Tax Credits As A Tool Of State Economic Development Policy

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EXECUTIVE SUMMARY

Tax credits come in many forms and serve an array of purposes, although economic development is central to their existence. Although tax credits come in many forms, they all share a basic structure: They are provided to a private entity for a specific project, usually to enhance the entity's ability to obtain financing. The holder of a tax credit can apply it against his or her tax liabilities according to its redemption value, its redemption date, and other rules governing the credit.

This paper summarizes the findings in the economics literature on the effectiveness of state tax credits in spurring economic development. Based on the literature, the three important lessons to be learned about applying tax credits are:

- Tax credits generally have not been found to lead to increased employment even at firms that receive them. This result seems to depend somewhat on the incentive structure of the tax credit program.

- In some sectors and some localities, it is possible for tax credits to lead to increased employment in non-recipient firms. This suggests that agglomeration economies might play a limited role in determining the effectiveness of tax credits. The literature provides little to no guidance, however, as to when and where tax credits can be targeted for this purpose.

- State tax credits do not tend to lead to higher levels of employment for local residents, nor, by extension, do they lead to higher levels of employment for state residents.

These lessons are consistent with the general literature on the, at best, lukewarm effects of development incentives on local employment. Keep in mind that the tax credit programs examined typically are geared directly at job creation. This suggests that for states like Missouri, which tend to have dual-purpose tax credit programs, it would be difficult to find strong evidence that development tax credits have generate significant increases in overall economic activity.

1. INTRODUCTION

Tax incentives are among the main instruments of state and local economic development policy, and tax credits are among the most revalent types of tax incentive.[1] Tax credits come in many forms and serve an array of purposes, although economic development is central to their existence.[2] The purpose of this paper is to summarize the findings in the economics literature on the effectiveness of state tax credits in spurring economic development. The context for this survey is the establishment of an official commission to review Missouri's tax credit programs with the purpose of streamlining and consolidating the state's myriad tax credit programs.[3] The commission's efforts are

certainly worthy, and its report contains many eminently sensible suggestions, but its proceedings avoided the extremely important question of whether or not the tax credits have been, or even can be, effective. This survey is a contribution to a clearer understanding of this issue.

The remainder of this paper surveys the state of the academic literature regarding the effectiveness of economic development incentives, with particular attention paid to state tax credits. The next two sections describe the basic structure of tax credits and their use in Missouri. Sections 4 and 5 discuss the use of development incentives in general, first outlining the economic efficiency arguments in their favor and then summarizing the literature estimating their effects. Section 6 describes the literature dealing specifically with the effects of tax credits, and the final section provides three broad conclusions drawn from this literature.

2. THE BASIC STRUCTURE OF TAX CREDITS

Although tax credits come in many forms, they all share a basic structure. They are provided to a private entity for a specific project, usually to enhance the entity's ability to obtain financing. The holder of a tax credit can apply it against his or her tax liabilities according to its redemption value, its redemption date, and other rules governing the credit. Typically, tax credits are transferable, meaning that they can be bought and sold, although the market price will be below the redemption value. The holder might have bought the credits several years before they can be redeemed, and the bigger the gap between the purchase and redemption dates, the larger the discount. Further, holding

tax credits entails some risk because they often have a provision, called a *clawback*, that negates them in the event that a project is not completed. Finally, various limits can be placed on the timing of redemption, such as whether they can be *carried back* (used against previous years taxes with amended tax returns) or *carried forward* (applied to some number of future years' taxes).
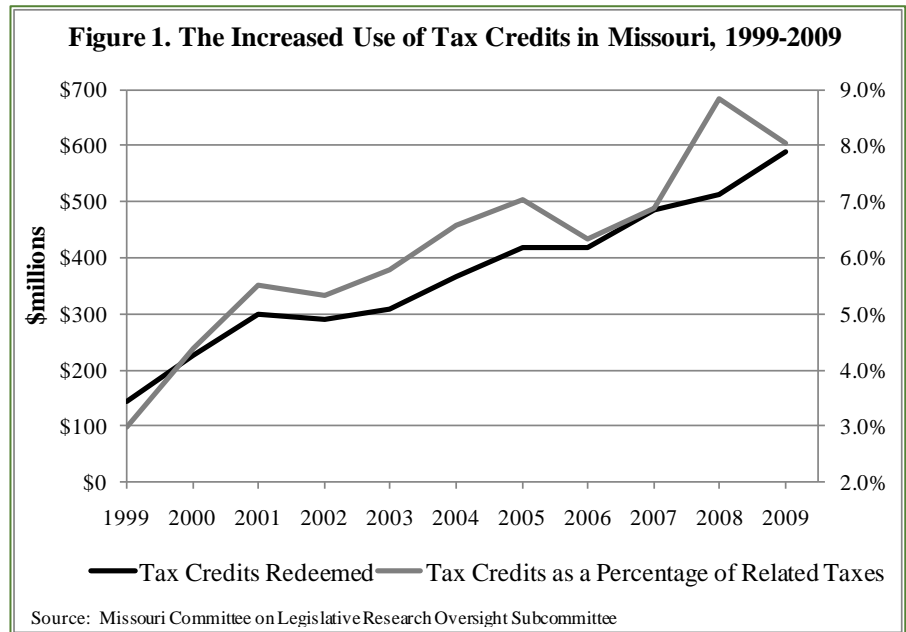
Tax credits are just one form of tax offset used as an economic development incentive. With *tax diversion*, taxes are collected but are then transferred to pay for a specific project such as additional infrastructure. *Tax abatement* is a straightforward reduction in future taxes, such as a when a firm is not assessed property taxes for a set number of years on a new investment. Similarly, a firm could benefit from a *tax deferral*, which allows it to postpone its tax payments, or be allowed a *tax deduction* to lower its taxable income. Because tax credits are provided up front and have a specified value, they are closer than any of these other tax offsets to a direct payment

to the firm from the government. Transferability makes the tax credits even more similar to a direct payment.

3. TAX CREDITS IN MISSOURI

In Missouri, $588 million of tax credits of all types were redeemed during fiscal year 2009, a value 4 times that for 1999.[4] As also shown in Figure 1, tax credits have become an increasingly prominent feature of tax policy, rising from about 3 percent to over 8 percent of the revenue collected by the related taxes between 1999 and 2009.

Missouri had 64 tax credit programs in 2009, including large programs with purposes in addition to economic development, such as historic preservation and the provision of affordable housing. Figure 2 presents the breakdown of Missouri's tax credits for the amounts issued in 2009. Note that six categories alone accounted for more than three-fourths of all tax credits issued. Even more telling, nearly two-thirds of all tax credits issued fell under just three

Figure 1. The Increased Use of Tax Credits in Missouri, 1999-2009

Source: Missouri Committee on Legislative Research Oversight Subcommittee

categories: Low-Income Housing, Historic Preservation, and Senior Citizen or Disabled Person Property. Similarly, as shown by Figure 3, the redemption of tax credits was similarly skewed toward a handful of categories. The six largest categories accounted for more than 80 percent of all redemptions in 2009, and the three largest accounted for about 70 percent of the total.

4. EFFICIENCY ARGUMENTS FOR TAX CREDITS

In the benchmark model of an economy, factors of production such as labor and capital are perfectly mobile and markets for consumption goods and factors of production are perfectly competitive. Under these conditions (and many others), unfettered markets will produce a *Pareto-efficient* outcome. That is, there will be no reallocation of inputs or output that can make one person better off without making at least one other person worse off. The Pareto criterion, though confining, is useful because it allows economists to focus on economic efficiency and to abstract from considerations that are more philosophical in nature, such as whether one outcome is more "just" or "equitable" than another.
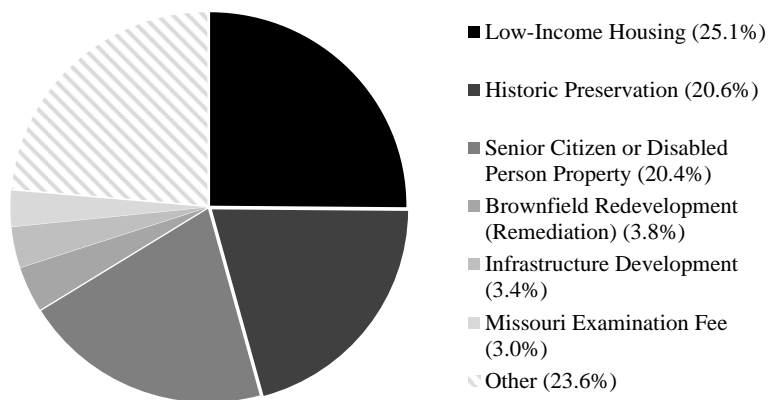
Economists do not believe that the benchmark model describes the actual economy exactly. It is used because economists tend to believe that, even with its strict assumptions and simplicity, it is a useful representation of reality. Nonetheless, most economists recognize that there can be *market failures* for which differences between the actual economy and the benchmark economy are significant. In such situations, which are

Figure 2. Shares of Tax Credits Issued, 2009

- Low-Income Housing (25.1%)
- Historic Preservation (20.6%)
- Senior Citizen or Disabled Person Property (20.4%)
- Brownfield Redevelopment (Remediation) (3.8%)
- Infrastructure Development (3.4%)
- Missouri Examination Fee (3.0%)
- Other (23.6%)

Source: Missouri Committee on Legislative Research

Figure 3. Shares of Tax Credits Redeemed, 2009

- Historic Preservation (31.7%)
- Senior Citizen or Disabled Person Property (20.2%)
- Low-Income Housing (18.0%)
- Brownfield Redevelopment (Remediation) (5.0%)
- Infrastructure Development (4.6%)
- Neighborhood Assistance (2.2%)
- Other (18.3%)

Source: Missouri Committee on Legislative Research

discussed in greater detail below, the free market will not achieve the efficient outcome and there might be room for government intervention to improve economic efficiency.

It is very important to keep in mind that the mere existence of market failures does not necessarily imply that the government should step in. Analogous to market failure is *government failure*, for which government action makes the outcome even worse than the less-than optimal free-market outcome. Government failure can arise for a number of reasons. For one thing, the information required to formulate effective intervention is

daunting, to say the least. But even if policymakers know exactly the correct policy to correct a market failure, government failure is still an inherent risk simply because of the nature of government decision making: Representative democracy may well be the best way to run a country, but few would claim, for example, that the horse trading that is typical of democratic process is likely to achieve an idealized notion of economic efficiency. In addition, the affected parties will not sit idly by once a government decides to intervene in the economy. Instead, they will expend resources trying to influence government policy to steer it in directions most favorable to themselves. At its most complete,
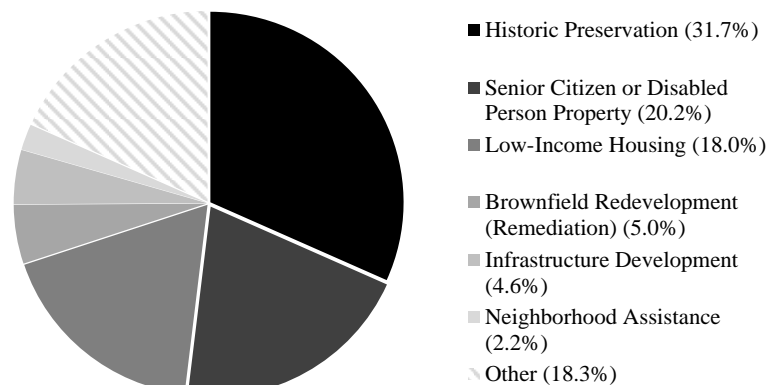
this *rent-seeking* can result in *regulatory capture*, whereby one of the parties affected by an intervention effectively takes control of government decision making and uses the power of government to enrich itself.

The general framework of market and government failures is useful for assessing the use of state and local development incentives to improve economic efficiency. For development incentives to be effective, the government must be able to identify the circumstances under which intervention will improve efficiency and then design government institutions in ways that ensure that the intervention will not end up making things worse.

The remainder of this section describes various types of market failures for which local development incentives might be appropriate solutions. The market-failure approach is also used by Bartik (1990, 1994) and Courant (1994), although the market failures they stress differ somewhat from mine, which are imperfect capital markets, public goods, agglomeration economies, and involuntary unemployment.

4.A. Imperfect Capital Markets

It is rare for a business to start or expand without having to raise money in financial markets. More often than not, this involves borrowing from banks, which are among the most-regulated firms in the economy. Entry into the banking sector is restricted, so the level of competition is far from the perfect competition of the benchmark model. This lack of competition might limit the amount of lending that banks are willing to do and, therefore, result in suboptimal levels of economic

activity. Banks are also monitored by regulators and face limits on the amount of risk they can carry, which might also mean that they lend too little. Strictly speaking, these imperfections are not due directly to market failures, but are the consequence of government policies to achieve other ends. Nevertheless, these negative consequences are out of the hands of the makers of state and local development policy.

In addition to government-induced imperfections, the banking sector can be affected by the absence of complete insurance markets. That is, banks are unable to insure completely against the incidence of default on loans they make because of *moral hazard* and *adverse selection*, problems that are inherent to any insurance market. If banks were able to insure completely, they would have less incentive to monitor the loans that they make because any losses would be borne by the insurers rather than the banks (moral hazard). In addition, because banks might have better information about the riskiness of their loans than would insurers, insurance would more likely be sought only for the riskiest loans (adverse selection). Either of these problems would make the insurance markets for banks incomplete and, therefore, can result in a suboptimal level of lending.

Because of such financial market imperfections, development incentives might be a way for state and local governments to step in so that the ventures foregone are pursued. Because they can be used as collateral, tax credits can be thought of as one way to address the possibility of less-than-optimal lending to businesses. Tax credits are a fairly roundabout way of addressing imperfections in financial markets, however. More directly,

policies such as loan guarantees are a way to reduce the risk exposure of banks and induce them to support ventures they would otherwise avoid.

Policymakers should be warned that it is not particularly easy to address imperfections in financial markets. A successful policy would require being able to select just those ventures that would be foregone because of financial market imperfections and not because they are bad ideas. Compounding this challenge is that the selection will be done through a political process of some sort.

4.B. Public Goods

Historic-preservation tax credits are one of the most widely used development tax credits in Missouri and are given to assist in redeveloping historic structures. As with any development incentive, these tax credits are used to spur economic development. But, because they are directed towards historic buildings, they serve the additional role of subsidizing the provision of a *public good*. Public goods have two defining characteristics: (1) when consumed by someone there is no reduction in the amount available to anyone else; and (2) no one can be excluded from consuming the good. Because of these characteristics, public goods would not be provided by the private sector without some government incentive to do so.

In the case of historic-preservation tax credits, the presumed public good being subsided is the historic nature of the redeveloped buildings. Anyone can drive by and enjoy a historic structure without reducing the ability of someone else to do the same. Because this enjoyment cannot be sold by the developer, he

or she must be given some sort of inducement to preserve the historic nature of the structure rather than building a new structure elsewhere or replacing the historic structure with a new, less-expensive one.

The public goods argument is illustrated by Figure 4, which represents the market for historic preservation. Presumably, occupants of rented office or housing space are willing to pay some premium for some level of historic preservation for the buildings they occupy, but the amount they are willing to pay is decreasing in the level of historic preservation (i.e., occupants' demand for historic preservation is downward sloping). The marginal cost of historic preservation rises with the amount of preservation that is done, meaning that its supply is upward sloping. In the absence of government intervention, equilibrium in the market for historic preservation is at point A, the intersection of the supply curve and the occupants' demand curve.

This free-market outcome does not account for the demand for historic preservation by non-occupants, however, who can enjoy historic structures without paying to do so.
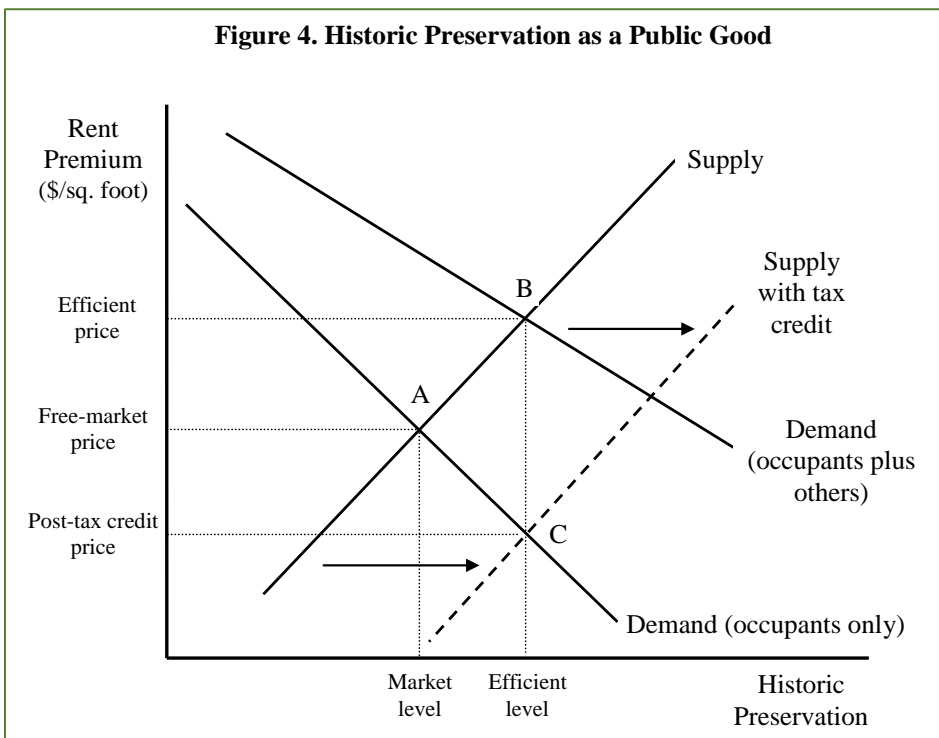
The efficient level of historic preservation would account for the total demand from occupants and non occupants, and is determined at point B, the intersection of total demand and the supply curve. Historic-preservation tax credits shift the supply curve for historic preservation to the right, thereby increasing the level of historic preservation produced. Taking account its cost, an optimal historic tax credit policy would result in an equilibrium at point C. Note also that the post-tax credit price— which would be paid by occupants—is lower than the free-market price, and that the cost paid by taxpayers for each unit of historic preservation is the difference between the efficient price and the post-tax credit price.[5]
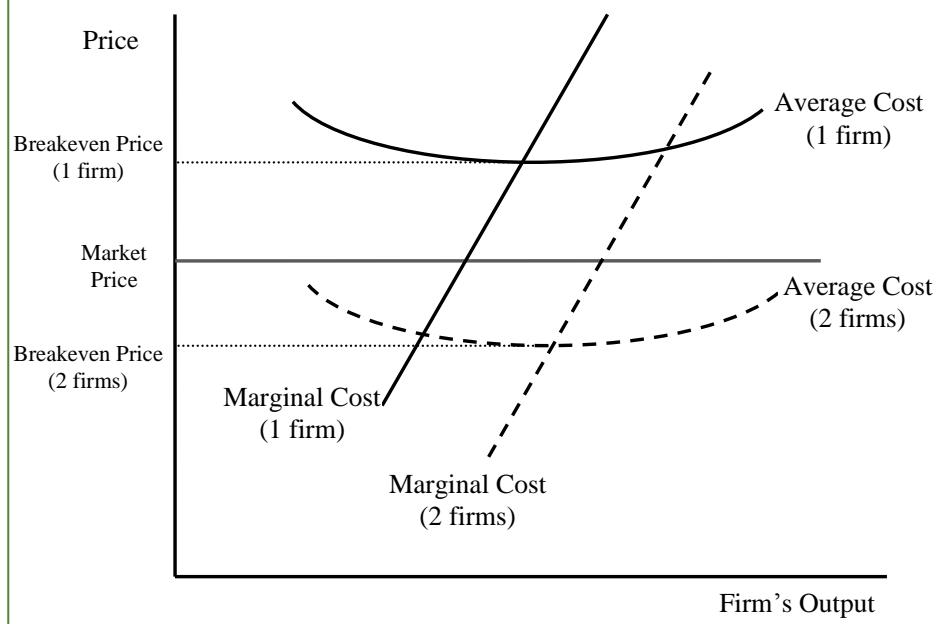
In reality, the determination of the optimal historic-preservation tax credit policy is not as easy as drawing a graph, primarily because of the difficulty in determining the value that non-occupants place on historic preservation. This is compounded by the dual nature of historic-preservation tax credits, which are also used as tools for spurring employment or income growth. As stressed by Courant (1994) and Rothstein and Wineinger (2007), estimates of the effectiveness of such policies should take account their broad effects on welfare, not just on their effects on employment or growth.

4.C. Agglomeration Economies

When a business is considering opening a new establishment or moving some of its activities into an area, its decision depends on its own profits only. It might be the case, however, that entering an area would increase the profits of business that might already be located nearby, or that are also considering a move into the area. Similarly, the potential entrant might see higher profits if other firms were already located nearby. That is, firms' decisions can have *positive externalities* and there can be benefits to firms agglomerating or clustering in certain areas.

The benefits of clustering can arise for several reasons, such as firms being near to their suppliers or to a specialized workforce, and can be obtained without any government intervention at all. This situation can illustrated by Figure 5, which considers the long run profitability of a single firm as dependent on the existence of firms producing related products. Imagine, for example, that a firm wants to open a factory to produce tables and is considering a location near a large forest that can

Figure 4. Historic Preservation as a Public Good

Figure 5. Agglomeration Economies and Firm Profitability

provide tax credits to one or more of the three firms in the story. Of course, the trick for policymakers is being able to foresee the firms and industries that should be induced, and the landscape is littered with expensive failures.

4.D. Involuntary Unemployment

According to both Bartik (1990 and 1994) and Courant (1994), state and local development incentives should be used to address *structural unemployment*, but not *cyclical unemployment*, which arises from fluctuations in the overall macroeconomy. Structural unemployment, they argue, can arise in the longer run because of local conditions even when the economy is fully into expansion.[6]

To Courant, structural unemployment can persist because of the high cost of moving to where the jobs are (*spatial mismatch*). Bartik, on the other hand, has in mind involuntary unemployment that arises because wages are not determined where the number of workers wanting to work equals the number of people working (the *market-clearing wage*), as in the benchmark model. Instead, he sees the *efficiency wage model* as more relevant to labor markets. In this model, because it is difficult to monitor worker effort there is an incentive for workers to shirk. Employers would then pay an efficiency wage above the market-clearing wage to increase the cost of job loss and, therefore, ameliorate the shirking. As a result, the wage is above the market-clearing wage and there is *involuntary unemployment*.

Economists are far from unanimous in believing that the efficiency wage model is the most-useful depiction of labor markets, although the view has many prominent adherents.

provide wood to its factory. If the firm would be the area's only consumer of wood, its breakeven price is at the intersection of the solid average and marginal cost curves in Figure 5. In the figure, this breakeven price is above the market price, which is given to the firm.

In the background of this firm's decision is another firm that produces the wood used to make the tables. Wood production might have strong economies of scale, meaning that the cost (and, therefore, the price) of wood falls the more wood is produced. If there were a second consumer of large amounts of wood, say a firm producing chairs, local wood producers would be able to capture economies of scale and the price of wood would fall, thereby lowering costs for the table producer. In other words, the table producer's breakeven price would be lower, as in the figure where it is at the intersection of the dashed average and marginal cost curves. If, as in

the figure, this breakeven price is below the market price, the table producer would be profitable in the long run and would decide to open a factory in the area. An analogous story can be told for the chair producer, which would benefit from the existence of the table producer.

According to the story above, the producers of wood, chairs, and tables all might benefit if their production is clustered in the same area. Market forces alone might create such a cluster, as evidenced by the existence of large numbers of industry clusters. It is a bit of a mystery why clustering occurs where it does, and it is often attributed simply to luck. A great deal of development policy, especially the provision of tax credits, is driven by governments seeking to make their own luck by providing the right incentives to kick start an agglomerative process. Specifically, according to this argument, such a process might be set into motion if a state were to

Leaving that debate aside, if we accept the model, how should development incentives be targeted so as to reduce involuntary unemployment? If, as in the model, firms cannot monitor shirking done by its own employees, what chance do state and local governments have in targeting their development incentives to counter involuntary unemployment? To Bartik, the answer is simple: development incentives should be targeted toward areas with higher measured unemployment. It is quite a leap, however, to conclude that the higher measured unemployment means greater involuntary unemployment resulting from efficiency wages. The theory does not provide compelling explanations for the differences in unemployment that persist between areas. There are other plausible explanations for this phenomenon (minimum wages coupled with significant differences in human capital, for example), for which targeted development incentives are not a solution.

5. THE EFFECTS OF DEVELOPMENT INCENTIVES IN GENERAL

The small but growing literature estimating the effects of tax credits is part of a larger literature examining the many different forms of targeted development incentives. Because most of the lessons learned from the broader literature are readily applicable to tax credits, it is worth summarizing it.[7] There are three prominent surveys of the effectiveness of development incentives in general as tools of economic development [Buss, 2001; Peters and Fisher, 2004; and Bartik, 2005]. All three concluded that there is little evidence that development incentives had been effective, but

each has its own perspective on why this was so.

Buss (2001), who surveyed the studies done prior to 2000, argued that the evidence is weak because development incentives actually were ineffective. Even so, he faults the literature as providing "little guidance to policy makers trying to fine-tune economic development (p. 101)." Further, "(d)epending on how one reads the literature, policymakers and their advisers should (or should not) intervene in economies (p. 101)." Buss concluded with a list of suggestions for policy makers in dealing with this lack of guidance.

Most of Buss's suggestions are ways to deal with the uncertainty surrounding the existence of beneficial results from the incentives. In other words, if development incentives can be beneficial, then his suggestions would increase the chances that they are applied where the benefits are greatest. If incentives are harmful, on the other hand, then following his suggestions would at least minimize their damage. For example, he provides the altogether sensible suggestion that policymakers should perform cost-benefit analyses *prior to* providing development incentives. The fact that Buss found it necessary to suggest cost-benefit studies in advance of a policy being implemented speaks volumes about the process by which these policy decisions were—and largely still are—made.

Peters and Fisher (2004) surveyed basically the same literature as Buss and provided an assessment that was even more negative. They outlined what they saw as the three broad failures of development incentives: (1) There is little-to-no

evidence that they lead to significant new investment or jobs; (2) When targeted at distressed areas, much of the benefit goes to people who live elsewhere; and (3) Supposed government fiscal benefits are illusory because, even if revenue increases directly from the subsidized area or firms, this will be offset by losses from other areas and firms. Rather than providing suggestions for improving the outcomes of development incentives, Peters and Fisher bluntly advised public officials to lower "their expectations about their ability to micro manage economic growth" and to focus instead on "providing sound foundations for growth through sound fiscal practices, quality infrastructure, and good education systems—and then letting the economy take care of itself (pp. 35-36)."

Bartik (2005) also found only modest empirical support for the use of development incentives, although he attributed this to the misapplication of incentives rather than to their actually having modest effects. He is much more certain than Buss about how and under what circumstances incentives could be beneficial, and, unlike Peters and Fisher (2004), he argues that policymakers could improve their use of development incentives if they did a better job targeting them at distressed areas. The basis of Bartik's analysis is his earlier call to focus development incentives on instances of market failure (Bartik, 1990 and 1994). Although his earlier call provided a list of market failures that could be addressed, this later work focuses on only one— involuntary unemployment arising from efficiency wages. As noted in the previous section, however, such an approach is not without significant caveats.

The Literature Estimating the Effects of State Tax Credits on Employment

Author(s)	State	Findings
Bartik and Erickcek (2010)	Michigan	Benefits per job from MEGA credits were five times the costs per job.
Faulk (2002)	Georgia	Recipient firms in Georgia saw increased employment, 3/4 of which would have occurred without tax credits.
Gabe and Kraybill (2002)	Ohio	Incentives did not lead to higher employment in recipient firms, but recipients' overstated projected job growth.
Greenbaum et al. (2010)	Ohio	Tax incentives were not allocated more toward distressed areas.
Hoyt et al. (2008)	Kentucky	Border counties saw small increases in employment, probably due to an increase in out-of-state commuters.
LaFaive and Hicks (2005)	Michigan	MEGA credits did not increase county-level employment in Michigan
LaFaive and Hohman (2009)	Michigan	MEGA credits were associated with county-level job losses in Michigan.
Luger and Bae (2005)	North Carolina	Incentives led to increased employment in recipient firms, but at a very high cost per job.
Sohn and Knaap (2005)	Maryland	Some targeted sectors experienced agglomeration effects that increased employment sector-wide.

6. THE EFFECTS OF DEVELOPMENT TAX CREDITS

The discussion in section 4 provides the efficiency arguments for development incentives, but the dominant focus of policy discussions and the literature estimating the effects of incentives is on what happens to employment. While this might be expected from policy discussions among non-economists, it is disappointing that the empirical economics literature has not done more to bring the focus on efficiency. Even so, an initial focus on employment is understandable given its importance and its measurability, but it ignores a number of important efficiency considerations. In the case of public goods and historic tax credits, for example, efficiency gains can occur without any measured increase in employment. Further, as discussed in detail by Rothstein and Wineinger (2007), many other tax credit programs in Missouri are targeted with equity considerations going hand in hand with development goals. Proper program evaluation would account for all of these considerations. Nonetheless, the question at hand is the existing literature on the measurable effects of state tax credits, warts and all, and employment is as good a measure as any to start with.

There are two types of papers in the literature (see the table), one which has estimated the effects of tax credits on the employment of recipient firms and the other that does so for the larger economy (usually the state or county). As noted when relevant, some of the studies bundled tax credits with other types of incentive. For these cases, however, tax credits were the dominant form of incentive. Before surveying this literature, it is worth looking at a recent paper looking at the where tax credits have tended to go.

As already noted, Bartik, among others, has suggested that for development incentives to be effective they should be targeted at distressed areas. A recent paper by Greenbaum, Russell, and Petras (2010) took this view as given and asked whether incentives have been directed toward distressed areas. They looked at data on three incentive programs in Ohio, including a statewide Job Creation Tax Credit (JCTC) program, which is available for businesses investing in the state, especially in distressed areas. The authors found that, despite the program's stated objective, the number of JCTC incentives per thousand employees was not related to any of several measures of economic distress.[8] They also found no evidence that the dollar value per thousand employees for the three programs combined was related to economic distress.

There are at least two opposing interpretations of these results. One could argue that the results demonstrate Bartik's point that the lack of evidence of the effectiveness of development incentives is because they have not been targeted appropriately. On the other hand, one could argue that, given that the stated objective of the program was to target distressed areas, the fact that this was not actually done demonstrates a systemic government failure. Despite the legislated objectives of the program, the incentives were directed elsewhere because of rent-seeking activities and political considerations.

6.A. Recipient-Firm Employment

One would think that development tax credits, particularly those linked directly to job creation, ought to at least increase the employment of the firms that receive them. As a testament to the weakness of the evidence in favor of these policies, however, the literature is ambiguous on this basic issue. In the debates preceding the allocation of incentives, the most oft-cited numbers are for the total number of new jobs that recipients claim that they will create after receiving the credits. This is not the relevant number, however, because it may well be that the recipient firm would have done nothing differently in the absence of the incentive. We would be more likely to expect an increase in employment if the amount of the incentive was tied to the actual increase in the number of jobs (rather than the planned number). Without a link between the level of incentive and jobs actually created, tax credits would likely increase the number of jobs only if the venture would not have been pursued at all without the incentives.

Gabe and Kraybill (2002) considered data on 366 establishments in Ohio that expanded their employment between 1993 and 1995. Of these establishments, 129 received some form of incentive from the state, and 101 of them received corporate tax credits under the Ohio JCTC Program. The dollar amount of the tax credit was not linked directly to the number of new jobs, but to the income taxes withheld for new workers.

The authors focused on two questions: Did firms that received incentives expand their employment more than they would have if they had not received the incentives? Did businesses that received incentives overstate the number of jobs they would create, perhaps so that they would receive larger incentive packages? Gabe and Kraybill concluded that the answers to these questions are, respectively, probably not and apparently so. Specifically, after controlling for a long list of factors that would affect employment levels, firms receiving incentives were found to have expanded by slightly less than they would have if they had not received the incentives (457 jobs versus 467 jobs, on average). On the other hand, the announced future expansions of firms that received incentives was 27 jobs higher, on average, than if they not received incentives.

Faulk (2002) estimated the effect that Georgia's JCTC had on employment in recipient firms. Unlike the Ohio program, Georgia's was linked directly to increases in the number of employees.[9] Georgia's program was also an entitlement, meaning that any firm that met a series of eligibility requirements could take the tax credit. To find the effect on recipients, Faulk exploited the fact that the majority of eligible firms did not claim any tax credits. After controlling for the variables that determined whether a firm chooses to participate, she compared the employment changes of the two sets of firms to determine the role played by the tax credit.

Faulk found that Georgia's job tax credit program did lead to higher employment in recipient firms. Specifically, recipient firms created about 25 percent more jobs than non-recipient firms. On the other hand, she also found that roughly three quarters of this difference would have occurred even if the program had not been in place. Put another way, of the $5 million that Georgia spent on the tax credits in the program, about $3.75 million was spent on jobs that would have been created anyway. If the entire increase in employment is used in the calculation, the cost per job of the program would be $630. If the jobs that would have been created anyway are subtracted out, the cost per job rises to around $2,500.

Luger and Bae (2005) examined the potential employment effects of a list of tax credit programs in North Carolina, taking a different approach from the earlier literature. Their simulation approach is much less data intensive than the econometric approaches that are more typical. As a result, it is potentially useful in projecting the effects of tax credit programs in advance, rather than waiting for several years after the fact to estimate the results.[10] They projected that, while North Carolina's various programs increased net employment in firms receiving tax credits, they did so at very high costs. Specifically, they calculated a per job cost $147,000 if the number of jobs that would have

been created without the programs were subtracted out. This is in contrast with a cost of about $5,000 per job if this correction were not done.

Sohn and Knaap (2005) examined whether a jobs creation tax credit program in Maryland increased employment in eligible located in distressed areas given special preference in the program. They found that the impact of the program was mild and sector-specific in that they found that only two of the five targeted sectors saw increased employment because of the tax credits. They also found, however, that the number of jobs attributed to the credits was nevertheless greater than the number of jobs for which credits were received. Their results are consistent with the influence of agglomeration effects under which job subsidies given to some firms led to increased employment in non-recipient firms within the same sector.

6.B. Total Employment

Studies like those summarized above, which looked at the effects of tax credits on recipient firms, are interesting because they can unlock some basic understanding about the programs. Specifically, they tell us that tax credits have not been found to lead to relatively large increases in employment even in the firms receiving them. While this is an important insight, the studies do not tell us very much about the welfare or efficiency effects of the tax credit programs. In the studies discussed in the preceding subsection, only the direct costs in terms of the value of the tax credits are considered when calculating the costs of the policy per job. The costs do not include any of the costs imposed on the rest of the local economy by the

diversion of labor and other resources to the subsidized firms. Any employment increases that are attributable directly to the programs can be offset by employment reductions elsewhere in the economy as labor and other resources become more expensive for firms not being subsidized.

For example, if the number of workers in an area is relatively fixed in the short run, then the additional number of workers that a recipient firm hires because of tax credits must come from elsewhere in the local economy. If they were all unemployed involuntarily, then the program has a net positive effect roughly equal to the number of jobs created by the recipient firms. But, if all of them were already employed elsewhere in the area, which is more likely the more skilled the workers are, then the net effect on employment is zero, or worse. The workers would be drawn from other firms, which might not survive because of the effect of the subsidy given to other firms competing with them over the same scarce resource. In the longer run, workers can move into the area to take the jobs created directly by the tax credits. The extent to which this occurs will determine the long run effects on the original residents of the targeted area.

Hoyt, Jepsen, and Troske (2008) looked at county-level data for Kentucky and examined whether higher levels of tax credits resulted in higher county employment growth. Their data were for the totals of all types of tax credits received by firms in each of 120 counties for every year from 1994 to 2005. After controlling for differences in demographics, school expenditures, and taxation, they found a small but statistically significant positive effect for tax

credits on employment. Specifically, a ten percent increase in tax credits would have increased county employment in the short run by about 0.013 to 0.015 percent. They also found, however, that most of this effect was due to expansions that occurred in counties bordering other states. In other words, tax credits had small effects for border counties as some establishments located in Kentucky instead of just over the border, but had almost no effect for interior counties.

Hoyt, Jepsen, and Troske also estimated the effects of worker training incentives and found that the impact per dollar was much higher than for tax credits. They suggested that this is because job training incentives result in the transfer of some general skills that are useful to all firms in a county, whereas tax credits are specific to the firms that receive them. Also, the employment data they used was for firms, meaning that the data do not indicate where the workers lived. When they used data on the local labor force instead of local employment, they found that the effect of tax credits was statistically insignificant for both border and interior counties. This suggests that a large percentage of the jobs created by the tax credits and worker training incentives went to people who lived in neighboring states and commuted into Kentucky to work. This result is consistent with the typical finding that the majority of jobs created by development incentives go to workers living outside of areas receiving the subsidy.

The tax credit programs of Michigan have received the most attention in the literature so far. The programs, administered by the Michigan Economic Growth Authority (MEGA), have been the

subject of three independent studies using very different methods and achieving sometimes very different results.

LaFaive and Hicks (2005) performed the first assessment of MEGA, using a time-series panel of Michigan counties.[11] They used data on all counties in Michigan for 1990-2003 and used their model to account for "long-run trends in the economy, the business cycle, labor force participation rates, and the impact of adjoining counties (p. 87)." In estimating their model they tried to control for selection bias due to the fact that MEGA credits are targeted to some extent at distressed counties. Without controlling adequately for selection bias it might be possible to misread any negative correlation between growth and tax credits as an effect of the credits rather than as a result of the mechanism for distributing them.

LaFaive and Hicks found that the effects of MEGA credits on county-level per capita income, employment, and unemployment rate were most often statistically no different from zero. In fact, they sometimes found the program to have had negative and statistically significant effects. For no county or variable did their results indicate a positive and statistically significant effect for MEGA credits. They cited four reasons why MEGA credits apparently did not work as its proponents had anticipated. First, the model that MEGA used to project the effects of the credits was seriously flawed; second, it is difficult to know whether tax credits are necessary for an employment expansion too occur; third, there were political incentives to use MEGA credits to claim credit for job growth; and fourth, the economy is too complex for

attempts at fine tuning to be successful. They concluded, unsurprisingly, that MEGA credits did not result in improved economic outcomes for Michigan as a whole.

LaFaive and Hohman (2009) reported an analysis of Michigan counties that focused on changes in manufacturing employment from 2001 through 2007. They used shift-share analysis to divide changes in each county's manufacturing employment into three parts: general trends in the Michigan economy, the performance of manufacturing in Michigan, and the performance of manufacturing in the county. They then compared the county-specific component of this analysis to the MEGA credits received by firms in the counties, finding a statistically significant *negative* relationship. Specifically, a $1 million dollar increase in tax credits was associated with the loss of 95 jobs in a county. The authors did not claim that they had proven a negative causal link between MEGA tax credits and manufacturing employment, but they did claim that such a link is possible and provide several reasons why.

Bartik and Erickcek (2010) took issue with the results of LaFaive and Hicks (2005) and LaFaive and Holman (2009), claiming that their statistical approaches did not adequately address potential selection bias.[12] Bartik and Erickcek's own approach was to first calculate the direct job effects for firms that received MEGA credits and to then insert these numbers into a forecasting model that they used to represent the dynamic structure of Michigan's economy. The result of this effort is the claim by Bartik and Erickcek that MEGA credits produced a benefit per year of over $20,000 per job created while incurring an

average cost per year of less than $4,000. They attribute this success to "the program's emphasis on export-based, high-wage industries with strong local supplier links (p. 20)."

In evaluating the evidence on the effects of MEGA credits, we are left with a choice between two very different sets of results. On the one hand, the econometric approaches of LaFaive and his coauthors take data on actual changes in county employment and try to determine the parts that can be attributed to MEGA credits rather than to other factors. Bartik and Erickcek are right to be wary of these results because of the inherent difficulty in controlling for selection bias and the many factors that can affect employment growth. They are, however, far too cavalier in their dismissal of these results, especially in contrast with their unquestioning acceptance of their own approach, which is based on the REMI forecasting model.[13]

Although it is popular and used widely to analyze local economies, the REMI model relies on numerous assumptions—especially having to do with multiplier effects and government fiscal constraints—that would not find universal acceptance among economic forecasters.[14] In effect, Bartik and Erickceck's results depend on a model that assumes the market failure model of involuntary unemployment. In other words, instead of estimating whether or not tax credits led to increased employment, Bartik and Erickceck simply assume that there was a positive effect and then use the REMI model to find out how large the effect was. Although any econometric approach, including those used by LaFaive and others, have the potential to suffer from

statistical problems, they are do not rely on simply assuming positive effects of tax credits.

7. SUMMARY AND CONCLUSIONS

As summarized above, three prominent surveys of the wider literature concluded that there was, at best, modest evidence that development incentives have been effective in generating local economic activity. This evidence led one surveyor—Buss— to advise policymakers to be very cautious because of the uncertain effects of development incentives. The authors of the second survey— Peters and Fisher—were led by the same evidence to advise policymakers to abandon their efforts at micromanaging their local economies and focus instead on providing infrastructure and education. On the other hand, the author of the third survey— Bartik—held out hope that incentives could be effective if they were targeted at distressed areas, where they could do the most good.

The literature on state development tax credits, which amounts to the nine papers listed in the table at the start of the previous section is by no means large, although it has much in common with the wider literature on the effects of development incentives in general. As summarized by the table, the papers are not directly comparable to each other because they use different empirical approaches to study the effect of tax programs in different states and with different incentive structures. Nevertheless, along with the earlier literature on incentives in general, they are all we have to go on for now. The three general lessons to be derived from the literature are

- Tax credits have not generally been found to lead to increased employment even at firms that receive them. This result seems to depend somewhat on the incentive structure of the tax credit program.

- In some sectors and some localities, it is possible for tax credits to lead to increased employment in non-recipient firms. This suggests that agglomeration economies might play a limited role in determining the effectiveness of tax credits. The literature provides little to no guidance, however, as to when and where tax credits can be targeted for this purpose.

- State tax credits do not tend to lead to higher levels of employment for local residents, nor, by extension, do they lead to higher levels of employment for state residents.[15]

These lessons are consistent with the general literature on the, at best, lukewarm effects of development incentives on local employment. Keep in mind that the tax credit programs that have been examined are typically geared directly at job creation. This suggests that for states like Missouri, which tend to have dual-purpose tax credit programs, it would be difficult to find strong evidence that development tax credits have generate significant increases in overall economic activity.

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NOTES

[1] See Eberts (2005), who summarized the types of development incentives that are used, and Zheng and Warner (2010), who described how the mix of incentives has changed over time.

[2] Chirinko and Wilson (2010) and Wilson and Notzon (2009) provide summaries of their prevalence across states, and Thompson (2010) focuses on New England states.

[3] Information on the Missouri Tax Credit Review Commission, including its final report, can be found at its website.

[4] Comprehensive descriptions of Missouri's programs are available from the Committee on Legislative Research and in the briefing material for the Tax Credit Review Commission.

[5] Because nonoccupants cannot be charged directly for their consumption, there can be no equilibrium where the supply with the tax credit intersects the demand from occupants and nonoccupants.

[6] Note also that policies should avoid trying to reduce *frictional unemployment*, which is a reflection of natural turnover and job search.

[7] For research on other policies, see Bondonio and Greenbaum (2007) and Hansen and Kalambokidis (2010), who look at enterprise zones; Dalehite, Mikesell, and Zorn (2005) and Reese, Larnell, and Sands (2010), who look at property tax abatement; and Mason and Thomas (2010), who look at tax increment financing.

[8] These are the unemployment rate, the poverty rate, percent minority, percent without a high school degree, and median housing value.

[9] Ihlanfeldt and Sjoquist (2001) provide a description of the various tax credit programs in place in Georgia at the time.

[10] Calcagno and Thompson (2004) have a highly stylized model to simulate the welfare effects of broad tax incentives. The advantage of their approach is that it is capable of calculating the effects of the incentives on the overall allocation of resources in an economy. These models become very technically advanced verquickly, and have not yet become a regular tool in the literature.

[11] These results are also found in LaFaive and Hicks (forthcoming).

[12] They also criticized a study by commissioned by the Michigan Education Association and the National Education Association that is not reviewed here because it is arguably neither independent nor academic in its approach (Anderson, Bolema, and Rosaen; 2010).

[13] The model is a product of Regional Economic Modeling, Inc.

[14] MEGA's own use of the REMI model has been criticized by LaFaive and Hicks (2005). See Mills (1993) for one description of the REMI model.

[15] This result is incompatible with Bartik's notion of large pools of involuntarily unemployed workers ready to be drawn into employment with proper incentives for employers. However, given the evidence that tax credits are not always targeted at distressed areas, this evidence is not entirely conclusive on this point.

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