Appendix A

Calculating the Fiscal Benefits from Jobs Created By Economic Development As An Offset to the Costs of Economic Development Programs

The calculation for the fiscal benefits of economic development is as follows. The net revenue (revenue R minus expenditure E) created per dollar of gross resources (S) devoted to economic development is ($R - E$ /S, which equals ($R - E$)/J divided by S/J, where J is the number of new jobs actually created by economic development policies. We assume an elasticity of new business activity with respect to state and local business taxes of −0.25, which splits the difference between Bartik's (1991, 1992) consensus figure of −0.3 and Wasylenko's consensus figure of −0.2. The gross cost per job created (S/J) is equal to state and local business tax revenue divided by the absolute value of this elasticity. This was previously derived in Bartik (1992, 1996), and comes from combining the definition of the elasticity, $E = (dJ/J)/(dT/T)$, where T is the state and local business tax rate, dT is the change in state and local business tax rate, and dJ is the change in jobs in the local economy due to that change in the tax rate, with the definition of the gross cost of lowering the tax rate, $S = JdT$. Bartik's figure of $1,634 in state and local business tax revenue per job in 1989 (Bartik 1992, 1996), updated by the 33.8 percent in prices according to the personal consumption deflator of GDP between those two years (Table 7.4 of BEA tables at http://www.bea.doc.gov/bea/dn/nipaweb/SelectTable.asp?Selected=N#S7), results in a gross annual cost per job created of $8,745. The present value of this cost at a 10 percent discount rate is $87,450.

Figures from the MEGA program suggest that with multiplier effects, each created job in Michigan generates annual personal income of $115,302 (spreadsheet provided by MEDC, using figures on 131 MEGA projects from 1996 to 2001, excluding the three large and unusual

retention credits for auto plants). MEGA program figures also suggest that state revenues are about 8.2 percent of this personal income, which is consistent with figures for Michigan state tax revenue as a percentage of personal income from the Census of Governments (http://www.census.gov/govs/estimate/9923mi.html). From the Census of Governments, local own-source tax revenue is about 3.057 percent of personal income in Michigan. The question then is how required expenditure increases compare with these revenue increases. We assume population increases in percentage terms by about four-fifths of the percentage increase in jobs and business activity, which is consistent with Bartik (1991, 1993). We assume that all state spending except income maintenance, Medicaid, and corrections increases proportionally with population; these three categories are about one-quarter of state own-source spending in Michigan (State of Michigan, Executive Budget Fiscal Year 2003, p. B-6). We assume that all local spending increases proportionally with population. Under these assumptions, the net state revenue (subtracting out expenditure requirements) generated per job is (1 − (0.8) (0.75)) (0.082) (115,302) = $3,782. The net local revenue generated per job is (1 − 0.8) (0.03057) (115,302) = $705. The total net state and local revenue, subtracting out needed expenditure increases, per job created is $3,782 + $705 = $4,487. At a 10 percent discount rate, the net present value of this net revenue surplus is $44,870. Dividing by the gross subsidy cost per job gives the net revenue offset per gross dollar of cost of economic development programs of $44,870/$87,450 = 0.51.

Appendix B

How Successful Must MEGA Be to Fiscally Pay Off?

Table B1. How Effective Must MEGA Be to Fiscally Pay Off for Michigan? Variation in Minimum Probability with Population and State Spending Responses to New Business

Ratio of state spending per additional person to average state spending per capita	Ratio of % gain in population to % gain in state personal income:				
	0	0.4	0.6	0.8	1.0
0	0.15	0.15	0.15	0.15	0.15
0.5	0.15	0.19	0.22	0.25	0.30
0.75	0.15	0.22	0.28	0.38	0.61
1.0	0.15	0.25	0.38	0.76	Loss
1.25	0.15	0.30	0.61	Loss	Loss

Note: Entries in body of table are minimum probability of MEGA credit being decisive that is needed for MEGA to fiscally benefit state, depending on how population and state spending respond to business locations or expansions.

The table in this appendix analyzes the minimum probability of the MEGA credit being decisive for the credit to fiscally pay off for state, under various assumptions about how population responds to economic growth, and how expenditures responds to population growth. This analyzes the MEGA credit in the terms assumed by the authorizing legislation, which focuses on fiscal benefits for the state. A more complete analysis would also consider the fiscal benefits for local government, and the employment benefits of MEGA, which are at least as important as the state's fiscal benefits.

The cutoff probability for the MEGA credit to fiscally pay off for the state is the probability p such that $p(Dr - dE) - M = 0$, or $p = M / (dR - dE)$, where M is the amount of the MEGA credit, dR is the gross state revenue induced by a new business location that is actually caused by the credit, and dE is the additional state expenditure associated with that new location. M, dR, and dE should all be the present value of the flows of MEGA credits, and the flows of additional state revenue and expenditure.

With some algebraic manipulation, the equation can be rewritten as $p = 1/[(dR/M)\ (1 - (dE/dR)]$, that is the cutoff probability decreases with an increase in the ratio of gross revenue to the state from a new location to the amount of the MEGA credit, and the cutoff probability increases with increases in the ratio of additional expenditure to additional revenue. In the model used by the state, essentially $dR = (R/Y)dY$, where Y is personal income, and dY is the increment to state personal income caused by the project. By definition, $dE = (dE / dPOP)(dPOP / dY)dY$, where $dPOP$ is the increment to state population due to the project, and the first expression in parentheses is how much state expenditure responds to this increment to population, and the second is how much state population increase is associated with the project-induced increment to state personal income. With some manipulation, this expression for dE can be rewritten as $dE = [(dE / dPOP) / (E / POP)]\ [d\ln POP / d\ln Y]\ [E / Y]\ dY$. Substituting into the equation, we have

$$p = 1 / [dR / M]\ \{1 - [(dE / dPOP) / (E / POP)]\ [d\ln POP / d\ln Y]\}.$$

The expression $[d\ln POP / d\ln Y]$ is the ratio of the percentage change in population to the percentage increment in state personal income due to the project. This expression would be one if the new jobs paid the same as existing jobs in the state and all the new jobs are held by in-migrants. This expression will be reduced considerably below one if the new jobs pay above average wages and more of the new jobs are held by state residents.

The expression $[(dE / dPOP) / (E/POP)]$ is the ratio of the additional expenditure per person due to this additional population to the average state spending per person. This would be exactly one if the state augments its expenditure to keep per capita expenditure constant as expenditure goes up. This will be less than one if economic development results in less need for some redistributional state expenditures such as welfare and Medicaid and prisons. This could

be more than one if the additional population leads to some very expensive infrastructure expenditures.

Thus described, it is clear that these ratios will vary with the project being considered, and will depend, among other things, on: (1) the wage rate paid on the new jobs; (2) who gets the new jobs; and (3) what public expenditures are demanded because of the additional economic activity. Our guess is that a reasonable average value for the percentage change in population to the percentage increment in state personal income is 0.6, and that a reasonable value for the ratio of marginal to average state spending per capita is 0.75. The 0.6 value for the ratio of the percentage increase in population to income assumes that ultimately 4 out of 5 new jobs are held by in-migrants, but that economic growth tends to be associated with higher earnings per job as well, which is supported by other research (e.g., Bartik 1991). The 0.75 value assumes that population growth associated with state economic development initiatives increases most spending proportionately, but that state spending on income maintenance, Medicaid, and corrections stays the same in real terms, and these three categories comprise about one-quarter of state own-source spending in Michigan (State of Michigan, Executive Budget Fiscal Year 2003, p. B-6).

The calculations done in the table are based upon figures from MEDC on MEGA projects from the beginning of MEGA to the end of 2001, including total state incentive payments for these projects, and net state fiscal impacts. We excluded the four large "retention" projects for auto plants because these projects' impacts appear to be somewhat atypical. The gross revenue associated with the project was derived by adding the various credits to MEDC's figures for net state impact. The average project lasts 13 years, and it was assumed that the revenue stream occurred evenly over that time period, so the gross revenue over 13 years in the MEDC data was

converted to an annual flow by dividing by 13. A 10 percent discount rate was used to convert this annual flow, which is assumed to occur forever, to a present value. (The high real discount rate implicitly allows for the possibility that the business will eventually leave.) All state credits, not just MEGA, were included in calculating the present value of state economic development incentives for the project. State job training expenditures and state CDBG infrastructure spending was assumed to occur up-front, so no discounting was required. State MEGA credits and state property tax abatements were assumed to occur evenly over the 13 year term of the typical project, and hence were divided by 13 to get annual flows of subsidies, and then the present value of this flow of 13 years of subsidies was derived using a 10 percent discount rate. Excluding the four retention projects, the resulting ratio of the present value of gross revenue to the present value of subsidies is 6.57. Including the four retention projects, this ratio is 11.33.