The Economics of a Targeted Economic Development Subsidy

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ABSTRACT

In an effort to spur economic growth and to burnish their job-creation bona fides, policymakers at the federal, state, and local levels often dispense targeted economic development subsidies. These selective incentives include targeted tax relief, targeted regulatory relief, cash subsidies, and in-kind donations of land and other valuable goods and services. The weight of economic theory suggests that these subsidies do not work and may even depress economic activity. In this paper, we review the economic case for and against targeted economic development subsidies, using Wisconsin's $1.2 billion to $3.6 billion subsidy to Foxconn to illustrate these points. We show that under realistic scenarios the subsidy may depress state economic activity by tens of billions of dollars over the next 15 years.

JEL codes: H71, O1, R11

Keywords: targeted economic development subsidies, economic development, regional growth, job growth, incentives, subsidies, rent-seeking

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1. TARGETED VS. GENERAL STRATEGIES FOR ECONOMIC DEVELOPMENT

Policies designed to boost economic growth preoccupy executives and legislators at all levels of government. States and localities spend an estimated $95 billion per year on targeted economic development subsidies.[1] Economist Timothy Bartik estimates that "business incentives have more than tripled since 1990."[2] Recent high-profile cases suggest that the subsidy race is heating up, but economic theory and experience suggest that, on balance, targeted subsidies do not boost economic development.[3] In this study, we review that evidence. Although our goal is to shed light on targeted subsidies in general, we find it useful to illustrate the general points by referencing the specific case of Foxconn. In the summer of 2017, Wisconsin legislators agreed to give Foxconn Technology Group $3.6 billion in cash subsidies and other benefits to be paid out over 15 years.[4] The deal was noteworthy for its sheer size (it is several times larger than the typical subsidy), its high profile, and its prominent defenders. Although the size of this subsidy makes it an outlier, we believe that the problems involved are endemic to targeted subsidies in general.

Broadly speaking, policymakers can pursue two economic development strategies. The first strategy might be called a "general approach." With this strategy, policymakers attempt to create an environment that is conducive to economic development without offering targeted assistance to particular firms or industries. This environment will include a mix of *generally applicable* tax, spending, regulatory, and legal rules that, if implemented correctly, should maximize economic opportunity and minimize entrepreneurial constraints. Academic research suggests that effective general strategies include the provision of genuine public goods and the preservation of economic freedom through limited taxation, reasonable regulation, and—above all—protection of private property rights.[5]

The second strategy might be called the "targeted approach" to economic development. With this strategy, policymakers attempt to directly promote the development of particular firms and industries through the use of exclusive privileges. These privileges include targeted tax relief, targeted regulatory relief, cash subsidies, loans and loan guarantees, in-kind donations of land, and targeted provision of other valuable goods and services.

Policymakers can target particular firms in a variety of ways. They might target individual firms, entire industries, specific regions (often called economic development zones), or all companies using particular production methods.[6] They can target specific firms through programs administered at the discretion of governors or other leaders. These programs are often known

as "deal closing funds." Or policymakers might target firms through programs that specify certain behaviors. For example, a firm might qualify for a certain tax credit if it hires a certain number of employees or makes an investment of a certain size.

No matter the form of the targeted approach to economic development, two salient characteristics distinguish it from the general approach. First, the targeted approach represents a deliberate attempt to direct growth, rather than letting it take its own course. In his Nobel Prize lecture, F. A. Hayek described this approach as the attempt "to shape the results as the craftsman shapes his handiwork" and contrasted it with what he called the "environmental approach to growth," in which policymakers aim to "cultivate a growth by providing the appropriate environment, in the manner in which the gardener does this for his plants."[7] Second, the targeted approach is discriminatory; it is executed through selective government-granted privileges to certain firms, industries, or regions—often at the expense of other taxpayers and residents.[8] In essence, the gardener is fertilizing some plants by composting others.

The targeted and the general approaches to economic development are not mutually exclusive; it's possible for a state to court businesses with generally applicable tax policies *and* targeted privileges. In practice, however, they may be substitutes for one another. For example, recent research by economists Peter Calcagno and Frank Hefner finds that states with higher tax burdens are more likely to give out tax incentives, and economists John Dove and Daniel Sutter find that targeted subsidies are negatively related to measures of economic freedom.[9] In other words, states that offer more privileged treatment to targeted companies are less likely to have free and open markets in which all companies can thrive.[10]

Some states and localities make their commitment to the "general approach" explicit. For example, in its bid for Amazon's second headquarters (HQ2), New Hampshire made clear that it wasn't offering Amazon any special treatment beyond its already-existing comparatively low tax burden.[11] Similarly, the mayor of San Jose was quite vocal in announcing that his city would not offer Amazon any targeted subsidies for HQ2.[12] These attitudes, however, are rare. In a recent survey of 110 mayors, 84 percent reported that they believe targeted incentives are good policy.[13]

In the next section we briefly outline the details of Wisconsin's Foxconn subsidy. In section 3 we present the economic arguments in favor of targeted subsidies and provide a rebuttal. In section 4 we discuss the quantifiable harm caused by targeted subsidies. In section 5 we discuss some difficult-to-quantify downsides to subsidies. In section 6 we review the political economy of targeted subsidies, without which the economic analysis is incomplete (and likely incorrect).

We conclude that the weight of economic theory suggests that the targeted approach to economic development is ineffective at best and counterproductive at worst. This conclusion helps explain why our forthcoming review of the empirical research of targeted subsidies finds that they have little to no effect on local community welfare.[14]

2. WISCONSIN'S FOXCONN SUBSIDY: A CASE STUDY

In July 2017, Foxconn Technology Group, a Taiwanese manufacturing giant, announced plans to open a production facility in southeast Wisconsin that would make large liquid crystal display (LCD) units.[15] The announcement was made in the East Wing of the White House with then governor of Wisconsin Scott Walker, then Speaker of the House Paul Ryan, and President Donald Trump on hand.[16] The deal was handwritten on a single sheet of Governor Walker's stationery and was signed by the governor and by then Foxconn chairman Terry Gou.[17] It listed the basic terms of the agreement as it then stood: the state would offer $3 billion in subsidies, and Foxconn would make a $10 billion investment and hire 13,000 workers.[18] Almost immediately, however, the size of the state's incentive package began to grow, whereas the size of Foxconn's investment began to shrink.

In its final agreement, the state offered Foxconn about $3.6 billion in financial subsidies, most of which would be paid over the course of 15 years. Table 1 lists the financial subsidies offered by the state.[19] The largest component of the deal is the combined $2.85 billion in refundable payroll and capital expenditure tax credits. Because the state already exempts manufacturers from its corporate income tax, this portion of the incentive is an outright cash subsidy, while other portions can be considered tax privileges.[20]

In addition to the state subsidies, localities agreed to a $764 million site development subsidy (which subsequently expanded to $911 million), funded via tax increment financing.[21] The state has agreed to underwrite 40 percent of these loans if the local government is unable to pay them off (but we do not include this potential cost in the state subsidies listed in table 1).[22] Beyond these financial incentives, the state also exempted the company from certain wetland regulations, permitting it to circumvent the standard environmental impact reports and to discharge material into nonfederal wetlands without a permit.[23] It also authorized over $332 million in electric and gas utility infrastructure improvements to service the plant, the costs of which will be borne by other utility customers.[24] Finally, the Village of Mount Pleasant declared 2,800 acres as "blighted," despite the area's comparatively low crime rate, and has spent $160 million to acquire property through eminent domain in order to transfer it to Foxconn.[25] As the Village goes through with these plans, some residents are challenging the proposed takings in court, citing Wisconsin law stipulating that property may not be taken via eminent domain and transferred to private developers unless the area's crime rate is three times the rate of surrounding areas.[26]

As we have noted, in exchange for these subsidies and tax and regulatory privileges, the

TABLE 1. WISCONSIN'S FOXCONN SUBSIDIES FOR A GENERATION 10.5 PLANT

Description	Cost over first 15 years ($)	Cost over all years ($)	Time period (years)
Payroll tax credits	1,500,000,000	1,500,000,000	15
Capital expenditure tax credits	1,350,000,000	1,350,000,000	15
General obligation bonds for construction[a]	306,225,000	408,300,000	20
Sales and use tax exemptions[b]	139,000,000	139,000,000	15
State road improvements[c]	134,000,000	134,000,000	15
Training program subsidies	20,000,000	20,000,000	15
Grants to local governments	15,000,000	15,000,000	15
Economic development liaison position	900,000	900,000	5
Total 15-year cost	**3,465,125,000**	**3,567,200,000**	
Average annual cost	**231,008,333**		

Notes:
a. This is to pay off $252.4 million in general obligation bonds for roadway construction. This committment will cost $408.3 million over 20 years; $306.225 million is 15 years' worth of payments. See also note C below.

b. According to standard principles of taxation, business-to-business transactions should not be taxed because they are a cost of doing business. Other firms in the state are not automatically exempt from these taxes, however, so we include this tax privilege in our calculations.

c. The benefits-received principle, a widely accepted idea in public finance, holds that those who directly benefit from a publicly provided service should pay for it. In keeping with this principle, it is common to lay higher taxes on those who will benefit from marginal improvements in infrastructure, for example, by designating the area around the improvement a public improvement district subject to higher property taxes for a number of years. In the Foxconn case, however, local infrastructure that primarily benefits Foxconn will be financed by taxpayers statewide. On the benefits-received principle, see Richard Abel Musgrave, *The Theory of Public Finance: A Study in Public Economy* (New York: McGraw-Hill, 1959), 61–89; James M. Buchanan, "Taxation in Fiscal Exchange," *Journal of Public Economics* 6, no. 1 (July 1, 1976): 17–29; Randall Holcombe, "Taxation, Production, and Redistribution," in *Handbook of Public Finance*, ed. Jurgen G. Backhaus and Richard E. Wagner (Boston: Springer, 2013), 146–47.

Sources: 2017 Wisconsin Act 58, Pub. L. No. 991.11 (2017); "Electronics and Information Technology Manufacturing Zone Tax Credit Agreement between the Wisconsin Economic Development Corporation and Sio International Wisconsin, Inc., FEWI Development Corporation, and AFE, Inc.," November 2018, http://www.thewheelerreport.com/wheeler_docs/files/1109wedcfoxconn.pdf.

company and its partners initially agreed to invest $10 billion in a "Generation 10.5" LCD manufacturing plant (Generation 10.5 plants specialize in making LCD displays 65 inches and larger). The project was expected to take six years to complete, and the company only promised to employ 3,000 workers, though it believed it had the potential to employ up to 13,000 workers.[27] The company projected that the average annual salary for workers at the plant would be $53,875 per year.[28]

As of this writing, some elements of the deal are in doubt. Despite the July 2017 promise of a $10 billion investment with 13,000 workers, the final agreement that was inked in November of that year allowed Foxconn to claim the full subsidy with only $9 billion in investments and 10,400 workers.[29] Then, in the summer of 2018, Foxconn scrapped plans to build a Generation 10.5 LCD plant, saying that it would instead build a Generation 6 facility to make smaller LCDs for devices such as tablets, mobile phones, and smart watches.[30] To those who track subsidies, this change was not surprising. In fact, a recent state audit has found that, on average, firms receiving Wisconsin subsidies create only about 34 percent of promised jobs.[31] Although the company maintained that it still planned to invest up to $10 billion in the facility, industry experts have said that a Generation 6 plant would require a $2 billion to $3 billion investment, rather than a $10 billion investment.[32] If Foxconn were to build the larger, Generation 10.5 facility, it would collect about $3.6 billion in subsidies. Because the payroll and capital gains tax credits are contingent on hiring and investment decisions,

TABLE 2. WISCONSIN'S FOXCONN SUBSIDIES FOR A GENERATION 6 PLANT

Description	Cost over first 15 years ($)	Cost over all years ($)	Time period (years)
Payroll tax credits[a]	76,400,000	76,400,000	15
Capital expenditure tax credits[b]	375,000,000	375,000,000	15
General obligation bonds for construction[c]	306,225,000	408,300,000	20
Sales and use tax exemptions[d]	139,000,000	139,000,000	15
State road improvements[e]	134,000,000	134,000,000	15
Training program subsidies	20,000,000	20,000,000	15
Grants to local governments	15,000,000	15,000,000	15
Economic development liaison position	900,000	900,000	5
Total 15-year cost	**1,066,525,000**	**1,168,600,000**	
Average annual cost	**71,101,667**		

Notes:

a. These payroll subsidy estimates assume that a Generation 6 plant would employ 3,250 workers, one-quarter the number projected to be employed at a Generation 10.5 plant. We account for the fact that Foxconn has already missed its hiring targets for 2018 (these subsidies can be recaptured if Foxconn has hired at least 2,080 workers by the end of 2019). We assume for the sake of simplicity that Foxconn meets all future hiring targets up to the 3,250 workers assumed to be necessary for a Generation 6 plant. This makes Foxconn eligible for up to $76.4 million in payroll subsidies ($19.1 million for hiring in 2019, $9.1 million in carry-forward subsidies for hiring in 2019, and $47.8 million for hiring in 2020). We do not include the effect of Wisconsin "clawing back" subsidies owing to projected employment for a Generation 6 plant being below the minimum number of jobs (6,500) needed to avoid recovery payments. In the past, policymakers and economic development officials have tended to either ignore such failures or else rewrite subsidy agreements to avoid having to engage in controversy that might draw negative public attention.

b. These capital subsidy estimates assume that a Generation 6 plant would require $2.5 billion in capital investments, one-quarter of those which were projected to be required for a Generation 10.5 plant. We assume that Foxconn undertakes capital investments and hiring such that it maximizes its subsidy eligibility each year. This would allow Foxconn to claim the full 15 percent subsidy for its entire capital investment, making the subsidy worth $375 million over the years 2019 and 2020.

c. This is to pay off $252.4 million in general obligation bonds for roadway construction. This commitment will cost $408.3 million over 20 years, and $306.225 million is 15 years' worth of payments.

d. According to standard principles of taxation, business-to-business transactions should not be taxed because they are a cost of doing business. But other firms in the state are not automatically exempt from these taxes, so we include this tax privilege in the table.

e. The benefits-received principle, a widely accepted idea in public finance, holds that those who directly benefit from a publicly provided service should pay for it. In keeping with this principle, it is common to lay higher taxes on those who will benefit from marginal improvements in infrastructure, for example, by designating the area around the improvement a public improvement district subject to higher property taxes for a number of years. In the Foxconn case, however, local infrastructure that primarily benefits Foxconn will be financed by taxpayers statewide. On the benefits-received principle, see Richard Abel Musgrave, *The Theory of Public Finance: A Study in Public Economy* (New York: McGraw-Hill, 1959), 61–89; James M. Buchanan, "Taxation in Fiscal Exchange," *Journal of Public Economics* 6, no. 1 (July 1, 1976): 17–29; Randall Holcombe, "Taxation, Production, and Redistribution," in *Handbook of Public Finance*, ed. Jurgen G. Backhaus and Richard E. Wagner (Boston: Springer, 2013), 146–47.

Sources: 2017 Wisconsin Act 58; "Electronics and Information Technology Manufacturing Zone Tax Credit Agreement."

however, the company stands to collect less in subsidies if its hiring and investments fall short.

More changes to the plan have unfolded during the final stages of writing this paper. In January 2019 Foxconn announced that the facility would not make any LCDs but would instead be a technology and packaging hub. By that time, the firm had already fallen short of its 2018 hiring projections.[33] Within days, however, the company reversed course again, saying that it would go through with the Generation 6 plan following a conversation between the company's chairman and President Trump.[34] Wisconsin Governor Terry Evers revealed later that Foxconn wanted to make changes to its contract with the state, but information on the revised contract is not publicly available.[35]

Although the situation is still fluid, table 2 presents our best estimate of the subsidies Foxconn will receive in the event that it develops the Generation 6 plant. The estimate assumes that industry experts are correct that a Generation 6

plant will require approximately one-fourth as many employees and one-fourth as much capital. This lower investment will reduce the total subsidy Foxconn would be eligible for to $1.2 billion.

Whatever its fate, the Foxconn subsidy package—which is orders of magnitude larger than many other deals—will help to illustrate the economics of targeted subsidies.

3. THE ARGUMENTS FOR TARGETED SUBSIDIES AND THE PROBLEMS WITH THESE ARGUMENTS

On balance, economic theory suggests that targeted economic development subsidies do not work. As we will show, targeted subsidies are more likely to diminish than to enhance the economic prosperity of those communities that offer them. First, however, in this section we endeavor to present the best arguments in favor of targeted subsidies to provide an even-handed analysis of this controversial policy.

The most common argument offered on behalf of a targeted subsidy is that it will create a multiplier effect in the local economy. A less common, though intellectually stronger, case for targeted subsidies is that industry clustering can create positive externalities. We present each argument in favor of targeted subsidies in turn, followed by counterarguments that explain why these standard reasons fail to hold water.

3.1. MULTIPLIERS

It is commonly asserted that targeted economic development subsidies are warranted because the direct economic activity that they support will spur other economic activity. The idea is that all economic activity has a "multiplier effect": When a firm builds a new production facility, it creates new demand for labor, capital, and materials. The workers, in turn, create new demand for goods and services. Thus, like ripples emanating from a stone thrown into a pond, the new production facility generates economic activity beyond its four walls.

The advent of input-output models—mathematical calculations that attempt to quantify interindustry relationships—has given credence to this intuitive idea.[36] The estimates derived from these models are often cited by the advocates of targeted subsidies and are widely reported in the press. In the case of Foxconn, one study commissioned by the Wisconsin Economic Development Corporation, the agency that negotiated the subsidy, employed an input-output model to estimate that the plant and its presumed 13,000 employees would create demand for an additional 18,057 workers in supporting industries.[37] A previous study conducted by EY Quantitative Economics and Statistics (EY) and commissioned by Foxconn itself had projected that the plant and its employees would create demand for an additional 22,245 workers.[38] The state Legislative Fiscal Bureau adopted these assumptions in its own analysis of the proposal.[39]

According to EY, construction of a Generation 10.5 plant would add $5.019 billion to Wisconsin GDP over the first four years, and ongoing operations of the plant would add another $57.4 billion in the 11 years after that. Thus, in total, a Generation 10.5 facility would add about $62.4 billion to Wisconsin GDP over 15 years.[40]

If industry experts are correct and a Generation 6 plant requires a substantially smaller investment than that promised by Foxconn, then the projected gross effect on GDP might be about $15.6 billion, or one-fourth as great as EY estimated for the Generation 10.5 plant.[41]

Although highly speculative, these estimates are not, in theory, wrong.[42] New economic activity does create other economic activity. The problem is that these widely reported and repeated multipliers are often misunderstood. Two common misunderstandings plague these sorts of estimates. We briefly review each in the subsections that follow.

3.1.1. Multiplier Estimates Incorrectly Assume That Subsidies Determine Location Decisions

The EY estimates imply a multiplier of nearly 18. In other words, they suggest that every $1 the state spends on the Foxconn subsidy will create about $18 in new GDP. If this seems like an extraordinarily high number, it is. One reason it is so high is that it assumes—with 100 percent certainty—that the Foxconn plant would not locate in Wisconsin but for the subsidy. Recent research, however, suggests that this is not a valid assumption in most cases.[43]

When multiple jurisdictions bid on a proposed facility, companies often do not choose the highest bidders. For example, in selecting its second headquarters, Amazon rejected much higher incentive packages offered by Cleveland and Ohio ($3.5 billion), Newark and New Jersey ($7 billion), Maryland ($8.5 billion), and Dallas–Fort Worth Airport ($23 billion) to initially select New York ($3 billion) and Virginia ($1.05 billion), only to later walk away from New York.[44] The choice to forgo higher subsidies may seem surprising; however, when it comes to facility location decisions, other factors such as labor costs, business logistics, and access to region-specific resources are often far more important.[45] For example, Bartik estimates that the costs of locally supplied labor are typically about 14 times larger than state and local business tax costs.[46] To put this in perspective, a mere 2 percent difference in wages can offset as much as a 40 percent difference in taxes.[47]

In most instances, therefore, subsidies pale in comparison to labor costs. Of course, Wisconsin's Foxconn subsidy is not typical. At $3.6 billion, one might think it would be enough to override concerns about higher labor costs. But this is not necessarily so. In selecting Wisconsin, the company rejected a $3.8 billion offer from Michigan.[48] And later, when the firm scaled back its plans from a Generation 10.5 to a Generation 6 plant, labor costs seem to have been its primary concern. Louis Woo, the special assistant to Foxconn's CEO, told Reuters that labor expenses in the United States made large TV construction in the United States cost prohibitive. "In terms of TV, we have no place in the U.S.," he said. "We can't compete."[49]

There are several difficult-to-quantify factors that made southeast Wisconsin an attractive site for Foxconn. It permits easy access to plenty of freshwater without (explicitly) violating the Great Lakes–St. Lawrence River Basin Water Resources Compact (this is due to its position in a city that has surplus water extraction allowances).[50] The site also offers a number of options for wastewater disposal because it straddles the boundary between the Great Lakes and Mississippi River watersheds. And the site affords easy access to transportation routes.

Beyond these geographic factors, the location also provided some political benefits. It was in the congressional district of the then–Speaker

TABLE 3. GROSS EXPECTED VALUE GIVEN DIFFERENT LIKELIHOODS THAT SUBSIDIES SWAYED THE LOCATION DECISION

	Generation 10.5 plant[a]					Generation 6 plant[b]				
	100% decisive	76% decision	50% decisive	25% decisive	2% decisive	100% decisive	76% decision	50% decisive	25% decisive	2% decisive
Gross expected value (millions)	$62,428	$47,445	$31,214	$15,607	$1,249	$15,607	$11,861	$7,804	$3,902	$312

Notes: The shaded values represent the most realistic range of estimates of the gross subsidy effect.
a. EY Quantitative Economics and Statistics (2017) estimated that plant construction would add $5,019 million to Wisconsin GDP over the first four years of the subsidy and that ongoing operations of the plant would add another $5,219 million to GDP for each of the next 11 years, for a total of $62,428 million over 15 years. To estimate the gross expected value of the subsidy, we multiply $62,428 million by 1.00, 0.76, 0.50, 0.25, and 0.02.

b. Here we assume that Foxconn instead builds a Generation 6 plant, per their publicly stated plans. Industry experts report that such a plant is likely to be a $2 billion to $3 billion investment. Taking the average of this range, we assume that it will be a $2.5 billion investment. At one-fourth the size of the Generation 10.5 plant, we assume that a Generation 6 plant will enhance gross GDP by $15,607 million over 15 years (= $62,428/4). Input-output models assume linear relationships regarding the capital-to-labor ratio needed for production and for production inputs from other industries. We then apply the same procedure as we did with the Generation 10.5 plant to produce the gross expected value range of $312 million to $15.6 billion.

Sources: Authors' calculations based on gross benefits estimated by EY, decisive subsidy probabilities by Bartik, and the size of a Generation 6 plant reported by Thomas. "Quantifying Project Flying Eagle's Potential Economic Impacts in Wisconsin" (EY Quantitative Economics and Statistics, July 2017); Timothy J. Bartik, "'But For' Percentages for Economic Development Incentives: What Percentage Estimates Are Plausible Based on the Research Literature?," Working Paper (Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 2018); Arthur Thomas, "Glass Plant Not a 'Necessity' with Foxconn Making Smaller Screens," BizTimes, June 20, 2018, https://www.biztimes.com/2018/industries/manufacturing-logistics/foxconn/glass-plant-not-a-necessity-with-foxconn-making-smaller-screens/.

of the House of Representatives and was close to the home of the then–White House chief of staff. Perhaps most importantly, the location was the first and preferred location suggested by the president of the United States, who was then engaged in a historic trade war.[51] Of course, it is impossible to quantify the effects of these factors.

Interestingly, the best evidence that subsidies are not decisive in determining plant locations comes from executives themselves. Keep in mind that the leaders of subsidized firms have an incentive to claim that the deals are decisive.[52] When questioned, however, leaders often admit that the deals were not, in fact, determinative.[53]

For example, BMW decided to locate a plant in Greenville, South Carolina, in 1992 after the state offered the firm a $150 million incentive package. The state had originally offered only $35 million but upped its ante to compete with a counteroffer from Nebraska. Both policymakers and BMW claimed that South Carolina's subsidies were decisive, but BMW's chairman acknowledged that proximity to a seaport was an important factor in site selection, making Nebraska an unlikely contender.[54] Similarly, Amazon was clear in its official announcement that "attracting top talent was the leading driver" in its decision of where to locate HQ2.[55]

More systematic research supports these anecdotes, suggesting that the vast majority of subsidies are, in fact, not decisive. In a recent review of 34 academic research papers, Bartik concludes that subsidies "probably tip somewhere between 2 percent and 25 percent of incented firms toward making a decision favoring the location providing the incentives."[56] In other words, in most cases, the odds are high (between 75 percent and 98 percent) that the subsidized company would have chosen to locate in the subsidizing locale even without the incentives. If that is the case, the odds are also high that subsidizing governments are wasting their money.

This knowledge should affect the way we estimate the value of a subsidy. The gross expected value of a subsidy can be calculated as the gross anticipated economic effect of the corporate relocation or expansion, multiplied by the probability that the subsidy made the difference in the com-

pany's location or expansion decision. We can summarize this estimation via equation (1):

$$\begin{aligned} &\textit{Gross Expected Value of Subsidy}_E \\ &= (\textit{Gross Economic Effect of Project})_E \\ &\times (\textit{Probability the Subsidy Was Decisive})_E \end{aligned} \quad (1)$$

The *E* subscripts indicate that these factors are estimates. Note that this equation indicates only the *gross* value of the subsidy. That is, it ignores the costs associated with the subsidy. Later in the analysis, we will incorporate these costs to produce an estimate of the *net* value of a subsidy.

Note that in this exercise, we are estimating the value of the subsidy, not the project itself. The point here is that even if a *project* is extremely valuable, the value of the *subsidy* might be quite low if there is a small chance that the subsidy actually caused the project to locate where it did.

Equation (1) can be used to estimate the gross value of the Foxconn subsidy in terms of the gross jobs, the gross output, or the gross GDP that the subsidy is expected to create.[57] In table 3, we apply this calculation to estimate the gross GDP projected to be generated by the plant's construction and operations that is attributable to Wisconsin's subsidies. We also estimate the effect of subsidies for a smaller Generation 6 plant, which now seems the most likely investment by Foxconn in Wisconsin and which industry experts predict will be one-fourth the size of the initially promised Generation 10.5 plant.[58]

As noted, the literature suggests that typical subsidies are decisive between 2 percent and 25 percent of the time. Wisconsin's subsidy to Foxconn was, however, about 10 times larger than typical subsidies, and it is possible that larger subsidies are more likely to be decisive. Unfortunately, because subsidies of this size are so rare, we have few data points to go on. Nevertheless, extrapolating from the experience with smaller subsidies, Bartik has recently figured that a subsidy of the size of the Foxconn subsidy might tip the balance with 76 percent probability.[59] His estimate is based on the size of the subsidy and does not include the impossible-to-quantify factors that might have mattered here, such as the location's geographic and political benefits. To account for the large size of the subsidy, we also include 50 percent and 76 percent decisive scenarios. We regard the shaded sections of the table—the 2 percent scenario through the 76 percent scenario—as the most realistic range of estimates of the gross expected value of the Foxconn subsidies. But as we have endeavored to make clear, this is hardly an exact science, and reasonable people can disagree. Indeed, the only thing we can know with certainty is that the 100 percent decisive scenario is unrealistic.

If Foxconn still builds the Generation 10.5 plant and if the subsidy was decisive with 100 percent probability, then the gross benefits of the subsidy are estimated to be $62.4 billion over 15 years. If, however, the company builds a Generation 6 plant and the subsidy was decisive with only a 2 percent probability, then the gross benefits of the subsidy are estimated to be $312 million over 15 years.

It is hard to know how such a large deal affects plant location decisions. It is telling, though, that even this immense deal was not enough to get the firm to stick with its promise to build a Generation 10.5 plant. More than anything, the figures in table 3 underscore the vast uncertainty involved in these sorts of estimates.

These estimates, however, represent only gross benefits. To obtain a full picture of the net expected economic effects of the plant, we must also account for the costs of the subsidy. We discuss those costs that are measurable in section 4.

3.1.2. Widely Cited Multiplier Estimates Do Not Incorporate the Cost of the Subsidy

Wisconsin's $3.6 billion subsidy to Foxconn did not materialize out of thin air. In order to fund this activity, the state first has to remove $3.6 billion from the Wisconsin economy through taxation. Noah Williams, an economist at the Center for Research on the Wisconsin Economy, explained in his analysis of the subsidy that "the income multiplier . . . only accounts for the direct income from the project, but does not account for . . . the cost of the subsidy funds."[60]

The logic of a multiplier is that economic activity indirectly creates other economic activity; a new production facility and its employees create demand for products and services offered by suppliers and other producers. This logic, however, *also applies to the resources that are used to fund the subsidy*. Just as the workers at an LCD factory create demand for other products and services, taxpayers also create demand for other products and services. With $3.6 billion less in their pockets, however, these individual and business taxpayers create less demand for other products and services.

In other words, the multiplier associated with the subsidy is only half the story. To appreciate its full effect, we must also know the size of the tax multiplier. Just as spending creates a positive multiplier, taxation creates a negative multiplier. Furthermore, as we show in section 4, taxation tends to discourage economic exchange, which means that there is good reason to suspect that the negative tax multiplier is, in fact, greater than the positive spending multiplier, making the *net* multiplier of the subsidy negative.

Although this is standard economic analysis, the journalists and industry leaders who repeat these estimates seem not to appreciate that they are telling less than half of the story. The Wisconsin Technology Council, for example, repeated Williams's estimate that operation of the Foxconn plant would generate $39 billion in gross benefits but presented it as if it were a net estimate of the economic effect of the subsidy.[61] At best, when reports do acknowledge a cost they state only the fiscal cost of $3.6 billion, failing to acknowledge that the $3.6 billion would have generated its own economic activity through its own multiplier.[62]

3.2. POSITIVE EXTERNALITIES

Basic economic theory holds that net benefits are maximized by pursuing any activity up to the point at which marginal benefits equal marginal costs. As a general rule, markets—even markets with relatively few participants—converge on this point through a discovery process that is guided by the signals of price, profit, and loss.[63]

Theory, however, offers an exception to this rule: the case of externalities. These occur when certain benefits or costs to the economic activity are not experienced by the consumer or producer, and therefore they are not "internalized" in the decision of how much of a good or service to produce and exchange. One theoretical solution is to impose a tax (in the case of a negative externality) or a subsidy (in the case of a positive externality) on the exchange in order to cause consumers and producers to internalize the additional cost or benefit.

Proponents of targeted economic development policy often argue that firm location decisions can create positive externalities by building "industry clusters" that lead to enhanced knowledge sharing, indirectly accelerating the development of valuable new ideas.[64] Using this reasoning, they argue that relocation subsidies could theoretically push businesses closer to making decisions that would lead to an optimal economic outcome

in a social sense. It is commonly argued that positive externalities occur when several firms from the same industry are "clustered" together in the same region.[65] If enough firms in the same industry co-locate, creating a critical mass of demand for production inputs and professional services, they will attract suppliers to that region as well. Empirical evidence supports this reasoning: economist Enrico Moretti has found that each new tech job in a region creates five additional support jobs.[66] The reduction in transaction costs and logistics expenses owing to this industrial concentration represents a positive externality.

Having so many workers from the same profession in one place inevitably gives rise to increased information channels, which enhance firm productivity. Economists generally consider knowledge to be a nonrival good. One person's possession of a particular idea or skill does not inhibit another person from having that same knowledge. This means, however, that firms have limited ability to benefit from investments in the development of new knowledge, resulting in less motivation for them to do so. This diminishes economic development, which depends on new knowledge of how to produce more or better things with fewer resource costs. Industrial clustering, to the degree that it facilitates the development and exchange of new ideas, helps to solve this problem.

Firms seeking subsidies and the economic development agencies dispensing them often point to these arguments in their attempts to strike targeted economic development deals. In its request for proposals (i.e., subsidies) for a second headquarters, Amazon asserted that every $1 "invested" in Amazon by Seattle had yielded "an additional $1.4 for the city's economy overall."[67] Furthermore, in its response to Amazon's request, the city of Boston mentioned the word "cluster" no fewer than 19 times.[68]

Contrary to the claims of both subsidy seekers and subsidy dispensers, however, industrial clustering effects do not make subsidies necessary or even desirable. Although he finds significant clustering effects in the tech industry, "like most economists, Moretti doesn't think cities should dangle billions in subsidies to Amazon."[69]

Importantly, many of the positive externalities of an industrial cluster are reciprocal. A firm that locates in a particular region will benefit other firms in that region; however, because it will in turn reap benefits from the others, it may not need inducement to locate there.[70] As Michael Porter, one of the originators of industrial cluster theory, has written, "Most clusters form independently of government action—and sometimes in spite of it."[71] This is especially so when firms cluster in an area to take advantage of local conditions afforded by the natural environment, the workforce, suppliers, or the customer base. No inducement is necessary to encourage tech firms to locate in Silicon Valley or financial firms in New York City or wineries in Napa.

In fact, subsidies may discourage the sort of beneficial clustering that would occur naturally. As Porter puts it,

> Government policies in developing economies often unwittingly work against cluster formation. Restrictions on industrial location and subsidies to invest in distressed areas, for example, can disperse companies artificially. Protecting local companies from competition leads to excessive vertical integration and blunted pressure for innovation, retarding cluster development.[72]

Although it may make sense for firms in the same industry to voluntarily co-locate in the short

run, there is little evidence that the larger community benefits from clustering over the long run. As Keith Chapman of the University of Aberdeen says,

> Although various studies have emphasized that there is no necessary association between geographical clustering and enhanced regional economic growth, there is a tendency to *assume* such an association when clusters are identified as targets of public policy.[73]

A number of researchers emphasize the disadvantages of overspecialization.[74] One long-term problem is that "economic specialization is a risky strategy, exposing regions to the threat of downturns in key sectors."[75] Detroit, which during the first half of the 20th century was the archetypal cluster, also showed the problems that can arise from an economy that is overly dependent on a single industry.[76]

Summarizing this research, economists Pierre Desrochers and Frédéric Sautet write, "Much evidence suggests that specialization leaves regional economies more likely to experience severe economic downturns and is less conducive to the development of symbiotic linkages between diverse firms."[77] Indeed, the best evidence suggests that industrially diverse areas are not only more resilient to downturns but also more likely to produce new innovations.[78]

Moreover, given the problems in the political economy of targeted subsidies (see section 6), there is little reason to suspect that policymakers will encourage the "right" sorts of industries to cluster. These political economy problems manifest as a tendency for policymakers to attempt to recreate a formula that has worked in other regions. Economic development officials often aspire to create the "next Silicon Valley."[79] Foxconn officials pitched their plans to Wisconsin as "Wisconn Valley."[80] Once a cluster like Silicon Valley has already been created, however, a second, third, or fourth cluster around the same industry in another location is less likely to be successful, not more so.

For centuries, economists have known that regions prosper when they specialize in producing those goods for which they have a comparative advantage—that is, those products and services that they can produce at lower opportunity cost than others can.[81] But specialization needs to take a natural course in order to be efficient, using the market signals of profit, loss, and price as a guide. Subsidies can encourage a firm to ignore its or its region's natural comparative advantage, oblivious to what economists have called "regional realism."[82]

To put this in the context of the Foxconn subsidy, it is certainly *possible* that an LCD facility could create positive externalities by developing a tech manufacturing cluster. If, however, Wisconsin were already well suited to the tech manufacturing sector, then Foxconn would need no inducement to locate there in the first place. Moreover, the targeted subsidy may discourage the sort of clustering that would occur naturally and may encourage the region to overspecialize or to specialize in a way that is not consistent with its comparative advantage.

Consider this fanciful but feasible alternative: The $3.6 billion in subsidies that Wisconsin promised Foxconn could instead have built 7 square miles of greenhouses to motivate orange growers to move from Florida.[83] This option would certainly create new jobs and an exportable product, but such a cluster would clearly not be a wise investment in terms of Wisconsin's comparative advantage.

4. QUANTIFYING THE COSTS OF A TARGETED ECONOMIC DEVELOPMENT SUBSIDY

An old economic adage that is no less true because of its age cautions that there is no such thing as a free lunch.[84] To put it another way, all human action involves both benefits and (opportunity) costs.[85] When a firm receives a subsidy, the benefits are conspicuous: investments are made, jobs are created, and new products or services are produced. These gains accrue to the firm's owners, employees, and customers; they should be tallied in the benefits column of a cost-benefit analysis. But the opportunity cost of a targeted subsidy, while less conspicuous than its benefits, is no less real.

The resources that pay for these benefits must come from somewhere, usually state general funds, which are financed by taxation. The potential alternative uses of these funds need to be considered as part of any analysis that properly counts both benefits *and* costs. To put it mathematically, the *net* economic value of a subsidy can be explained by equation (2). It shows that the net value is equal to the gross value already described in equation (1), minus the estimated opportunity cost of the project.

$$\begin{aligned} &\textit{Net Value of Subsidy}_E \\ &= (\textit{Gross Economic Effect of Project})_E \\ &\times (\textit{Probability the Subsidy Was Decisive})_E \\ &- (\textit{Opportunity Cost of Resources Used on Project})_E \end{aligned} \qquad (2)$$

As noted earlier, the opportunity cost of a resource is the value of the next-best alternative use of that resource. For example, the $3.6 billion transfer to Foxconn might have instead financed a genuine public good such as public safety. While it is sometimes asserted that a subsidy will "pay for itself" by generating new economic activity and thereby enlarging the tax base, the evidence suggests this is not the case. New research by scholars at North Carolina State University finds that incentives tend to draw resources away from state governments and that they negatively affect state fiscal health.[86] Other research suggests that, over time, subsidies crowd out state spending on public services.[87] If the provision of public services were the next-best use of that money, then the value of the forgone public services would have to be subtracted from the economic value created by the subsidy in order to obtain the net value of the subsidy.

Alternatively, these resources might have permitted a generalized reduction in tax rates.[88] As we've noted, recent research suggests that subsidies are associated with lower levels of economic freedom.[89] Among other things, Wisconsin taxes personal income, corporate income, and sales of certain goods and services. Table 4 shows how the two different subsidies—$3.6 billion for a Generation 10.5 plant and $1.2 billion for a Generation 6 plant—relate to various Wisconsin tax

TABLE 4. THE FOXCONN SUBSIDY AND TAX CUTS THAT COULD HAVE BEEN

	Current Rates and Revenue Forecasts				
	Sales tax	Personal income tax	Corporate income tax	Fuel tax	Total, all revenue
Anticipated average annual state tax revenue, FY 2018–FY 2032 (millions)	$7,254	$10,863	$1,053	$1,221	$21,556
Anticipated total state tax revenue, FY 2018–FY 2032 (millions)	$108,809	$162,951	$15,790	$18,314	$323,335
Current tax rate(s)	5.00%	4.00%, 5.84%, 6.27%, 7.65%	7.90%	$0.309	see note
	Tax Reductions in Lieu of Subsidies for a Generation 10.5 Plant				
Possible percent reduction in tax in lieu of Foxconn subsidy	−3.18%	−2.13%	−21.94%	−18.92%	−1.07%
Potential rate in lieu of Foxconn subsidy	4.84%	see note	6.17%	$0.251	see note
	Tax Reductions in Lieu of Subsidies for a Generation 6 Plant				
Possible percent reduction in tax in lieu of Foxconn subsidy	−0.98%	−0.65%	−6.75%	−5.82%	−0.33%
Potential rate in lieu of Foxconn subsidy	4.95%	see note	7.37%	$0.291	see note

Note: Such a simple calculation is not possible with a graduated income tax.

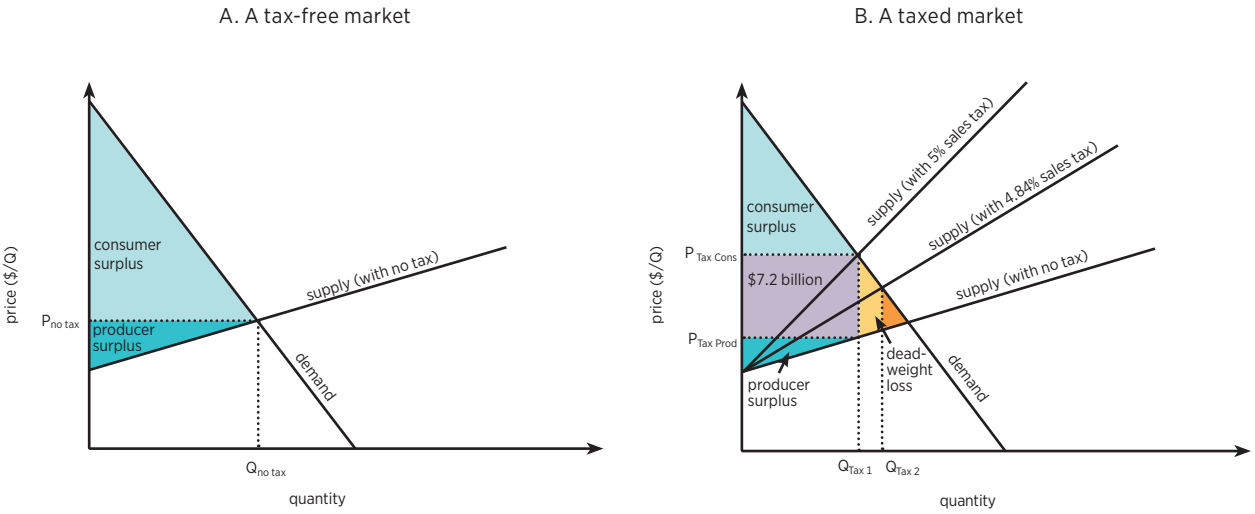
Sources: Authors' calculations. Anticipated future revenue was calculated using historical trends derived from the comprehensive annual financial reports issued by the state of Wisconsin from 2005 to 2018. The estimates assume that historical growth rates in revenue will continue over the next 15 years. Possible tax reductions show how each tax could be changed if, instead of subsidizing Foxconn, Wisconsin had reduced that particular tax. Current tax rates are derived from Joe Henchman and Michael Lucci, "Facts & Figures 2019: How Does Your State Compare?," Tax Foundation, Washington, DC, 2019.

sources. For example, we project that Wisconsin's corporate income tax (CIT) will collect about $15.79 billion over the course of the next 15 years (about 16,000 firms currently pay this tax).[90] In lieu of subsidies for a Generation 10.5 plant, the state could have reduced its CIT rate by about 22 percent. The state taxes corporate income at a flat 7.9 percent rate, so this means that it could have instead reduced the rate to about 6.17 percent and kept it at this lower rate for a decade and a half.[91] Similarly, the state's flat fuel tax of $0.309 per gallon could be lowered by 18.92 percent down to $0.25 per gallon. Or, more broadly, overall tax revenue could be reduced by 1.07 percent.

Because taxation causes what is known as "deadweight loss," the opportunity cost of a taxpayer-financed subsidy *exceeds* the pure financial cost of the subsidy. Deadweight loss results from the fact that taxation discourages the taxed economic activity. Consider figure 1, which models the market for retail sales in Wisconsin.[92] Panel A depicts this market in the absence of taxation. If untaxed, the equilibrium would occur where the supply (with no tax) curve intersects with the demand curve. Consumers would pay producers a price of $P_{\text{No Tax}}$ and the quantity of sales would total $Q_{\text{No Tax}}$. Consumers obtain value in excess of what they pay—the consumer surplus—while producers obtain revenue in excess of their costs—the producer surplus.

Wisconsin's sales tax, however, alters this equilibrium. Panel B shows the effect. Imposed on the suppliers' side of the market, the sales tax results in higher marginal costs, shifting the supply curve up by the amount of the tax. This shift causes the price paid by consumers to rise to $P_{\text{Tax Cons}}$. Since producers must pay the tax, the net-of-tax price they receive is $P_{\text{Tax Prod}}$.

FIGURE 1. THE DEADWEIGHT LOSS OF TAXATION



Source: Created by the authors. Not to scale.

Over the next 15 years, Wisconsin's sales tax is expected to raise about $7.2 billion on an annual basis; this amount is indicated by the purple rectangle, which is equal to the tax collected per sale, multiplied by the quantity of sales. Both producer surplus and consumer surplus are smaller as a result of the tax, reflecting the fact that the tax has raised the price that consumers pay, lowered the price that producers receive, and decreased the total amount of sales. It is important to note that, together, consumers and producers lose *more* value than tax coffers gain. This difference reflects the fact that taxation discourages economic exchange and is indicated by the orange triangle labeled "deadweight loss."

Panel B also offers a comparison with a "what-if" scenario: What if, instead of subsidizing Foxconn, the state had instead lowered its sales tax? As indicated in table 4, in lieu of the Foxconn subsidy, the state could have reduced its sales tax from 5 percent to 4.84 percent. This reduction would allow the supply curve to shift closer to the "no tax" supply curve, reducing the deadweight loss. This loss is indicated by the smaller and darker orange triangle.[93]

As tax rates rise, deadweight losses rise faster.[94] In figure 1's simple example with straight-line demand and supply curves, a doubling of the tax rate *quadruples* the deadweight loss from taxation.[95] This finding has an important implication for targeted economic development subsidies. It means that, assuming equal elasticities, the deadweight loss *avoided* by reducing one firm's tax burden is less than the deadweight loss *created* by increasing all other firms' tax burdens in order to fund the subsidy. As public finance scholars Harvey Rosen and Ted Gayer put it,

> It is better to tax many commodities at a lower rate than to tax a few commodities at a higher rate. In other words, a broader tax has less excess burden [another name for deadweight loss] than a narrow tax. . . . Therefore, two

TABLE 5. LONG-RUN ELASTICITY OF BUSINESS ACTIVITY WITH RESPECT TO THE TAXES THAT FUND THE FOXCONN SUBSIDY

Range of estimates	Elasticity[a]	The long-run DWL of taxes to fund Generation 10.5 plant, FY 2018–FY 2032 ($, millions)[b]	The long-run DWL of taxes to fund Generation 6 plant, FY 2018–FY 2032 ($, millions)[c]
Lower bound of the 95% confidence interval	−0.15	−8,745	−2,671
Best estimate	−0.50	−29,149	−8,905
Upper bound of the 95% confidence interval	−0.85	−49,533	−15,138

Notes: DWL = deadweight loss.

a. Range reported by Bartik, *Who Benefits from Economic Development Incentives?*, 10.

b. Authors' calculations. From 2004 through 2018, Wisconsin's nominal GDP has grown at an average rate of 3.36 percent per year. This estimate assumes that Wisconsin's GDP will continue to grow at 3.36 percent per year from 2018 through 2032. US Bureau of Economic Analysis, "GDP by State," January 1, 2020, https://www.bea.gov/data/gdp/gdp-state. The Generation 10.5 subsidy requires taxes to be 1.08 percent higher than they would otherwise be. We assume that the deadweight loss from taxation is phased in over seven years.

c. See previous note on calculations. The Generation 6 subsidy requires taxes to be 0.33 percent higher than they would otherwise be.

> relatively small taxes will have a smaller excess burden than one large tax that raises the same amount of revenue, other things being the same.[96]

Since the Foxconn deal was designed to lure new business activity to the state, it is particularly interesting to evaluate its opportunity cost in light of interstate business activity. Timothy Bartik has recently surveyed the relevant literature and reports that, holding public services constant, the best estimate of the long-run elasticity of state and local business activity to state and local taxes is −0.5, with a 95 percent confidence interval of estimates ranging from −0.15 to −0.85.[97] In other words, if a state were to increase taxes by 10 percent, the estimated long-run effect would be a reduction of business activity of about 5 percent. Table 5 uses these data to estimate the opportunity cost of the Foxconn subsidy. As shown in table 4, in lieu of the Generation 10.5 plant subsidy, Wisconsin could have reduced all its taxes by 1.07 percent. Stated another way, in order to fund the subsidy, Wisconsin taxes will be 1.08 percent higher than otherwise necessary over the long run. Applying the elasticity estimate found by Bartik, and assuming that the full costs of taxation are gradually phased in and fully realized in the seventh year, we estimate the opportunity cost of these taxes in terms of the potential to reduce deadweight loss.[98] We estimate that from 2018 to 2032, Wisconsin GDP will total $6.4 trillion. The higher taxes to fund a Generation 10.5 plant subsidy will be associated with economic losses of about $29 billion, with a plausible range between $8.7 billion and $49.5 billion. We estimate that higher taxes to fund the subsidy for a Generation 6 plant will be associated with economic losses of about $8.9 billion, with a plausible range between $2.7 billion and $15.1 billion.

In our discussion of multipliers in section 3.1.2, we noted that the widely reported figures tell only one side of the story: they estimate the gross increase in GDP owing to the subsidy, but they ignore the gross decrease in GDP associated with the taxes that pay for the subsidy. In equation (2) we presented a more holistic approach to estimate the net value of a subsidy. Now, in table 6, we combine information from tables 3 and 5 to tell the entire story.[99] The top panel of table 6 shows the range of GDP estimates in the event that Foxconn goes forward with a Generation 10.5 plant, and the bottom panel shows the

TABLE 6. NET EXPECTED VALUE OF FOXCONN SUBSIDY, FY 2018–FY 2032 (MILLIONS)
($ OF GDP GAINED FROM SUBSIDIES MINUS $ OF GDP LOST FROM TAXATION)

Generation 10.5 plant							
			Range of expected gross benefits				
			100% decisive	76% decisive	50% decisive	25% decisive	2% decisive
			$62,428	$47,445	$31,214	$15,607	$1,249
Range of expected gross costs	Low DWL of taxation	−$8,745	$53,683	$38,700	$22,469	$6,862	−$7,496
	Best estimate of DWL of taxation	−$29,149	$33,279	$18,296	$2,065	−$13,542	−$27,900
	High DWL of taxation	−$49,553	$12,875	−$2,108	−$18,339	−$33,946	−$48,304
Generation 6 plant							
			Range of expected gross benefits				
			100% decisive	76% decisive	50% decisive	25% decisive	2% decisive
			$15,607	$11,861	$7,804	$3,902	$312
Range of expected gross costs	Low DWL of taxation	−$2,671	$12,936	$9,190	$5,133	$1,231	−$2,359
	Best estimate of DWL of taxation	−$8,905	$6,702	$2,956	−$1,101	−$5,003	−$8,593
	High DWL of taxation	−$15,138	$469	−$3,277	−$7,334	−$11,236	−$14,826

Notes: DWL = deadweight loss. The shaded values represent the most realistic range of estimates of the average net subsidy effect.

Source: Authors' calculations, building on estimates presented in tables 3 and 5.

range of estimates if it develops a smaller Generation 6 plant, as currently seems to be the plan.

For each plant size we present five estimates for the gross potential GDP created over the next 15 years attributable to the subsidy, as well as the low, high, and best estimates for the gross GDP lost over the next 15 years as a result of taxes that fund the subsidy. We then calculate the net expected value for each scenario as the sum of these two estimates. As noted in section 3.1.1, we regard it as unrealistic that the subsidies caused the location decision with 100 percent certainty; given the range reported in the literature, some may regard even the 76 and 50 percent scenarios as unrealistic. Nevertheless, we present a 100 percent scenario, a 76 percent scenario, and a 50 percent scenario for the sake of comparison. We regard the shaded values as the most realistic range of estimates of the average effect of the Foxconn subsidy.

If we restrict our attention to the Generation 6 plant, 8 of the 15 scenarios suggest a net loss from the subsidy, and just 1 of what we regard as the realistic scenarios are positive. Using the best estimate of the deadweight loss, we find that the Generation 6 plant subsidies yield net positive effects only under a scenario in which the subsidy was decisive with greater than 57 percent probability.[100]

The worst-case scenario occurs in the event that Foxconn builds a Generation 10.5 plant, the expected value of the subsidy is on the low end of the range (because of a high probability that the company would have made the investment anyway), and the deadweight loss associated with taxation is on the high end of the range. In this case, the expected net economic effect of the subsidy is a GDP loss of over $48 billion over 2018–32. This loss results from the fact that the expected gross costs of the subsidy under this scenario are about 40 times larger than the expected gross benefits. The best-case scenario occurs in the event that Foxconn builds a Gen-

eration 10.5 plant, the expected value of the subsidy is high because it was likely to be decisive, and the deadweight loss associated with taxation is low. In this case, the expected net economic effect of the subsidy is a GDP gain of nearly $54 billion over 2018–32.

Note that both the upside and the downside potentials are smaller with the Generation 6 plant than with the Generation 10.5 plant.

5. ADDITIONAL DIFFICULT-TO-QUANTIFY COSTS OF A TARGETED ECONOMIC DEVELOPMENT SUBSIDY

The scenarios reported in table 6 are based on quantifiable estimates, but many of the most important costs of a subsidy are difficult, if not impossible, to quantify. This difficulty makes those costs no less real, however. In this section, we review a few of these "unseen" costs.[101]

5.1. THE DEADWEIGHT LOSS OF A SUBSIDY

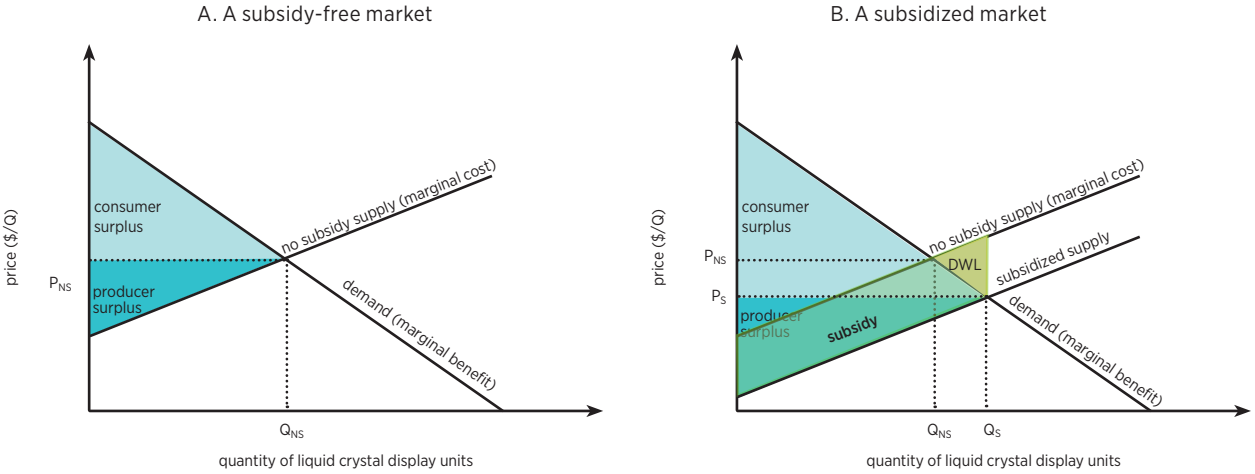
Often, a state will not simply reduce a targeted firm's tax burden but will actually grant it a subsidy. In the case of the Foxconn deal, the company may collect refundable tax credits from Wisconsin even though it has no CIT liability, making this portion of the incentive package an outright subsidy. Foxconn will also receive another subsidy, financed through the creation of a local tax-increment financing district. When a firm receives such subsidies, another deadweight loss occurs, this time in the *subsidized* market because the subsidies encourage too much of the subsidized activity.

All endeavors entail both costs and benefits. As the scale of any endeavor increases, its marginal benefits eventually decline while its marginal opportunity costs eventually increase. Panel A of figure 2 illustrates this point. The supply curve for LCD units is upward sloping, reflecting the fact that in the short run the marginal cost of producing one more unit rises as the scale of production increases.[102] The demand curve for these units is downward sloping, reflecting the fact that marginal benefits decline as scale increases.

The combination of declining marginal benefits with increasing marginal costs means that all endeavors—even valuable ones such as the production of LCD units—have an optimal scale. There is a right size for the factory floor, an optimal number of salespeople, and a correct number of production locations.[103] The optimal scale for this activity is the nonsubsidized quantity, $Q_{NS,}$ at which point any additional marginal benefits derived from increasing the scale would not be worth the marginal costs.

Because competitive markets tend to gravitate toward the point where supply equals demand, production tends toward the nonsubsidized quantity, Q_{NS}. Firms produce up to the point at which another unit of production would not be worth the cost. Subsidies, however, encourage firms to produce beyond this point. Consider panel B of figure 2. Here, a taxpayer subsidy, indicated by a green parallelogram overlaying the diagram, permits the firm to increase supply and produce the subsidized quantity, Q_S. Buyers and sellers clearly gain from the subsidy. This gain is illustrated by the fact that both consumer and producer surpluses are larger in panel B than in panel A. The costs of the subsidy, however, exceed the

FIGURE 2. THE DEADWEIGHT LOSS OF A SUBSIDY



Note: DWL = deadweight loss.

Source: Created by the authors. Not to scale.

gains to consumer and producer surplus. For each unit produced between Q_S and Q_{NS}, the marginal cost exceeds the marginal benefit, resulting in a deadweight loss in the subsidized market.

This sort of loss might also materialize if the subsidy encourages a firm to locate somewhere that is less suitable than the optimal region for the production of its product or service. As Adam Smith observed in *The Wealth of Nations*, "By means of glasses, hotbeds, and hotwalls, very good grapes can be raised in Scotland, and very good wine too can be made of them at about thirty times the expense for which at least equally good can be brought from foreign countries."[104] The concern that subsidies might distort location decisions has long dominated economic analyses of subsidies.[105]

This kind of deadweight loss might also appear if subsidies encourage producers to use one kind of input or production process over another. For example, subsidies sometimes encourage the substitution of labor for capital (or vice versa), which may result in less efficient production than would otherwise occur. Summarizing this concern, Peter S. Fisher and Alan H. Peters write,

> Incentives that lower the price of capital goods have both an output effect (whereby production and employment increases because costs are lowered) and a substitution effect (whereby capital is substituted for labor). If the substitution effect is stronger, a capital incentive could reduce employment.[106]

Recent research by economist Carlianne Patrick finds that capital subsidies are associated with "capital-labor substitution, decreased employment density, and changes in local industry mix."[107]

As noted in section 3.1.1, both policymakers and subsidy recipients tend to emphasize that subsidized investments would not occur but for the subsidies being proffered. The discussion in this section suggests, however, that subsidies present a double-edged sword. In the 75 percent

to 98 percent of cases in which a subsidy is not decisive, the state is wasting taxpayer money in order to induce a decision that would have been made anyway. Conversely, in the 2 percent to 25 percent of cases in which the subsidy does affect the firm's decision, it may do so by encouraging a decision that *should not* be made. Thus, one way or another, subsidies may waste resources.

5.2. THE ANTICOMPETITIVE EFFECTS OF A SUBSIDY

A subsidy is an anticompetitive advantage. As such, it invites a host of possible social costs such as productive inefficiencies and diminished dynamism.

5.2.1. X-Inefficiency

One problem, identified by Harvard economist Harvey Leibenstein, is known as "X-inefficiency."[108] The idea here is that most firms have some degree of "slack" that allows them to waste resources. Although the competitive profit-maximizing firm is an elegant model, few firms live up to it in reality.[109] Leibenstein's insight was that firms which are protected from competition—say, by a large corporate subsidy—have more slack and are likely to be less disciplined than competitive firms, meaning that subsidized companies will likely have higher production costs and diminished attention to consumer preferences.[110]

Panel B of figure 3 depicts the problem with X-inefficiency. The firm uses the subsidy to cover part of its marginal costs, allowing it to increase output to Q_S and causing a deadweight loss as a side effect (because the actual marginal costs exceed marginal benefits for the units between Q_{NS} and Q_S).

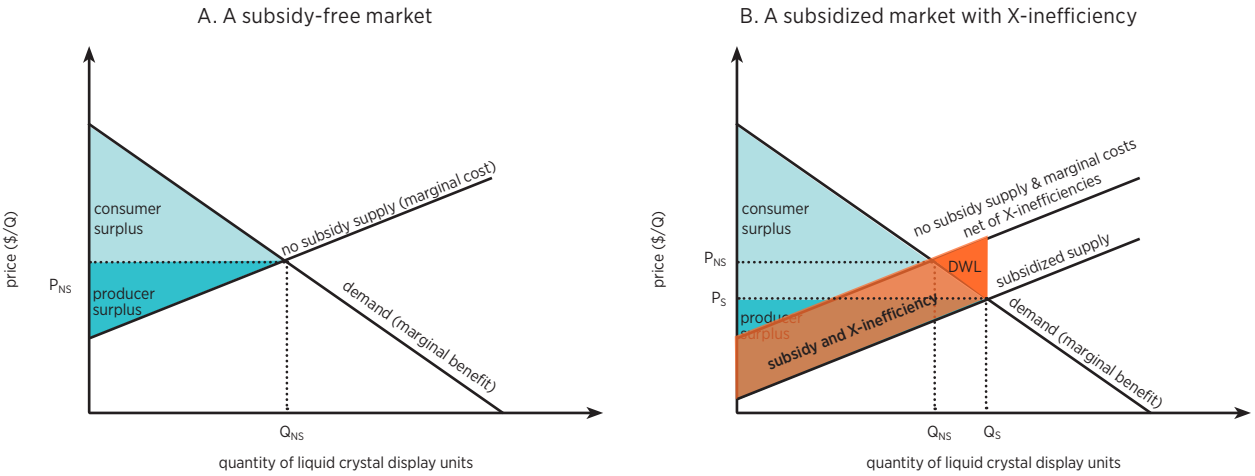
In the previous discussion of a subsidy's deadweight loss, the taxpayers' cost that results from the subsidy is partially offset by the higher consumer and producer surplus provided by the subsidized production. In the case of X-inefficiency, however, the unnecessarily high marginal costs are not offset by anyone's gains (unless one considers lethargy itself to be valuable).[111] In addition, the losses associated with X-inefficiencies can be quite large because they affect all units produced, not just the marginal units.

There is considerable evidence that firms protected from competition do have production inefficiencies. For example, economic historian Burton Folsom has documented that subsidized steamship operators in the 19th century were less efficient than their nonsubsidized competitors.[112] In contrast, James J. Hill's Great Northern Railway, the only transcontinental railroad to be built without any federal aid, was also the only transcontinental railroad that never went bankrupt. In addition, it was "the best built, the least corrupt, [and] the most popular."[113]

Contemporary research suggests that X-inefficiency is still a problem for privileged industries. One study of the dairy industry, for example, finds that a 10 percent increase in subsidies is associated with a 1.8 percent increase in total costs of production.[114] Other research has documented X-inefficiency in developing nations.[115] The Jones Act—which requires all ships traveling between US ports to be American flagged, owned, constructed, and crewed—offers another example. Economist Thomas Grennes has found that the per-day operating costs of Jones Act vessels are more than twice those of comparable foreign-flagged ships.[116]

In the case of Foxconn, X-inefficiency suggests that Wisconsin's subsidy will allow the company to waste up to $231 million annually (on aver-

FIGURE 3. X-INEFFICIENCY



Note: DWL = deadweight loss.

Source: Created by the authors. Not to scale.

age) in unnecessarily high production costs, as this is the size of the annual subsidy (see table 1).

5.2.2. Dynamic Inefficiency

The concept of "economic efficiency" found in the standard model of a perfectly competitive firm is a static notion. It suggests that, *at any one moment in time*, competition between producers to satisfy consumer desires will maximize consumer welfare and minimize producer costs. In contrast, the restriction of competition through subsidies or regulatory privilege fails to maximize consumer welfare and fails to minimize costs—again, at any given moment.

There is, however, another notion of efficiency. It refers to a firm's ability to change over time, to respond to altered market conditions, and to motivate such change itself by implementing new production processes that reduce costs, increase product quality, or both, thereby increasing consumer and producer welfare.[117] We will refer to this variety of efficiency as "dynamic efficiency."[118] Dynamic efficiency requires that entrepreneurs be able to easily enter into markets, adapt to changing circumstances, and run experiments with new product lines and the use of new production techniques.

In a dynamically efficient industry, entrepreneurs are under constant pressure to improve their products and production techniques. The lure of monopoly profit plays an important role in a dynamically efficient industry by offering entrepreneurs an incentive to tailor their products to niche customers and to find new ways to create value at lower cost. At the same time, the threat of new competitors entering the market keeps these entrepreneurs from charging exorbitant prices. In many ways, this notion of competition as an *activity* rather than an *outcome* is more consistent with the way the word "competition" is used by businesspeople.[119]

The notion of dynamic efficiency dates at least as far back as the great economist Joseph Schumpeter, but a large body of recent microeconomic and macroeconomic empirical research

supports it.[120] On the microeconomic side, new data have illuminated the outsized role that new businesses play in productivity and job creation.[121] A number of authors, for example, have found that new firm creation is highly correlated with increases in productivity, accelerating productivity growth, or both.[122] At the same time, macroeconomic research has found that dynamically efficient markets play an important role in long-term economic growth.[123]

As economist Israel Kirzner has put it, a dynamically efficient market is "open ended"; we cannot predict where, exactly, it will go next. F. A. Hayek similarly stressed that the dynamism of the market is a discovery process.[124] Entrepreneurs are guided in this process by the market signals of prices, profit, and loss.

Subsidies, however, can stall the market's discovery process. Subsidies to existing firms may discourage newcomers from entering by allowing the incumbents to keep their prices artificially low. By distorting price signals, subsidies may also encourage firms to hold onto antiquated technologies and production processes. The previously mentioned subsidized steamship operators and railroads of the 19th century illustrate the point. Subsidized steamship lines in both the United States and the United Kingdom were slower to adopt iron hulls and screw propellers than their unsubsidized competitors, and subsidized railroads were slower to shift from wrought iron rails to technologically superior Bessemer rails.[125]

In some cases, policymakers actively throttle the process of change by protecting privileged companies from competition. According to economist Royal Meeker,

> Both the Admiralty [in the United Kingdom] and the Post Office departments [in the United States] refused to permit mail steamers to use the screw propeller until long after other lines had adopted it. . . . Without government aid to inefficiency, the [subsidized] Cunard Company would have been compelled to adopt improvements in order to compete with other and more progressive lines.[126]

Protectionist impulses often compel policymakers to lock in inefficient technologies. For example, according to Folsom, the subsidized transcontinental railroads "were required in their charters to buy [inferior] American-made steel, so they were stuck with the lesser product."[127] Although steel producers benefited from this mandate (and other mandates as well), American railroad travelers were forced to pay higher prices. As we've illustrated previously, economic theory suggests that consumers lose more from protectionist policies than producers gain, meaning that the net effect is a smaller and weaker economy.

In the case of Foxconn, policymakers have included eligibility restrictions for the subsidies they have committed to provide, including mandates on the minimal level of capital investment and employment at the manufacturing facility.[128] Policymakers no doubt believe that it is beneficial to impose such requirements. Even critics of targeted subsidies tout the necessity of imposing such requirements and of "clawing back" subsidies when firms fail to meet these requirements. The truth is, however, that capital expenditures and payroll expenses belong on the *cost* side of a cost-benefit ledger.[129] Investments should be made and jobs created only if they generate more value than they cost (and, as previously noted, cost encompasses opportunity cost). For exam-

ple, it's been reported that the LCD industry will experience a surge in supply in coming years as multiple new Generation 10.5 plants come online, meaning that the best, and least wasteful, option—from a global economy perspective—might be for Foxconn to abandon its plans for an LCD manufacturing facility in Wisconsin, especially considering the higher labor cost there as compared to other factory locations.[130] Subsidies, especially those with strings attached or clawback clauses, make it harder for a firm like Foxconn to adapt to changing circumstances.[131]

Eligibility restrictions and clawbacks can compound the problems with subsidies by motivating unwise investments. At any one moment in time, these policies can cause resources to be wasted, but these policies are also inefficient from a forward-looking, dynamic perspective. Large, mandated investments can create path dependency, locking in particular production technologies and processes. Even worse, subsidized jobs are not sustainable in the long run, putting workers who are lured into these positions at risk. This risk exists not only because of the potential for future layoffs, but also because the particular skillset the workers developed at the subsidized company may have less long-term career value than the skillsets they might otherwise have developed at an unsubsidized, dynamically efficient company.

5.3. RENT-SEEKING COSTS

Subsidization involves another cost. As we have already noted, consumers and producers of the subsidized product gain from the subsidy while taxpayers and would-be competitors lose. Firms do, however, expend real resources in seeking and defending these transfers while others expend real resources opposing them. Firms lobby.[132] They lend their time and resources to political causes. More subtly, they change their products and their production techniques in order to curry favor with politicians—for example, by locating a facility in a certain politician's district or by promising to use inputs made by a certain producer.[133] (It is telling that Foxconn chose to locate its plant in the most preferred location of the president of the United States, a district represented by the then–Speaker of the House of Representatives and near the home of the then–White House chief of staff.[134]) These efforts waste valuable resources, and this wastage must be added to the cost side of the cost-benefit ledger, even if it is difficult to measure.[135]

The above-normal profits earned by a privileged firm are known as economic "rents," and the economically wasteful efforts of firms to pursue these privileges are called "rent-seeking."[136] The research on rent-seeking is vast, but several implications of this literature are worth emphasis.[137]

5.3.1. Rent-Seeking Occurs on Many Levels

Rent-seeking waste can take place at a number of different levels. Companies spend resources to sway the creation of favorable policies—for example, in order to establish a state office of economic development—but they also rent-seek in order to obtain the privileges dispensed by that office.[138]

Firms are not the only ones to waste resources by rent-seeking. Office seekers and would-be bureaucrats also expend scarce resources to win the political contest to hand out privileges and thus collect quid pro quo campaign donations and other benefits from favored firms.[139] In addition, those who pay for subsidies—such as taxpayers

and the competitors of subsidized firms—also expend scarce resources fighting these transfers, a process that the economist Fred McChesney has dubbed "rent extraction."[140]

5.3.2. Waste Increases with the Size of the Rent

The amount of resources wasted in seeking the rent is proportional to the size of the rent. In figure 3, as the size of the parallelogram in panel B grows, so does the rent-seeking waste. Put in terms of actual subsidies, all else being equal, one would expect the $3.6 billion state subsidy to Foxconn to entail approximately 445 times more rent-seeking waste than Indiana's high-profile $7 million subsidy to air conditioning manufacturer Carrier, which was a more traditionally sized subsidy.[141]

5.3.3. Waste Increases with More Rent-Seeking Competition

The more individuals and entities that are involved in seeking or dispensing privileges, the greater the rent-seeking waste.[142] It is even possible that, in the aggregate, firms might spend more money seeking the rent than the rent is even worth, a phenomenon economists call "overdissipation."[143] Note that this is exactly the opposite of the way most markets work. Normally, the more producers and consumers there are in a market, the more efficient it becomes.[144]

In recent years, a number of highly publicized bidding wars have drawn in large numbers of contestants. As we've previously noted, Amazon's bid to open a second North American headquarters resulted in over 200 bids from cities across the continent.[145] All the resources each municipality put into developing its bid are irretrievably lost.

5.3.4. Waste Begets More Waste

Policymakers and firms often establish sequential bidding processes that increase the rent-seeking waste.[146] For example, once a firm has secured a subsidy, that firm often goes back to policymakers seeking more. The producers of the television show *House of Cards* did this.[147] The show films in Maryland, using the state capitol building as a stand-in for the US Capitol. In its first two seasons, the state had given the production company $26 million in tax credits. Before filming started for the third season, the show's producers sent the governor a letter threatening to pull out of the state if they didn't receive more credits. The state found a way to give the production company $7.5 million more than it had planned for the third season.

Because past subsidies are sunk costs (that is, costs that cannot be recovered), policymakers often oblige rent-seekers when they come back to seek more. In the case of Foxconn, there is nothing to stop the firm from coming back in a few years in search of more subsidies. Even worse, if there are increasing returns to scale in rent-seeking (that is, if firms with larger rent-seeking operations are more efficient at seeking favors), then, in the aggregate, firms may even expend more resources seeking the privilege than the privilege is worth.[148]

5.3.5. Unproductive Entrepreneurship

Rent-seeking has dynamic as well as static costs. In their original formulation of the concept, economists stressed that rent-seeking is wasteful at any given moment in time.[149] More recently, economists have also come to stress the dynamic costs of rent-seeking. The key to understanding these dynamic costs is to focus on entrepreneurs.[150] These individuals are the change

agents who develop new and different ways of doing things. In a rent-seeking society, however, those with entrepreneurial spirit are motivated to spend their efforts thinking of new and different ways to seek privileges rather than new and different ways to create value for customers. This finding helps explain why economies in which rent-seeking is prevalent seem to grow at a slower pace than other economies.[151]

5.3.6. The Tradeoff between Waste and Inequity

Depressingly, rent-seeking waste can be curbed if the process for handing out rents is difficult to contest.[152] For example, if a policymaker is inclined to offer a privilege to a firm because that firm's CEO is a chum, then few other firms will bother seeking the rent.[153] Similarly, if an economic development agency is inclined to dole out resources to "flashy" firms such as Tesla or Foxconn, more pedestrian enterprises will not bother seeking these subsidies.

5.4. THE ZERO-SUM GAME

Ignore, for the moment, that subsidies entail deadweight losses in the taxed markets that fund them and in the subsidized markets that benefit from them. Ignore, further, that subsidies entail anticompetitive effects and rent-seeking costs. Forgetting all these considerations, subsidies are at best a zero-sum game on a national scale: when one state lures a firm with a subsidy, its gain is exactly offset by another state's loss. This phenomenon is perhaps best illustrated by what has come to be known as the "Kansas–Missouri economic border war." There, in less than a decade, the two states have spent about $335 million to lure firms back and forth across the state line that splits Kansas City.[154]

Economists have long likened the nationwide subsidy race to a "prisoner's dilemma"—a game theory example in which the rules of the game constrain the players to pursue socially destructive behavior.[155] More recently, some have called for an economic cease-fire in the subsidy war.[156] Interestingly, even some economic development officials agree. As one Kansas City economic development official put it, "There ought to be a law against what I'm doing."[157] This extraordinary waste recently motivated the state governments to agree to stop offering subsidies for border-jumping companies (but only for those counties that are part of the Kansas City metropolitan area).[158]

6. THE POLITICAL ECONOMY OF TARGETED SUBSIDIES

Targeted subsidies are ostensibly designed to change the decisions that businesses make. Upon close examination, however, it is clear that policymakers themselves face a number of perverse incentives that make it nearly impossible for them to dispense targeted subsidies in a manner that promotes the general welfare.

6.1. CONCENTRATED BENEFITS AND DIFFUSE COSTS

Targeted economic development subsidies follow a pattern that is common to many government transfers: those who benefit from these subsidies are few in number, whereas those who pay for them are numerous. Foxconn is again illustrative: just one firm stands to receive a $3.6 billion subsidy while some 16,000 other Wisconsin businesses must pay a corporate income tax that could be reduced by 22 percent in the absence of that subsidy.

A number of political scientists and economists have noted that this pattern of concentrated benefits and diffuse costs is problematic.[159] Being few in number, those who benefit from these transfers tend to find it relatively easy to get politically organized. They often have active government affairs divisions with extensive lobbying operations and sophisticated political donation strategies. By contrast, the numerous taxpayers, consumers, and competitors who bear the costs of subsidies tend to find it relatively more difficult to get politically organized. This means that the political landscape is tilted to transfer wealth from the diffuse, less influential groups to the concentrated, better-organized groups—even if, because of deadweight and rent-seeking losses, the diffuse groups lose more than the concentrated groups gain.[160]

6.2. INVESTING WITH OTHER PEOPLE'S MONEY

When Donald-Trump-the-entrepreneur invests his own money—or even borrowed money—in a private venture, he has the motivation to carefully weigh both the costs and the benefits of the project because he bears the risk and receives the reward (or suffers the consequences).[161] An economist would say that the benefits and costs are "internalized" into his decision-making process and therefore inform his final choice. He therefore has an incentive to minimize the expense he incurs relative to the reward he may reap. He may choose to trade higher risk for higher yield but will do so only on the basis of his own risk tolerance.

When Donald-Trump-the-president negotiates a targeted economic development package, the situation is quite different. In the case of the

Foxconn deal, the costs are to be borne by Wisconsin's taxpayers and were therefore external to President Trump's and Governor Walker's decision-making processes, giving them little incentive to minimize costs. Most of the benefits of the deal were also external to the decision-making process, since they are to accrue mostly to Foxconn stock owners, Foxconn executives and workers, and Foxconn customers.[162] Politicians primarily benefit by being seen as "doing something"—whether it works or not—to help the community, with the media coverage serving as free advertising to build their political brands.[163]

Although the president and Governor Walker faced political risks and rewards for offering the subsidy, these risks and rewards are not the same as being personally financially responsible for a $3.6 billion investment. They faced little incentive to maximize these returns or to ensure that they matched the risk tolerance of Wisconsin taxpayers. As Nobel laureate Milton Friedman was fond of saying, buying something for one person using someone else's money almost always guarantees a suboptimal decision.[164]

6.3. POLITICIANS MAKE INVESTMENTS GUIDED BY MIXED SIGNALS

Private entrepreneurs not only have a stake in their investments but also have signals that guide their decisions. The signals of relative price, profit, and loss steer entrepreneurs away from riskier or lower-yield projects and toward safer or higher-yield projects. Markets for goods and services aggregate widely dispersed pieces of information into a relatively simple signal—price—allowing producers and consumers to efficiently coordinate their plans with others in the market.[165] Those with the most knowledge regarding a particular investment have an entrepreneurial incentive to make trades that are informed by that knowledge, which pushes the price to incorporate the best available information.[166] Other consumers and producers may not have access to that knowledge, but they still incorporate that information into their decisions because the changing price—and its value relative to other prices—guides them.

For example, if the best available information suggests that a particular venture is risky relative to its potential payoff, investors will be reluctant to fund it and may even short it. Entrepreneurs will experience this signal as increased difficulty in obtaining investment capital and will be less likely to pursue the project.

Policymakers, however, are not guided by these market signals.[167] They raise capital by imposing taxes and typically pay the same (political) price for a tax that funds a risky project as for a tax that funds a safe project. In some cases, policymakers are even politically rewarded for ignoring market signals. For example, declining industries such as coal, steel, and textiles have often been propped up by targeted subsidies or protections with the approval of local taxpayers who fear the loss of anchor industries.[168]

Subsidies, however, typically cannot stave off change forever. Their delay of the inevitable decline can sometimes make the adjustment more sudden and painful than it might have been if it had happened gradually. Economist Terry Buss cites a number of these examples, including the millions of dollars that Pennsylvania politicians used to prop up Sharon Steel, "only to have it eventually fail."

> This shields business from the consequences of bad choices, leaving managers unaccountable. By propping up

> firms in decline, other firms making correct choices are injured, as their resources are diverted to help the unproductive.[169]

All else being equal, investors will judge a project with political backing to be safer than one without such backing, and the cost of investment capital will reflect this fact. As a result, policymakers may get the false impression that capital markets have judged the project to be safer than alternative projects, when in fact the markets have only judged it to be subsidized.[170] This misconception may invite further economically inefficient government subsidies.

6.4. POLITICAL BUNDLING, VOTER IGNORANCE, AND IRRATIONALITY

Public choices differ from private choices.[171] The person who chooses peanut butter or a mortgage or a car sees a direct connection between the action (buying these items) and the desired outcome (possessing or consuming them). This is not the case, however, for government decision makers (voters, politicians, and bureaucrats). A person may choose to vote against the politician who supports subsidies but will end up paying for those subsidies nonetheless. The subsidies, moreover, are bundled together with dozens of other policy positions—everything from community policing to street repair—and sold together as a single candidate's platform. Voters therefore find it difficult to reward or punish policymakers for any particular position or decision.

To make matters worse, elections are infrequent, uncompetitive, and typically winner-take-all. The substantial period between elections, the practical constraints on the field of candidates, and the lack of differences between the most likely winners (motivated by the rules governing most US political contests—especially the fact that only the first-place candidate is elected to office) all serve to limit voters' ability to clearly signal their preferences. Moreover, the typical voter's chances of affecting an election, even a local election, are vanishingly small. This political market is substantially different than a competitive market for goods and services.

For these and other reasons, voters tend to make political decisions with relatively little information.[172] Given that information-gathering is costly and that voters see little benefit to becoming informed, it is rational—in an economic sense—for most voters to remain ignorant about most policy issues. By and large, voters are what economists call "rationally ignorant."

Worse still, voters and policymakers may be guided by certain biases that are systematically irrational.[173] As we have already noted, it is common in political decision-making to misclassify costs as benefits and to think that a project is more valuable because it involves a larger investment or requires a larger workforce.[174] It is also common to simply ignore costs altogether. In our discussion of the multiplier effect in section 3.1.2, for example, we noted that policymakers emphasize the positive effects of spending multipliers but ignore the negative effects of the tax multipliers.

Economic development policy suffers from other irrational biases. For example, it tends to favor "flashy" industries such as film production even though no evidence exists that these industries create any more value for consumers or producers than more pedestrian industries such as auto repair, grocery stores, or home construction.[175] Recent research finds that constituents, even though they bear the diffuse costs of subsidies, tend to reward policymakers

who pursue these targeted incentive strategies, suggesting that voters are either ill informed or rationally ignorant—or both.[176]

6.5. SHORT-TERMISM AND SUBSIDIES THAT WORK ONLY ON FLIGHTY FIRMS

Private firms, especially publicly traded ones, are often accused of undue focus on the short term.[177] If anything, political time horizons are even shorter than private-sector time horizons because politicians aren't typically motivated to think further ahead than the next election. The typical state legislator is up for reelection every two years. Governors serve only four-year terms and are usually limited to two of these. The political cycle incentivizes policymakers to demonstrate nearly immediate results, to front-load benefits, and to push costs off into the future.[178] In contrast, financial markets reward investors who make long-term bets that are expected to pay off.

If a firm that was enticed by subsidies to relocate then decamps for another location after a few years, policymakers pay almost no cost for their poor investment of public dollars. Jumping ship shouldn't be unexpected, though. A firm whose location decision is swayed by a subsidy is also more likely to *move away* if a better deal is offered elsewhere.[179]

As we have previously noted, academic research finds that subsidies rarely sway a company's location decision. In the cases where the subsidy does influence the decision, it makes sense that those firms are less tied to the local economy or regional characteristics than companies that would have made the same decision regardless of the subsidy.[180] As a result, when an economic development subsidy "works," it's actually a *riskier* investment of public dollars than when the subsidy is immaterial to the company's decision.

This appears to be one reason why highly mobile industries such as film production companies and professional sports teams have been so successful in obtaining subsidies. If a company is pursuing a subsidy, it's more likely to be a flighty firm.

6.6. POLITICAL DISCRIMINATION LEADS TO A POLICY TRAP

In theory, inefficient policies create their own pressures for reform.[181] If a policy imposes certain costs on citizens, some will push for its elimination. The greater those costs, the greater will be this pressure. If targeted economic development subsidies spare the best-organized interest groups from the burden of a particular policy—say, a steep tax or an onerous regulation—while other, poorly organized groups must continue to bear the burden, then the pressure for reform will be reduced.[182] The ensuing unhealthy economic equilibrium may be difficult to escape.

For example, about 16,000 Wisconsin firms pay the corporate income tax while some 3,500 firms are spared the burden by virtue of the fact that they are manufacturers or agribusinesses. This privilege makes manufacturers less inclined to apply political pressure to reduce the state's CIT rate. Recent research finds a statistically significant negative relationship between targeted subsidies and economic freedom, suggesting that those states that offer more subsidies tend to have higher tax and regulatory burdens.[183]

7. CONCLUSION

Economic theory offers little reason to think that targeted economic development subsidies benefit the broader communities that ultimately pay for them.

To begin with, the most common argument for subsidies—that they create large multipliers—is often misstated or misunderstood. Multiplier estimates typically assume that subsidies decisively determine firm location decisions, although the best academic research suggests that, in the vast majority of cases, subsidies actually do not sway firms. When this likelihood of the subsidy affecting the decision is accounted for, the gross expected value of these multipliers is significantly lower. Moreover, these multipliers are only gross effects—not net effects—because they ignore the economic activity lost as a result of the taxes that fund subsidies.

Another common notion is that targeted subsidies will create positive spillover benefits owing to clustering effects. The clustering literature, however, does not support the use of subsidies. Most clusters exist apart from, and even in spite of, government efforts.

While a tax cut or outright subsidy for one firm may indeed spur additional economic activity, it comes at the cost of higher taxes for other individuals and businesses or of reductions in public services, discouraging economic activity in other parts of the economy. Moreover, economic theory suggests that such uneven taxation does more to discourage economic activity—it has a higher deadweight loss—than broad-based, low-rate taxation. Using Wisconsin's Foxconn subsidies as an example, we have shown that under most plausible scenarios, the taxes funding the subsidies will discourage more economic activity than will be encouraged by the subsidies themselves. In short, the net effect of targeted economic development subsidies is likely to be negative.

Subsidies entail other costs. By prompting firms to make investments that they might not otherwise make, subsidies encourage inefficient activities in which the marginal costs exceed the marginal benefits. Targeted subsidies also create anticompetitive effects, such as higher-than-necessary production costs and dynamic inefficiency. Moreover, a tendency to provide subsidies motivates the further waste of scarce resources to pursue government-granted privileges, a socially and economically costly phenomenon known as rent-seeking.

There are a number of reasons to suspect that the political economy of targeted development is rife with bad incentives for both policymakers and firms. These political economy problems are likely to lead to subsidies that concentrate benefits on a few highly organized interest groups while spreading costs among a large

and diffuse number of unorganized taxpayers, consumers, and would-be competitors. Policymakers also typically lack the knowledge or the incentive to properly channel targeted subsidies. Moreover, politicians often rely on uninformed or even irrational ideas of economic development that tend to favor short-term, symbolic gestures.

As a result, the case for targeted economic development subsidies is quite thin—both economic and political economic theory offer reasons to be skeptical of their success. Furthermore, the empirical research bears out the theoretical prediction: subsidies do not create widespread economic growth.[184]

This finding is problematic, given that US states and municipalities spend up to $95 billion each year on targeted subsidies. To the extent that targeted economic development subsidies discourage other sorts of economically efficient reforms, local policymakers throughout the country seem to be pursuing a strategy that will hamper economic development for decades to come.

NOTES

1. Targeted vs. General Strategies for Economic Development

1. There have been various estimates of annual state and local spending on targeted economic development subsidies: $30 billion (see Slattery and Zidar [2020], accounts for tax-related subsidies only), $16 billion (see Thomas [2019], includes state-only, investment-motivating subsidies), $45 billion (see Bartik [2017], only considers export-base industries and does not include TIF [tax increment financing] subsidies), and $70 billion (see Thomas [2011], provides an estimate of total state and local subsidies using state program data from 2005). Thomas's 2011 estimate of total subsidies is the most comprehensive. Adjusting for inflation, it is equivalent to $95 billion in 2020 dollars. Thomas's 2019 research reanalyzed 2012 research by the New York Times to correct for mischaracterized expenditures. In personal correspondence, he estimates that the New York Times data showed total state and local spending on subsidies to be about $41.2 billion (this value is the sum of the estimated $16 billion in state-provided, investment-motivating subsidies, combined with an assumed equivalent amount of local subsidies, as well as another $9.2 billion in other forms of state subsidies). Adjusting for inflation, this estimate is equivalent to $48.2 billion in 2020 dollars. However, Thomas argues that his 2019 research underestimates total subsidy spending because the New York Times data lack cost estimates for multiple subsidy programs. Therefore, the research in Thomas's 2011 book remains the best comprehensive estimate of total annual spending by state and local government on subsidies. Cailin Slattery and Owen Zidar, "Evaluating State and Local Business Tax Incentives," *Journal of Economic Perspectives* 34, no. 2 (2020): 90–118; Kenneth Thomas, "The State of State and Local Subsidies to Business" (Mercatus Policy Brief, Mercatus Center at George Mason University, Arlington, VA, October 2019); Timothy J. Bartik, "A New Panel Database on Business Incentives for Economic Development Offered by State and Local Governments in the United States," (Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, February 2017); Kenneth Thomas, *Investment Incentives and the Global Competition for Capital* (London: Palgrave Macmillan, 2011); Kenneth Thomas, "Estimates of Total State and Local Subsidies," Personal communication with Michael D. Farren, May 4, 2020; Louise Story, "As Companies Seek Tax Deals, Governments Pay High Price," New York Times, December 1, 2012.
2. Bartik, "A New Panel Database on Business Incentives," 3.
3. In a deal struck in 2007, the state of New York agreed to give Alcoa $5.6 billion in discounted electricity from its state-owned power plant over the course of 30 years. In 2013, Washington state awarded Boeing $8.7 billion in tax breaks over the course of 16 years. In September 2017, when Amazon announced that it was interested in building a second

headquarters—"HQ2"—somewhere in North America, 238 cities and states lined up to offer subsidies. The bids were as high as Maryland's $8.5 billion incentive package and Dallas–Fort Worth Airport's $22.7 billion 99-year deal. The company ultimately chose to split HQ2 between Northern Virginia and New York City to tap the local tech talent in each labor market. Amazon abruptly pulled out of New York after a vocal group of local policymakers, unions, and interest groups protested the company's arrival, premised in part on the state's and city's combined $3 billion incentive package. Philip Mattera, Kasia Tarczynska, and Greg LeRoy, "Megadeals," Good Jobs First, Washington, DC, August 2019, https://www.goodjobsfirst.org/megadeals; Laura Stevens, "Amazon Says 238 Places Want to Host Its New Headquarters," *Wall Street Journal*, October 23, 2017, sec. Tech; Michael Farren and Tamara Winter, "The Hidden Costs of Maryland's Amazon Bid" (Mercatus Center at George Mason University, Arlington, VA, May 8, 2018); Shawn Shinneman, "Not a Typo: To Lure Amazon, DFW Airport Had a Plan to Offer Nearly $23 Billion over 99 Years," *D Magazine*, December 13, 2018.

4. Mattera, Tarczynska, and LeRoy, "Megadeals."
5. Robert Barro, "Government Spending in a Simple Model of Endogenous Growth," *Journal of Political Economy* 98, no. 5 (1990): 103–25; Chris Doucouliagos and Mehmet Ali Ulubasoglu, "Economic Freedom and Economic Growth: Does Specification Make a Difference?," *European Journal of Political Economy* 22, no. 1 (March 2006): 60–81; Andreas Bergh and Magnus Henrekson, *Government Size and Implications for Economic Growth* (Washington, DC: AEI Press, 2010); Joshua C. Hall and Robert A. Lawson, "Economic Freedom of the World: An Accounting of the Literature," *Contemporary Economic Policy* 32, no. 1 (January 2014): 1–19.
6. Wisconsin, for example, recently exempted all manufacturers from its corporate income tax. Katelyn Ferral, "Wisconsin's Sweeping Manufacturing and Agriculture Tax Credit Reaches Full Force This Year," *Capital Times*, May 16, 2016.
7. F. A. Hayek, "The Pretense of Knowledge" (Nobel Prize Lecture, Sweden, December 11, 1974).
8. Matthew D. Mitchell, *The Pathology of Privilege: The Economic Consequences of Government Favoritism* (Arlington, VA: Mercatus Center at George Mason University, July 9, 2012).
9. Peter Calcagno and Frank Hefner, "Targeted Economic Incentives: An Analysis of State Fiscal Policy and Regulatory Conditions," *Review of Regional Studies* 48, no. 1 (2018): 71–91; John Dove and Daniel Sutter, "Is There a Tradeoff between Economic Development Incentives and Economic Freedom? Evidence from the US States," *Review of Regional Studies* 48, no. 1 (2018): 55–69.
10. The direction of causality is not clear. On the one hand, states that give out more incentives may need to raise taxes to fund their incentive programs. On the other hand, states with high tax and regulatory burdens may need to offer more incentives to make up for their otherwise poor business environments. Matthew Mitchell, Daniel Sutter, and Scott Eastman, "The Political Economy of Targeted Economic Development Incentives," *Review of Regional Studies* 48, no. 1 (2018): 1–9.
11. "Hey Amazon: You're Invited to New Hampshire: A Guide to Breaking Ground, Breaking Barriers, and Living Free" (New Hampshire Division of Economic Development, 2017).
12. Sam Liccardo, "Why I'm Not Bidding for Amazon's HQ," *Wall Street Journal*, October 4, 2017, sec. Opinion.
13. Richard Florida, "Analysis: Why Mayors Keep Trying to Woo Business with Tax Breaks," MSN, February 12, 2019.
14. Matthew Mitchell, Jeremy Horpedahl, and Olivia Gonzalez, "Do Targeted Economic Development Incentives Work as Advertised?" (Mercatus Working Paper, Mercatus Center

at George Mason University, Arlington, VA, forthcoming).

2. Wisconsin's Foxconn Subsidy: A Case Study

15. Patrick Marley and Jason Stein, "Foxconn Announces $10 Billion Investment in Wisconsin and up to 13,000 Jobs," *Milwaukee Journal Sentinel*, July 26, 2017.
16. The White House, "President Trump Welcomes Foxconn to the White House for a Major Jobs Announcement" (The White House, July 16, 2017).
17. Rick Romell, "With Flourishes, Walker and Foxconn Chairman Sign Contract for Huge Factory, Huge State Aid," *Milwaukee Journal Sentinel*, November 10, 2017.
18. Romell, "With Flourishes."
19. 2017 Wisconsin Act 58, Pub. L. No. 991.11 (2017); "Electronics and Information Technology Manufacturing Zone Tax Credit Agreement between the Wisconsin Economic Development Corporation and Sio International Wisconsin, Inc., FEWI Development Corporation, and AFE, Inc.," November 2018, http://www.thewheelerreport.com/wheeler_docs/files/1109wedcfoxconn.pdf.
20. A tax privilege is a provision that permits one firm or a subset of firms to have a lower tax liability than other similarly situated firms. In some cases, the tax privilege can be larger than any tax liability the firm would have had, making it equivalent to an outright cash subsidy. This is the case with Foxconn's refundable tax credits.
21. Under tax increment financing (TIF), the government creates a TIF district, a geographic area surrounding a certain firm. As the assessed property value of that area increases, the government then either transfers any increase in property tax revenue to a particular firm within that district that it believes to be responsible for the appreciation in land value, or it spends the revenue raised through these property taxes on infrastructure and public services that primarily benefit the companies located in the TIF district. Corrinne Hess, "Owners near Foxconn Say They Were Misled. Now Their Homes Are Gone," *MinnPost*, September 4, 2019.
22. 2017 Wisconsin Act 58.
23. 2017 Wisconsin Act 58; Todd Richmond, "Illinois Democrats Ask Wisconsin Governor to Re-evaluate Foxconn Plant's Environmental Impact," *Chicago Tribune*, February 15, 2019.
24. Rich Kirchen, "Cost Estimate for Foxconn Electric Lines Lowered by 16%," *Milwaukee Business Journal*, February 1, 2018; Jill Tatge-Rozell, "New Gas Pipeline May Take Revised Route through Brighton, Paris," *Kenosha News* (Wisconsin), December 13, 2018; Rick Romell, "We Energies Plans 49-Mile, $187 Million Gas Pipeline to Station near Foxconn Site," *Milwaukee Journal Sentinel*, May 21, 2018.
25. The threat of eminent domain may be enough to encourage owners to sell. It should also be noted that the Village's plan also allows it to finance the redevelopment by issuing bonds that are exempt from both state and federal taxes. Rick Romell, "Village of Mount Pleasant Declares Foxconn Area as Blighted, May Use Eminent Domain to Take Properties," *Milwaukee Journal Sentinel*, June 5, 2018.
26. As of this writing, no property has been taken via eminent domain because the court cases fighting it are still active. See Hess, "Owners near Foxconn"; Rick Romell, "Foxconn-Area Residents Angry over Plans to Take Their Homes," *Milwaukee Journal Sentinel*, March 21, 2018.
27. Seth Fiegerman and Julia Horowitz, "Apple Supplier Foxconn Says It Will Build Big Wisconsin Factory," CNN Tech, July 26, 2017.
28. Rick Barrett, "Foxconn Says It Will Create Thousands of Jobs at Surprisingly Good Wages," *Milwaukee Journal Sentinel*, July 26, 2017.
29. Romell, "With Flourishes"; "Electronics and Information Technology Manufacturing Zone Tax Credit Agreement."
30. Rick Romell and Molly Beck, "Foxconn Now Declines to Say It Plans to Build Type of

Factory Named in State, Local Contracts," *Milwaukee Journal Sentinel*, August 23, 2018.

31. Joe Chrisman, "Wisconsin Economic Development Corporation" (Joint Legislative Audit, Legislative Audit Bureau, Madison, WI, May 2019), http://legis.wisconsin.gov/lab/media/2861/19-6full.pdf.
32. Arthur Thomas, "Foxconn Denies It's Changing Plans for Wisconsin Project," *BizTimes*, May 23, 2018.
33. Rick Romell, "Foxconn Falls Short of First Job-Creation Hurdle but Reiterates Ultimate Employment Pledge," *Milwaukee Journal Sentinel*, January 18, 2019.
34. Danielle Paguette, "Foxconn Says It Will Actually Build Factory, Cites 'Conversation' with Trump," *Washington Post*, February 1, 2019.
35. Tony Evers, "Letter to Foxconn about Renegotiating the Deal," April 23, 2019, https://www.scribd.com/document/407458765/Wisconsin-Gov-Tony-Evers-letter-to-Foxconn-about-renegotiating-the-deal. Bartik also recently provided an analysis for the costs and benefits of the Foxconn project, assuming that the contract with Wisconsin would be revised. His findings are generally even more pessimistic than our own, which assume that the current deal between Foxconn and the state remains in place. Bartik concludes that "it is difficult to come up with plausible assumptions under which a revised Foxconn incentive contract, which offers similar credit rates to the original contract, has benefits exceeding costs. The incentives are so costly per job that it is hard to see how likely benefits will offset these costs." Timothy J. Bartik, "Costs and Benefits of a Revised Foxconn Project" (Report, W. E. Upjohn Institute for Employment Research, Kalamazoo, MI, July 31, 2019).

3. The Arguments for Targeted Subsidies and the Problems with These Arguments

36. Wassily Leontief created the first input-output model in the late 1940s and won the Nobel Prize for his work in 1973. Wassily Leontief, *Input-Output Economics*, 2nd ed. (New York: Oxford University Press, 1986).
37. This implies an employment multiplier of 2.39 = (13,000 + 18,057) / 13,000. Baker Tilly Virchow Krause, LLP, "Project Flying Eagle: Updated Limited Scope Report" (Report for Wisconsin Economic Development Corporation, August 10, 2017).
38. This implies a labor multiplier of 2.71 = (13,000 + 22,245) / 13,000. EY Quantitative Economics and Statistics, "Quantifying Project Flying Eagle's Potential Economic Impacts in Wisconsin" (EY, July 2017), http://www.thewheelerreport.com/wheeler_docs/files/0728ey.pdf.
39. "Indirect and induced jobs associated with the project are estimated to total 22,000 beginning in 2021, based on a multiplier of 2.7." Legislative Fiscal Bureau, "2017 Wisconsin Act 58 (Foxconn/Fiserv)," 24.
40. EY Quantitative Economics and Statistics, "Quantifying Project Flying Eagle," p. ii.
41. Input-output models assume linear relationships regarding the capital-to-labor ratio needed for production and for production inputs from other industries. Therefore, it is appropriate to proportionately reduce the size of the gross GDP generated by the plant by one-fourth, the same ratio as the reduction in capital investments from a Generation 10.5 plant ($10 billion) to a Generation 6 plant ($2 billion to $3 billion).
42. The speculative nature of these estimates is obscured by the precision with which they are reported (over the course of 15 years, 18,057—not 18,056—jobs will be indirectly supported by Foxconn). If one digs below the top-line numbers, it is clear that these estimates are highly sensitive to assumptions. For example, EY estimates that the number of jobs created for Foxconn's suppliers will be 11,453, whereas Baker Tilly puts that number at 1,957. Thus, the two estimates differ by a factor of nearly 6.
43. Timothy J. Bartik, "'But For' Percentages for Economic Development Incentives: What Percentage Estimates Are Plausible Based on

the Research Literature?" (Working Paper, W. E. Upjohn Institute for Employment Research, Kalamazoo, MI, July 1, 2018).

44. Michael D. Farren and Anne Philpot, "What Could States and Municipalities Have Done with That Amazon HQ2 Money?," *The Bridge*, December 6, 2018; Erin Cox, "Maryland OKs $8.5 Billion in Incentives to Lure Amazon, Biggest Offer in Nation," *Baltimore Sun*, April 4, 2018; Nick Castele, "Cleveland's Amazon HQ2 Bid Offered $3.5 Billion In Local, State Incentives," *Ideastream*, March 9, 2019; Joshua Burd, "Amazon HQ2: Newark Council Approves $2 Billion Incentive Package," *Real Estate NJ*, July 12, 2018; Shinneman, "Not a Typo."
45. For a detailed discussion of these factors in the Amazon HQ2 case, see Scott Cochn, "Amazon Reveals the Truth on Why It Nixed NY and Chose Virginia for HQ2," CNBC, July 10, 2019. For a broader discussion of these factors, see Michael Farren and Anne Philpot, "Amazon HQ2 Is the Only Competition Where the Losers Are Winners" (Mercatus Policy Brief, Mercatus Center at George Mason University, Arlington, VA, November 13, 2018).
46. Timothy J. Bartik, *Who Benefits from State and Local Economic Development Policies?* (Kalamazoo, MI: W. E. Upjohn Institute, 1991), 61; these figures likely vary by sector. See James Papke, "Interjurisdictional Business Tax Cost Differentials: Convergence, Divergence and Significance," *Tax Notes* 9, no. 4 (1995): 1701–11.
47. It is important to note that the local cost of living can vary by as much as a factor of 2 across the United States. Leah Beth Curran et al., "Economic Wellbeing and Where We Live: Accounting for Geographical Cost-of-Living Differences in the US," *Urban Studies* 43, no. 13 (December 1, 2006): 2443–66; G. Cornia, W. Testa, and F. Stocker, "State-Local Fiscal Incentives and Economic Development" (Urban and Regional Development Series Number 4, Academy of Contemporary Problems, Columbus, OH, 1978).
48. Jason Stein, "Michigan Offered Foxconn $3.8B, Still Lost to Wisconsin," *Milwaukee Journal Sentinel*, October 19, 2017.
49. Jess Macy Yu and Karl Plume, "Exclusive: Foxconn Reconsidering Plans to Make LCD Panels at Wisconsin Plant," Reuters, January 29, 2019.
50. Michael Hawthorne, "Foxconn Finds Way to Stick 7 Million-Gallon Straw into Lake Michigan," *Chicago Tribune*, March 7, 2018; Scott Gordon, "Gravity of Precedent Fuels Challenge to Foxconn's Lake Michigan Bid," WisContext, June 19, 2018; Anna Clark, "Why Should Wisconsin Drain Lake Michigan for Foxconn?" *Washington Post*, August 28, 2019.
51. According to then–Chief of Staff Priebus: "So, when Foxconn came into the White House, into the Oval Office, the president said "I know a good spot you should go: That place in Kenosha." And then all of a sudden, the conversation started and the governor came on board, and Walker has been doing a lot of work ever since." Dan Shafer, "Priebus Recalls Beginning of Foxconn-to-Wisconsin Process," *Milwaukee Business Journal*, July 25, 2017.
52. Carlianne Patrick, "Identifying the Local Economic Development Effects of Million Dollar Facilities," *Economic Inquiry* 54, no. 4 (October 1, 2016): 1745.
53. For example, Bad Boy Mowers received $4 million in state money to expand production in Arkansas, but in an interview the CEO revealed that he would have expanded even without the subsidy. Nate Jensen's research has uncovered multiple similar examples in Texas alone. Jacob Bundrick, "Tax Breaks and Subsidies: Challenging the Arkansas Status Quo" (Arkansas Center for Research in Economics at the University of Central Arkansas, Conway, AR, 2016); Nathan M. Jensen, "Bargaining and the Effectiveness of Economic Development Incentives: An Evaluation of the Texas Chapter 313 Program," *Public Choice* 177, no. 1 (2018): 29–51.
54. "Great Navy of the State of Nebraska," *History Nebraska* (blog), December 12, 2017; Patrick,

"Identifying the Local Economic Development Effects."

55. "Amazon Selects New York City and Northern Virginia for New Headquarters," *Day One Blog* (Amazon), November 13, 2018.
56. Bartik, "'But For' Percentages." For two other studies with similar results, see Dennis A. Rondinelli and William J. Burpitt, "Do Government Incentives Attract and Retain International Investment? A Study of Foreign-Owned Firms in North Carolina," *Policy Sciences* 33, no. 2 (2000): 181–205; Jensen, "Bargaining and the Effectiveness of Economic Development Incentives."
57. Note that GDP measures only the value of final goods and services, while output also includes the value of intermediate goods and services. Since much of what Foxconn makes are intermediate goods, their production would be counted as output but not as GDP.
58. Arthur Thomas, "Glass Plant Not a 'Necessity' with Foxconn Making Smaller Screens," *BizTimes*, June 20, 2018; John Schmid, "Wisconsin Might Not Get a Foxconn Plant of Any Size, Analysts Say," *Milwaukee Journal Sentinel*, March 6, 2019.
59. Timothy J. Bartik, *Who Benefits from Economic Development Incentives? How Incentive Effects on Local Incomes and the Income Distribution Vary with Different Assumptions about Incentive Policy and the Local Economy*. Kalamazoo, MI: W. E. Upjohn Institute for Employment Research, March 2018, 11.
60. Williams's estimate of the Foxconn plant's effect on GDP is lower than that of the EY report because he focuses only on ongoing plant investments and employment and ignores facility construction. Noah Williams, "An Evaluation of the Economic Impact of the Foxconn Proposal" (Center for Research on the Wisconsin Economy, Madison, WI, July 2017), 4.
61. Tech Council, "UW-Madison Economist Foresees Big Payback in Jobs, Growth Multipliers from Foxconn Deal," Wisconsin Technology Council, August 21, 2017.
62. See, for example, the press release by the Metropolitan Milwaukee Association of Commerce, "Foxconn Package Returns $18 in Economic Impact for Every $1 in State Incentive," March 23, 2018.
63. It is common to cite Kenneth Arrow and Gerard Debreu for their elegant mathematical proof of this proposition. We find it far more compelling to note that Vernon Smith has found that actual humans (college undergraduates, to be precise) discover market-clearing (that is, marginal cost equals marginal benefit) prices in laboratory experiments. Smith termed this the "Hayek hypothesis," referencing Hayek's famous 1945 paper. Omar Al-Ubaydli and Peter Boettke have shown that field experiments also yield this conclusion. F. A. Hayek, "The Use of Knowledge in Society," *American Economic Review* 35, no. 4 (September 1, 1945): 519–30; Kenneth J. Arrow and Gerard Debreu, "Existence of an Equilibrium for a Competitive Economy," *Econometrica* 22, no. 3 (1954): 265–90; Vernon L. Smith, "An Experimental Study of Competitive Market Behavior," *Journal of Political Economy* 70, no. 2 (April 1, 1962): 111–37; Vernon L. Smith, "Markets as Economizers of Information: Experimental Examination of the 'Hayek Hypothesis,'" *Economic Inquiry* 20, no. 2 (1982): 165–79; Omar Al-Ubaydli and Peter Boettke, "Markets as Economizers of Information: Field Experimental Examination of the 'Hayek Hypothesis'" (IDEAS Working Paper Series from RePEc, St. Louis, MO, 2012).
64. Michael E. Porter, "Clusters and the New Economics of Competition," *Harvard Business Review* 76, no. 6 (December 11, 1998): 77–90.
65. Porter, "Clusters"; Enrico Moretti, *The New Geography of Jobs* (Boston: Mariner Books, 2013).
66. Associated Press, "A Tough Question for U.S. Cities: Is Amazon's HQ2 Worth It?," CBS News, October 18, 2017.
67. Amazon Office of Economic Development, "Amazon HQ2 RFP," Seattle, 2017, https://images-na.ssl-images-amazon.com/images

/G/01/Anything/test/images/usa/RFP_3._V516043504_.pdf.

68. City of Boston, "Amazon HQ2 Request for Proposal Response," Boston, MA, October 2017, https://d279ml9s9jjbhy.cloudfront.net/BostonAmazonHQ2.pdf.
69. Associated Press, "A Tough Question for U.S. Cities."
70. For a similar example of positive externalities that go in both directions, see Steven N. S. Cheung, "The Fable of the Bees: An Economic Investigation," *Journal of Law & Economics* 16, no. 1 (1973): 11–33.
71. Porter, "Clusters," 89.
72. Porter, "Clusters," 86.
73. Keith Chapman, "From 'Growth Centre' to 'Cluster': Restructuring, Regional Development, and the Teesside Chemical Industry," *Environment and Planning A: Economy and Space* 37, no. 4 (April 1, 2005): 610.
74. O. Fritz, H. Mahringer, and M. T. Valderrama, "A Risk Oriented Analysis of Regional Clusters," in *Clusters and Regional Specialisation: On Geography, Technology, and Networks*, ed. Michael Steiner (London: Pion Ltd., 1998); G. Tichy, "Clusters: Less Dispensable and More Risky than Ever," in *Clusters and Regional Specialisation: On Geography, Technology, and Networks*, ed. Michael Steiner (London: Pion Ltd., 1998), 226–37; Gilles Duranton and Diego Puga, "Diversity and Specialization in Cities: Why, Where and When Does It Matter?" (CEPR Discussion Paper, Centre for Economic Policy Research, London, October 1999).
75. Chapman, "From 'Growth Centre' to 'Cluster,'" 610.
76. Holman W. Jenkins Jr., "Detroit Was a Cluster," *Wall Street Journal*, July 30, 2013.
77. Pierre Desrochers and Frédéric Sautet, "Entrepreneurial Policy: The Case of Regional Specialization vs. Spontaneous Industrial Diversity," *Entrepreneurship Theory and Practice* 32, no. 5 (September 1, 2008): 813–32.
78. Duranton and Puga, "Diversity and Specialization in Cities."
79. Gert-Jan Hospers, Pierre Desrochers, and Frédéric Sautet, "The Next Silicon Valley? On the Relationship between Geographical Clustering and Public Policy," *International Entrepreneurship and Management Journal* 5, no. 3 (September 1, 2009): 286.
80. Austin Carr, "Inside Wisconsin's Disastrous $4.5 Billion Deal with Foxconn," *Bloomberg Businessweek*, February 6, 2019.
81. David Ricardo, *On the Principles of Political Economy and Taxation* (London: John Murray, 1817).
82. Hospers, Desrochers, and Sautet, "The Next Silicon Valley?," 286.
83. A farmer in northern Nebraska has developed a geothermal greenhouse that can grow citrus fruits during the Midwestern winter. The cost is $22,000 per 1,200 square foot of greenhouse (around $18.33 per square foot). Grant Gerlock, "Citrus in the Snow: Geothermal Greenhouses Grow Local Produce In Winter," *The Salt*, NPR, February 11, 2016.

4. Quantifying the Costs of a Targeted Economic Development Subsidy

84. A more memorable but less grammatically correct rendering has it that "there ain't no such thing as a free lunch." The origin of the phrase is unknown. At its core, the idea is about opportunity cost, a concept that dates at least as far back as Frédéric Bastiat's 1848 essay, "That Which Is Seen, and That Which Is Not Seen." More recently, the Nobel laureate Milton Friedman adopted the phrase as somewhat of a motto and as a title of one of his books. Frédéric Bastiat, "That Which Is Seen, and That Which Is Not Seen," in *The Bastiat Collection*, 2nd ed. (Auburn, AL: Ludwig von Mises Institute, 1850); Milton Friedman, *There's No Such Thing As a Free Lunch* (LaSalle, IL: Open Court Publishing Company, 1975).
85. James M. Buchanan, *Cost and Choice* (Indianapolis: Liberty Fund, 1969).
86. Bruce McDonald et al., "You Don't Always Get What You Want: The Effect of Financial Incentives on State Fiscal Health" (Working

Paper, Social Science Research Network, Rochester, NY, April 23, 2019).

87. Jia Wang, "Do Economic Development Incentives Crowd Out Public Expenditures in U.S. States?," *B.E. Journal of Economic Analysis & Policy* 16, no. 1 (January 1, 2016): 513–38.
88. It is beyond the scope of the current analysis to determine which of these two alternatives is the next-best alternative.
89. Dove and Sutter, "Is There a Tradeoff between Economic Development Incentives and Economic Freedom?"
90. For Wisconsin's CIT rate, see Joe Henchman and Michael Lucci, "Facts & Figures 2019: How Does Your State Compare?" (Tax Foundation, Washington, DC, 2019). For corporate income tax collections, see National Association of State Budget Officers, "State Expenditure Report: Examining Fiscal 2014–2016 State Spending," Washington, DC, 2016. In 2012, the last year for which data were available, 19,441 firms paid the state's corporate income tax. Of these, 3,565 were manufacturers. Manufacturers were subsequently exempted from the state's CIT, leaving about 16,000 firms with a CIT liability. Michael Oakleaf, "Wisconsin Corporate Income and Franchise Taxes" (Wisconsin Department of Revenue Division of Research and Policy, June 9, 2016).
91. For simplicity, we are assuming static revenue forecasting. In reality, because tax reductions tend to be associated with more economic activity, the state could reduce the rate by more than 22 percent and still collect the same amount of revenue.
92. To simplify the discussion, this figure assumes that there is one market for all retail sales. In reality, there are thousands of distinct markets for particular goods.
93. The actual size of a tax's deadweight loss depends on the effective tax collected per unit, the before-tax quantity, the before-tax price, and the shapes of the supply and demand curves. The more responsive the quantity supplied and the quantity demanded are to price changes—that is, the more elastic the supply and demand curves are—the greater the deadweight loss.
94. Intuitively, this is because taxes reduce consumer and producer surplus through both a price effect and a quantity effect.
95. Let t be the tax collected per unit. Let η be the absolute value of (the compensated) demand elasticity. Let ε be supply elasticity. In that case, the size of the deadweight loss triangle will be

$$\frac{1}{2}\frac{P_{NT}Q_{NT}}{\frac{1}{\eta}+\frac{1}{\varepsilon}}t^2.$$

In other words, when demand and supply are linear, deadweight loss is proportional to the square of the tax rate; when the curves are nonlinear, this is only approximately true. Harvey S. Rosen and Ted Gayer, *Public Finance*, 10th ed. (New York: McGraw-Hill Education, 2013), 333.

96. Rosen and Gayer, *Public Finance*, 333. An alternative view, known as *Ramsey-rule taxation*, holds that high-elasticity goods should be taxed at lower rates while low-elasticity goods should be taxed at higher rates. This view has been criticized by constitutional political economy scholars, who contend that such a rule would lead to exploitation of low-elasticity markets. Geoffrey Brennan and James M. Buchanan, eds., *The Power to Tax: Analytic Foundations of a Fiscal Constitution* (New York: Cambridge University Press, 1980). Moreover, in the case of economic development, favorable taxation of locationally elastic firms may result in an industrial base of flighty firms. See section 6.5.
97. Bartik, *Who Benefits from Economic Development Incentives?*, 10. It is important to control for public services since this is an estimate of the gross costs of taxation. We use this estimate for two reasons. First, as Bartik puts it, it is the "consensus" estimate of the long-run elasticity of business activity with respect to state and local taxation. Second, Bartik uses this elasticity to construct his "but for" estimates of a subsidy's decisiveness, which we used earlier to calculate the gross benefits of a subsidy. So it makes sense

to use this estimate on both the cost and benefit sides of the calculation.

98. The seven-year phase-in for tax effects is a conservative assumption. Romer and Romer, for example, find the maximum impact of taxation after three years. Christina D. Romer and David H. Romer, "The Macroeconomic Effects of Tax Changes: Estimates Based on a New Measure of Fiscal Shocks," *American Economic Review* 100, no. 3 (June 2010): 763–801.
99. As with any model, this is a simplified abstraction. For example, we ignore any positive revenue feedback that might be generated through tax reductions and simply model the tax reductions statically.
100. The equation to calculate this is: $15.607 billion × (probability that the subsidy was decisive) − $8,905 billion > 0, which returns a "break-even" probability of 0.57. If the likelihood that the subsidy swayed Foxconn's final decision is less than 63 percent, then the deal results in a net loss to Wisconsin's economy.

5. Additional Difficult-to-Quantify Costs of a Targeted Economic Development Subsidy

101. Bastiat, "That Which Is Seen, and That Which Is Not Seen."
102. In microeconomics, the short run is defined as the period of time over which any input is fixed. Over the long run, most inputs are not fixed and scale economies are possible, meaning that marginal costs may be reduced by increasing output.
103. Uncontroversial among economists, this insight is central to the economic way of thinking. When they discuss economic development, however, policymakers often ignore it. They speak as if every job, every investment, and every factory is worthwhile.
104. Adam Smith, *The Wealth of Nations* (n.p.: Simon & Brown, 2012), book IV, chap. II, para. 15.
105. Melvin L. Burstein and Arthur J. Rolnick, "Congress Should End the Economic War among the States," Federal Reserve Bank of Minneapolis 1994 Annual Report, January 1, 1995, 3–20; Peter S. Fisher and Alan H. Peters, *Industrial Incentives: Competition among American States and Cities* (Kalamazoo, MI: Upjohn Press, 1998), 213.
106. Peter S. Fisher and Alan H. Peters, "Tax and Spending Incentives and Enterprise Zones," *New England Economic Review* (April 1997): 125.
107. Carlianne Patrick, "Jobless Capital? The Role of Capital Subsidies" (Upjohn Institute Working Paper 15-237, W. E. Upjohn Institute for Employment Research, Kalamazoo, MI, January 1, 2015).
108. Harvey Leibenstein, "Allocative Efficiency vs. 'X-Efficiency,'" *American Economic Review* 56, no. 3 (June 1, 1966): 392–415.
109. The model assumes, among other things, that firms are able to equate marginal costs and marginal benefits along all margins.
110. Mitchell, *The Pathology of Privilege*.
111. X-inefficiency theory is not without its critics. It assumes that the firm will choose to forgo some profit in order to enjoy some slack. George Stigler, for one, found this implausible. For others who see some truth to economist John Hicks's aphorism that "the best of all monopoly profits is a quiet life," the theory seems plausible. George J. Stigler, "The Xistence of X-Efficiency," *American Economic Review* 66, no. 1 (1976): 213–16; J. R. Hicks, "Annual Survey of Economic Theory: The Theory of Monopoly," *Econometrica* 3, no. 1 (1935): 1–20.
112. Burton W. Folsom, *The Myth of the Robber Barons: A New Look at the Rise of Big Business in America*, 7th ed. (Herndon, VA: Young America's Foundation, 2013), 6.
113. Folsom, *Myth of the Robber Barons*, 18.
114. Lassaad Lachaal, "Subsidies, Endogenous Technical Efficiency and the Measurement of Productivity Growth," *Journal of Agricultural and Applied Economics* 26, no. 1 (July 1994): 308.
115. John P. Martin and John M. Page, "The Impact of Subsidies on X-Efficiency in LDC Industry: Theory and an Empirical Test," *Review of*

Economics and Statistics 65, no. 4 (1983): 608–17.

116. Thomas Grennes, "An Economic Analysis of the Jones Act" (Mercatus Research, Mercatus Center at George Mason University, Arlington, VA, May 2, 2017).
117. Israel M. Kirzner, *Competition and Entrepreneurship* (Indianapolis: Liberty Fund, 1973); Israel M. Kirzner, *Discovery and the Capitalist Process* (Chicago: University of Chicago Press, 1985).
118. For an overview of the concept, see Jerry Ellig, ed., *Dynamic Competition and Public Policy: Technology, Innovation, and Antitrust Issues* (New York: Cambridge University Press, 2001).
119. Matthew D. Mitchell and Peter J. Boettke, *Applied Mainline Economics: Bridging the Gap between Theory and Public Policy* (Arlington, VA: Mercatus Center at George Mason University, 2017), 36.
120. Joseph Alois Schumpeter, *Capitalism, Socialism and Democracy* (New York: Harper Perennial Modern Thought, 1942).
121. John Haltiwanger, Ron S. Jarmin, and Javier Miranda, "Business Dynamics Statistics: An Overview" (Kauffman Foundation, Kansas City, MO, January 2009); John Haltiwanger, "Job Creation and Firm Dynamics in the United States," in *Innovation Policy and the Economy*, vol. 12, ed. Josh Lerner and Scott Stern (Chicago: University of Chicago Press, 2012), 17–38; Ryan Decker et al., "The Role of Entrepreneurship in US Job Creation and Economic Dynamism," *Journal of Economic Perspectives* 28, no. 3 (2014): 3–24.
122. Stephen J. Nickell, "Competition and Corporate Performance," *Journal of Political Economy* 104, no. 4 (August 1, 1996): 724–46; Lucia Foster, John C. Haltiwanger, and C. J. Krizan, "Aggregate Productivity Growth. Lessons from Microeconomic Evidence," in *New Developments in Productivity Analysis*, ed. Charles Hulten, Edwin R. Dean, and Michael J. Harper (Chicago: University of Chicago Press, 2001), 303–72; John C. Haltiwanger, Eric Bartelsman, and Stefano Scarpetta, "Microeconomic Evidence of Creative Destruction in Industrial and Developing Countries" (World Development Report Background Paper, World Bank, Washington, DC, 2004); Lucia Foster, John Haltiwanger, and Chad Syverson, "Reallocation, Firm Turnover, and Efficiency: Selection on Productivity or Profitability?," *American Economic Review* 98, no. 1 (March 1, 2008): 394–425; Chad Syverson, "What Determines Productivity?," *Journal of Economic Literature* 49, no. 2 (2011): 326–65.
123. Hyunbae Chun et al., "Creative Destruction and Firm-Specific Performance Heterogeneity," *Journal of Financial Economics* 89, no. 1 (July 2008): 109–35; Kathy Fogel, Randall Morck, and Bernard Yeung, "Big Business Stability and Economic Growth: Is What's Good for General Motors Good for America?," *Journal of Financial Economics* 89, no. 1 (July 2008): 83–108; Philippe Aghion, Ufuk Akcigit, and Peter Howitt, "What Do We Learn from Schumpeterian Growth Theory?," (NBER Working Paper No. 18824, National Bureau of Economic Research, Cambridge, MA, February 2013).
124. Israel M. Kirzner, "40 Years after the Nobel: F. A. Hayek and Political Economy as a Progressive Research Program" (Hayek Speaker Series, George Mason University, Arlington, VA, October 2, 2014); F. A. Hayek, "Competition as a Discovery Procedure," trans. Marcellus Snow, *Quarterly Journal of Austrian Economics* 5, no. 3 (Fall 2002): 9–23.
125. Folsom, *Myth of the Robber Barons*, 10–18.
126. Royal Meeker, *History of Shipping Subsidies* (New York: Published for the American Economic Association by the MacMillan Company, 1905), 11.
127. Folsom, *Myth of the Robber Barons*, 30.
128. For example, for Foxconn to claim the full amount of the jobs-related subsidy, it must employ at least 10,400 workers (among other conditions). For it to claim the full investment subsidy, it must spend at least $9 billion in capital investments and employ at least 8,450 workers (among other conditions). To avoid

a potential $500 million fine, it must employ 6,500 workers from 2024 through 2032. "Electronics and Information Technology Manufacturing Zone Tax Credit Agreement."

129. Policymakers systematically miscategorize costs as benefits. Barry R. Weingast, Kenneth A. Shepsle, and Christopher Johnsen, "The Political Economy of Benefits and Costs: A Neoclassical Approach to Distributive Politics," *Journal of Political Economy* 89, no. 4 (August 1, 1981): 642–64.
130. Schmid, "Wisconsin Might Not Get a Foxconn Plant."
131. Nilay Patel, "Foxconn Exec Complains about Not Being Able to Change Wisconsin Plans Whenever It Wants," *The Verge*, July 5, 2019.
132. Firms spend about 13 times as much on lobbying as they do on political action committee contributions. Lee Drutman, *The Business of America Is Lobbying: How Corporations Became Politicized and Politics Became More Corporate* (New York: Oxford University Press, 2015), chap. 1.
133. Franklin Spinney, a noted Pentagon watchdog, coined the term "political engineering" to describe the practice of using production location decisions to curry political favor. Franklin C. Spinney, "Defense Power Games" (Project on Government Oversight, Alexandria, VA, 1990).
134. See footnote 51.
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7. Conclusion

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