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ABSTRACT

I thank Claire Black and Wei-Jang Huang for assistance in preparing this paper. I appreciate the comments of George Erickcek on a preliminary version of this paper. This paper was previously presented on November 20, 2009 at the 57th Annual Economic Outlook Conference of the Research Seminar in Quantitative Economics (RSQE) at the University of Michigan. I appreciate comments and questions for participants at that conference.

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What Should Michigan Be Doing To Promote Long-Run Economic Development?

This paper argues that Michigan can take cost-effective actions to significantly improve the primary state economic development goal: higher per capita income of Michigan's residents. Higher per capita income of Michigan's residents can be achieved through state policy actions that use cost-effective means to either lower the marginal costs of businesses that expand in the state, or boost the skills of state residents.

In this paper, I offer eight ideas for how to lower marginal business costs and boost skills. Four of these ideas focus on lowering marginal business costs. Four other ideas focus on boosting skills. For each of these eight policy proposals, I suggest a plausible scale and cost for the proposal. I also provide an estimate of the benefits of the proposal. These benefits are measured as the increase in the present value of per capita labor earnings of Michigan residents.

Because of limitations on time and space, I only sketch the rationale for why these eight ideas make sense. The references given provide more information. The eight ideas are meant to provoke discussion and further exploration.

These eight ideas are not the only possible ways of improving Michigan's economic development. These eight ideas are chosen on the basis of my own imperfect knowledge of what policies offer the most persuasive research evidence of cost-effectiveness in improving state economic development. I'm sure there are other policies that are just as effective, but for which there is less research evidence, or for which I am unaware of the research evidence.

I also consider barriers to making such investments in Michigan's economic development. These barriers are twofold. First, there is the barrier of Michigan's long-run structural budget imbalance. Without significant tax and spending reforms, the state does not

have the room to make needed economic development investments. I believe this barrier is primarily a political barrier. The solutions to Michigan's structural budget problems are well-known. The question is whether our political system can adopt these known solutions.

The second barrier is an inadequate state knowledge infrastructure that is dedicated to long-run applied policy analysis, and that has the ear of state policymakers. The state needs the capacity for focusing analytical attention on long-run budget solutions and long-run economic development issues. Developing that capacity will require some small but crucial investments. In addition, state policymakers will have to be willing to pay attention to long-run analysis of state policy issues.

How To Think About State Economic Development

This paper is based on the assumption that the goal of state economic development is to improve state residents' per capita income. There is not space here to extensively argue for this assumption. Growth in per capita income provides broad benefits to state residents' well-being, while growth in overall state economic activity, by itself, may not improve the well-being of state residents. Greater state employment, population or economic output does not provide broad benefits to state residents if per capita income is no higher. Growth is a means to the end of higher state per capita income, not an end in itself. Higher per capita income also is the most reliable way to provide fiscal benefits to state and local governments, as it will increase tax revenues by more than required public service costs. Growth in state economic activity, if unaccompanied by increased per capita income, has more ambiguous effects upon the state and local fiscal situation.

If higher per capita income is the prime goal of state economic development, then it must largely be achieved through higher labor income per capita, as labor income is the majority of income. Higher labor income per capita in turn depends upon some combination of higher employment rates and higher wage rates.

State economic development policy should be viewed as being the same as state labor market policy. The object of state economic development policy is to improve the labor market outcomes of state residents.

Labor market outcomes can be improved by working on the demand or supply side of the labor market. On the labor demand side, we can directly interact with employers to improve the number or quality of jobs they offer to state residents. To target improvements in state labor demand, public policy needs to lower employers' marginal costs of creating more or better jobs. Such public policies will be most cost-effective when they lower these marginal costs by a large amount compared to the cost of the policy. The costs of the policy include both higher spending and foregone revenue.

On the labor supply side, we can try to improve the employability or job skills of the state's labor supply. Such public policies will be most cost-effective when they improve workers' earnings by a large amount compared to the cost of the policy.

Effective state economic development policy requires finding labor demand policies or labor supply policies with high cost-effectiveness. Such policies will either lower employers' marginal costs or improve workers' skills by a large amount compared to program costs. The effectiveness of such investments can be measured as the increase in the present value of the per capita earnings of state residents, compared to the costs of such investments.

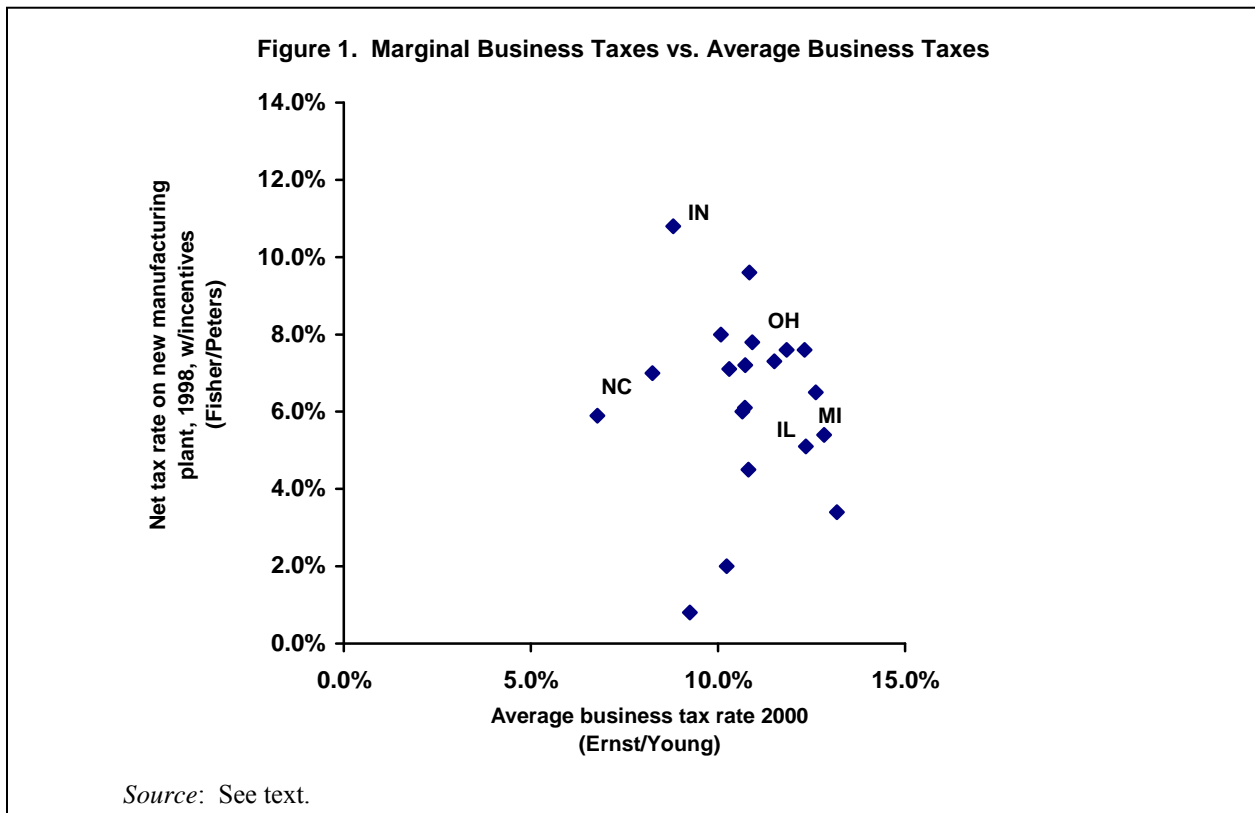
I identify eight promising cost-effective economic development policies in this paper. Four seek to interact with employers to lower their marginal costs of creating more or better jobs in Michigan. Four interact with Michigan residents to increase their long-run productivity. For each policy, I identify a feasible scale for such a policy that could be pursued immediately. By feasible scale, I mean feasible in the sense that the program could be run productively at that scale. Whether such a scale is politically feasible depends upon securing adequate funding as well. I then provide estimates of the effects of the policy on the present value of the increase in per capita earnings of state residents. Of course, such policies could potentially be scaled up over time to achieve larger benefits.

The concept of focusing on marginal business costs and worker productivity is not original to me. The economic historian Peter Lindert has used this framework to analyze the economic success of Western European countries, in his book *Growing Public* (2004). The puzzle is how these countries' economies have succeeded despite high taxes and social spending. Lindert's answer is that despite high taxes, most Western European countries impose modest taxes on business investment. The marginal cost of additional business investment is not high. Furthermore, much of the public spending is productive spending. The spending goes for infrastructure that boosts productivity, or investments in education and job training that boost the productivity of workers.

Michigan, like Western Europe, is unlikely to be the lowest tax and wage location in the world. If Michigan is to compete, it will have to figure out cost-effective ways of keeping the marginal costs of business expansion low, while improving the productivity of Michigan's workforce.

The principles of low marginal business costs and cost-effective investments in worker skills may seem obvious. But they frequently are ignored in policy debates. For example, in debates over the business climate, it is common to measure the business climate by the revenue collected by business taxes. But such revenue reflects the average tax rate on business. The average tax rate on business often has little relationship to the additional tax rate paid on business investment.

Figure 1 illustrates the lack of relationship between average and marginal business taxes. On the horizontal axis, I show the average tax rate on business in 20 leading industrial states.¹ On the vertical axis, I show the marginal tax rate on business investment in a new branch plant, averaged across various manufacturing industries. This reflects investment and employment tax credits associated with a new plant, as well as customary economic development incentives provided to such a plant.²



As one might expect, marginal taxes on business investment are generally below average business taxes. This occurs due to various tax credits and economic development incentives for business investment and job creation. In addition, there is no discernible relationship between average business taxes and marginal business taxes across the states. States that have relatively high average business tax rates are just as likely to have relatively low marginal business tax rates as relatively high marginal business tax rates. Michigan, for example, has lower marginal business tax rates than Ohio and Indiana, even though its average business tax rates are higher. Across all 20 states, the correlation between average business tax rates and marginal business tax rates is -0.08 . This correlation is statistically insignificantly different from zero.

It is perhaps understandable that lobbies for business interests favor lowering average tax rates for all businesses rather than lowering marginal business tax rates for only those businesses that make extensive new investments. However, policymakers should see lowering marginal business tax rates as being more cost-effective than lowering average business tax rates. It makes a state more attractive for business investment at a lower cost in foregone revenue.

It also is common for political leaders to use rhetoric about improving skills to justify all kinds of educational and other programs. However, it is less common to do hard-headed analysis of exactly how much skills improvement (and associated earnings benefits) will be achieved per dollar of investment in a specific program. It does no good to “invest in skills” unless such investments are productive.

Four Ideas for Boosting Michigan Labor Demand

I now turn to presenting my eight ideas for productive investments that will raise Michigan per capita labor market earnings, either by lowering the marginal costs of business

creation of good jobs, or raising skills. The first four ideas focus on boosting labor demand through lowering marginal business costs, although in some cases they also include elements that will boost skills.

Idea 1: Upfront Business Incentives

One idea is to expand Michigan's current tax incentives for new business expansion. In developing this idea, we need to address three questions:

- 1) What effects would expanded tax incentives have on per capita earnings of Michigan residents, per dollar of incentive costs?
- 2) Given what we know about tax incentives, how can they most effectively be designed?
- 3) What scale of expanded tax incentive might reasonably be considered in the short-run?

As I have outlined in other research (Bartik 2005), the effects of business incentives can be estimated using two types of prior research. First, there is the research on how overall state and local business taxes affect business location and growth decisions. This research estimates how a lower stream of tax rates over time affect business location and growth decisions. Under the reasonable assumption that "a dollar is a dollar," the effects of a given tax incentive can be assumed to be the same as a given reduction in overall tax rates with the same present value to the business.

Second, there is the research literature on how state and local employment growth affects employment rates and wage rates. We have good knowledge about what these effects are in the short-run and the long-run.

One important issue in estimating the effects of incentives is how businesses discount future cash flows. Business incentives are generally provided over a shorter time period than the effective life of the investment. Therefore, the time pattern of how business incentives affect business cash flow is not the same as the time pattern of how reductions in overall business tax rates affect cash flow. Calculating the effects of business incentives versus lower business tax rates requires some assumption about business discount rates.

The available research evidence suggests that business decision makers use very high discount rates for future cash flows. The stereotype that business decision makers are focused on short-term profits and stock prices is to some extent true. For example, research by Summers and Poterba (1994) suggests that the median real discount rate (adjusted for inflation) of business decision-makers is 12 percent annually.

We also need some information on how policymakers should discount future cash flows, so that we can evaluate the present value from a public perspective of different streams of benefits and costs at different times. There is a general consensus from the research literature that the appropriate social discount rate that should be used by the public sector is considerably less than a 12 percent real discount rate. In my calculations here and elsewhere, I have used a real social discount rate of 3 percent, which is in the middle of suggested social discount rates. (See the appendix of Bartik 2008 for a review of different discount rates and why 3 percent is a moderate assumption.)

I use all these assumptions to evaluate the effectiveness of a business incentive program that provides the incentive evenly over a ten year period.³ A ten year period for a business incentive would not be unusual among state and local business incentives. Based on these assumptions, I calculate the ratio of the present value from a public perspective of the increased

per capita earnings of state residents from this incentive program, to the present value from a public perspective of the foregone tax revenue from this incentive program. This “benefit to cost” ratio ends up being 3.14. For each \$1 in tax revenue foregone from the incentive, on a present value basis, the incentive program increases the present value of state residents’ earnings by \$3.14.

However, given the discrepancy between the real discount rates of business decisionmakers and the social discount rate, there is room to improve the cost effectiveness of business incentives by making the incentive more up-front. Intuitively, the incentive provided seven or more years from now is not worth very much to the business decision-maker in affecting business location decisions, given a 12 percent annual discount rate. On the other hand, the incentive provided seven or more years from now should be considered to be significant in cost by public decisionmakers, given the social discount rate of 3 percent.

If the incentive is provided entirely upfront, the benefit to cost ratio increases from 3.14 to 4.47. In other words, per \$1 of an incentive provided entirely today, the estimated increase in present value of state residents’ earnings is \$4.47. This is over 40 percent greater than the benefit-cost ratio from an incentive provided over ten years. This 40 percent greater cost-effectiveness occurs because the upfront incentive affects business location decisions by 40 percent more per dollar of incentive.

There is one problem with upfront incentives: what if the business then leaves? This can be dealt with by putting in legally binding clawback agreements, under which the business is legally obligated to pay back the incentive if certain employment or investment goals are not met. Weber (2002) reviews the research literature on clawbacks.

Clawbacks are not always easy to enforce, so one might consider some arrangements that move the incentive upfront as much as possible, while minimizing the number of cases where clawback agreements must be invoked. In particular, projects are sometimes delayed, or are modified before the new investment is finalized. It might be possible to base incentives on employment and investment decisions during a relatively limited time span (say two to three years) after the incentive is agreed to. This would avoid the problems of slippage between the incentive agreement and the buildup of the project. The incentive would then have clawbacks if total earnings at the facility are reduced more than a certain percentage below the level achieved during the second or third year. By basing incentives on employment and earnings achieved during the first two to three years, we avoid problems of having to invoke clawbacks due to modifications of investment and employment decisions after the incentive announcement. This approach also encourages businesses to more quickly implement the location decision. By only having clawbacks when the earnings at the facility are reduced more than some cutoff percentage below the second or third year level, we also reduce the number of cases where clawback agreements must be enforced.

It should be recognized that more upfront incentives may be significantly more cost-effective than longer-term incentives. This justifies taking some risk that some business location decisions may not work out long-term, and that in some cases clawback provisions will need to be invoked.

How much in additional business tax incentives might be considered in Michigan? We currently devote the following resources to business tax incentives in Michigan: \$245 million in property tax abatements, \$117 million in film credits, \$111 million in Renaissance zone tax exemptions, \$95 million in MEGA tax credits, and \$73 million in brownfield tax credits

(Executive Budget Appendix on Tax Credits, Deductions, and Exemptions, FY 2009). Other programs could also be considered business tax incentives, for example the \$310 million devoted to tax increment financing programs, under which tax revenue in a certain geographic neighborhood is diverted for infrastructure and services in that area. In any event, it is clear that business tax incentives in Michigan exceed \$600 million annually. Therefore, I suggest that additional tax incentives of \$100 million per year might not be out of the question.

If these additional business tax incentives were provided all up front, they would be estimated to increase the present value of Michigan residents' earnings by \$447 million. If the incentives were provided over two or three years, the estimated effects on earnings would be somewhat reduced.

If business tax incentives are so effective, why not just reduce overall business taxes across the board? Cutting average business tax rates has a much higher revenue loss relative to effects on business decision-making, compared to business tax incentives that target marginal business tax costs. For example, simulations indicate that cuts in general business tax cuts would lead to cuts in public spending that would reduce labor demand sufficiently to offset 40 percent of the job creating effects of the general business tax cuts (Bartik et al. 2006). If these cuts in public spending also reduce public services valued by business, it is quite possible that general business tax cuts would actually reduce jobs in Michigan. In contrast, cuts in marginal business tax costs due to incentives cause far less of a revenue hit for the state.

Idea 2: Customized Job Training

A second idea for encouraging business creation of more and better jobs is customized job training programs. The research evidence suggests that the cost per job of creating jobs

through customized training programs is far less than the cost per job of creating jobs through business tax incentives.

State customized job training programs typically provide training grants to individual firms that are customized to their individual skill needs. The training is usually provided through local community colleges. The training grant is typically tied to a new plant location, to a plant expansion, or to saving jobs in a firm threatened by tough global competition.

Previous research suggests that customized job training programs are 10 to 16 times as cost-effective in creating jobs as business tax incentives. The 16 times as effective figure comes from a study by Hollenbeck (2008). The 10 times as effective figure comes from a study by Hoyt et al. (2008).

The Hollenbeck study is of Massachusetts's customized job training program for incumbent worker training. This program provides government grants of about \$1,300 per worker, with matching contribution by business, and training of about 18 months. One-third of firms receiving training grants have less than 50 employees, and 88 percent have less than 500 employees.

The Hollenbeck evaluation is based on evidence from surveys of firms. Of firms surveyed, 30 percent say the training grants led them to add workers, and 20 percent say the training grants averted layoffs.

The Hoyt et al. study is based on regression analysis of county employment growth rates in Kentucky. Hoyt et al. examined the relative effectiveness in increasing county employment growth of training subsidies versus business tax breaks.

Why might training programs be more effective than tax breaks? In part, it is because training programs are by definition up-front assistance, which is more salient to business location

decisions. However, another factor is that training programs can increase worker productivity by considerably more than they cost. Training programs for adults are most effective when they are tied closely to employer needs. The evidence for these statements is considered further below, when I consider proposals for expanding job training programs.

Michigan already has a customized training program for economic development, which spends about \$5 million per year. However, in the past, Michigan has spent what in today's dollars would be \$35 million per year on customized job training. Furthermore, North Carolina has devoted resources to customized job training that if adjusted to Michigan's size would amount to \$70 million per year.

It seems feasible for Michigan's customized job training programs to be expanded by at least \$30 million per year and still be highly productive programs with plenty of good projects to be funded. If these programs are roughly 10 times as effective in creating jobs and earnings as business tax breaks, then their ratio of their effects on the present value of state residents' earnings, to program costs, will be at least 30 to 1. (As noted above, the ratio for the typical business tax break is 3.14, which implies a ratio for customized job training programs of at least 31.4). This \$30 million expansion would then increase the present value of earnings for Michigan residents by \$900 million.

Idea 3: Manufacturing Extension Services

A third idea for boosting Michigan per capita earnings is expanding manufacturing extension services. The research evidence suggests that such extension services can create additional jobs in a state economy more cost-effectively than is true of business tax breaks.

Manufacturing extension services are inspired by the Agriculture Extension Service's assistance to help farmers be more productive and successful. Manufacturing extension programs are usually funded in part by the Manufacturing Extension Partnership program of the U.S. Department of Commerce. The goal of the program is to help small and medium-sized manufacturers become more competitive and successful. Each state and local office typically has a small staff that provides consulting services to individual manufacturers. These consulting services are usually highly subsidized but not completely free. The local offices typically have staff expertise in a variety of business areas including engineering, computers, marketing, and business planning. Manufacturing extension programs also frequently provide referrals to reliable outside consultants who can provide longer-term assistance to manufacturing firms. In some cases, some partial subsidy is provided for such consulting. In some states (for example, Pennsylvania and Tennessee), the manufacturing extension services are part of the state university system, and link manufacturers to consulting help from university faculty.

A variety of good research studies show that manufacturing extension services can be cost-effective. The Michigan Manufacturing Technology Center has studies suggesting that MMTC saves manufacturers \$3 in costs for every \$1 spent on the program. At the national level, Jarmin (1998) has done studies comparing productivity growth of assisted with unassisted firms before and after intervention. These studies use techniques such as matching assisted to unassisted firms, or relating the probability of assistance to a firm's distance from the nearest extension center, to make sure what is being estimated is a true effect of the program. Jarmin's analysis suggests that manufacturing extension services on average raise the productivity of assisted firms by at least 2.5 percent. This productivity effect is at least twice the cost of the program.

Determining the jobs impact of manufacturing extension is a more difficult issue. On the one hand, helping firms to improve productivity may cost jobs, holding output constant. On the other hand, helping firms to be more competitive may expand output and jobs. The more careful analysis is done in a study by Ehlen (2001). This study suggests that manufacturing extension, compared to business tax incentives, is about nine times more cost effective in creating jobs.⁴

We currently devote about \$7 million to manufacturing extension in Michigan. It would seem feasible to quadruple this effort without reducing the quality and productivity of assistance to manufacturers. This added \$21 million in costs would be predicted to increase the present value of Michigan earnings by over 28 times as much, or \$597 million. ($28.45 = 3.14 \times 9.06$).

Idea 4: MEED Program

The MEED program was a subsidized employment and economic development program active in Minnesota from 1983–1989. The acronym originally stood for Minnesota Emergency Employment Development program and later for Minnesota Employment and Economic Development program. I have argued that MEED was one of the most innovative employment programs in the U.S. in the last 50 years (Bartik 2001, 2009). Some simulations I have done suggest that a MEED-style program could be quite cost-effective in increasing both the short-run and long-run earnings of Michigan residents.

The MEED program has a number of components from other employment and economic development programs, but combined in a unique mix. The basic idea is to temporarily subsidize new job creation by both public and private employers for the long-term unemployed. The hope is that these temporary employment subsidies then increase long-run earnings in the state. These long-run earnings effects occur through two mechanisms. First, the subsidies to employers may

induce employers to permanently add jobs to the state economy. Second, the temporary employment experience for the long-term unemployed may permanently raise their employability and productivity, which will boost their long-run earnings. Thus, the program simultaneously works on both the demand side and the supply side of the labor market.

The MEED program's wage subsidies were up to \$10 per hour (in 2008 dollars) for six months of employment. Job slots had to pay the employer's prevailing wage for that type of job. The MEED wage subsidies were generally about 80 percent of the total wages paid.⁵

The MEED program was a spending program run by local workforce agencies, not a tax credit. The local workforce agencies matched eligible workers with eligible employers, and had discretion in determining how to allocate wage subsidies to maximize the various goals of the program.

The eligible group whose hiring could trigger subsidies included any unemployed person who was not receiving unemployment benefits. However, the program was required to target individuals on some form of public assistance, and most of those assisted in Minnesota had formerly been on public assistance.

Eligible employers included both public and private employers. At the program's beginning in 1983, about 60 percent of the created jobs were in the public sector, mostly in small non-profits. However, in latter years over 75 percent of the job slots were in the private for-profit sector.

The subsidized jobs were required to be newly created jobs, not job vacancies. This requirement was imposed to reduce the displacement due to the program, from the disadvantaged taking jobs that would have been available anyway. For private sector job slots, employers were required to keep MEED workers for one year after the 6-month subsidy period. If this did not

occur, private employers either had to repay up to 70 percent of the wage subsidy, or agree to hire another MEED worker.

The program gave preference to targeting small and medium sized businesses. Most of the businesses involved in the program were small and medium sized businesses. In addition, the program tried to target businesses that were “export-based” businesses, that is businesses that sold their goods and services to persons and businesses from outside of Minnesota.

It is important to note that even if the MEED program had zero demand-side employment effects (that is, all MEED subsidized jobs would have been created even without the program’s help, or all subsidized jobs led to displacement of employment at other employers in the state), the MEED program could have considerable jobs impact if it raises the employability and skills levels of targeted workers. Increasing the employability and skills levels of disadvantaged workers will raise the effective labor supply of a state. State labor market models show that an increase in the quantity and quality of state labor supply will end up stimulating an expansion in the quantity and quality of labor demanded, which will increase state earnings.

Thus, a full analysis of the earnings effects of a MEED program must incorporate both demand side and supply side impacts. Demand side impacts are due to the MEED program creating jobs by either spending or subsidizing export-based expansion of private state employers. Supply side impacts are due to the MEED program increasing effective labor supply in a state by turning “unemployable” state residents into productive workers.

Some survey results for the MEED program suggest that it was successful. Fifty-eight percent of assisted employers said the new jobs slots would not have been created but for the program’s assistance. This percentage was much greater for smaller employers. Smaller

employers reported that the program helped overcome cash flow barriers to expanding employment.

Seventy-eight percent of MEED subsidized workers completed the six month subsidy period plus another 60 days of work. This is some indication that the program may have increased long-run employability.

Experimental evidence from similar subsidized employment programs such as Supported Work suggests a program such as MEED can have significant impact on both in-program and out-of-program employment of targeted groups. Based on the Supported Work experiment, about 80 percent of the extra in-program work experience of disadvantaged workers in subsidized employment is employment due to the program (Bartik 2001). About one-third of that extra work experience persists long-term, certainly at least eight years, with little sign of diminution over time (Couch 1992).

Based on MEED program data, along with data from other subsidized employment programs, I have run simulations of plausible earnings impacts of a MEED program on state earnings. These simulations suggest that each dollar spent on a MEED-style program will increase the present value of state residents' earnings by \$5.67. Of this \$5.67, \$2.67 is due to "demand-side" impacts (job creation in employers in both the short-run and long-run), and \$2.98 is due to supply-side impacts (greater productivity of targeted workers).

At its height in Minnesota, the program was run on a scale that in today's dollars, and adjusted to Michigan's population, would be equivalent to a program costing \$263 million per year. The estimated impact of one year of program funding would be to increase the present value of Michigan residents' earnings by \$1.492 billion.

Four Ideas for Boosting the Productivity of Michigan’s Labor Supply

I now consider four ideas that have proven effectiveness in boosting the employability and productivity of the labor supply of Michigan residents. Boosting the employability and productivity of Michigan residents will boost long-run employment and earnings of Michigan residents. State labor market and economic models show that a larger and more productive labor supply will attract additional employment from business location decisions, business expansions, and new businesses. As reviewed in Bartik (2001), for every 100 additional productive workers, we can expect Michigan employment to expand by two-thirds as much.

Idea 5: Universal Pre-K

High-quality universal pre-K and other early childhood programs have been shown in numerous studies to have significant long-run effects on educational attainment and adult employment rates and wage rates (Bartik 2006, 2008). These long-run effects occur because, as Nobel prize-winning economist James Heckman has said, “Skill begets skill and learning begets more learning. Early advantages cumulate; so do early disadvantages.” (Cited at website of Pre-K Now.) High-quality early childhood programs increase both hard skills and soft skills of children entering kindergarten. This initial success leads to better behavior and better success in kindergarten. This initial school success then leads to more success in school, fewer assignments to special ed., and a lower probability of being held back a grade. The cumulative success changes the teacher’s view of the student, the parent’s view of the student, and the student’s view of himself or herself. Some of the cognitive test score effects of pre-K and other early childhood programs tend to fade over time. However, the behavioral changes and the success in reaching life goals do not seem to diminish. Participants in high quality pre-K programs have

higher high school graduation rates and college attendance. Furthermore, their increase in adult employment rates and wage rates are even greater than one would expect based only on their increases in educational attainment.

Based on these effects, I have estimated the long-run effects on state economic development of implementing high-quality universal pre-K for 4-year-olds (Bartik 2006, 2008). This program would be a half-day school-year program. Getting to universally accessible pre-K for all four-year-olds is assumed to require state funding for 70 percent of all four-year-olds. The remaining four-year-olds would be in Head Start or private preschool programs, or would have families who choose not to participate in preschool programs. Oklahoma, which has been the leading state in implementing high-quality pre-K programs, has 71 percent of all four-year-olds in state-funded pre-K programs, and over 90 percent of all four-year-olds in some type of pre-school program (NIEER 2008).

My simulations suggest that universal pre-K will increase the present value of state residents' earnings by 2.78 times its costs. This present value calculation accounts for the fact that many preschoolers will later move to another state, the increased earnings for those who move out of state is ignored. The calculation also assumes that there is some labor market displacement, meaning that only two-thirds of the increased earnings potential of state residents results in a response of labor demand that increases state earnings.

Michigan currently has 18 percent of the state's four-year-olds enrolled in state-funded pre-K, at a cost of about \$104 million (NIEER 2008, and House Fiscal Agency Analysis of Conference Report on HB4447). (This is prior to the most recent budget cuts; the final impact of these budget cuts on enrollment in state-funded pre-K is unclear at present.)⁶ Expanding four year participation in state-funded pre-K in Michigan to 70 percent would cost an additional \$300

million. This investment of \$300 million would increase the present value of state residents' earnings by \$834 million.

Idea 6: Targeted Mandatory Summer School in Early Elementary Grades

Research suggests that targeted mandatory summer school in early elementary can significantly increase student learning. Other research suggests that even a modest increase in early elementary test scores is causally related to higher adult employment rates and wage rates.

Research on mandatory summer school is largely based on Chicago's attempt to require that students below a certain achievement level go to summer school, and improve achievement to a certain level, or be retained in grade for the next year. Such a program provides strong incentives for students, parents, and teachers to improve academic performance during the summer session, to avoid student retention in grade. The program also provides incentives for students who are at risk of being required to go to summer school to reach higher achievement levels during the school year.

The Chicago research suggests that in such a program leads to students learning about two or three times more per week than these students typically learn during the school year. Even a summer session of only six weeks can increase achievement levels by three months (Roderick, Jacob, and Bryk 2004). In addition, meta-analysis of the effects of summer school suggest it can raise academic performance by an "effect size" of 0.2 or 0.3, which in early elementary grades can amount to two or three months of extra achievement in "grade level equivalents" (Cooper et al. 2000).

There also is some research on the connection between early elementary test scores and later employment rates and wage rates (Currie and Thomas 1999). This research finds that

increasing achievement levels by relatively modest amounts, in terms of grade level equivalents, is correlated with significant increases in adult earnings. An improvement in test scores in later grades also is related to adult earnings. However, it takes a larger improvement in grade levels in high school to increase adult earnings by the same amount.

I have done some simulation estimates of the effects of early elementary test scores on state residents' earnings. These simulations adjust for outmigration. The increased earnings of those children who leave the state as adults are not included in the calculation. These calculations suggest that improving a student's test scores in early elementary grades by an "effect size" of 0.2 would be predicted to increase the present value of their future earnings in Michigan by \$16,624.

Suppose the state of Michigan paid for school districts to run a mandatory summer school program for early elementary students who are significantly below grade level. This program could be structured so that there are not only strong incentives for students to improve performance, but also strong incentives for school districts. For example, bonus payments could be made to school districts in which student performance during the summer session improves the most.

Suppose such a program cost \$2,000 per student.⁷ Suppose that sufficient funding was provided to provide funding for the equivalent of 20 percent of one Michigan elementary grade. Twenty percent of a single elementary grade in public education in Michigan is about 24,400 students.⁸ (Of course, alternatively the program could fund summer school for the bottom 10 percent in two elementary grades.) Then the total cost of such a program would be \$49 million per year.

Based on how such a program would be predicted to affect test scores, and the effects of test scores on later earnings, such a program would be predicted to increase the present value of state residents' earnings by 8.31 times its costs ($8.31 = \$16,624 / \$2,000$). A one-year program of \$49 million would increase the present value of state residents' earnings by \$406 million.

Idea 7: Career Academies

Skills demand in the U.S. is increasing. But this increase is not simply an increase in demand for labor with four or more years of college. Contrary to what is sometimes claimed, a large part of the increase in skills demand is for skills that require some postsecondary education, but not four years of college.

For example, based on research by Harry Holzer of Georgetown and Bob Lerman of the Urban Institute, over the next decade, only 22 percent of job openings will NOT require some post-secondary education. But over the next decade, only 33 percent or one-third will require a bachelor's degree or higher credential (Holzer and Lerman 2007). The remaining 45 percent of job openings will require some post-secondary education but not a bachelor's degree. In other words, 4 out of 5 job openings will require some postsecondary education. But the majority of jobs requiring postsecondary education will require less than a bachelor's degree.

We need to figure out how to reform high schools and postsecondary options so as to provide high levels of skills for students that will lead to good careers. But these good careers need not in all cases involve a bachelor's degree.

The needed high school reforms may require some modification of Michigan's high school graduation requirements. The current high school graduation requirements are premised

on the notion that all students should meet the requirements associated with successful entry into a college or university leading to a bachelor's degree.

What are good models for reforming high schools to prepare students for a broad range of postsecondary options and careers? One such model, with proven success, is the Career Academy model. The Career Academy model has been studied with an experimental methodology by MDRC (Kemple and Wilner 2008). This experiment suggests that Career Academies have high earnings benefits relative to costs.⁹

Career Academies typically serve between 150 and 200 students from grades 9 or 10 through 12th grade. Career Academies have three key features:

- 1) Each academy is designed as a small learning community in which teachers and students get to know each well, and teachers work as a team to help students.
- 2) Career Academies have a curriculum that combines academic and career material around a career theme.
- 3) Career Academies establish partnerships with local employers to help make sure the curriculum is relevant, to increase career awareness among students, and to provide work-based learning opportunities.

The MDRC evaluation results show no effect, positive or negative, of Career Academies on postsecondary educational attainment. However, the Academies increased employment and earnings among students participating, compared to the randomly assigned control group, in follow-ups up to eight years after the scheduled high school graduation of the student.

The earnings effects of Career Academies are about \$1,700 annually per student in years 1 to 4 after scheduled high school graduation. These earnings effects increase to about \$2,800 annually in years five to eight after the scheduled high school graduation.¹⁰ These effects are

average effects on the treatment group compared to the control group. Presumably these average effects reflect higher effects for some students, and little or no effect for other students. The earnings effects are due to both higher wage rates and hours worked. Effects tend to be more positive for males than for females.

The cost of the Career Academy Program is about \$2,200 per student (Belfield and Levin 2007). This \$2,200 is the total cost over the three years of the program, not an annual cost. The earnings effects after the program are therefore large compared to program costs. Furthermore, the time pattern of the earnings effects suggests that these earnings effects are not diminishing over time.

Suppose we assume that the Career Academy earnings effect persists for 25 years after high school graduation. I make further downward adjustments to adjust for some Career Academy graduates moving out of state or dying, and to adjust for any displacement effects of the program.¹¹ Then the Career Academy program increases the present value of state residents' earnings by 10.97 times its costs.

If Michigan enrolled 20 percent of its public school 9th graders in such academies, the program would cost in the long-run about \$69 million per year.¹² Michigan would have to set up about 155 such academies that would initially enroll about 31,000 students. This enrollment would increase to three or four times that number as the academies filled out to include all four high school grades.

This \$69 million investment in Career Academies for just one cohort of Michigan 9th graders would be expected to increase the present value of Michigan residents' earnings by \$757 million.

Idea 8: Adult Job Training

Government sponsored adult job training has a bad reputation. Despite this bad reputation, the best government-sponsored job training for disadvantaged adults has high benefit cost ratios.

The bad reputation of government-sponsored job training for disadvantaged adults is perhaps due to the finding that the average effect of such programs on the earnings of those entering training is modest. However, these modest annual earnings effects do tend to persist over time. And the cost per trainee entrant of government job training for disadvantage adults is also modest.

Consider JTPA (the Job Training Partnership Act), which from 1982 to 1998 was the main federal job training program. Experimental results indicate that the average annual earnings effects of JTPA training on adults entering training, in the second year after training was completed, was a modest \$1,324 (2008 dollars). But the costs per person entering training were only \$1,760 (Friedlander et al. 1997). Furthermore, the earnings effects appear to persist for at least five years (GAO 1996). Effects don't diminish much in years three or four after training was completed, and then tail off a bit in year five.¹³

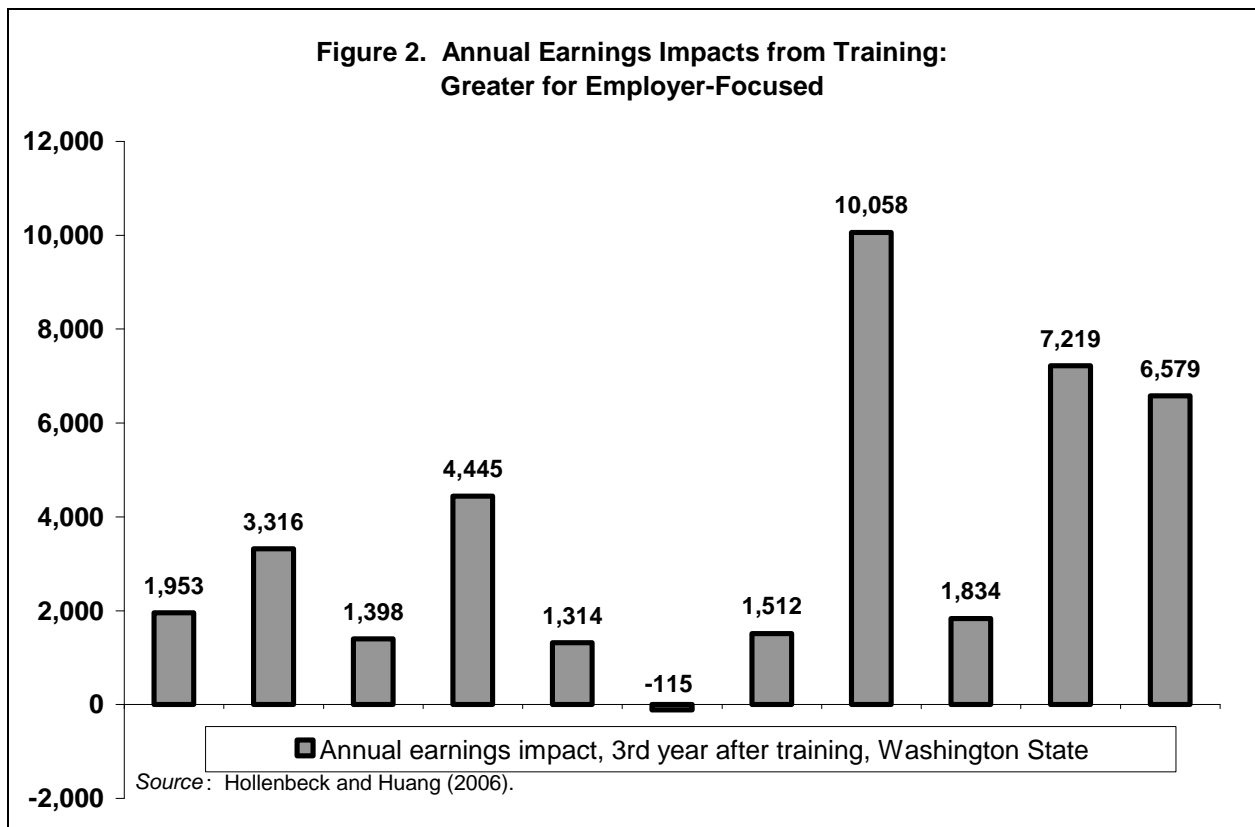
Suppose we assume that the effects of government sponsored training programs on adults' earnings decline by 10 percent per year after the second year after training. I also make downwards adjustments for outmigration, mortality and labor market displacement.¹⁴ The resulting calculation concludes that the ratio of the present value of earnings effects of training on state residents, to program costs, is 2.61.

Federal adult job training dollars have been cut by 35 percent, after adjusting for inflation, since 2000. If Michigan were to simply seek to restore that program cut, it would cost

the state \$41 million per year. This investment of \$41 million would be expected to increase the present value of state residents' earnings by \$107 million.

These positive results for adult job training are consistent with recent large scale state studies by my colleague Kevin Hollenbeck (Hollenbeck and Huang 2006, 2008). In both the states of Washington and Virginia, Hollenbeck has done a comprehensive analysis of the earnings effects of each state's workforce programs. These estimates of earnings effects are done by statistically matching workers receiving training to otherwise similar workers who do not receive such services. Workers are matched in part based on their pre-program earnings.

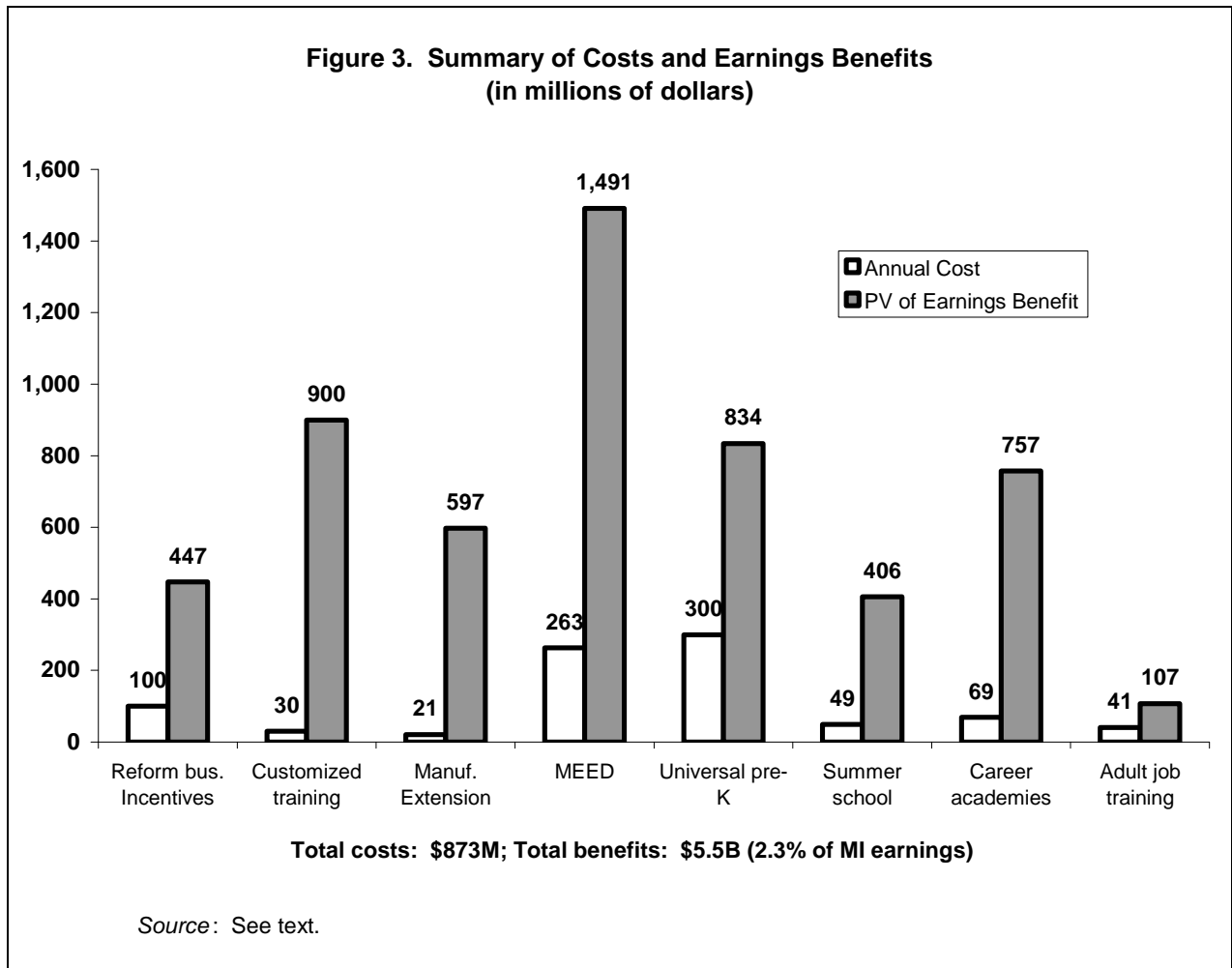
These earnings effects indicate that many of these states' training programs have significant effects on post-program earnings. Figure 2 provides representative results for annual earnings impacts during the third year after training in Washington State.



Some of the largest annual earnings effects are for programs with close ties to employers. For example, there are sizable effects for such programs as apprenticeships, which obviously have extensive involvement with employers.

Summary of Results

Figure 3 summarizes the costs of one year of investment in each of these eight ideas. The figure also shows the resulting benefit of that one year of investment in an increased present value of earnings of state residents.



Summed over these eight ideas, the total annual cost of this one year of investments is \$873 million. The total effect on the present value of state residents' earnings is \$5.5 billion. These eight ideas certainly have a high benefit to cost ratio, exceeding 6 to 1.

On the other hand, an increase in the present value of state residents' earnings should be appropriately compared with today's annual earnings of Michigan residents. (That is, after all, the purpose of present value calculations.) These investments increase the present value of state residents' labor market earnings by an amount that is equivalent to only 2.3 percent of Michigan's residents' annual earnings. (Earnings totals for Michigan are calculated from the Regional Economic Information System of the U.S. Department of Commerce.)

A 2.3 percent earnings effect may seem disappointing. It should be noted that it is difficult to affect earnings by a large percentage when annual Michigan earnings are over \$200 billion. Compared to the size of Michigan's economy, an investment of \$873 million is modest. It takes very large returns even to get a 2.3 percent effect on earnings.

Furthermore, it should be noted that many of these initiatives could be scaled up considerably. I suspect the eight ideas mentioned above could eventually be increased by double their current size without much reduction in the benefit to cost ratio.

Finally, these are just eight ideas for which I happen to have some evidence for effectiveness. Presumably there may be other ideas that also offer similarly high returns.

Therefore, it may be feasible to figure out a set of investments that might boost Michigan per capita earnings by 5 percent or even 10 percent. But to reach this scale of effects requires somehow finding room to invest billions of dollars. It also requires identifying policy ideas with very high returns for state earnings per dollar invested.

Barriers to Investing

It seems to me that there are two primary barriers to Michigan making these sorts of investments. The first is Michigan's fiscal capacity. The second is Michigan's analytical capacity.

In terms of fiscal capacity, as is well known, Michigan's current policy budget shows a growing structural budget gap between current policy state revenues and current policy state expenditures. Based on research by the Citizens Research Council (CRC), in cooperation with the Upjohn Institute, even with a modestly growing state economy, the state of Michigan has a structural budget imbalance that will grow to about \$10 billion per year in 2017 (CRC 2008).

Unless Michigan can make reforms that will deal with this structural budget problem of \$10 billion, it will be impossible to find the funds to make additional investments of \$1 billion or \$2 billion to boost state economic development. On the other hand, if the state can make reforms sufficient to close a \$10 billion structural budget gap, some modest tweaks should be able to free up \$1 or \$2 billion for investments.

I believe the solutions to Michigan's structural budget problem are well-known among state policy analysts. To help revenues keep better pace with state income, tax reforms should broaden the sales tax to services, make the state income tax somewhat more progressive, and begin limiting the exemption of pension income from state income taxation. On the expenditure side, reforms need to begin cutting costs of the criminal justice system, and limiting the costs of increases in health benefit costs for current and retired public employees.

The issue is not a lack of knowledge about what is needed to deal with the structural budget deficit of the state of Michigan. The issue is whether the state has the political will and political institutions that will adopt such reforms, all of which are opposed by various groups.

The second barrier to making these types of investments is the state's analytical capacity for doing long-term policy analysis, and policymakers' willingness to listen to such analysis. The state needs to have the analytical capacity to look at a number of long-run policy issues, such as:

- What are the marginal taxes and costs facing various types of business location and expansion decisions, and how are these affected by state policy?
- What does the research literature say about the most effective investments to help businesses expand? What does the research literature say about the most effective investments to increase workers' skills?
- What does the research literature say about what policy reforms will be best at controlling criminal justice system costs and health costs, with the least adverse effects?
- Is a given state program effective, comparing those assisted by the program with similar non-participants? (This type of analysis can potentially be done for both programs seeking to help individual business expand and be more competitive, and for programs seeking to increase the skills of Michigan residents.)

There is no state agency or state-affiliated agency that has been given the budget and charge to be able to begin to answer such long-run policy questions. Furthermore, there is no sign that even if such an agency magically appeared from thin air, that state policymakers would pay much attention to its findings. There is a need for both greater analytical capacity and a change in political culture to value such analytical capacity.

One possible model for such a state agency is the Washington State Institute for Public Policy. This agency was created by the state legislature and is funded by the legislature to do this type of long-term policy analysis. This policy analysis is based on both synthesizing results from previous research, and conducting original research. WSIPP uses both its own staff, and contracts out for consulting help or special expertise.

Perusing the studies done by WSIPP reveals an amazing array of highly policy-relevant analysis. For example, WSIPP has analyzed the benefits and costs of options for reducing

corrections costs in Washington State (Aos et al. 2006). These options include crime prevention programs as well as adult and juvenile offender programs. WSIPP considered over 70 possible programs to reduce corrections costs by reducing crime, and analyzed over 500 studies that used some sort of comparison group to evaluate these program approaches. They then identified which of these program options seemed to offer the greatest benefits to costs ratios, and presented the findings to the legislature. The findings led to specific decisions by the legislature to invest in proven programs that will lower the need for additional prison beds by lowering crime.

Conclusion

The approach adopted by this paper is not necessarily the usual approach to looking at economic development policy. To highlight how this approach differs from the usual approach, I mention some typical economic development policy issues that I do not consider in this paper, and why they were skipped.

It might be expected that an economic development analyst would recommend what the state of Michigan should do about the auto sector, to help these businesses adjust to economic change. But I don't have any idea what will happen in the future to the Detroit 3 or their suppliers, or exactly what should happen. Nor do I think the state of Michigan is in possession of this information. I do think that if we provide customized job training and extension services to small and medium sized businesses in the auto sector, these businesses will be more successful, whether in the auto industry or in selling to more diverse customers. But it is not clear why we would want to focus such assistance solely on the auto sector. Nor should such assistance be provided with some pre-ordained government goal in mind.

It might be expected that an economic development paper presented at the University of Michigan might discuss the various efforts to leverage the research of the University of Michigan or other state universities into more Michigan-based spinoffs. I certainly have nothing against such efforts. However, I am unaware of rigorous research evidence that we know how to replicate the success of Silicon Valley. I do think we know that more mundane activities that may involve the higher education system, such as customized training programs and manufacturing extension services, do have proven success. One of the challenges in encouraging applied research spinoffs is whether most of the jobs will stick around, or whether they will quickly move elsewhere in the U.S. or the world. I don't know of any formula with demonstrated success to overcome this problem. But I emphasize that absence of evidence is not evidence of absence. I'm not saying that efforts to encourage a large employment base due to applied research spinoffs cannot work. I'm merely saying I do not know of research showing that it does systematically work in a predictable way.¹⁵

It might be expected that an economic development analyst today would talk about attracting the creative class, as advocated by Richard Florida. I have nothing against such efforts either. But I don't know of any research on how the creative class can be predictably attracted in a cost-effective manner. In addition, I note that attracting the creative class only pays off for current Michigan residents to the extent to which educated outsiders provide external economic benefits for Michigan residents. In contrast, investing in greater skills of Michigan's current residents provides direct benefits for the Michigan residents who gain from such investments, as well as spillover benefits for others.

Thus, the approach in this paper is to focus on proven methods of lowering marginal business costs of expansion and raising Michigan residents' skills. I am less interested in

speculative approaches that might work than in approaches that have good research evidence suggesting they will have large ratios of benefits to costs.

The successful approaches highlighted here suggest that providing businesses with information and training is often a relatively cheap way of encouraging business expansion. Investing in residents' skills seems most effective if done either early in life or with close cooperation with employers.

These successes rest on some significant market failures in information and training markets. Private markets on their own do not always efficiently provide all needed information and skills.

Overcoming market failures is one of the keys to efficiently promoting state economic development goals. Such market failures are rarely confined to one industry. Therefore, focusing on market failures leads us away from economic development strategies that focus unduly on particular industries. It is not clear that public policy can effectively do industrial planning for a state's economy. Public policy has a sufficient challenge in providing information and training and education services that require government intervention, without taking on other planning tasks that may be beyond the public sector's comparative advantage.

But public policy can make a difference to state economic development. As this paper has shown, if Michigan makes significant economic development investments in high-return programs, over time it is possible to significantly boost the earnings of Michigan's residents. The question is whether we have the political will to make such investments.

NOTES

¹ This is based on Ernst and Young's measurement of state and local business taxes in 2000 (Cline et al. 2004). The Ernst and Young measure of state and local business taxes is divided by a measure of gross operating surplus of business, from the Regional Economic Information System, as a rough measure of business taxes as a percentage of profits.

² This is based upon Peters and Fisher's measure of effective tax rates on a new manufacturing branch plant in 1998 (Peters and Fisher 2002, Table 3.3). Their effective tax rates is based on the percentage reduction in the net present value of the cash flow of a new branch plant over a 20-year period due to state and local business taxes and economic development incentives.

³ That is, I use the consensus of the research literature on a -0.2 elasticity in how state and local business taxes affect business location decisions (Wasylenko 1997). I also use a 12 percent real discount rate for business decisionmakers. I use a 3 percent real discount rate in discounting various benefits and costs from a public perspective. I use the research literature on how state and local employment growth affects employment rates and wage rates over time. All of these assumptions and procedures are outlined in more detail in Bartik (2008).

⁴ The estimated cost per job created in today's dollars from the Ehlen study is \$17,612 per job. The estimated cost per job created in today's dollars from business tax incentives is \$159,582 (Bartik 2008). The cost-effectiveness of manufacturing extension is 9.06 times the cost-effectiveness of business tax incentives ($9.06 = 159,582 / 17,612$).

⁵ The various data on the design and results of the MEED program are summarized in Bartik (2001 2009). Bartik (2001) provides the sources.

⁶ I use as the dollar figure for funding the total amount for the Great Start Readiness Program for FY 2008–2009. This includes both school district allocations and competitive grants. The competitive program was cut in half for FY 2009–2010, while the district grants were nominally unchanged. This nominally cuts funding from \$104 million to \$96 million. However, school districts were allowed to reduce their GSRP allocations to make up for cuts

to formula grants. Therefore, the final effect upon state funding for pre-K is uncertain.

⁷ Estimated costs of elementary summer school in Kalamazoo Public Schools are \$1,000 per student (personal communication with Deputy Superintendent Gary Start, November 2009). However, this figure is a marginal cost figure and does not include district administration and evaluation costs. The \$2,000 figure allows for various overhead and evaluation costs, bonuses for districts that perform well, and the possibility that statewide costs may average greater than costs in Kalamazoo.

⁸ This is based on student headcount data from the Center for Educational Performance and Information for 2005-2006. The count for each grade for grades 2, 3, and 4 are about 122,000 public school students statewide.

⁹ The description and results for Career Academies are based on Kemple and Willner (2008).

¹⁰ Effects here, and throughout this paper, are stated in 2008 dollars.

¹¹ I multiply by 0.70 to adjust for out-migration and death, and by two-thirds to adjust for displacement. This is roughly consistent with more detailed procedures used in my preschool report.

¹² This is the long-run cost after 20 percent of all four high school grades are in the academy, or the per cohort costs. The numbers of 9th graders are based on figures for 2005–2006 from the Center for Educational Performance and Information.

¹³ Note that these costs and earnings effects are per person entering training, not exiting training. Because many training entrants do not complete training, the costs and earnings effects per person exiting training may be two or three times higher.

¹⁴ I multiply by 70 percent to allow for outmigration and mortality, and by two-thirds to allow for displacement.

¹⁵ Bartik and Erickcek (2008) review the research evidence on the local economic development effects of universities.

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