDC's current ROI formula compares cash flow to the state from new personal income generated by projects to the cost of the incentive over the period of the incentive agreement. By relying on this narrow definition of ROI, the state misses the opportunity to address whether incentivized projects are making a positive impact on the state economy in a manner consistent with MEDC's mission and vision.

Reorienting ROI from its focus on short-term state-level fiscal returns to longer-range economic costs and benefits for the state's residents would require extending the timeframe for analysis. ROI estimates based on returns achieved over three years, as is current practice, would not adequately capture the net value of new job creation to the state economy. The original impact simulation model that was adapted for this study assumes an 80-year time horizon to

understand the long-term economic implications associated with different policy and budget scenarios, such as reductions on K-12 education spending where the effects only become apparent after decades. As presented in this study, a 10-year timeframe is sufficient to see economic effects take hold without requiring heroic assumptions about the underlying business activity driving the change.

MEDC may consider adapting its current REMI-based impact modeling approach to include economic as well as fiscal impacts. In doing so, the timeframe for ROI analysis should be 10 years in order to capture a more complete set of expected benefits and costs. Another option would be to adopt a version of the Upjohn economic simulation model used for this analysis for future ROI estimations.

ROI for economic development

The term ROI can be misleading when public sector funds are used for economic development. Governments typically seek a combination of economic and fiscal benefits from incentive spending, rather than a straight financial return as is the case in the private sector. Further, there is no established consensus on how to determine ROI for an economic development incentive program. Different programs across states use a variety of approaches, including a multiple fiscal and economic outcome measures to try to quantify their “return.”

A useful definition of ROI should consider a broad range of both benefits and costs to state residents. The estimation of benefits depends on the nature of the incentive program but typically includes how new jobs and their multiplier effects alter state residents’ per capita earnings by increasing local employment-to-population ratios and workers’ wage rates. Additional state and local taxes generated and increased property values are other benefits that can be estimated. The fiscal impact of the program should include the effects of state population growth on the needs for expanded state and local public spending to maintain the quality of public services.

Address Costs More Explicitly in ROI Estimations

Economic impact estimates will be viewed with skepticism if they overstate the benefits and ignore costs. If an incentive program’s ROI will be based on economic impact, it must consider several cost categories, including the cost of the incentive itself, public service costs associated with new jobs and accompanying population growth that must be paid for with state and local taxes, and higher prices for local businesses.

Less visible costs should also be incorporated into the estimates.

- If incentivized businesses primarily serve the local population (e.g., retail), it may negatively affect existing businesses and their accompanying jobs, wages and taxes.
- Providing incentives to firms also represents an opportunity cost for taxpayer dollars that might otherwise be devoted to increasing spending on government services or returned to taxpayers through tax cuts. The modeling challenge is that the economic magnitude of these effects can be widely disputed. However, it is untenable to assume that increased taxes or reduced public spending has zero economic impact.

The MEDC specifically asked that this effectiveness study take into consideration several of these cost factors. Going forward, the ROI estimation procedures should be adapted to reflect additional costs as well as economic benefits. We believe this effort would establish MEDC as a national leader in deploying rigorous and accurate ROI analyses that more fully capture the net benefits to taxpayers of the state's economic development work.

Account for the Incentive's Level of Influence on Investment Decisions

One way that ROI measures can overstate benefits is by assuming that the incentive is responsible for all positive outcomes. As in most states, MEDC's current ROI methodology implicitly assumes that 100% of the estimated benefits can be attributed to the incentive. This study has demonstrated that, whether considered through an economic lens or from a site seeker's perspective, this assumption is flawed.

This does not mean that incentives were "wasted" if it can't be definitively proven that the incentive drove the investment decision. In fact, we know that we can *never* definitively determine what would have happened without the incentive. Incentive policy conversations are often stymied by the impossible charge to prove the unknowable: what would have occurred in the absence of the incentive? What we do know is that many location-specific factors – including incentives but also talent, sites and buildings, and infrastructure – interact with each other and together influence each company's investment choices.

Since incentives are considered in combination with other factors, they rarely – if ever – are 100% responsible for an investment. Similarly, they rarely – if ever – have zero impact. Applying for and complying with discretionary incentive program rules involves costs that the business would not bother to incur if there were no value to be gained from the incentive. In short, there is no "right" answer, but the level of influence (or "but for" percentage) should be between 0 and 100%. Estimated benefits should be reduced to reflect this uncertainty.

MEDC can most easily operationalize the need to adjust for the incentive's impact by discounting estimated net benefits by percentages representing various levels of incentive

influence. For example, project analyses could consider how a given incentive amount compares to 10%⁹, 50%¹⁰, 70%¹¹ and 100% of estimated net benefits to calculate adjusted ROIs. This approach can be applied regardless of the specific ROI model MEDC chooses to use. This simple method would also allow MEDC to identify the break-even point for projects and, with experience, establish either target levels or minimum levels for project approvals.

Alternatively, MEDC could choose to use either of the two methods developed for the effectiveness study to adjust the estimated ROI during the project award phase. The cost sensitivity approach would compare the value of the incentive (estimated by MEDC) to the value-added per full-time employee by industry sector (obtainable from the Bureau of Economic Analysis). The ratio of these two numbers would be used to estimate the “but-for”, or level of influence, of the incentive on the investment.

The other approach would be to adapt the firm choice approach provided in this study to allow MEDC to estimate the incentive’s level of influence for each prospect based on project competition, specified financing gaps or competitive disadvantages, the ratio of the proposed incentive to the proposed project investment, whether the company is a new to the state, cost-sensitivity of the industry, and other factors MEDC deems relevant.

The project team recognizes that neither approach will generate the “right” answer because there is no right answer, only estimates that fall between 0 and 100 percent. In fact, the two approaches used in this study – the Upjohn cost sensitivity and the CREC firm choice – generate very different results. Any effort to incorporate a “but-for” estimate into the ROI analysis should recognize the inherent uncertainty. Therefore generating a range of estimates and/or assessing the incentive against a series of returns calculated using a set of “but-for” ranges is preferable to a single point estimate. Either approach specified in this study could be combined with the continued use of the REMI model or other economic impact models.

The ROI Model Can Help Direct Incentives toward Projects with the Greatest economic Impact . . .

The model used to estimate ROI is designed to highlight a series of costs and benefits that are affected when incentives are offered to companies. This analysis identified some of the most

⁹ Average estimated “but-for” level for past MBDP projects based on research on company sensitivity to tax costs.

¹⁰ Average estimated “but-for” level for completed and terminated MBDP projects hypothesizing the likely level of influence based on company- and project-specific factors affecting the propensity to value incentives in decision-making.

¹¹ Average estimated “but-for” level for completed MBDP projects hypothesizing the likely level of influence based on company- and project-specific factors affecting the propensity to value incentives in decision-making.

important factors that boost modeled ROI. Prioritizing projects with these characteristics should generate greater impacts for the Michigan economy. For example:

- Prioritize projects in high unemployment areas. The economy benefits most from new investments when new jobs go to local residents. Local residents are more likely to benefit from new jobs when local unemployment rates are high. In other words, the state's ROI is greater when investments are targeted to locations with high unemployment. MEDC could incorporate the local unemployment rate into its upfront analysis to flag these opportunities.
- Continue to favor projects with high multipliers. Projects in industries with high multipliers generate higher benefits. In practice, this tends to mean emphasizing projects in manufacturing industries with extensive networks in the state.
- Recognize the potential for housing price pressures to dampen positive effects from job and population growth. If housing supply is not able to keep up with growth in demand (and housing prices increase), ROI will be diminished.

... But ROI Should be Used in Concert with Other Project Review Criteria to Drive Decisions that Reflect Economic Objectives

Calculating the ROI helps quantify benefits and enables comparisons among otherwise diverse projects. A downside is the inability of a single ROI measure to capture all the relevant project details that determine its contribution to state and local economies.

For example, manufacturing firms, especially in the automotive sector, usually have high multipliers, while service industries have lower multipliers. A decision to focus only on manufacturing will keep the ROI high, but it could lead the state to over-specialize and miss out on high-income job generating opportunities in other faster-growing sectors. While manufacturing is relatively healthy now, most new jobs are being created in service sectors. An incentive program designed to support job creation would miss most job opportunities if it ignored the service sectors because of low multipliers. In addition, manufacturing-heavy communities often wish to diversify their economies to be less susceptible during economic downturns, and incentives can be one way to help attract new types of businesses to communities that might not be competitive without them.

On the other hand, within the model, some of these same high multiplier sectors tend to have a low "but-for" or incentive level of influence that diminishes the estimated ROI. It would be unwise to dismiss these high value-added manufacturing sectors because that very characteristic (high value-added) lowers the calculated return relative to other sectors.

To take another example, the model indicates that projects in the Detroit metropolitan area would have a lower ROI because of higher costs, including those associated with absorbing the additional population that would come with new jobs. The implication is not that incentives should not be used for projects in southeast Michigan in favor of projects elsewhere. In fact, the higher costs of doing business may suggest a greater need for incentives. It does not make strategic sense to avoid projects in the state's largest metropolitan area that are likely supporting the Michigan's most important economic sectors, redeveloping properties, and generating local taxes simply to bump up the average modeled ROI.

In short, the MEDC's project review, including the ROI estimate, should be used to support the state's economic development strategy, not the other way around. The strategy should be about more than generating a high ROI. ROI is appropriate as one element of project decision-making criteria but should not be relied upon exclusively to determine incentive awards. MEDC should be willing to accept lower ROIs when projects help achieve important economic objectives not captured in the ROI calculation. We heard several examples of these benefits throughout the course of our interviews, including building improvements, bringing abandoned or underutilized properties back into productive use, training and hiring programs for populations with barriers to employment, and positioning Michigan-based operations for future growth.

One way to think about the tradeoffs is from a portfolio perspective. Investment portfolios should be diversified to mitigate risk and should not concentrate all assets in the highest-yield investments. Incentivizing projects that generate a certain ROI will tend to concentrate funds in narrow categories of investments that may actually increase long-term economic risk. A diverse portfolio supports a broader set of industries and mitigates the potential impact should downturns affect specific industries and their supply chain networks.

Revisit MBDP's Purpose and Eligibility Rules to Assess Match with Current State Needs

The project review, assessment of internal procedures, and local partner interviews surfaced several options to improve MBDP's utility. At the same time, the economic, political and incentive environments have changed since MBDP was created, prompting reconsideration of how and why MBDP operates the way it does.

MEDC may wish to consider MBDP's role and potential adaptations that could improve its effectiveness in today's economic development setting.

- When MBDP was established in the post-recession period, job creation was the primary economic development concern. Today, finding enough talented workers to fill job openings is the dominant economic development challenge facing communities. At the same time, MBDP has historically funded a high proportion of manufacturing operations,

where the trend is toward greater automation requiring fewer people with higher skills. For both reasons, is it sensible to continue to emphasize job creation metrics?

- MBDP was created during a time of very negative political perceptions about tax incentives, led by a Governor who famously described them at the time as the “heroin drip of state government.” It was intended to focus on short-term investments and to be tightly controlled. Today, the new Governor is a more enthusiastic proponent of incentives for economic development. Does the MBDP remain the right approach given political expectations?
- MBDP has been joined by the Good Jobs for Michigan Program in MEDC’s incentive program portfolio. Good Jobs for Michigan also strives to serve new businesses creating jobs in Michigan and, as MBDP was intended, to help the state become more competitive in attracting desirable investment. Businesses that create a minimum of 250 new jobs with an average wage of 125% of the regional average are eligible. Should the MBDP consider revising its own eligibility criteria to focus on smaller, Michigan-based enterprises?

One option for consideration is linking MBDP to worker training programs among the incentivized companies. Grants and support for customized job training is an increasingly common state-level incentive that should generate a high return by increasing the employment levels and expected wages of the state’s residents. There is good evidence that customized job training may often have a higher dollar value to assisted companies, and hence higher effects, than cash incentives, particularly for smaller companies. Evaluating a training option either within MBDP or within MEDC is sensible in terms of both ROI to the state and meeting business needs, as articulated by incentivized firms that have trouble achieving their hiring goals and local economic development partners working with these companies.

Continue Efforts to Use UI Data to Verify Company-provided Data on Job Creation

States are increasingly verifying jobs and payroll data provided by incentive recipients with information that companies submit to state unemployment insurance (UI) agencies. While these records can provide a useful check on the data that incentivized firms submit for compliance purposes, the structure, timing and coverage of the data can mean they are not a foolproof method of verification for the incentive program.

In Michigan, the UI Agency generally does not collect site-specific data for employers paying into the system: “Unless the firm asked the Unemployment Insurance Agency to create “chargeable locations” for their firm, all wage records would be aggregated to the firm’s total employment for the state.” This is the case for the majority of Michigan firms. This means that UI data would not allow wage and employment verification for MBDP-funded project unless the

project is either with a single-site company or happens to be one of the few firms to have created records by “chargeable location.”

One option to consider would be to request or require businesses applying for an MBDP grant to create “chargeable locations” for their firm in order to allow milestone compliance verification. It is unclear what burden this might place on firms in the state although many other states require firms to report these data at an establishment level. We suggest that MEDC and the Bureau of Labor Market Information and Strategic Initiatives (within the Department of Technology, Management and Budget) seriously examine the viability of this option. A complementary option for businesses that do not wish to provide location-specific data to the UI Commission could be to specify an alternative verification procedure that would involve more robust periodic site visits to verify reported employment data.

A more holistic solution would be to advocate for legislative authority to require enhanced wage records that include start date, job title, hours worked, and employment site location. State law should allow for sharing this data between MEDC and the UI system for evaluation and statistical purposes. Other states are taking this approach. For example, Nebraska allows for data sharing between agencies on a voluntary basis for firm establishments that receive incentive awards. Other states, including Alaska, Washington, Oregon, and Louisiana, provide authority to their UI system to collect these data for all employers receiving incentives, and the data can be shared with the economic development agency for use in verifying reports provided by incentive recipients.

Strengthen Cooperation with Local Partners

The MBDP could be improved by strengthening cooperation with local economic development partners. Local partners often have valuable knowledge about opportunities proposed for their communities, especially for expansion projects, that could enhance MEDC’s up-front analyses. They are also well-placed to facilitate compliance reporting and to engage with the company on an ongoing basis, thereby providing an early warning system if problems (or opportunities) emerge. Closing communication gaps in real time would be helpful to both MEDC and local staff to facilitate better evaluation, but also to capture critical insights about the impact and efficacy of the incentives.

In general, local partners sought greater collaboration with MEDC during MBDP project development. Specifically, during the decision-making phases, local partners expressed a desire for greater transparency into project opportunities earlier in the process so they could prepare and respond appropriately and quickly, especially regarding the local incentive match. At the same time, many felt they could contribute valuable intelligence about the nature of the project that would be useful during the assessment phase.

Multiple local partners expressed frustration that they were not privy to updates on project progress, especially related to MBDP milestone achievements in their communities. The knowledge itself would be welcome, but partners could also bring to the table resources to help local firms meet their milestones, such as local workforce identification and training programs. If kept informed, they would also be in a better position to make sure their local companies stay in compliance.

Options going forward include providing local partners greater transparency on local projects, sharing updates on milestones from companies in their communities, and collaborating to work with companies to make it easier administratively and operationally to achieve their milestone commitments. Closer local engagement could ameliorate the challenges MEDC faces in managing compliance reporting from the company. If it chooses, MEDC could engage local partners to answer critical questions about the impact of the project even after formal project completion.

Appendix A. Detailed ROI Methodology

This study's methodology is based on a version of the model described in Bartik (2018a). This model is adapted to Michigan, and to the MBDP program, using Michigan data and MBDP data, as will be described in a later section.

The study follows MBDP in defining ROI to be the net benefits of a project (or the program overall), divided by the MBDP incentive costs. However, the study defines net benefits quite differently from MEDC's current approach. MEDC currently defines net benefits as being the expected increased state revenue over the term of the MBDP incentive, either two or three years, adjusted downwards by some local incentive costs.

In contrast, this study defines net benefits of MBDP as being the present value of the gains in real income per capita for various Michigan residents. These gains in real income per capita are of the following types:

- Increases in real earnings per capita due to increases in the employment to population ratio.
- Increases in real earnings per capita due to increases in Michigan real wages.
- Capital gains for Michigan residents who own Michigan property due to increases in property values.
- Fiscal benefits for Michigan taxpayers due to increased state and local tax revenue from an expanded economy, minus the increased public service needs due to an expanded population.
- Reductions in profits of businesses owned by Michigan residents that face increased costs due to higher wages and property costs.
- To avoid double-counting, the increases in real earnings, increased property values, and reductions in profits are converted to after-tax versions using Michigan tax rates.
- MBDP's incentive costs are subtracted out from these various benefit numbers to yield net benefits. But MBDP's costs are first adjusted to account for the reality that some incentive costs may be directly "exported" to non-state residents, specifically out-of-state owners of businesses that may pay increased taxes to finance the incentives.

This methodology contrasts with MEDC's current methodology in being much more comprehensive in considering both additional benefits, as well as possible offsets to benefits. This study's methodology captures the idea that economic development incentives such as

MBDP are primarily aimed at giving a state's residents better economic opportunities due to increased access to good jobs. The model's inclusion of gains in real earnings per capita due to higher employment to population ratios and higher real wages captures the value of such better opportunities. But this study's methodology also captures various offsets; for example, new jobs, while they may increase a state's tax revenue, also increase the state's population, which requires additional state and local public spending to maintain the same quality of public services.

The study does not count the overall increase in state output or state income as a gain, unless it is associated with higher per capita output or income. Much of the gain in state output and income is due to population increase. The model's philosophy is that simply increasing a state's population, with no increase in state income per capita, is not really a real income gain for any one, and certainly not for state residents.¹²

This study's present value of net benefits is calculated over an 80-year period. This does make a difference compared to MEDC's current approach of only looking at the 2 to 3-year term of the MBDP incentive. However, as will be shown later, in most model simulations, this present value doesn't change much if only the first 10 years are considered. Most of the net benefits of new jobs for a state's residents occur in the first 10 years after the jobs are created.

We now turn to more detail on how these real income gains are estimated. We first consider how the real income effects are estimated conditional on a given net change in Michigan jobs due to the MBDP incentives. We then consider how the net change in Michigan jobs is estimated based on the "but for" number of jobs induced by the MBDP incentive. A separate section considers the important topic of how the study's model estimates the "but for" percentage of MBDP jobs induced by these incentives. Finally, we consider how this model adjusts for the reality that some of the MBDP's incentive costs can be directly exported to non-state residents, whose income gains and losses are not counted in this Michigan-centric model.

Real Income Gains Due to Job Growth in Michigan

The model is based on estimates of how the Michigan labor market and housing market respond to the state's job growth, and how the state's economy affects state and local tax revenue and government spending needs. Each of these will be discussed in turn. This discussion assumes a given level of job growth in Michigan. How that job growth is determined will be discussed later.

¹² As has been argued before (Bartik 1991), it is probably not a gain even for in-migrants, who otherwise could have moved to some other state with quite similar income prospects.

Labor market effects

A shock that increases the number of jobs in Michigan by some amount is assumed to have both short-run and long-run effects in increasing labor force participation rates, reducing unemployment rates, and increasing real wage rates. The source for these estimates is the empirical literature on local labor markets, and the specific sources are referenced in Bartik (2017). As one would expect, the short-run effects of an increase in the Michigan job level on these various labor market outcomes are greater than the long-run effects. As migration increases over time, some of the initial labor market effects are offset. However, some effects, for example effects on labor force participation rates, are relatively persistent, lasting for many years, and certainly well beyond a 2- or 3-year time horizon.

Based on the empirical literature, the magnitude of the effects of a job shock on labor market outcomes is assumed to vary with the local unemployment rate. With higher local unemployment, a given increase in local jobs is estimated to lead to greater reductions in unemployment, and greater increases in labor force participation. Therefore, labor market benefits of higher Michigan job growth are significantly greater for projects located in Michigan counties with high unemployment, or for projects undertaken at times when Michigan's overall unemployment rate was higher.

Job growth's estimated effects on local unemployment and local labor force participation imply effects on overall population and hence on in-migration. Mathematically, a state's jobs must be exactly equal to its employment to population ratio times its population. Therefore, any jobs that do not increase the employment to population ratio, either by reducing unemployment or increasing labor force participation, must increase population. These population increases play an important role later in the model in helping to determine state and local public spending needs to maintain public service quality. Such population increases are important. Empirical estimates suggest that in the long-run, after 10 years or so, a 1 percent increase to a state's number of jobs leads to an increase in the state's population by 0.7 to 0.8 percent, on average.

All local earnings effects are adjusted to after-tax versions using Michigan tax rates. All taxes are included, not just income taxes.

Housing market effects

Job growth and its associated population growth also lead to higher property values. Property value increases are estimated based on the empirical research literature on how changes in local employment and population affect housing values. Only the increases in property owned by Michigan residents are counted.

The increases in property values result in a one-time capital gain for some Michigan residents. The model also subtracts out the subsequent increases in property taxes, based on estimated Michigan property tax rates.

Fiscal benefits

The model uses a straightforward fiscal impact model to measure the fiscal benefits of job growth and its resulting population growth. Personal income in the state is assumed to grow by the same percentage as state jobs. This is then combined with estimates from the empirical literature on how elastic different types of state and local taxes are with respect to state personal income. State and local spending needs are assumed to grow by the same percentage as population growth.

Because population growth in the model in the long-run is 70 to 80 percent or more of job growth, there is some tendency for spending needs to grow by an appreciable percentage of the growth in state and local tax revenue. This is exacerbated by the estimates from the literature that Michigan's state and local tax revenue, as in most states, tends to be slightly inelastic with respect to personal income, that is state and local tax revenue in percentage terms tends to grow somewhat slower than state personal income.

A more complete, complex, and difficult-to-estimate fiscal impact model might be able to improve upon these estimates. On the one side, the model may under-estimate the public infrastructure costs of growth. Existing public infrastructure in many cases was paid for in the past with federal grants and purchased at a time when land costs were much lower, and there was less existing infrastructure to be demolished. New public infrastructure may have to be financed without as much federal aid and may require more expensive costs for retrofitting existing infrastructure or demolishing it and buying more expensive land. In other words, increased congestion costs of new infrastructure, and diminished federal aid, may mean that a given percentage increase in jobs and population may cause a much larger percentage increase in infrastructure costs.

On the other hand, job growth, by increasing employment to population ratios and wage rates, may imply that state welfare spending, including the state portion of Medicaid spending, may grow by a lesser percentage than state population growth. Overall, it is unclear whether a more complex fiscal impact model would increase or decrease the net fiscal benefits of state job growth. The state of Michigan should consider constructing a more complete state and local fiscal impact model, which would have a variety of uses for all kinds of government policies, not just economic development incentives.

Reductions in profits of Michigan-owned businesses

The increased wages and land prices due to growth will increase business costs. This will decrease business profits unless the cost increases can be passed on to consumers. The model assumes that for "non-export-based" goods and services, that is those goods and services sold to Michigan buyers, that these higher Michigan costs are fully passed on to buyers. (The resulting increase in prices is already accounted for in the model, as the model's estimated effects on wages adjust for local price changes due to growth.)

On the other hand, for export-based businesses, which sell their goods and services outside of Michigan, there is little if any ability for Michigan-based businesses to pass on their costs to buyers, as the prices of these goods and services is determined in a national market. Among these Michigan-based export-base businesses, the resulting loss in profits is only counted as a loss in the model if the loss is for businesses owned by Michigan residents. The model is consistent throughout in taking a Michigan-centric perspective: only real income gains and losses for Michigan residents are counted, and effects on non-state residents are ignored.

Based on various empirical data, detailed in Bartik (2018a), the model assumes that 26 percent of businesses in the Michigan economy are owned by local residents, and that only 22 percent of such Michigan-owned businesses sell their goods and services outside their local economy. Therefore, of the increase in local costs estimated in the model, only about 6 percent (26 percent times 22 percent) are borne by Michigan businesses owned by Michigan residents.

All these changes in real income per capita of Michigan residents are conditional on a given change in the number of jobs in Michigan. The next section turns to considering how the number of jobs created in Michigan is determined, conditional on a given but-for effect of MBDP on jobs in the incented firm. After the next section, we consider how the but-for effect on jobs is determined.

Net Job Growth Effects of a Given Increase in Incented Jobs

For a given increase in jobs in firms receiving incentives, there will be some net increase in jobs in Michigan. Some economic forces augment the jobs created in firms receiving incentives; other economic forces reduce other jobs in the state economy. On the positive side are input-output multipliers and agglomeration economies. On the negative side are crowding out and congestion costs, and the opportunity costs of government paying for the incentives. Each will be discussed in turn.

Multiplier effects

The jobs created in incented firms will affect other jobs in the state economy via “input-output” effects. The jobs and output of the incented firm requires some supplies of goods and services as inputs, and some of these inputs will be obtained locally, increasing jobs in local supplier firms. Both the incented firm and its local suppliers will use as inputs some local workers, who in turn purchase as “inputs” to their life style some locally produced goods and services.

The magnitude of these input-output multipliers depends partly on whether the technology and organization of the industry has led to particularly complex tiers of suppliers – the more complex and extensive the supplier networks, the larger the multiplier. These supplier network multipliers also depend upon how the extent of development of the local supplier network, so holding industry constant, these supplier network multipliers will tend to be higher in states that have a greater history of being concentrated in a particular industry. Thus, for example, autos tend to

have higher multipliers than other industries, and autos in Michigan tends to have higher multipliers than other states.

The magnitude of these input-output multipliers may also depend upon the range of local goods and services of high quality and low price that are readily available. Workers have a choice of whether to purchase locally, and these local purchases may vary in different local economies.

Input-output multipliers are available from several sources, including from the U.S. Bureau of Economic Analysis, IMPLAN, and REMI. For this study, we used the “RIMS II multipliers” for different industries available from BEA.

Agglomeration economy effects

The size of a local economy, or greater concentrations of local industries in a cluster, may increase productivity of at least some industries. These “agglomeration economy” effects are believed by regional economists to exist due to either local “thick market externalities”—a larger local market for a particular good or service will result in greater availability of more specialized suppliers—or due to local information spillovers, in which firms and workers steal ideas from other local firms and workers.

Although it is widely believed that agglomeration economies exist—otherwise, how could Silicon Valley exist with its high costs?—such agglomeration economies only increase multipliers if the job increase in the incented firm increases these agglomeration economies. If the incented firm’s expansion allows the local economy or cluster to reach a scale where certain specialized goods and services can be economically produced locally or allows a local economy or cluster to have better synergies of information “sharing/stealing,” then the multiplier may be higher. The resulting greater local productivity will attract local job growth in other local firms, such as specialized suppliers or even competing firms.

There is no real consensus on whether agglomeration economies lead to higher multipliers in practice, and if so, in which types of local economies such higher agglomeration multipliers will occur. Therefore, the model used in the study assumes that increases in jobs in incented firms do not have any special extra multipliers due to agglomeration effects.

Crowding Out and Congestion Costs

The jobs in incented firms, and any input-output or agglomeration economy multiplier effects, will lead to shortages in some local inputs. Local land is in fixed supply—they’re not making any more of it—so local land prices will go up, which will in turn push up local wages even if real wages are unchanged. Higher land prices and wages will lead to higher prices of other locally produced goods, and even of locally distributed goods due to higher local distribution costs.

In the current study, the effects of increases in land prices and other local prices and nominal wages are derived from studies of how local jobs respond to increases in business taxes, under

the assumption that an increase in local costs by some given dollar amount has the same effect no matter what the source. The effects of higher local real wages on local jobs seem to be smaller in the empirical literature than would be predicted based on business tax effects, and these observed smaller effects for local real wages are assumed in the model. Real wage increases may have smaller effects on business job creation because higher real wages may increase worker productivity in various ways, for example by reducing turnover and hiring costs, and inducing greater worker effort.

The offsets from higher local costs are considerable. Higher local costs in this study's model reduce net job creation by over one-quarter. Thus, if the job multiplier was originally 4, these higher local costs would reduce the net multiplier to 3.

These offsets are not impervious to policy intervention. For example, if a state or local economy makes efforts to make land easier to develop for new housing or new business, this will reduce the property value effects of local job growth. This in turn will reduce overall cost effects, thereby reducing the offset due to increased costs. Based on some empirical estimates, the model assumes that in the Detroit metropolitan area, compared to the rest of the state of Michigan, housing price elasticities are higher, which will reduce net job creation from incentives in this portion of the state. This presumably reflects some scarcity of land in the Detroit suburbs, which is in part affected by public policy.

Opportunity costs of government financing the incentives

Under the plausible assumption that the fiscal benefits of incentives are lower in present value than the direct incentive costs, and assuming further that state and local governments must balance their budgets, the net costs of incentives, after fiscal benefits, must be paid for by some combination of state and local tax increases and spending cuts. These tax increases and spending cuts will affect the state economy in two ways: demand-side effects; supply-side effects.

On the demand side, either state and local tax increases, or spending cuts, will reduce the purchasing power of some state residents. As explained in Bartik (2017), the model uses some of the most recent evidence of such demand-side effects, which may be larger than previously supposed.

On the supply-side, either tax increases or spending cuts could potentially have some effects on the quantity or quality of various business inputs, potentially affecting output or jobs in a state. This study's model focuses on the supply-side effects with the greatest evidence: business tax increases; cuts in K-12 spending.

Other tax increases and spending cuts may also have supply-side effects, but there is less reliable evidence, so such supply-side effects are not incorporated into the model. One could imagine that infrastructure spending cuts might have considerable supply side effects in

retarding the growth of the state economy. However, such effects are likely to vary enormously with the particular infrastructure spending that is cut, so it would be speculative to include any such effects in the model.

For business tax increases, this study uses a large literature that estimates the negative effects of business tax increases, holding public services constant. This research suggests that a 10 percent increase in overall state and local business taxes, holding public services constant, will reduce the long-run number of jobs in a state by about 5 percent. Based on prior research, the state economy gradually converges to this long-run equilibrium at a rate of about 9 percent per year.

It might be wondered if such business tax increases would completely offset the effects on business of business tax incentives. In general, the model's answer is No, for two reasons. First, business tax incentives, unlike general business taxes, are targeted on a state economy's "export-base" sector, that is on businesses that sell their goods and services outside the state. We expect the export-base sector to be far more sensitive to changes in taxes and incentives and business costs in general than is true for the non-export base sector, as the non-export base sector can largely pass on changes in their costs to local consumers; the export-base sector cannot do so because the output prices of the goods and services this sector produces are determined in national and international markets. Second, business tax incentives are, mostly, targeted at new investment decisions, and hence have more immediate effects than business taxes on business decisions about overall capital stock and jobs. To put it another way, changes in overall business taxes, unlike incentives, affect many businesses that are not contemplating any significant change in their scale of operations, and these businesses are unlikely to be substantially affected in the short-run by business tax changes.

In addition, it might be assumed that because business tax increases have a negative effect upon job creation, that financing tax incentives by increased business taxes is a bad idea. Not necessarily. As will be explored more below, there is a countervailing factor: a substantial portion of increased business taxes fall on businesses owned by out-of-state owners, such as stockholders living in some other state. To the extent to which incentives are financed by business costs, a portion of these costs are not paid by state residents. In turn, the reduced job creation due to business tax increases have some negative effects on state wages and property values, which shifts some of these costs back to state residents, but not all.

For K-12 spending cuts, the model uses estimates from a recent paper by Jackson, Johnson, and PepsiCo (2016), that a 10 percent cut in public school spending, over all 13 years from K-12, will reduce future wages by about 8 percent. The model only counts such reduced wages as costs for K-12 students who stay in Michigan after graduation. As one might expect, the bulk of the costs of lower K-12 spending for Michigan's economy occur only after a generation, as the cohort in school enters their prime earnings years. Therefore, if incentive costs are financed by

K-12 spending cuts, an 80-year perspective is necessary to give a true picture of the policy's benefits and costs. For this type of financing, a 10-year perspective misses a lot.

The baseline model used in this study assumes that MBDP incentives are implicitly financed by business tax increases, compared to what business taxes would be otherwise. That is, the model assumes that if the MBDP program were to be abolished, the most likely political scenario is that the cost savings would be used to reduce the state's overall business taxes. However, the model also considers alternative financing scenarios in which incentives are instead financed by: increases in non-business taxes; reductions in K-12 spending; reductions in non-K-12 spending. As we will show, the overall ROI only significantly changes if incentives are financed by K-12 spending, which significantly reduces the ROI. Financing economic development incentives by cuts in other policies that have large effects on economic development is a bad idea.

Incentive Costs and Offsets to Such Costs

As mentioned, the project includes incentive costs on both the numerator and denominator of the calculated "return on investment" or ROI. For each project, the present value of actual incentive costs is the denominator. The present value of incentive costs is also subtracted from other economic effects to calculate net benefits in the numerator of the ROI calculation. But in the numerator, the present value of investment costs must be adjusted to reflect that not all costs of financing incentives are paid by Michigan residents.

The baseline model assumes that the net fiscal costs of incentives, after considering fiscal benefits, are financed by business taxes being higher than they otherwise would be. A portion of those business taxes will be paid by out-of-state business owners. The model ends up concluding that about 15 percent of gross incentive costs end up not being paid by state residents, and this "benefit" reduces the incentive subtraction by about 15 percent in the ROI numerator.

Adapting the Model to Michigan

A full description of the basic model is in Bartik (2018a). For this project, the model was tweaked in various ways to be applicable to Michigan. Following is a summary of the adaptations:

- The original Upjohn economic simulation model considered an incented firm whose jobs did not change over time. To model each MBDP project, the model was modified to use the actual jobs created as reported in the MEDC database on this program. The actual incentive disbursements and repayments from the MEDC database were also used.
- To calculate the but-for probability estimate, the model requires data on the present value of incentives paid and jobs created both now and in the future. For all projects, the

model assumes that the last-reported cumulative number of jobs created will persist indefinitely in the future. This assumption essentially holds that agglomeration effects of more jobs will exactly counter-balance depreciation over time of the incented jobs.

- For all projects, the model assumes no future incentive disbursements or incentive repayments will be made. The basic Bartik (2018a) model assumes that the incented jobs will at some point receive future incentive payments. This assumption was abandoned for this study because such an assumption implies that the MBDP program will necessarily lead to such payments for the incented jobs. Rather, future incentive payments for incented jobs will depend upon policy choices made by future state government personnel and should be analyzed separately.
- The above assumptions about job creation and incentive payments do not seem problematic for the 41 completed and terminated projects in the database.¹³ However, for the 198 “First Milestone” projects, in many cases some future job creation (or destruction) will occur and some future incentive payments (or repayments) will occur. It seems likely that on net, these projects will have both some positive job creation and some additional incentive payments. The former will add to project benefits, the latter will add to incentive costs. The impact on the ROI is uncertain.
- For all calculations that involve value added, Michigan specific figures on value-added per industry are used to assign value-added to different projects.
- The analysis of each project uses information on the unemployment rate in the county in which the project is located.
- All the fiscal calculations of budget effects on revenues and taxes use Michigan-specific information on different types of taxes and spending.
- The estimated effects of state personal income on different types of taxes uses Michigan-specific estimates from Bruce, Fox, and Tuttle (2006), and Anderson and Shimul (2012), rather than the national average information used in Bartik (2018a). Based on Anderson and Shimul, separate urban and non-urban elasticities of property tax revenues are used.
- The input-output multipliers used in the study are Michigan multipliers for each industry obtained from the RIMS II model of the U.S. Bureau of Economic Analysis.

¹³ Of those projects, 32 are formally and legally completed or terminated, whereas 9 are awaiting some final verification steps. Most of the analysis focuses on the 41 and 198 project groupings, but the model is also run for just the 32 formally terminated projects to see if results differ drastically.

- The housing price elasticities are taken from Saiz (2010) and are Michigan-specific. The Detroit metro area elasticities are used for projects in the Detroit metro area, and projects in the rest of the state use the Grand Rapids metro elasticities.
- Border counties use adjusted multipliers and “but for” percentages. The multipliers assume that for a border county, 25 percent of the multiplier occurs in the next state, and is lost to Michigan. (The rationale is that a border county is bordered on three sides by Michigan, and on one side by another state.). Thus, if the BEA says that the multiplier for this industry is 5, the adjusted multiplier would be $4 (= 1 + 0.75 * (5 - 1))$. Similarly, the “but for” percentage is adjusted to a weighted average of the average inter-state elasticity of 10 with respect to a 1 percent change in costs as a percent of value-added, and estimates from the literature that within a metropolitan area, the response to a 1 percent change in costs in one part of a metro area is 40. The weighted average is 25 percent on 40, and 75 percent on 10, which yields 17.5. The rationale is that in considering different sites for a location decision, 25 percent of the time the firm is choosing between different sites in the same local labor market. These adjustments are admittedly ad hoc, but serve in the absence of better evidence on border county effects.

Technical Note: How This Study’s ROI Differs from the ROI Currently Produced by MEDC

To explore further the differences between the MEDC ROI and the ROI results derived during this study, a specific project is considered: ‘Project Bob.’ Table A.1 shows how the ROI changes when the MEDC model is modified to this study’s models. The MEDC ROI for this project was 9.8. When this project’s model is modified to match the MEDC model as closely as possible—only counting state tax revenue for 3 years as a benefit—a project ROI of 7.47 is derived, which is a reasonably close match to MEDC’s calculation.

Table A.1 Explaining Difference in Model ROIs, Using the ‘Project Bob’ Example

But-for assumed	MEDC ROI	Attempt to duplicate MEDC	Adding financing effects	Switching to PV of SL revenue for 3 years	Adding PV of spending needs to fiscal effects for 3 years	ROI based on effects over 10 years	Over 80 years
100.0% Fiscal ROIs	9.8	7.47	3.79	10.97	4.77	13.18	15.60
100.0% Plus earnings effects					38.31	106.64	146.77
100.0% Plus other effects					77.60	137.36	160.03
2.7% Upjohn but for						2.77	3.34
80.0% CREC but for							108.92

The MEDC model is then modified by including the funding sources that typically pay for incentive expenditures. States typically finance incentives through increased taxes or reduced spending, and these choices have a calculable negative consequence. In the baseline version

of this study's model, this financing is assumed to be from higher business taxes, which has negative effects both by reducing Michigan demand for goods and services, and by reducing job growth in some Michigan businesses. The ROI over 3 years, looking only at state revenue gains, is then cut in half, from 7.47 to 3.79. Financing effects for incentives are important.

Next, the model is modified from just considering state revenue to also considering local revenue. The model is modified to be on a present-value basis, discounting future cash values at 3 percent annually. The ROI then increases from 3.79 to 10.97. Accounting for effects on Michigan local governments is important.

The spending needs associated with the increased population attracted by the new jobs being created is then subtracted. Adjusting for spending needs reduces the ROI by more than half, from 10.97 to 4.77.

The remainder of the table considers two different types of modifications to the model. In the columns to the right, the time horizon is modified from 3 years to 10 years to 80 years. For example, if calculating fiscal benefits ROI, the switch in time horizon from 3 to 10 years can result in a large difference, increasing the ROI from 4.77 to 13.18. However, going to an 80-year time horizon has a less significant effect on the fiscal benefits ROI, increasing it from 13.18 to 15.60. An important issue to consider is whether the MEDC time horizon for incentives analysis should extend beyond 3 years to consider more medium-run benefits and costs within 10 years.

Going to the second and third rows modifies the analysis by adding in additional benefits. Row 2 adds in earnings effects and row 3 also adds in all other effects in the model. The different columns show how ROI with these additional benefits varies at a 3-year time horizon, a 10-year time horizon, and an 80-year time horizon. These rows and columns show that earnings effects are the major effect over an 80-year or 10-year time horizon. Over a 3-year time horizon, being able to export some costs to out-of-state business taxpayers and property value gains are relatively more important. Most of these benefits are exhausted after 3 years, however, and the more persistent benefits of job creation, due to labor market benefits, loom as more important.

All the analysis in these first three rows assumes a 100 percent "but for" probability. Without the incentives provided to Project Bob, this project and any substitute job creation at this site would not have occurred at all. Under this assumption, the full 80-year ROI for this project is 160.03, over 16 times the 9.8 ROI estimated by MEDC. Including many more benefits dramatically increases project ROI, with the earnings benefits of the project being of particular importance.

However, both the Upjohn cost-sensitivity model and the CREC firm choice "but for" model maintain that the "but for" probability for this project is less than 100 percent. The Upjohn cost-sensitivity model yields a "but for" percentage of just 2.7 percent. The CREC firm choice model results in 70 percent. These adjustments reduce the project ROI to 3.34 using the Upjohn "but for" estimation approach and 108.92 using the CREC "but for" approach. These lower "but for"

approaches are approximately, but not exactly, equal to the 160.03, “but for” multiplied by the lower “but for” percentages. (The approximation is because of various interaction effects in the model.)

It might seem surprising that a project such as Project Bob can get a positive ROI even with a “but for” of 2.7 percent. When the earnings per capita benefits of more jobs in a local economy are included, the net present value of benefits per job becomes quite high. In the model, the average present value of the benefits from having one more job in Michigan’s economy calculated over an 80-year period is \$433,647. This value may seem implausibly large, but it is only a fraction of the wages paid by that new job over 80 years. On a per-year basis, \$433,647 represents an average benefit for state residents of one new job of \$13,009 per job year. One additional job maintained for 1 year will add \$13,009 in increases in real per capita income to Michigan’s economy.

Because of the high value of one more job in industries with high multiplier effects, incentives with modest costs can achieve sizable benefits relative to costs even if the “but for” is relatively low. This is why the MBDP program, which targets high-multiplier firms (in industries with an average multiplier of 3.69) and offers modest direct costs per job (at about \$7,500), can achieve a positive ROI, even if it were only able to demonstrate very low “but for” estimates.

Appendix B. Detailed “But For” Methodology

Background

Michigan, like many other states, seeks to incentivize investments that require state involvement to go forward; that is, “but for” the incentives, the project would not happen in Michigan. MEDC’s current methodology for estimating the return on investment (ROI) from incentivized projects also implicitly assumes that 100% of the estimated benefits can be attributed to the incentive. The underlying assumption is not only that the incentive is required to ensure the business decides to invest in Michigan, but also that all of the impacts can be attributed to the incentive’s availability.

Most economic development organizations and expert analysts also take this all or nothing approach: either the incentive made the difference or it did not. However, critics contend that this assumption can overstate the value of the incentive and the estimated ROI resulting from the investment. The point is well taken. An all-or-nothing (or “binary”) determination of “but for” suggests that incentives are *the* tipping factor and are therefore of utmost importance. This approach ignores the role that incentives play within the context of multiple elements that contribute to a competitive business environment. Using this binary approach to determining the “but for” inadvertently leads policy makers to overstate the importance of the incentive and downplay the significance of other factors that may be much more important – such as infrastructure and talent availability – to business investment decisions.

Meanings and implications of the term “but for”

Note that there are two different issues associated with the “but for” concept: 1) Was the incentive “needed” to drive the decision; and 2) How much of the benefit (if any) should be attributed to the incentive? In Michigan, the issues are connected because the ROI calculations used to help determine whether to offer an incentive are also used to estimate the amount of incentive to be offered and the benefits likely to accrue to the state.

This two-pronged approach to considering the importance of incentives is well-grounded in the research literature on economic development program evaluation. Program evaluation studies have emphasized the following concepts (Storey, 1990; Foley, 1992; Persky et al. 1997; Abravenel et al., 2010):

- Substitution, deadweight costs, and redundancy of capital: In other words, did the incentive simply replace money that would have been spent anyway? And was the substitution complete, or was it partial?
- Additionality: How much of the beneficial outcome did the incentive itself actually cause, or how much can be reasonably be attributed to the incentive?

These concepts first emerged from efforts to evaluate the federal Urban Development Action Grant program in the 1980s because policy makers were concerned that public funds should not substitute for private capital (Abravenel et al., 2010). The term “but for” developed in this context. One academic study suggests that the term itself was embedded in state urban renewal statutes and supported by advocates for tax increment finance (TIF) programs because it helped establish a “public purpose” that created a “need” for public financing. The article implies that the term was intended to give developers more power to move projects forward by threatening not to invest, causing communities to fear decline and a loss of opportunity¹⁴ (Weber et al., 2013).

The term “but for” has since been stretched from its initial focus on gap financing needed to enable urban redevelopment projects and is now often applied to all types of business incentive programs, including those intended for business attraction. In this case, “but for” has come to mean that an incentive was the deciding factor in a firm’s location, expansion or retention decision.

Studies have attempted to apply this definition of “but for” during incentive program evaluation research. However, Bartik (2018b) has found that, “Overall, the research literature on incentives’ “but for” effects is not as rigorous as one might hope.” Reasons include positive or negative bias and not considering incentive program design and award magnitude. In addition, many “but for” studies do not look directly at the effect of an incentive on individual company’s *decisions*, but instead use a variety of techniques to compare job growth or other economic outcomes at either the firm level or by geographic area after the fact in order to infer the incentive’s impact.

The methods (empirical vs. survey and aggregate vs. micro) and outcomes examined in these studies also vary, as do the type of incentive programs being evaluated (grants, tax credits, payroll credits, discretionary, statutory, etc.). Several studies use various approaches to job growth to determine the “but for” level, including job growth among a set of comparison companies, total employment and/or job growth at the county level, industry-specific job change, total employment, ratio of jobs created to claimed jobs created, and economic growth by county (Bartik 2018b). A key point is that in these cases, “but for” refers to the effect on broader community-level economic outcomes, rather than the influence on a company’s investment decision.

In short, the economic development field has adopted “but for” as a meaningful standard for assessing incentive effectiveness, but the term is not well-defined nor is it used consistently.

¹⁴ “These statutes required that municipalities attest that the area in question would not develop to its “highest and best use” in the absence of public assistance. In other words, the options of not providing public assistance were stasis or continued decline (“let nature take its course” noted Homer Hoyt and Leonard Smith, 1943; quoted in Fogelson, 2001). This difficult-to-demonstrate but easy-to-argue test harkens back to the notion that every area is a potential slum” (Weber et al., 2013, p. 197).

Consequently, related findings about the value of “but for” assessments in the firm decision process do not rest on a strong research foundation.

“But for” as an all or nothing proposition is not appropriate

What is often overlooked in the debate about economic development incentives is that grants and tax breaks **are just one of many factors** that firms consider in selecting a location or expanding in a location. Firms seek specific land and real estate, transportation access and infrastructure, different regulatory environments and key utilities, and workforce availability, including the expected ease of training or retraining the existing workforce to their specifications. They also consider the quality of the education system and quality of life for their employees and their families. These investments can be critical as a foundation for whether a location represents a viable option for the firm.

Incentives are part of the mix, but they are typically considered in combination with these other public investments. Here incentive advocates and skeptics can find common ground because the social benefits from investments in a variety of policy domains such as education, transportation, infrastructure, health care systems, quality of life amenities, and so forth are highly valued by firms seeking a good place to do business as well as citizens seeking a well-managed government. The requirement for an incentive as well as the amount of incentive required to influence a business decision may be strongly influenced by public investments in these other policy domains. Considering the variety of public policy factors influencing company decisions, determining whether firm decisions are based on the provision of economic development incentives may be less relevant than determining to what degree incentives affect firm decisions within the context of an array of location factors (both within and outside the control of state government).

Other incentive attributes also indicate that it is not appropriate to make a single, all-or-nothing determination of an incentive’s importance to business investment decisions:

Incentives **play different roles at various stages** of the investment decision process. For example, companies may research incentive program rules and availability early in the site selection process to help identify jurisdictions of interest. They may request incentive information or a general proposal once they’ve identified communities that meet their operational requirements. They will likely incorporate incentives into their cost model and decision matrix during the location evaluation phase. They may then participate in incentive negotiations to close any cost gaps, maximize their opportunities, and make a final decision. Incentives will have different levels of importance for each company at each stage. Companies likely apply to the MBDP for an incentive award after preliminary research in which companies have identified a set of Michigan (and other state) locations that meet their basic operational needs. At this stage of the process, companies are identifying best options among a smaller set

of viable alternatives and reviewing incentives to close any financial or competitive gaps between locations.

Incentive characteristics, including award size and program design, likely affect their level of influence. Larger incentives may have a greater effect on decision-making. Grants and loans may affect company decision-making differently than tax breaks. Discretionary incentive programs for which companies must be screened before receiving awards surely have a different impact on firm decisions than statutory tax breaks for which all eligible businesses automatically receive the benefit. The period of time over which incentives are available, the match with company needs (in the case of, say, R&D and workforce related incentives), and program administrative rules are also design factors that likely change the level of influence of the incentive.

In practice, it is **impossible to know** whether the company would have made the investment without the incentive. Even if economic development professionals became mind readers, they would find that company representatives themselves have different perspectives on the value of incentives depending on their position within the firm. The problem gets even more challenging as time elapses from the original decision and both company and public sector staff change.

In general, then, it is inappropriate for policymakers to regard an incentive as ever being 100 percent responsible for the jobs incited. Given the inherent uncertainty about the determinants of business location and expansion decisions, it will forever be impossible to say with 100 percent certainty that the location or expansion would not have occurred “but for” the incentive. Furthermore, even if the incentive did trigger this particular firm to choose this particular site, perhaps without the incentive some other firm would, within a relatively short time frame, have chosen the same site, and created a similar number of jobs.

Therefore, incentives rarely – if ever – are 100% responsible for an investment. Similarly, they rarely – if ever – have zero impact. Applying for and complying with discretionary incentive program rules involves costs that the business would not bother to incur if it believed there were no value to be gained from the incentive. However, since determining the exact level of influence of any given incentive on any given investment is impossible, the study team developed a method that reflects this uncertainty.

Study Method

This study uses two approaches to determine a “but for” percentage for individual MBDP projects. The cost sensitivity approach was used for most of the ROI estimates and was applied to all 239 projects. It is based on the research literature addressing how location decisions in general are sensitive to tax costs and how incentives help firms reduce those costs. The firm choice approach draws on the research literature describing factors that affect “but for” and

applies these factors to individual MBDP projects to create a score hypothesizing the likely level of influence of the MBDP incentive on each business decision. Since the MBDP is a discretionary grant program to which firms must apply and receive approval - as opposed to a statutory tax program available to all eligible companies - it is reasonable to assume the MBDP could have a different level of influence on individual firm decisions than would be assumed from the tax cost sensitivity literature. In other words, a discretionary grant offered during a competitive site selection process is likely to have a different impact than a general reduction in costs.

Cost sensitivity – Upjohn approach

The research literature suggests that a 10 percent reduction in state and local business taxes will, in the long-run, holding the quality of public services constant, increase a state's level of business activity by about 5 percent. The "Upjohn approach" assumes that "a cost is a cost", and that changes in business costs due to other factors, such as incentives, will have similar effects per dollar as business tax changes.

To operationalize this, we re-express the tax effects by effects on overall business costs associated with a firm's activity. There are a variety of ways to measure the magnitude of a business's activity. One standard measure of a business's scale is its "value-added": the value of its output (gross sales) less the value of the material inputs it purchases. This represents the "value of output added" by the business's labor and capital. For example, a steel producer's value-added would be the revenue from the steel sold, minus the company's costs to buy iron, coal, and other raw materials. A company's value-added can also be calculated by looking at the sum of all worker compensation (including to managers), the payments to debt holders, and company's profits. The sum of all value-added in the U.S. economy is gross domestic product (GDP).

State and local business taxes have historically averaged around 5 percent of business value-added (Bartik, 2017; Phillips, Sallee, and Peak, 2016). Therefore, if a 10 percent reduction in business taxes increased desired business activity by 5 percent, a 0.5 percent reduction in costs (as a percentage of value-added) will increase desired business activity by 5 percent. So, to be consistent with the effects of tax changes on business location and expansion decisions, a 1 percent business cost reduction (as a percent of business value-added) provided by an incentive would increase the probability of the business making the desired location or expansion decision by 10 percentage points.

In calculating incentive costs as a percentage of value-added, we must consider how firms weigh immediate investment costs with changes in profits next year, five years from now, and ten years from now. The available evidence indicates that businesses substantially discount future benefits in their new plant location or expansion decisions. For example, a study by Poterba and Summers (1995) suggests that the average discount rate used by corporate

executives in evaluating future cash flows is 12 percent annually. This is the real discount rate after adjusting for inflation. This discount rate implies that even after adjusting future dollars for inflation, a real dollar provided 10 years from now is valued at \$0.32 today. This means that upfront incentives have a substantially greater impact than incentives offered many years from now.

Whether it makes sense for policymakers to exploit this high discount rate of business decision makers depends upon whether policymakers should have a substantially lower discount rate than 12 percent annually. Research literature explores the optimal discount rate used for various public policies. As reviewed in Bartik (2011), much of that research literature implies that policymakers should use a real discount rate of 3 percent or less. For evaluating environmental regulations, the U.S. Environmental Protection Agency analyzes benefits and costs using a 3 percent discount rate, and, for comparison purposes, a 7 percent discount rate.

For this study, we assume a social discount rate of 3 percent. Hence, the model analyzes the present value of changes in state residents' incomes, and of incentives, from the perspective of policymakers, at a 3 percent discount rate. However, in estimating the effects of MBDP incentives on individual businesses, the model assumes that businesses are using a 12 percent discount rate in making their decisions.

For the firm analysis, we estimate value added associated with a project over an infinite time horizon. However, only short- and medium-term impacts matter because the model estimates the implications for firm-level decisions using a real discount rate of 12 percent. The MBDP incentives are also discounted using a 12 percent discount rate. The ratio of the incentive to the estimated project value added is then taken. This percentage is then used to project the but-for percentage for that project.

The model as operationalized also assumes that larger incentives have less of an impact (per public dollar invested) on the "but for" percentage than smaller incentives. The but-for percentage here is the percentage of incented firms whose location decision is due to the incentive. This is because the response of businesses to cost changes resulting from incentives is assumed to be logarithmic as described in appendix D of Bartik (2018a). As a result, the ratio of the "but for" percentage to the percentage the incentive is of value added, declines as the incentive percentage gets larger, but only slightly until we get to very large incentives. For example, an incentive of 0.1 percent of value added has a 1 percent but for percentage, 10 times as great. An incentive of 1 percent of value added has a but for percent of 9.6 percent, or 9.6 times as great, a very slight decline. In contrast, an incentive of 10 percent of value added would have a but for percentage of 65.1 percent, or 6.51 times as great. The result of this assumption is that increasing incentive magnitudes tends to reduce the ROI for incentives, but only modestly until we get to very large incentives, at the Amazon or Foxconn level.

For MBDP, the average incentive has a present value of about \$7,500 per job; that is the incentive is equivalent to giving each firm cash of \$7,500 per job today. The average value-added per job of the incented firms is \$168,000 annually per job. The present value of this, evaluated at a 12 percent discount rate, is \$1,568,000 per job. Therefore, the average MBDP incentive is about 0.5 percent of the present value of value-added for the firm. To put it another way, the average MBDP incentive is equivalent to lowering the state and local business taxes owed by the firm by 10 percent, because state and local business taxes are about 5 percent of value-added.

Therefore, a naïve aggregate projection is that the “but for” for the MBDP program should average around 5 percent, based on the research literature that a 10 percent reduction in business taxes increases positive business location decisions by 5 percent. In practice, the estimated average “but for” ends up being higher, as we will see, at almost 10 percent. This slightly higher average is due to the variation across individual projects in incentive amounts and value added per job.

There is some evidence that non-cash benefits in the form of in-kind services to small businesses function in the same way as “incentives” and that they may have higher effects per dollar of public investment. For example, there is research evidence that manufacturing extension services and customized job training have effects on business costs of at least five times the costs of providing these services. If so, in-kind services should affect location and expansion decisions five times as much as tax and other cash incentives. This greater cost-effectiveness depends upon difficult-to-measure assessments of service quality, relevance (i.e., meeting information, cost, or financing gaps), and enhanced accessibility as perceived by targeted small businesses.

Firm choice – CREC approach

Researchers have used three techniques to estimate the “but for” levels for specific incentive programs: interviews/asking the company, comparing assisted companies to non-assisted companies, and regression analysis (Storey, 1990). Since our purpose is to understand the incentive’s effect on the set of companies that received MBDP incentives, the study team developed a variation on the first approach (asking the company) to assess each firm’s propensity to value incentives during the investment decision. In this case, the company’s actual application served as the primary input on the importance the company placed on the incentive, since it represents the company’s statement of interest during the investment decision process itself.

We assumed that the best source of information would be that provided at the time of application with the signature of the company’s leadership attesting to its accuracy. We did not make this assumption naively. Since the applicant is the only valid source that will know its own intentions, the statement of need for the incentive should be taken seriously if not at full face value. Even if the applicant company is being completely honest about the incentive’s

importance, it is not going to be a perfect source. First, its self-interest may lead it to overstate the role of incentives. Second, company personnel do not all value decision factors in the same way, and the perceived importance of the incentive will vary among leaders within the company and can change over time.

The MBDP requires companies seeking program assistance to provide additional supporting documentation when they apply for assistance.¹⁵ The application requests basic applicant details such as name and address, the parent company name and location, the firm's current statewide Michigan employment, the location of each Michigan facility, a project description, proposed project location, alternative project configurations (other sites being considered), demonstration of why the incentive assistance is needed to ensure the project will happen in Michigan, and other data to be considered in evaluating the project for incentives. The study team opted to use the same information available to MBDP in its assessment of the importance of the incentive to securing the deal.

The research literature suggests several firm and project characteristics affect the importance of incentives to business investment decisions. These include:

- **Geographic area.** Efforts to measure incentive influence depend on the geographic frame of reference. For example, a company may have already decided to invest in the United States (so a national incentive would be assumed to have no influence on that choice) but has not chosen the specific state (so state-level incentives would be more likely to affect that decision) (Storey, 1990).
- **Consideration of multiple locations.** Companies that have credibly considered multiple locations that are able to meet their operational needs or have functions that are mobile (that is, they do not need to locate in a specific place in order to meet their operational needs) are more likely to value state and local incentives in their decision process (James, 2013; Jensen, 2016; Tavares-Lehmann et al., 2016). A special case occurs when the investment decision will be made among multiple locations where the company already has operations, and corporate leaders are evaluating which site will generate the highest return.

¹⁵ Applicant firms must also provide a substantial amount of additional information to MEDC. Details on proposed employment, including timing of hires and average annual wages, benefits offered, whether new jobs will be direct employees, investment details, and project contacts are also requested. Supporting documentation that must accompany the application includes a detailed business entity organization chart, financial capacity documentation (three years of annual financial statements), disclosure of lawsuits and proceedings pending or resolved, listing of administrative agency proceedings, articles of organization or incorporation, and a Certificate of Good Standing from the state.

- **New or existing facility.** Incentives are considered especially valuable to attract new businesses or encourage new investment (Hoover, 1975; Stimson, Stough, and Roberts, 2002), but in practice, incentives are frequently offered to existing businesses for retention purposes to encourage investment that might not have otherwise occurred and/or to build goodwill with the firm to ensure that it does not consider alternative locations for its expansion.
- **Features of the incentive offer.** The relative size of the incentive benefit affects its impact (James, 2013; Bartik, 2018a) as do the incentive type and structure, timing of the application, and whether a firm is a first-time or repeat incentive recipient (Foley, 1992; Lenihan et al., 2005).
- **Firm attributes.** Cost-sensitive or efficiency-seeking operations (such as manufacturing, call centers, and distribution centers) and foreign investors have also been found to be more likely to be influenced by the availability of incentives, as are companies for whom the incentive meets a specified need, such as project financing or support services (Tavares-Lehmann et al., 2016).

To operationalize these concepts, we identified project- and firm-specific information available from the MBDP applications and MEDC briefing memos and term sheets for 25 completed projects and 16 terminated projects. As part of the review, we also examined company-provided answers to application queries on alternative project configurations and other sites being considered, why the incentive assistance was needed to ensure the project happened in Michigan, and the project description.

We then selected ten primary factors affecting the importance of incentives (Table B.1), drawn from the research literature and team experience. We established weights for each factor by first assuming each factor carried an equal weight (10%) and then obtaining perspectives on how that baseline assumption should change by querying 23 state and local economic development leaders. This informal approach gave us confidence in the relative ranking of these factors (that is, which were most important and least important), but the weights themselves should not be viewed as definitive. Further research and additional perspectives would strengthen the findings and their utility for understanding the relative influence of different project- and company-specific factors on the importance of incentives. Future iterations would also more fully specify factor descriptions. For example, the factor “project was capital-intensive” was intended to represent cost-sensitive or efficiency-seeking operations, but the wording did not clearly convey those concepts.

Table B.1 Factors affecting the importance of financial incentives to investment decisions

	Baseline weights	Adjusted weights from local partners and state economic development leaders
Considered multiple locations	10%	26%
Addressed a competitive disadvantage	10%	14%
Filled a financing gap	10%	11%
Investment to be made in an existing facility	10%	8%
High incentive to proposed investment ratio	10%	7%
Project was capital-intensive	10%	9%
Project was in final decision stage	10%	7%
Company had operations in multiple locations	10%	13%
Company was foreign-owned	10%	4%
Company was publicly held	10%	2%
Other		

Q: Please weight the factors in the table by their influence on the importance of the incentive. It is not necessary to assign importance to each factor, but the total adjusted weights should total 100%.

From this set of ten factors, we chose seven that were considered important and for which we had consistent data from MBDP applicants: whether the company credibly considered multiple locations, description of a financing gap or competitive disadvantage (specified need), the ratio of the incentive to the projected investment (incentive offer size), whether the company already had operations in multiple locations, whether the company already operated in Michigan or was new to the state, foreign or US parent company ownership, and cost-sensitive industry category. The rounded factor weights are provided in Table B.2.

We then created a scoring system for each factor. Each factor received a score between 0 and 1 as follows:

- Considered multiple locations: 0 = no; 0.5 = yes, among its own existing operations; 1 = yes, multiple locations not limited to its own existing operations
- Described financing gap or disadvantage in the application: 0 = did not describe; 1 = did describe
- Incentive value/projected investment value: 0.25= an incentive to investment ratio between 0 and .125; 0.5 = an incentive to investment ratio between .126 and .25; 0.75 = an incentive to investment ratio between .26 and .375; 1.0 = an incentive to investment ratio between .376 and .5. (No MBDP incentives exceeded 50% of the projected investment value.)
- Company has operations in multiple locations: 0 = no; 1 = yes
- Company already operates in Michigan: 0= yes; 1 = no

- Company is foreign-owned: 0= no; 1 = yes
- Cost sensitive industry: 0 = other; 1 = NAICS 31, 32, 33, 48, 56

Table B.2 Weighting and scoring of factors influencing the importance of incentives

Factor	Scoring Approach	Factor Weight
Considered multiple locations	0=no; 0.5=yes, among its own operations; 1=yes, multiple locations not limited to its own operations	0.25
Described financing gap or disadvantage	0=did not describe gap or MI disadvantage in application; 1=did describe specific gap or disadvantage	0.25
Incentive amount relative projected investment	0=0.125=0.25; 0.126-0.25=0.5; 0.26-0.375=0.75; 0.376-0.5=1	0.15
Company has operations in multiple locations	0=no; 1=yes	0.15
Cost sensitive or capital-intensive industry	0=other; 1=NACIS 31, 32, 33, 56	0.10
Expansion or new to Michigan	0=expansion; 1=new	0.05
Foreign owned	0=US parent; 1=foreign owned company	0.05
Total Factor Weight (combination of the above factors)		1.00

Each of the 25 completed projects and 16 terminated projects were reviewed and scored by two study team members. The last step involved multiplying each factor score by the appropriate weight and adding the factor scores to determine a total project score that hypothesized the likely level of influence the incentive had on each company’s investment decision.

The result was a score for each incentivized project between 0 and 1 that could be provided as an alternative input to the Upjohn model in lieu of Upjohn’s built-in “but for” assumption calculated based on cost sensitivity (as described in the previous section). However, we were mindful that presenting an overly precise figure might be construed as too deterministic, especially given the number of assumptions we have made in developing this approach and the inherent uncertainty associated with the entire “but for” issue. Therefore, we opted to group scores into five categories and assigned a “but for” percentage to each range based on the mid-point of that range. For example, a project that scored 0.75 was given a probability score of 70% based on the score range of 0.61-0.80. The interpretation is that there is about a 70% chance this project was influenced by the incentive given project and company characteristics.

Table B.3 ‘But For’ Probability Assignments based on Weighted Scores

Score Range	Assigned probability
0.05-0.20	10% “but for” or “additionality”
0.21-0.40	30%
0.41-0.60	50%
0.61-0.80	70%
0.81-.0.99	90%

We assume the incentive’s influence can be neither 0 nor 100%.

The scores and assigned probabilities for each project are summarized in Table B.4. Again, each total score indicates that project’s “but for” percentage based on the characteristics described in Table B.2. Our range of estimates suggests that the MBDP incentive would have typically have been responsible for 50-70% of company choices to invest in Michigan These findings suggest that the incentive played an important role in influencing the company’s investment decision. These rates are driven by the applicants’ descriptions of specific other viable locations under consideration, plus additional factors as listed in Table B.2.

Table B.4 Summary project findings and the adjusted “but for” percentage for ROI analysis

	SCORE	“BUT FOR” PERCENTAGE FOR USED IN ROI ANALYSIS
AGS	0.7125	70%
Avon Protection	0.4625	50%
Brose New Boston 2012	0.6125	30%
Denso Manufacturing 2015	0.7125	70%
Denso Manufacturing 2016	0.7125	70%
Fairlife	0.8375	90%
FIAMM	0.7125	70%
HCL	0.5625	50%
Huntington Foam	0.45	50%
Integrated Manufacturing	0.575	50%
JCIM	0.6625	70%
Lacks Enterprises	0.7875	70%
Magna Exteriors	0.5	70%
Magna Seating	0.7875	70%
MedDirect	0.7375	70%
Muskegon Castings	0.6375	70%
Ogihara	0.7125	70%
Pinnacle	0.7875	70%

	SCORE	“BUT FOR” PERCENTAGE FOR USED IN ROI ANALYSIS
Rassini Brakes	0.7125	70%
Sakthi	0.4875	50%
Summit Polymers	0.6625	70%
Undercar Products	0.7125	70%
Unique Instruments	0.6625	70%
Ventra Grand Rapids	0.6625	70%
Whirlpool	0.6	50%
Baker Aerospace Tooling & Machining	0.6625	70%
Cataphora	0.15	10%
Challenge Manufacturing-	0.5125	50%
Eberspacher North America	0.4625	50%
Fullerton Tool Company	0.3875	30%
Martin-Brower Company	0.4375	50%
NEMO Capital Partners LLC	0.2	10%
Nexthermal Corporation	0.425	50%
Norplas Industries	0.7125	70%
NOVO 1	0.8625	90%
Penske Vehicle Services	0.6875	70%
Quality Edge	0.5375	50%
ROL USA	0.8375	90%
Teijin Advanced Composites America	0.6375	70%
Terryberry Company	0.4125	50%
XanEdu Publishing	0.6375	70%

This methodological approach to estimating the importance of the incentive was supplemented by interviews with local economic development partners in the communities where each project occurred.¹⁶ The MBDP process requires a local partner contribution, giving them some insight into the project. In most cases, the local contribution is a property tax abatement that is active for several years beyond the MBDP incentive period, so our working assumption was that the local partner would be familiar with the project both past and present. The local partner also often has current knowledge of the investment’s status and latest developments. For these reasons, the local partner perspective was valuable to understanding the MBDP’s effectiveness to securing the deal and achieving desired outcomes.

¹⁶ Local partners were from MEDC’s regional partners (Economic Development Collaboratives), local government staff, or local economic development organizations, depending on the location and project.

The project team prepared an interview questionnaire, identified local partners for each completed project, and completed 30- to 40-minute phone interviews with local partners for 23 of the 25 completed projects between June and September 2018. Several of the questions were used as checks on our own analyses to make sure our findings did not vary widely from the local understanding. As summarized in the main body of the report, most interviewees agreed that incentives were “very important” or “important.” Further, only one interviewee thought that the project would have gone ahead unchanged without the incentive, while the remainder believed the project would have either gone to another state or would have been delayed or reduced without the incentive.

Local Partner Interview Questions

1. We’d like to start by reviewing our understanding of the project and asking a few questions about the project’s characteristics.
2. A. Which factors motivated xx company’s decision to invest in your community?
 B. Now I would like you to rank some of these factors:

	Very important	Important	Somewhat important	Little importance	Unimportant
Ability to serve markets/customers					
Access to skilled workers					
Availability of infrastructure/utilities					
Availability of site/building					
Overall cost of operations					
State and local incentives					
Other(s) _____					

3. In the absence of grant assistance, would the project (investment) have (choose one option only):
 - a) Gone ahead as now unchanged (that is, same scale, time and location)
 - b) Gone ahead at a different location outside of Michigan (but otherwise unchanged)
 - c) Gone ahead in Michigan at a later date but otherwise unchanged (delayed but otherwise unchanged)
 - d) Gone ahead in Michigan on a reduced scale (but otherwise unchanged)
 - e) Project would have been abandoned

4. Do you think the firm would have hired fewer workers without the financial assistance?
5. How credible was the company’s consideration of other locations, in your opinion?
6. How could the MBDP be improved (in terms of program design or administration)?
7. OPTIONAL: Please weight the factors in the table below by their influence on the importance of the incentive to decision-making. Your answers can apply to investments in general, not just the project we have been discussing.

For example, in your experience, when a company “considers multiple locations” before making an investment, does a financial incentive become more or less important to the decision? It is not necessary to assign importance to each factor, but the total adjusted weights should total 100%

Factors affecting importance of financial incentives to investment decisions	Baseline Weights	Adjusted Weights
Considered multiple locations	10%	
Addressed a competitive disadvantage	10%	
Filled a financing gap	10%	
Investment to be made in an existing facility	10%	
High incentive to proposed investment ratio	10%	
Project was capital-intensive	10%	
Project was in final decision stage	10%	
Company had operations in multiple locations	10%	
Company was foreign-owned	10%	
Company was publicly held	10%	
Other: _____		
TOTAL	100%	100%

Appendix C. State Comparison Interview Protocol and Program Profiles

Interview Protocol

Call opening

We are seeking to better understand the landscape of incentives, specifically how best-practice job creation incentive programs—like your own—are administered and monitored. We’d like to learn from you more about the process behind assessing companies/projects applying for incentives as well as the way your organization tracks and reports outcomes from incentivized investments.

These interviews will be confidential in that we will not quote anyone involved in the conversation, but we will share the states and titles of the participants. When we have completed the interviews we will give you a summary of our findings. We envision this as a paper or memo organized by question that will be completed around the end of the year. We hope this information will be useful to you.

Questions

- Do you consider a project’s return on investment (ROI) when making awards?
 - How do you calculate ROI?
 - Do you use a model to calculate ROI? Over what timeframe do you calculate ROI?
 - What role does it play in your decision-making or reporting?
 - What is the average projected and actual ROI for this program?
- Which factors determine which companies/projects are awarded funds?
 - Specifically, prior to awarding funds to a company, do you have measures in-place to ensure the funds are essential for a project or that the funds are integral to a company investing where it otherwise would not have? In other words, do you account for the “but-for”? And if so, how?
- Do you keep track of companies that were not awarded incentives?
- What is your process for monitoring projects that are awarded funds?
 - Are there project milestones, progress reports, legislative reports?
 - Would you be willing to share copies?
 - How do you verify data that is provided by the company?
- How many jobs have been created by incentivized projects?
 - How do you track projected versus actual jobs created?
 - How have projected jobs (here we mean original projected jobs, not amended projections) compared to actual jobs created?
- How do you manage clawbacks or projects that do not meet the terms of the agreement?

Profiles of State Comparison Programs

Minnesota Job Creation Fund: Minnesota Department of Employment and Economic Development

Overview

The Job Creation Fund (JCF) provides financial incentives to new and expanding businesses that meet certain job creation and capital investment targets. Companies deemed eligible to participate may receive up to \$1 million for creating or retaining high-paying jobs and for constructing or renovating facilities or making other property improvements. In some cases, companies may receive awards of up to \$2 million.

Minnesota Job Creation Fund (2014-2018)	
Number of Establishments	77
Avg. Incentive Investment Amount	\$472,898
Avg. Number of Projected New Jobs	65
Avg. Projected Private Investment	\$6,451,461
Avg. Median Wage of Created Jobs	\$23.47
Avg. Incentive Investment Amount per Job Committed	\$9,801

Eligibility

The program is available to businesses engaged in manufacturing, warehousing, distribution, technology-related industries, finance, insurance; or professional or technical services. Companies must work with the local government (city, county or township) where a project is located to apply to DEED to receive designation as a Job Creation Fund business.

At minimum, a business must:

- Be engaged in an eligible business activity
- Obtain local government support for their project via council resolution
- Invest at least \$500,000 (\$250,000 for Targeted Populations*) in real property improvements within one year of becoming a designated Job Creation Fund business
- Create at least 10 (5 for Targeted Populations*) new full-time permanent jobs within two years of becoming a Job Creation Fund business while maintaining existing employment numbers

- Pay at least \$13.01/hour in wages and benefits in 2018, adjusted annually based on 110 percent of federal poverty guidelines. The level will change again on Jan. 1, 2019.
- Have other location options outside of Minnesota
- Cause no undue harm to Minnesota business competitors
- Certify that the project would not occur without Job Creation Fund assistance

Projects that start their activities prior to becoming designated by DEED are not eligible for the Job Creation Fund.

Projects that receive \$200,000 or more in Job Creation Fund assistance are subject to prevailing wage requirements.

Program Provisions and Guidelines

The Minnesota Job Creation Fund provides a maximum award of \$1 million following performance achievement through two innovative capital investment and job creation incentive award components. Awards of up to \$2 million are available to companies that hire targeted populations, in addition to meeting all other requirements.

Companies that meet eligibility requirements must sign a business subsidy agreement with DEED to meet job retention, creation, wage, and capital investment requirements. The following benefits may be available once a business meets the conditions of its agreement and provides proof of performance:

1. \$1,000 (\$2,000 for Targeted Populations*) per year per job created for jobs paying at least \$26,837 in cash wages
2. \$2,000 (\$3,000 for Targeted Populations*) per year per job created for jobs paying at least \$36,126 in cash wages
3. \$3,000 (\$4,000 for Targeted Populations*) per year per job created for jobs paying at least \$46,448 in cash wages
4. Up to a 5 percent rebate for real property improvements for businesses located in the Twin Cities Metro
5. Up to a 7.5 percent rebate for real property improvements for businesses located in Greater Minnesota

Process

Applications for the Job Creation Fund are accepted year-round. Businesses must apply through the local government unit (city, county or township) where the project will be located. In consultation with DEED, the local government unit will determine whether the business meets

minimum program requirements. Projects that meet the minimum requirements go through the following four-step process:

Step One: With assistance from the local government, the business submits the Job Creation Fund Application Form and required supporting documents to DEED.

Step Two: DEED evaluates the application and notifies the local government and business of approval or denial. If approved, DEED will formally designate the business as a Job Creation Fund business and determine an award amount. Awards in excess of \$500,000 require DEED to hold a public hearing.

Step Three: After a public hearing (if applicable), DEED drafts a business subsidy agreement specifying project goals and duration for the agreement and sends it to the business for signature. The business then returns the agreement to DEED for final signature by the DEED commissioner.

Step Four: Through the duration of the business subsidy agreement, the local government will continue to provide assistance to the designated JCF business. This includes collecting required reporting information and submitting progress reports, annual reports, requests for payment, and providing updates to the business regarding updates to annually adjusted wages.

Job Development Investment Grant: North Carolina Department of Commerce

Overview

The Job Development Investment Grant (JDIG) is a performance-based, discretionary incentive program that provides cash grants directly to new and expanding companies to help offset the cost of locating or expanding a facility in North Carolina. The grant amount is based on a percentage of the personal income tax withholdings associated with the new jobs.

North Carolina's JDIG Program Summary (2013-2017)	
Number of Establishments	92
Avg Incentive Investment Amount	\$8,338,704
Avg Number of Jobs Created	394
Avg Projected Private Investment	\$75,986,169
Average Pay Rate	\$31.93

Eligibility

The JDIG program is available to eligible businesses that create qualified new jobs and investments in North Carolina. Qualified new jobs must meet the county average wage requirement and the business must provide health insurance and pay at least 50% of the

premiums for participating employees to be eligible. JDIG cannot be used to incentivize job retention.

Program Provisions and Guidelines

The JDIG program provides support in the form of annual grant disbursements for a period of up to 12 years to new and expanding businesses based on a percentage of withholding taxes paid by new employees during each calendar year of a grant.

For high-yield projects that invest \$500+ million and create 1,750+ jobs, JDIG can provide a grant worth up to 100% of personal income tax withholdings for up to 20 years. For transformative projects that invest \$4 billion+ and create 5,000+ jobs, JDIG can provide a grant worth up to 100% of personal income tax withholdings for up to 25 years.

When deciding whether to award a grant and the appropriate amount and term of a grant, the Economic Investment Committee considers both economic and fiscal impacts. The amount of a JDIG award is calculated by weighing several factors to determine its potential value, including:

- Location of the project
- Project county tier designation
- Number of projected net new jobs
- Projected Wages of the added jobs compared to the county average wage
- Level of projected investment
- Whether the industry is one of the state's targeted industry sectors

Fees

Grant applicants are required to pay a \$10,000 nonrefundable fee with the submission of a completed application (application fees were raised from \$5,000 in 2013). Grant recipients are also required to pay an annual fee with the submission of each annual report, when filed with the NC Department of Commerce. The annual fee amount is the greater of \$2,500 or .03% of the grant amount awarded to the company. The amount of a grant associated with any specific position may not exceed \$16,000 in any year.

Process

A five-member Economic Investment Committee (EIC) evaluates projects and determines the disbursement amount of JDIG awards. The North Carolina Department of Commerce administers the program on behalf of the EIC. North Carolina statute requires that the company maintain operations at the project location, or at another approved site in North Carolina, for at least 150% of the term of the grant.

Project application materials and the results of staff analysis are provided to the EIC and considered in one or more closed sessions. The EIC then considers the appropriate terms for a given project, and a term sheet is provided to the company that outlines the structure and proposed terms of the grant and the conditions necessary to fulfill the grant requirements. If the company accepts the terms in writing and commits to locate the project in North Carolina, subject to the award of the grant, an open meeting is held by the EIC to award the grant, and a Community Economic Development Agreement (“CEDA”) is executed. Grantees are required to submit performance reports by March 1st of each year following the end of a calendar year during the grant term. These reports allow Commerce and the EIC to assess grant performance and eligibility to receive scheduled disbursements. The actual disbursement amount for which the company is eligible is determined from Commerce’s analysis of the annual performance reports. The Department of Revenue certifies the company’s reported withholdings and the absence of overdue tax debts. All disbursements must be approved by the EIC before actual payment.

JobsOhio Economic Development Grant: JobsOhio

Overview

The JobsOhio Economic Development Grant (“The Grant”) is a performance-based, discretionary incentive program that provides cash grants directly for projects in Ohio engaged in targeted industries. Grant decisions are based on several project factors, including but not limited to job creation, additional payroll, fixed-asset investment commitment, project return on investment, and project location.

Eligibility

The Grant is available to companies engaged in Ohio’s targeted industries or business functions seeking to locate a project in the state. Ineligible projects include but are not limited to retail and other population driven businesses. Companies must operate in one of the following industries to be eligible for the grant:

- Aerospace & Aviation
- Automotive Manufacturing
- Financial Services
- BioHealth
- Advanced Manufacturing
- Energy
- Food Processing
- Information Technology and Services
- Polymers and Chemicals
- Headquarters and Consulting
- Back Office
- Logistics
- Research and Development

Eligible costs must focus on fixed asset and infrastructure investment, including land, construction and renovation, machinery and equipment, relocation, infrastructure, site development, and software development. The Grant cannot be used to finance any debt or bond obligations, repay any fines or penalties, or rental payments. Grant applicants are required

to create a specified number of jobs within a set period as determined by JobsOhio, typically within 3 years. Projects that retain jobs may also be considered. JobsOhio will set a wage floor based on multiple wage considerations for each project.

Program Provisions and Guidelines

The Grant provides support in the form of a reimbursement-based cash grant for meeting specified job and investment targets. Claims of job creation and retention, and investment, require supporting documentation to receive disbursements.

When deciding whether to award a grant and the appropriate amount for a grant, JobsOhio considers several factors influencing the economic impact and fiscal effects of a project including:

- Average Wage of New Employees
- Number of Jobs to be created
- Number of Jobs to be retained
- Fixed-Asset Investment Commitment
- Project Return on Investment
- Project Location
- Project Industry

JobsOhio may also consider providing assistance for eligible projects that improve operational efficiencies or production expansion at a facility.

Fees

For information on the grant application and any fees, applicants must contact JobsOhio.

Process

JobsOhio reviews all applications and administers the program. Companies are required to submit commitments for job creation and the associated payroll, job retainment, and fixed asset investment in their application. Applicants for The Grant are also eligible to receive additional program support in the form of grants or loans from JobsOhio as a result of their application. Grantees must provide supporting documentation of their attainment of specified targets to receive grant disbursements.

JobsOhio Economic Development Grant Program Summary (2015-2018)	
Number of Establishments	230
Avg. Incentive Investment Amount	\$ 422,768.33
Avg. Number of New Jobs Committed	142
Avg. Number of Jobs Retained	261
Avg. Median Wage of Committed New Jobs	\$ 46,058.60
Avg. Projected Private Investment	\$ 30,596,441.27
Avg. Incentive Investment Amount per Committed New Job	\$ 2,973.51
Avg. Incentive Investment Amount per Committed New and Retained Job	\$ 1,047.62

Texas Enterprise Fund: Office of the Governor, Economic Development and Tourism Division

Overview

The Texas Enterprise Fund (TEF) is a performance-based, discretionary incentive program that provides cash grants directly to new and expanding companies where a single Texas site is competing with another viable out-of-state option. The grant amount is determined by an analytical model of the state's estimated increase in sales tax revenue attributable to the project.

Eligibility

The TEF is available to companies planning a new project, with significant projected job creation and capital investment, where a single site in Texas is actively competing with at least one viable out-of-state option. The company must not have conducted actions that signify a location decision, such as signing a lease, purchasing land, or hiring employees, to receive the grant. Eligible companies must operate in an advanced industry that could potentially locate elsewhere including:

- Advanced Technologies and Manufacturing
- Aerospace, Aviation, and Defense
- Biotechnology and Life Sciences
- Information and Computer Technology
- Petroleum Refining and Chemical Products
- Energy

The TEF considers significant job creation to be at least 75 full time employees (FTE) in urban areas or 25 FTE in rural areas. The total average wage for new jobs must remain above the average county wage of the project location throughout the full term of the agreement. Projects must demonstrate significant levels of planned capital investment and a significant return on public investment, as determined by the Governor's Office.

Only applications by companies that demonstrate financial stability will be considered. Additionally, the project must have community involvement in the form of local economic incentive offers from the city, county, and/or local school district in which the project is located.

Program Provisions and Guidelines

The TEF provides support in the form of grant disbursements awarded for meeting contractually agreed upon job and wage targets for a given individual period, typically set annually.

When deciding whether to award a grant and the appropriate amount and term of a grant, the Governor's Office ultimately considers the fiscal impacts of a project. The amount of a TEF award is calculated according to an economic model (STAMP), that ensures the state will see a full return on investment within the period of a project contract in the form of estimated sales tax revenues. The ROI and the associated grant amount is determined by several factors, including:

- Average Wage of New Employees
- Number of Jobs to be Created
- Timeframe for Hiring
- Average Wages to be Paid
- Total Proposed Capital Investment

Grantees must maintain the contractually agreed upon job and wage figures throughout the full term of the contract. Grant funds are disbursed according to a company’s ability to meet the target dates for qualified job creation and investment, prorated to any partial attainment of these targets. If a grantee fails to maintain these figures or fails to meet other terms of the contract, the Governor’s Office may demand repayment of previously disbursed funds in the form of clawbacks.

Fees

Grant applicants are required to pay a \$1,000 nonrefundable fee with the submission of a completed application to be considered for the TEF.

Process

The Governor, Lieutenant Governor, and Speaker of the House review all applications and must unanimously agree to support the use of TEF for each project. The Texas Office of the Governor, Economic Development and Tourism Division administers the program.

Companies must submit a completed application package to the Office of the Governor to be considered for the award. Applications are accepted on a rolling basis. After applying, the company will be subject to an 11-step due diligence process including a review of corporate activity, financial standing, tax status, legal issues, and credit ratings. The Office of the Governor will also consider the project’s estimated economic impact, and the business climate of competing locations in reviewing an application. If a project is approved for a TEF award, a performance-based grant contract will be executed, which will include provisions to ensure that Texas taxpayer funds are spent effectively and efficiently. This includes the grantee agreeing to submit an annual progress report to the Office of the Governor containing information regarding the attainment of each set performance target. If TEF offers a grant of \$1,000,000 or more to an applicant, the company must additionally submit a “Disclosure of Interested Parties Form” to the Governor’s Office. After signing the contract, each TEF grantee will also participate in a press release with the Governor’s Office announcing the project and the TEF award amount.

Texas Enterprise Fund Program Summary from Site (2004-2017)	
Number of Establishments	152
Avg. Incentive Investment Amount	\$ 3,981,382.87
Avg. Number of Jobs Committed	597
Avg. Projected Private Investment	\$ 178,474,642.95
Avg. Clawbacks and Other Repayments	\$ 499,708.82
Avg. Incentive Investment Less Clawbacks	\$ 3,481,674.05
Avg. Incentive Investment Amount per Job Committed	\$ 6,668.98
Avg. Incentive Investment Amount less Clawback per Job Committed	\$ 5,831.95

Appendix D. ROI and But-For Calculations by Project

Table A.1 ROI for Each Project: 41 Completed and Terminated Projects, Plus 198 Pending Projects, with Project Characteristics

Upjohn project number	MEDC Project ID	Project name	Year	Industry (NAICS)	Multiplier	Value Added per FTE Worker	Project type ^a	Project Status ^b	PV of MBDP costs (\$M)	Final jobs	County	Unemp rate	MEDC Total ROI	Upjohn ROI
Project 1	0066000000JWHgU	AGS Automotive Systems - 2012 E	2013	3361-3363	4.15	\$255,644	E	C	1.101	90	Macomb	9.5	4.4	2.22
Project 2	0066000000Sq4G5	Avon Protection Systems - E - Fire Service Industry Mfg.- 2014 E	2015	339	2.76	\$116,400	E	C	0.117	29	Wexford	6.7	11.6	5.19
Project 3	0066000000KsWQo	Brose New Boston, Inc.-Project Fire	2012	3361-3363	4.15	\$250,392	NF	C	4.433	350	Wayne	11.7	6.1	2.61
Project 4	006600000016IndB	Denso Manufacturing Michigan -Inc. Project Bob - E - FY2015 Battle Creek	2015	3361-3363	4.15	\$244,875	E	C	0.748	100	Calhoun	5.1	9.8	3.34
Project 5	0063200000110SZq	Denso Manufacturing Michigan, Inc.- E - FY2016	2016	3361-3363	4.15	\$238,380	E	C	0.733	341	Calhoun	4.8	2.5	3.61
Project 6	0066000000KvAC2	Fairlife, LLC - Coopersville E Project 2012	2013	311-312	3.65	\$131,717	E	C	1.086	130	Ottawa	6.1	4	5.14
Project 7	0066000000HTHuK	FIAMM Technologies, Incorporated - New Electronic Horn	2013	3361-3363	4.15	\$255,644	E	C	0.620	35	Wexford	11.1	3.8	3.27
Project 8	0066000000lqcgi	HCL America Inc.-MI Office	2013	518-519	2.81	\$94,464	NF	C	0.847	100	Jackson	8.3	9.8	5.90
Project 9	0066000000KuiCP	Huntington Foam Corporation- Huntington Foam E and Retention 2012	2012	325	3.70	\$212,306	E	C	0.436	30	Montcalm	10.2	5.8	3.25

MBDP Effectiveness Study

Upjohn project number	MEDC Project ID	Project name	Year	Industry (NAICS)	Multiplier	Value Added per FTE Worker	Project type ^a	Project Status ^b	PV of MBDP costs (\$M)	Final jobs	County	Unemp rate	MEDC Total ROI	Upjohn ROI
Project 10	0066000000S7IJE	Integrated Manufacturing & Assembly, LLC- Combined E-2013	2014	3361-3363	4.15	\$239,128	E	C	4.011	620	Wayne	9.7	14.1	2.86
Project 11	0066000000RBzsl	JCIM US, LLC-2013-E	2014	3361-3363	3.36	\$239,128	E	C	0.944	219	Monroe	6.1	11.7	3.90
Project 12	0066000000ltdvr	Lacks Enterprises, Inc.- Lacks E 2011	2013	332	2.86	\$96,725	E	C	0.395	124	Kent	6.2	21.5	5.31
Project 13	0066000000uLpVt	Magna Exteriors and Interiors USA, Inc.-E (Phase 2) - FY2014	2014	3361-3363	4.15	\$239,128	E	C	0.999	445	St Clair	9.6	32.4	2.69
Project 14	0066000000KLEKP	Magna Seating of America Inc.- Highland Park E 2012	2012	3361-3363	4.15	\$250,392	E	C	0.904	263	Wayne	11.7	13.3	2.67
Project 15	0066000000KtzIB	MedDirect, Inc.- MedDirect E 2012	2012	54	2.36	\$91,510	E	C	0.316	100	Kent	6.8	7.8	4.31
Project 16	0066000000IR6f6	Muskegon Castings Corp - new facility 2012	2012	331	3.37	\$182,786	NF	C	0.671	148	Muskegon	10	6.1	3.97
Project 17	0066000000LR3cl	Ogihara America Corporation-Howell	2014	3361-3363	4.15	\$239,128	E	C	0.364	78	Livingston	6.4	15.8	2.18
Project 18	0066000000HROYN	Pinnacle Foods Corporation/Vlasic Brands-SQF E	2013	311-312	3.65	\$131,717	E	C	1.011	46	Lapeer	11.4	1.8	4.24
Project 19	0066000000P1YFe	Rassini Frenos S A de C V - Rassini Brakes	2013	3361-3363	4.15	\$255,644	NF	C	0.607	61	Genesee	9.7	2.6	3.26
Project 20	0066000000JUDQZ	Sakthi Auto Group USA- Design Development and Manufacturing Project	2013	3361-3363	4.15	\$255,644	NF	C	2.572	172	Wayne	11.5	19.6	2.71
Project 21	0066000000M4YQG	Summit Polymers, Inc.- Three Site E	2013	326	3.22	\$98,565	E	C	0.468	77	Kalamazoo	6.9	7.6	6.11
Project 22	0066000000MZdp4	Undercar Products Group-Undercar E 2012	2013	326	3.22	\$98,565	E	C	0.580	151	Kent	6.2	19.5	6.36
Project 23	0063200001lpXKt	Unique Instruments, Inc.- FY2016 - manufacturing relocation	2017	339	2.76	\$112,917	R	C	0.112	34	Saginaw	5.5	5.8	5.60

MBDP Effectiveness Study

Upjohn project number	MEDC Project ID	Project name	Year	Industry (NAICS)	Multiplier	Value Added per FTE Worker	Project type ^a	Project Status ^b	PV of MBDP costs (\$M)	Final jobs	County	Unemp rate	MEDC Total ROI	Upjohn ROI
Project 24	0066000000TopJ8	Ventra Grand Rapids 5, LLC-Sassy E 2013	2014	333	2.95	\$115,448	E	C	0.770	170	Kent	4.9	9.9	4.62
Project 25	0066000000KvxPC	Whirlpool Corporation-Project Perch	2013	54	2.02	\$91,567	R	C	2.893	180	Berrien	8.7	3.3	5.76
Project 26	0066000000ODjwU	Baker Aerospace Tooling & Machining, Inc.- E	2013	332	2.86	\$96,725	E	T	0.601	92	Macomb	9.5	6.6	4.66
Project 27	0066000000LSEZG	Cataphora-Ann Arbor	2013	51	2.72	\$171,355	E	T	0.190	1	Washtenaw	5.8	3.6	1.24
Project 28	0066000000OkQJN	Challenge Manufacturing-Challenge E 2013	2015	3361-3363	4.15	\$244,875	E	T	1.150	153	Allegan	4.1	9	2.77
Project 29	0066000000NEKip	Eberspacher North America, Inc.-E-2014	2016	3361-3363	4.15	\$238,380	E	T	1.279	142	Livingston	4.1	7.6	2.24
Project 30	0066000000xJ4aG	Fullerton Tool Company - E - 2014	2015	333	2.95	\$118,937	E	T	0.152	21	Saginaw	5.7	5.8	5.63
Project 31	0066000000KuhuT	Martin-Brower Company-M&M Acquisition & E 2012	2013	42	2.49	\$169,650	A and E	T	0.411	126	Clinton	6	10.6	2.16
Project 32	00660000001HEWmU	NEMO Capital Partners LLC - E - 2015	2015	55	3.08	\$161,717	E	T	0.302	45	Oakland	4.7	10.6	2.36
Project 33	0066000000xGSYY	Nexthermal Corporation - E - 2014	2015	335	3.34	\$178,122	E	T	0.026	6	Calhoun	5.1	7.3	3.57
Project 34	0066000000Ng2vi	Norplas Industries - Michigan Assembly	2014	3361-3363	4.15	\$239,128	NF	T	0.765	393	Wayne	9.7	16.2	2.82
Project 35	0066000000X22zv	NOVO 1 - New Michigan Center 2014	2014	56	1.50	\$44,086	NF	T	0.000	0	Kent	4.9	9	
Project 36	0066000000M1qxy	Penske Vehicle Services formerly Alternative Automotive Technologies / QEK-E 2012	2012	54	2.36	\$91,510	E	T	0.463	6	Oakland	8.2	25.6	2.21
Project 37	0066000000LSu0l	Quality Edge, Inc. - QE 2012	2013	331	3.37	\$165,283	E	T	0.029	27	Kent	6.2	6.6	3.19

MBDP Effectiveness Study

Upjohn project number	MEDC Project ID	Project name	Year	Industry (NAICS)	Multiplier	Value Added per FTE Worker	Project type ^a	Project Status ^b	PV of MBDP costs (\$M)	Final jobs	County	Unemp rate	MEDC Total ROI	Upjohn ROI
Project 38	0063200001i0KFc	ROL USA, Inc.- Project Lithuania E - FY2016	2016	337	2.87	\$114,098	E	T	0.000	30	Allegan	3.9	2.7	
Project 39	0066000000ltdy7	Teijin Advanced Composites America Inc.-Tech Center	2013	54	2.36	\$91,567	NF	T	0.385	22	Oakland	7.8	4.5	3.06
Project 40	0066000001ihXAc	Terryberry Company - E - FY2015	2015	339	2.76	\$116,400	E	T	0.157	30	Kent	3.8	6.9	4.46
Project 41	0066000000X1Lbt	XanEdu Publishing, Inc.-E 2014	2016	42	2.49	\$166,595	E	T	0.084	16	Washtenaw	3.7	8.5	2.47
Project 42	0066000000Tr7iu	Advance Engineering Company-E 2014	2015	3361-3363	4.15	\$244,875	E	P	0.234	78	Wayne	6.9	8.4	2.65
Project 43	0066000001OBlkH	Agape Plastics, Inc. - E - FY2015	2016	326	3.22	\$105,588	E	P	0.320	58	Ottawa	3.4	4.5	6.37
Project 44	0066000001dOs7H	AGC America, Inc - Project R - FY2016	2017	327	3.19	\$143,124	R	P	0.076	10	Oakland	3.4	6.3	3.43
Project 45	0066000000S9W1K	Aisin Technical Center-Northville relocation E 2013	2015	54	2.36	\$94,297	E	P	0.895	103	Wayne	6.9	5.6	4.14
Project 46	0066000000xHdHh	American Axle & Manufacturing - E (Detroit Technical Center) - 2014	2015	3361-3363	4.15	\$244,875	E	P	0.607	44	Wayne	6.9	1.4	2.62
Project 47	0066000000ld8p6	Anchor Coupling, Inc.- E (Project Topaz) - 2014	2015	333	2.46	\$118,937	E	P	0.873	57	Menominee	5.4	2.4	5.69
Project 48	0060d00001qSrBl	Antolin Shelby, Inc.- E - FY2018	2017	3361-3363	4.15	\$233,804	E	P	3.755	110	Macomb	4.3	7.5	2.61
Project 49	0063200001mi0Mf	ArcelorMittal - E - FY2017 (Project Ace)	2017	332	2.86	\$96,220	E	P	1.968	83	Wayne	5.4	3.2	4.99
Project 50	0066000000LST6O	ArcticAx US Ltd- ArcticAX 2012 New Site in Grand Rapids	2012	54	2.36	\$91,510	NS	P	0.156	9	Kent	6.8	7.6	4.03
Project 51	0066000001dND9F	Atomic Object, LLC - E - FY2015	2016	54	2.36	\$94,509	E	P	0.090	8	Kent	3.5	4.2	4.56
Project 52	0063200001oZ0X7	Attwood Corporation - Project MotorGuide - E FY2017	2018	332	2.86	\$94,468	E	P	0.305	16	Kent	3.6	4	6.08

MBDP Effectiveness Study

Upjohn project number	MEDC Project ID	Project name	Year	Industry (NAICS)	Multiplier	Value Added per FTE Worker	Project type ^a	Project Status ^b	PV of MBDP costs (\$M)	Final jobs	County	Unemp rate	MEDC Total ROI	Upjohn ROI
Project 53	0063200001mRpil	Automotive Lighting LLC - Automotive Lighting Manufacturing Conversion - FY2017	2017	3361-3363	4.15	\$233,804	E	P	1.669	167	Oakland	3.4	7.8	2.60
Project 54	0066000000dwlc4	AvaSure - E - 2014	2016	339	2.76	\$115,127	E	P	0.403	75	Kent	3.5	9	4.79
Project 55	0063200001oD644	Baker Industries, Inc. - E - FY2017	2017	333	2.95	\$108,560	E	P	0.153	40	Macomb	4.3	3.7	4.70
Project 56	0066000000MblEd	Black & Veatch Corporation- New Market E	2014	54	2.36	\$92,415	NS	P	0.314	51	Washtenaw	4.9	9.2	4.31
Project 57	0066000000MZeM9	Bleistahl North America LP-Project Heavy Metal	2014	3361-3363	4.15	\$239,128	NS	P	0.550	56	Calhoun	6.3	5	3.76
Project 58	0066000000PhUM0	Blissfield Manufacturing Company-2013 MI - IN Consolidation	2014	333	2.46	\$115,448	R	P	0.152	39	Lenawee	6.4	5.7	6.02
Project 59	0066000000Qf5Kp	BorgWarner Inc. - R&D Center E - FY2014	2015	3361-3363	4.15	\$244,875	E	P	3.740	180	Oakland	4.7	4.7	2.14
Project 60	0063200001mBac0	BorgWarner, Inc. - R&D E - FY2016	2017	3361-3363	4.15	\$233,804	E	P	0.764	76	Oakland	3.4	0.8	2.70
Project 61	0066000000xluE6	Brose North America -Project Huron	2015	54	2.36	\$94,297	E	P	2.384	257	Wayne	6.9	3.9	4.17
Project 62	0066000001ihuSt	Byrne Electrical Specialists - E - FY2016	2016	334	3.03	\$110,289	E	P	0.171	34	Montcalm	5.3	7.6	6.27
Project 63	0066000000dtdSt	Capital Welding, Inc.-2014 E	2014	Rest of 336	3.54	\$111,948	E	P	0.488	73	Wayne	9.7	6.1	5.86
Project 64	0066000000lczGf	Cargill Kitchen Solutions - E - FY2015	2015	311-312	3.65	\$134,184	E	P	0.287	83	Ionia	4.6	6	5.64
Project 65	0063200001jG6b7	Carhartt, Inc. - E - FY2015	2016	315-316	1.90	\$58,911	E	P	0.326	51	Wayne	6.3	6.2	5.77
Project 66	0066000000ldndX	Cascade Die Casting Group - E - 2014	2015	331	3.37	\$142,992	E	P	0.317	54	Kent	3.8	7.5	4.40

MBDP Effectiveness Study

Upjohn project number	MEDC Project ID	Project name	Year	Industry (NAICS)	Multiplier	Value Added per FTE Worker	Project type ^a	Project Status ^b	PV of MBDP costs (\$M)	Final jobs	County	Unemp rate	MEDC Total ROI	Upjohn ROI
Project 67	0066000000OkmQE	CDK Global, LLC - Automatic Data Processing, Inc.- New Development 2013	2014	54	2.36	\$92,415	NS	P	1.799	150	Wayne	9.7	4.3	4.02
Project 68	0066000000leJXU	CDK Global, LLC - E - 2014	2015	54	2.36	\$94,297	E	P	1.093	117	Wayne	6.9	4	4.28
Project 69	0066000000WzOp5	Challenge Manufacturing Company-East Side Plant	2016	3361-3363	4.15	\$238,380	NS	P	1.525	250	Oakland	4.2	8.6	2.43
Project 70	0066000000LQ3nj	Cherry Growers, Incorporated- Materne Second Phase	2012	311-312	3.65	\$133,250	NS	P	3.306	59	Grand Traverse	8.3	2.9	4.12
Project 71	0066000000TpKtl	Chi - Charter House Innovations- New Headquarters & Manufacturing Center	2014	337	2.87	\$113,617	NS	P	0.231	63	Ottawa	4.8	6	5.03
Project 72	0066000000Ph2na	Circuit Controls Corporation-VW E	2015	3361-3363	4.15	\$244,875	E	P	0.210	38	Emmet	7.2	8	3.39
Project 73	0066000000SWKrQ	Comprehensive Logistics - New Building Detroit - 2013	2015	42	2.49	\$167,083	NS	P	0.696	300	Wayne	6.9	13.1	2.16
Project 74	0066000000JTopg	Computerized Facility Integration - E 2011	2015	54	2.36	\$94,297	E	P	0.129	43	Oakland	4.7	9.1	3.49
Project 75	0066000000LSqBx	Continental Automotive Systems - Project Apollo	2015	3361-3363	4.15	\$244,875	E	P	0.963	250	Oakland	4.7	21.1	2.59
Project 76	0066000000S7prc	Cooper Standard Automotive-Ford Work	2014	3361-3363	4.15	\$239,128	E	P	1.151	192	Oscoda	11.8	6.8	4.11
Project 77	0066000000lrRGR	Cooper Standard Automotive-Leonard E	2013	3361-3363	4.15	\$255,644	E	P	0.162	30	Oakland	7.8	11.1	1.87
Project 78	0063200001jmBw9	Coyote Logistice - Logistics Operations - FY16	2016	48-49	1.91	\$77,797	E	P	0.187	78	Washtenaw	3.7	4.5	4.94

MBDP Effectiveness Study

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Project 79	0066000000P3Em5	Coyote Logistics, LLC-Michigan E-2013	2014	54	2.36	\$92,415	E	P	1.142	122	Washtenaw	4.9	1.9	4.75
Project 80	0063200001nZzpq	Creative Foam Corporation - E - FY2017	2017	326	3.22	\$103,562	E	P	0.134	37	Genesee	5.8	3.4	7.61
Project 81	0066000000KKuwp	Credit Acceptance Corporation- 2012 E	2013	52	2.81	\$96,102	E	P	2.051	310	Oakland	7.8	7.2	4.77
Project 82	0063200001mTUHY	CUP Acquisition, LLC dba Custom Profile, Inc. - E - FY2017	2017	326	3.22	\$103,562	E	P	0.227	57	Kent	3.5	1.8	6.53
Project 83	0063200001kZvPy	Daifuku - E (Engineering Center and HQ 'Project Kryptonite') - FY2016	2016	55	3.08	\$162,913	E	P	0.417	68	Oakland	4.2	23.1	2.36
Project 84	0066000000OkKce	Dairy Farmers of America-Project Thumb	2014	311-312	3.65	\$131,767	NS	P	0.584	31	Tuscola	8.6	4	5.60
Project 85	0066000000xGaBH	DAVID Corporation-2014 E	2015	51	2.72	\$173,462	E	P	0.120	18	Wayne	6.9	10.4	2.24
Project 86	0063200001nRjy	Denso International America, Inc.- E - FY2017	2018	3361-3363	4.15	\$229,547	E	P	0.305	47	Oakland	3.51	7.1	2.81
Project 87	0066000000OFILo	Denso Manufacturing Michigan, Inc.-2012 E	2013	3361-3363	4.15	\$255,644	E	P	1.774	266	Calhoun	7.9	7.3	3.19
Project 88	0066000000OCPzV	Denso-2012 R&D E	2013	3361-3363	4.15	\$255,644	E	P	1.799	176	Oakland	7.8	5	2.18
Project 89	00660000016jupO	Detroit Diesel Corporation - E - FY2015	2016	3361-3363	4.15	\$238,380	E	P	0.270	50	Wayne	6.3	19.6	2.83
Project 90	0066000000Nftp4	Detroit Diesel-E 2013	2016	3361-3363	4.15	\$238,380	E	P	0.255	100	Wayne	6.3	11	2.85
Project 91	0063200001nZw2y	Detroit Engineered Products, Inc. - E - FY2017	2017	54	2.36	\$94,614	E	P	0.178	26	Oakland	3.4	6.4	3.76

MBDP Effectiveness Study

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Project 92	0066000000LQOKK	Detroit Thermal Systems-2012 E Detroit Thermal Systems	2013	3361-3363	4.15	\$255,644	E	P	0.931	329	Wayne	11.5	26.6	2.53
Project 93	0066000000OFAsk	Dieomatic, Inc.- Cosma Casting E 2013	2014	3361-3363	4.15	\$239,128	E	P	0.763	201	Calhoun	6.3	11.5	3.87
Project 94	0066000000NEWj8	Dieomatic, Inc.- E 2012	2013	3361-3363	4.15	\$255,644	E	P	0.759	235	Oakland	7.8	28.6	2.36
Project 95	0063200001I0uvS	Disher- E - FY2016	2017	54	2.36	\$94,614	E	P	0.050	18	Washtenaw	3.6	8.3	4.91
Project 96	0063200001Iqcdb	Dorel Home Furnishings, Inc. - E - FY2017	2017	337	2.40	\$105,018	E	P	0.107	36	Cass	4.7	3.8	7.09
Project 97	0063200001I2Vp9	Dornerworks Ltd - E - FY2016	2016	54	2.36	\$94,509	E	P	0.119	16	Kent	3.5	4.7	4.76
Project 98	0063200001I0mzf	Duo Security - E - FY2016	2017	51	2.72	\$164,035	E	P	0.641	75	Washtenaw	3.6	8.7	2.86
Project 99	0063200001I25ny	Eagle Film Extruders - E - FY2016	2017	326	3.22	\$103,562	E	P	0.313	50	Kent	3.5	4	6.55
Project 100	0066000000dv4NO	Eissmann Automotive Port Huron LLC-Project Sentinel- 2014	2015	3361-3363	4.15	\$244,875	NS	P	0.499	132	St Clair	6.8	32.6	2.79
Project 101	0066000001HDzfx	Emhart Teknologies/St Stanley Black & Decker/St Stanley Engineered Fastening - Retention - FY2015	2016	332	2.86	\$98,103	E	P	0.368	91	Macomb	5.2	12.7	5.09
Project 102	0063200001mT62g	Fairlife, LLC - Project Boundary Waters - FY2017	2017	311-312	3.65	\$136,220	E	P	2.451	52	Ottawa	3.3	1.3	4.61
Project 103	0066000000QdS39	Firstronic LLC-GR E 2013	2013	3361-3363	4.15	\$255,644	E	P	0.372	110	Kent	6.2	15.9	2.70
Project 104	0066000000IezLp	Flow-Rite Controls, Ltd. - E - 2014	2014	332	2.86	\$97,634	E	P	0.128	70	Kent	4.9	9.8	6.13
Project 105	0066000001OBe9T	Fori Automation - E - FY2015	2015	333	2.95	\$118,937	E	P	0.280	55	Macomb	5.8	11.8	4.30
Project 106	0066000000xGmSG	Founders Brewing Company - E - 2015	2015	311-312	3.65	\$134,184	E	P	0.265	283	Kent	3.8	8.2	6.13

MBDP Effectiveness Study

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Project 107	0066000000OkzE6	Fuyao Automotive North America Inc - Encapsulation Plant	2015	327	3.19	\$154,867	E	P	0.865	84	Oakland	4.7	2.9	2.90
Project 108	0066000000xGEPc	Gentherm - E and Relocation - FY2015	2015	54	2.36	\$94,297	E	P	0.539	103	Oakland	4.7	20.5	3.71
Project 109	0066000000P1pgc	GKN Driveline North America-Project EDGE	2014	54	2.36	\$92,415	E	P	1.200	50	Oakland	6.5	0.7	3.17
Project 110	0066000000OkQSK	Grand Rapids Chair Company-GR Chair Training Opportunity 2013	2015	337	2.87	\$114,098	R	P	0.229	53	Kent	3.8	5.6	4.89
Project 111	0066000001dNNOF	Great Expressions Dental Center HQ- HQ Relocation (E) - FY2015	2016	55	3.08	\$162,913	R	P	0.314	84	Oakland	4.2	9.6	2.68
Project 112	0066000000uLMUe	Hannigan Insurance - E - 2014	2015	56	1.50	\$45,128	E	P	0.095	16	Washtenaw	3.7	3.7	5.87
Project 113	0063200001kPcbu	Hanson Systems, LLC dba Eagle Technologies Group - E - FY2016	2016	333	2.46	\$110,685	E	P	0.497	73	Berrien	5	8.3	7.09
Project 114	0066000000Kut5L	Hanwha L&C Alabama-manufacturing facility	2014	326	2.67	\$100,055	E	P	0.195	0	Monroe	6.1	3.6	0.30
Project 115	0066000001VVCVQf	Harloff Manufacturing Company, LLC - Relocation - FY2015	2015	332	2.86	\$97,697	NS	P	0.069	11	Van Buren	6.3	5.7	7.00
Project 116	0066000000uLitS	Harman - E (+Consolidation) - 2014	2016	334	3.03	\$110,289	E	P	0.427	72	Oakland	4.2	15.6	4.23
Project 117	0063200001jXlpl	Hearthside Food Solutions - E K2 - FY2015	2016	311-312	3.65	\$138,886	E	P	0.328	80	Kent	3.5	5.9	5.08
Project 118	0066000001dMjIC	Hearthside Food Solutions, LLC - Hickey and Associates - E - FY2015 Project Desert	2015	311-312	3.65	\$134,184	E	P	0.505	149	Kent	3.8	4.5	5.11

MBDP Effectiveness Study

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Project 119	0066000000Mcl7t	Henrob Corporation-Project W	2013	332	2.86	\$96,725	E	P	0.355	154	Oakland	7.8	15.3	4.49
Project 120	0063200001jGhRL	Herbruck Poultry Ranch Inc - E - FY15	2015	11 (Farm)	1.52	\$45,425	E	P	0.834	110	Ionia	4.6	13.7	6.02
Project 121	0066000000M4a97	Herbruck Poultry Ranch, Inc.- Herbruck Hennerly Sewer 2012	2014	11 (Farm)	1.52	\$49,971	E	P	0.607	53	Ionia	6.2	1.3	4.65
Project 122	0066000000leE3e	Hirotec America Inc. - Major E - 2014-2015	2015	333	2.95	\$118,937	E	P	1.117	110	Oakland	4.7	6.3	3.99
Project 123	0066000000xHKd4	Howmet Corporation - E (Thermatech Coatings) - 2014	2017	Rest of 336	3.54	\$118,435	E	P	0.174	15	Muskegon	5.4	5	6.91
Project 124	0066000000TpN3u	HTC Global Services, Incorporated-E 2013	2015	54	2.36	\$94,297	E	P	1.869	252	Oakland	4.7	3.8	3.62
Project 125	0066000000dxPRN	InGlass- North American E 2014	2015	331	3.37	\$142,992	E	P	0.238	50	Kent	3.8	11.2	4.59
Project 126	0066000000TpZbW	Intrepid Properties, Inc. - Attraction (Costco Distribution Center) - 2014	2015	48-49	1.88	\$77,852	E	P	0.481	270	Wayne	6.9	10.9	4.25
Project 127	006600000016tWf	Irwin Seating Company - E - 2015	2015	55	3.08	\$161,717	E	P	0.321	119	Kent	3.8	8.6	3.70
Project 128	0066000000Nh4Se	Jackson National Life Insurance Company-HQ E 2012	2014	52	2.44	\$109,084	E	P	3.202	400	Ingham	6.2	6.3	4.78
Project 129	0066000000KNIOH	Jason Incorporated (dba Janesville Acoustics)- New Battle Creek Facility 2012	2013	326	3.22	\$98,565	NS	P	1.876	253	Calhoun	7.9	12.2	6.83
Project 130	0063200001mCKuL	Johnson Technology, Inc - GE Aviation - Muskegon E - FY2016	2017	Rest of 336	3.54	\$118,435	E	P	0.833	82	Muskegon	5.4	4.6	6.95

MBDP Effectiveness Study

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Project 131	0063200001lpL2R	JR Automation Technologies, LLC- Project River E - FY 2016	2017	333	2.95	\$108,560	E	P	2.262	256	Ottawa	3.3	3.5	5.47
Project 132	0066000000P3HyZ	JR Automation Technologies, LLC- West Michigan Growth Project	2013	333	2.95	\$113,838	E	P	0.367	93	Ottawa	6.1	18.5	4.73
Project 133	0066000000KuYi8	Kalitta Air-Oscoda E 2014	2014	48-49	1.91	\$78,687	E	P	2.314	220	Iosco	9.7	1.8	5.60
Project 134	0066000000OFplz	Kay Automotive Graphics-new facility	2015	323	2.31	\$78,439	NS	P	0.274	43	Oakland	4.7	1.7	4.85
Project 135	0066000000P2Qhl	Kay Manufacturing-E	2014	332	2.40	\$97,634	E	P	0.409	83	Berrien	6.8	12.2	7.77
Project 136	0063200001mRqLa	Kerkstra Precast, Inc. - E New Facility (Project Mix) - FY2017	2017	23	2.20	\$86,231	NS	P	0.153	40	Wayne	5.4	2.6	4.56
Project 137	0063200001mTG7O	Koops, Incorporated- E - FY2017	2018	313-314	1.95	\$80,689	E	P	0.153	25	Allegan	3.96	4.9	5.06
Project 138	0063200001l2rKG	Kraft Heinz Company - Project Footprint E - FY 2016	2017	311-312	3.65	\$136,220	E	P	0.509	55	Ottawa	3.3	3.1	5.52
Project 139	0066000001OBxgS	KUKA Systems North America LLC - Retention - FY2015	2015	333	2.95	\$118,937	E	P	0.539	119	Macomb	5.8	5.8	4.89
Project 140	0066000000Tomyb	Lauren Plastics- Iso-Trude Acquisition	2014	326	3.22	\$100,055	R	P	0.270	50	Ottawa	4.8	7.2	5.90
Project 141	0066000000OEEej	Lenawee Stamping Corporation-2013	2013	3361-3363	3.36	\$255,644	NS	P	6.025	475	Lenawee	7.8	1.8	3.95
Project 142	0066000001OD14P	LHP Software-E- 2015	2016	54	2.36	\$94,509	E	P	0.426	71	Oakland	4.2	6.3	3.81
Project 143	0063200001oB52Q	Lineage Logistics LLC - HQ Relocation - FY2017	2017	48-49	1.88	\$79,078	R	P	0.320	40	Oakland	3.4	3.6	3.46
Project 144	0066000000lcQhg	Lippert Components Manufacturing Inc- IDS Acquisition & Growth	2015	54	2.36	\$94,297	E	P	0.224	103	Macomb	5.8	12.8	3.95

MBDP Effectiveness Study

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Project 145	0063200001pkdsu	Lighthouse, Inc. - E - FY2018	2017	311-312	3.65	\$136,220	E	P	0.470	102	Kent	3.5	1.9	5.44
Project 146	00660000016mZWs	Loc Performance Products, Inc. - E (Defense) - 2014	2015	Rest of 336	3.54	\$124,331	E	P	0.683	95	Wayne	6.9	7.1	5.27
Project 147	0066000000OEEci	Lyons Consulting Group-Ann Arbor E-2012	2014	518-519	2.81	\$104,208	E	P	0.353	30	Washtenaw	4.9	5.1	5.07
Project 148	00660000016jNnL	Magna International of America, Mimco Inc.- E (Autosystems America Inc. DBA Magna Lighting) - FY2015	2017	3361-3363	4.15	\$233,804	E	P	1.204	175	Wayne	5.4	11	2.98
Project 149	006320000110NYu	Magna Seating of America Inc.- E - FY2016 Highland Park	2016	3361-3363	4.15	\$238,380	E	P	0.804	213	Wayne	6.3	11	2.89
Project 150	0066000000QdcLJ	Mahindra GenZe - EV Manufacturing	2015	3361-3363	4.15	\$244,875	NS	P	0.328	36	Washtenaw	3.7	2.3	3.28
Project 151	0066000000dvGTw	Mahindra Vehicle Manufacturers Ltd (formerly Mahindra North American Technical Center) - NA Technical Center - FY14	2014	54	2.36	\$92,415	NS	P	0.581	127	Oakland	6.5	17.8	3.82
Project 152	006320000111vil	Majestic Industries, Inc. - Retention/E - FY2016	2016	333	2.95	\$110,685	E	P	0.175	25	Macomb	5.2	4.7	4.60
Project 153	0066000000RE7Pa	Mann+Hummel-Portage-E 2013	2015	326	3.22	\$108,099	E	P	0.367	70	Kalamazoo	4.3	12.3	6.44
Project 154	0066000000dtpw6	Marada Industries Inc. dba Cosma Body Assembly Michigan - New Development - FY2015	2016	3361-3363	4.15	\$238,380	NS	P	1.032	164	Oakland	4.2	10	2.71
Project 155	006320000111Y0m	Marquardt Automotive - E - FY2016	2017	335	3.34	\$175,003	E	P	0.153	25	Oakland	3.4	3.3	2.89

MBDP Effectiveness Study

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Project 156	0066000000LQAUx	Materne North America-GoGoSqueeze Phase 2	2013	311-312	3.65	\$131,717	NS	P	3.791	65	Grand Traverse	7.6	2.7	4.23
Project 157	0066000000JTh6K	Mayser Polymer USA, Inc.-North American Assembly Facility and Headquarter	2013	3361-3363	4.15	\$255,644	E	P	0.248	50	Wayne	11.5	10	2.47
Project 158	0066000000le2RN	Medbio, Inc. - E - 2014	2015	339	2.76	\$116,400	E	P	0.202	47	Kent	3.8	13.9	4.78
Project 159	0066000000SSXfW	Medimpact Healthcare Systems, Inc- E project 2014	2015	42	2.49	\$167,083	E	P	0.112	66	Wayne	6.9	13.2	2.21
Project 160	0066000000P3rhG	Merhow- Relocation	2013	3361-3363	3.36	\$255,644	R	P	0.240	49	St Joseph	7.8	11	3.56
Project 161	0066000001ihLBF	Michigan Brand - E - FY2015	2016	311-312	3.65	\$138,886	E	P	0.274	98	Saginaw	5.3	12.6	6.11
Project 162	0066000001dMinD	Mico Industries - E - FY2015	2016	332	2.86	\$98,103	E	P	0.082	34	Kent	3.5	6.5	6.42
Project 163	0066000000ldH4v	Middleville Tool & Die Company, Inc. - E New Product Line - 2014	2015	333	2.95	\$118,937	NS	P	0.392	36	Barry	4.3	4.2	5.14
Project 164	0063200001oZBBM	Milacron - DME Company LLC - E FY2017	2017	333	2.95	\$108,560	E	P	0.178	40	Montcalm	5.1	6.3	6.23
Project 165	0063200001kOm7v	MMI Engineered Solutions, Inc. - Advanced Manufacturing - FY16	2017	326	3.22	\$103,562	E	P	0.134	43	Washtenaw	3.6	9	6.88
Project 166	0066000000uLtOE	Mobis North America - Plymouth	2015	54	2.36	\$94,297	R	P	0.853	46	Wayne	6.9	5.7	3.75
Project 167	0066000000SoJxc	Molina Healthcare - Michigan Healthplan Operations E 2014	2015	52	2.44	\$124,192	E	P	2.630	542	Oakland	4.7	5.4	2.78
Project 168	0066000000M4Kef	Mophie- Kalamazoo Relocation	2014	54	2.36	\$92,415	R	P	0.280	52	Kalamazoo	5.6	5.3	4.58
Project 169	0066000000NgRpm	Moran Iron Works, Inc.-Dock E	2013	332	2.86	\$96,725	E	P	1.215	0	Presque Isle	14.7	0.3	1.25

MBDP Effectiveness Study

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Project 170	0063200001ouVCG	MOVE Manufacturing Company LLC - E FY2017	2017	54	2.36	\$94,614	E	P	0.066	9	Kent	3.5	4.3	4.82
Project 171	0063200001InnxX	National Composites, LLC - E - FY2016	2017	Rest of 336	3.54	\$118,435	E	P	0.096	25	Shiawassee	5.3	11.7	7.08
Project 172	0066000000Pgnnw	Navitas Advanced Solutions Group-Ann Arbor	2013	335	3.34	\$192,503	E	P	0.596	40	Washtenaw	5.8	4.1	2.85
Project 173	0063200001jWbX0	Neapco Drivelines, LLC - E (Driveline Systems) - FY2015	2016	3361-3363	4.15	\$238,380	E	P	0.561	58	Wayne	6.3	1	2.82
Project 174	0066000000dveTq	Neogen Corporation - E - 2014	2015	325	3.70	\$244,909	E	P	0.112	166	Ingham	4.7	9.5	2.86
Project 175	0066000000NhEYj	Newell Rubbermaid-attraction-2013	2014	54	2.36	\$92,415	NS	P	2.421	102	Kalamazoo	5.6	1.8	4.26
Project 176	006600000016kpDM	NHK International Corporation- E - 2015	2016	54	2.36	\$94,509	E	P	0.168	26	Oakland	4.2	6.7	3.61
Project 177	0066000000uMCjh	Norma Group Americas - E & Consolidation - FY2015	2016	332	2.86	\$98,103	E	P	0.187	97	Oakland	4.2	17.5	4.58
Project 178	0063200001joEde	Norplas Industries Inc (Magna Dexsys) Phase II (E) - FY 2015	2016	3361-3363	4.15	\$238,380	E	P	0.672	193	Eaton	4.1	19.4	3.52
Project 179	0066000000Tqj51	Nyloncraft, Inc.-MI vs Sister Facilities & Mexico 2013	2014	326	2.67	\$100,055	R	P	0.175	41	Hillsdale	7	6	7.83
Project 180	0066000000xHqhZ	Oakland Stamping - E Detroit - 2014	2015	3361-3363	4.15	\$244,875	E	P	0.328	103	Wayne	6.9	22.9	2.79
Project 181	0063200001lpvbS	Oerlikon USA-New production facility	2017	333	2.95	\$108,560	NS	P	0.417	50	Wayne	5.4	5.8	5.15
Project 182	00660000001OEULq	OMT VEYHL USA CORPORATION - E - FY2015	2015	23	2.20	\$79,840	E	P	0.799	206	Ottawa	3.6	6.8	5.63
Project 183	0066000000MdHrw	OPS Solutions-HQ location	2013	334	3.03	\$118,635	E	P	0.474	26	Oakland	7.8	1.6	4.28
Project 184	006600000016kQ7E	Paslin Company- E - 2015	2015	333	2.95	\$118,937	E	P	1.954	200	Macomb	5.8	6.9	4.00

MBDP Effectiveness Study

Upjohn project number	MEDC Project ID	Project name	Year	Industry (NAICS)	Multiplier	Value Added per FTE Worker	Project type ^a	Project Status ^b	PV of MBDP costs (\$M)	Final jobs	County	Unemp rate	MEDC Total ROI	Upjohn ROI
Project 185	0063200001jXn2t	Performance Fabricating, LLC - New Development - FY2016	2017	332	2.86	\$96,220	NS	P	0.160	56	Genesee	5.8	5.1	7.16
Project 186	0066000000RCd2J	Pillar Technology Group, LLC-Office E	2014	54	2.36	\$92,415	E	P	0.391	52	Washtenaw	4.9	4	5.11
Project 187	0066000000X0THj	Plasan Carbon Composites - E - 2014	2014	3361-3363	4.15	\$239,128	E	P	5.702	418	Kent	4.9	22.9	3.16
Project 188	0066000001OCXxn	Plasan North America Inc Project Shield - Relocation - FY2015	2016	335	3.34	\$178,428	E	P	0.393	41	Kent	3.5	6.8	3.47
Project 189	0066000001VDXdi	Project Wildcat - Attraction (Hangar) - FY2015	2016	48-49	3.25	\$77,797	NS	P	1.047	85	Wayne	6.3	2.1	7.42
Project 190	0066000000X0k2W	Proos Manufacturing, Inc.- E Proos Manufacturing 2014	2015	332	2.86	\$97,697	E	P	0.088	20	Kent	3.8	5.6	5.66
Project 191	0066000000P3dFW	Rec Boat Holdings-Jet Propulsion Boat E	2014	Rest of 336	3.54	\$111,948	E	P	0.972	1	Wexford	8.6	4.6	0.66
Project 192	0063200001jm5Ko	Rivian Automotive - R&D Center - 2015	2016	54	2.36	\$94,509	NS	P	0.729	68	Wayne	6.3	2.8	4.08
Project 193	0066000000KwJWx	RNFL Acquisition LLC- Biogenic Reagents	2012	335	3.34	\$181,446	NS	P	2.528	27	Marquette	8.1	12.3	3.32
Project 194	0066000000X0LMs	Roush Industries, Inc. - E - Allen Park 2014	2015	54	2.36	\$94,297	E	P	1.145	210	Wayne	6.9	5.6	4.27
Project 195	0066000000ld5mP	S&P Data LLC - New Operations Center - 2014	2014	56	1.50	\$44,086	NS	P	0.713	100	Oakland	6.5	10.5	4.60
Project 196	0066000000dvsEC	Sakthi Auto Group USA - E - 2014	2015	3361-3363	4.15	\$244,875	E	P	3.886	367	Wayne	6.9	7.6	2.93
Project 197	0066000000PhXY7	Senderra RX Partners, LLC-E- 2013	2014	44-45	1.49	\$53,818	E	P	0.243	72	Genesee	7.9	7	5.23
Project 198	0066000001HGP9Q	Sensient- E - (Harbor Beach) - 2015	2017	311-312	3.65	\$136,220	E	P	0.153	28	Huron	5.3	12.5	5.44

MBDP Effectiveness Study

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Project 199	0066000001OExdb	Shepherd Caster LLC Project Flock - E - FY2015	2015	332	2.40	\$97,697	E	P	0.393	50	Berrien	5.2	4.6	7.05
Project 200	0066000001HGnq1	Shift Digital - E HQ - FY2015	2016	54	2.36	\$94,509	E	P	0.321	95	Oakland	4.2	7.7	3.74
Project 201	0066000000lc9SH	Shiloh Industries, Inc., Canton Mfg Division - E - FY2015	2015	331	3.37	\$142,992	E	P	1.641	102	Wayne	6.9	26.6	4.14
Project 202	0063200001kZvcU	Shipston Aluminum Technologies - E - FY2016	2017	331	3.37	\$121,395	E	P	0.265	50	Ottawa	3.3	11.7	5.64
Project 203	0063200001mTM5W	Sigma Machine - E - FY2017	2017	331	3.37	\$121,395	E	P	0.122	20	Kalamazoo	4.1	7.1	5.91
Project 204	0066000000xFhws	SL America - North America Engineering Center - 2014	2015	54	2.36	\$94,297	E	P	0.603	55	Oakland	4.7	5.2	3.84
Project 205	0066000000OCY6Y	SMR Automotive Systems USA, Inc.- Southern E	2014	327	3.19	\$135,084	E	P	4.598	354	St Clair	9.6	4.1	3.88
Project 206	0066000000lbvmd	SolarBos - Attraction 2014	2015	335	3.34	\$178,122	NS	P	0.187	52	Kent	3.8	7.8	3.61
Project 207	0063200001oZaYJ	Sonoco Protective Solutions - E - FY2017	2017	339	2.76	\$112,917	E	P	0.159	31	Shiawassee	5.3	1.6	5.49
Project 208	0066000000TpZqv	Spartan Stores-Project Mockingbird 2013	2014	42	2.49	\$167,340	E	P	1.776	72	Kent	4.9	7.4	2.40
Project 209	0063200001nhvfd	Speedrack Products Group, Ltd. - E - FY2017	2018	332	2.40	\$94,468	E	P	0.153	26	Hillsdale	4.95	4.6	8.13
Project 210	0063200001lp117	Spiech Farms - E - FY2016	2016	11 (Farm)	1.52	\$38,868	E	P	0.173	43	Van Buren	5.8	4.6	8.34
Project 211	0066000000LPvjO	SRI International-2012 E	2014	54	2.36	\$92,415	E	P	0.440	20	Wayne	9.7	0.5	4.17
Project 212	0063200001kZcdS	ST USA Holding Corp dba Sport Truck USA Inc. - E - FY2016	2016	3361-3363	3.36	\$238,380	E	P	0.325	80	Branch	4.8	20.5	4.43
Project 213	0066000000X05II	STEC-Window Regulators Manufacturing Plant	2017	334	3.03	\$108,172	NS	P	0.071	17	Oakland	3.4	27.3	4.59

MBDP Effectiveness Study

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Project 214	0063200001kZzlf	Stoneridge, Inc. - E/Consolidation (Project Pebble) - FY2016	2017	3361-3363	4.15	\$233,804	R	P	0.361	28	Oakland	3.4	5.5	2.58
Project 215	00660000016lpqU	Summit Polymers, Inc. Project SP - Multi-Site E - 2015	2015	326	3.22	\$108,099	E	P	0.634	146	Kalamazoo	4.3	7.6	6.31
Project 216	00660000016li2S	Superior Industries International Inc. - Relocation of HQ - FY15	2015	3361-3363	4.15	\$244,875	R	P	0.905	67	Oakland	4.7	8.7	2.36
Project 217	0066000000X2Mhe	TD Ameritrade-New 2014	2015	52	1.59	\$124,192	NS	P	0.568	52	Washtenaw	3.7	6.6	2.07
Project 218	0063200001i38rO	TecNiq - E/Relocation - FY2016	2017	3361-3363	4.15	\$233,804	E	P	0.168	35	Kalamazoo	4.1	14.1	3.57
Project 219	00660000016jUir	TG Fluid Systems USA Corporation - E - FY2015	2015	3361-3363	4.15	\$244,875	E	P	0.167	39	Livingston	4.6	7	2.47
Project 220	00632000011iGWH	ThinkTech, Inc - E (TD Ameritrade) - FY2016	2017	54	2.36	\$94,614	E	P	0.176	50	Washtenaw	3.6	8.3	4.89
Project 221	00660000016jpBv	TI Automotive LLC - HQ E - FY2015	2016	3361-3363	4.15	\$238,380	E	P	0.195	26	Oakland	4.2	4.4	2.41
Project 222	0066000000X0cxq	Toyoda Gosei North America - E (HQ) - 2014	2014	3361-3363	4.15	\$239,128	E	P	0.286	51	Oakland	6.5	13.7	2.38
Project 223	0066000000lfd6	Transform Automotive LLC - New Facility - FY2015	2015	3361-3363	4.15	\$244,875	NS	P	0.605	82	Macomb	5.8	11.8	2.70
Project 224	0066000000S7HEv	Triumph Gear Systems-Project TG1-2013	2015	334	3.03	\$109,080	E	P	0.112	54	Macomb	5.8	5.8	4.91
Project 225	0066000000PgTyT	TRMI-E-Project Local	2014	3361-3363	4.15	\$239,128	E	P	0.840	153	Calhoun	6.3	10.7	3.38
Project 226	0066000000NhavV	Two Men And A Truck-Corporate HQ E-2012	2013	55	3.08	\$156,085	E	P	0.426	76	Ingham	7.7	9.5	3.77
Project 227	0063200001naD2y	UACJ Automotive Whitehall Industries, Inc.- E - FY2017	2017	331	3.37	\$121,395	E	P	0.255	50	Mason	5.8	7.5	6.57

MBDP Effectiveness Study

Upjohn project number	MEDC Project ID	Project name	Year	Industry (NAICS)	Multiplier	Value Added per FTE Worker	Project type ^a	Project Status ^b	PV of MBDP costs (\$M)	Final jobs	County	Unemp rate	MEDC Total ROI	Upjohn ROI
Project 228	0063200001k49qR	Ultra Manufacturing (USA) Inc. dba Mitchell Plastics-2016 Manufacturing	2018	42	2.49	\$165,962	NS	P	0.178	69	Macomb	4.32	7.4	2.27
Project 229	0066000000xGdE1	Unified Business Technologies, Inc. - E - 2014	2015	334	3.03	\$109,080	E	P	0.351	25	Oakland	4.7	14.3	3.97
Project 230	0066000000SSADq	Urban Science Applications, Inc.- E - FY2014	2016	51	2.72	\$176,838	E	P	0.477	63	Wayne	6.3	10.3	2.20
Project 231	0063200001mi0hY	Valeo North America, Inc. - E & Test Track (Project Leo) - FY2017	2017	3361-3363	4.15	\$233,804	E	P	0.182	71	Oakland	3.4	2.8	2.65
Project 232	0066000001OE0wH	Valiant International E - FY2015	2016	333	2.95	\$110,685	E	P	1.613	160	Oakland	4.2	8.5	4.23
Project 233	0066000000TrjF5	Vectorform LLC-E-New HQ-2013	2016	51	2.72	\$176,838	NS	P	0.274	63	Oakland	4.2	8.4	2.07
Project 234	0066000000dtree	Ventra Ionia Main, LLC - E 2014 Ventra Ionia Facility	2015	3361-3363	4.15	\$244,875	E	P	0.569	406	Ionia	4.6	13.3	3.16
Project 235	0063200001mhw8d	Vickers Engineering, Inc. - E - FY2017	2017	332	2.40	\$96,220	E	P	0.127	40	Berrien	5	6.1	7.96
Project 236	0066000000dvevl	Walbro Engine Management - E (Cass City) - 2015	2015	326	3.22	\$108,099	E	P	0.184	30	Tuscola	6.7	9.6	6.82
Project 237	0066000000Sna6t	WKW Roof Rail Systems, LLC JanSar Inc.-Project Maxwell-Battle Creek 2014	2015	331	3.37	\$142,992	NS	P	0.265	0	Calhoun	5.1	17.9	0.31
Project 238	0063200001mRs4v	Zhongding USA Cadillac dba Michigan Rubber Products-Consolidation- FY 2016	2017	326	3.22	\$103,562	E	P	0.195	49	Wexford	5.7	6.2	7.55
Project 239	0066000000P3nEK	ZYNP International Corporation-Romulus E 2013	2014	54	2.36	\$92,415	E	P	0.213	26	Wayne	9.7	8.8	4.00

^a Abbreviations: E = Expansion; NF = New facility; R = Relocation; A = Acquisition; NS = New site.
^b Abbreviations: C = Completed; T = Terminated; P = Pending.

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